

FTA



Headquarters

1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

October 14, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Approval and Resubmittals Required for Corrective Action Plans in Response to Special Directive 22-9, Workforce Capacity

Dear Mr. Poftak,

Thank you and your team for submitting the Massachusetts Bay Transportation Authority's (MBTA) Corrective Action Plans (CAPs) for the Federal Transit Administration's (FTA) Special Directive (SD) 22-9, Workforce Capacity. The MBTA submitted these CAPs on time as required in SD 22-9, addressing [FTA's four \(4\) findings and four \(4\) required actions](#).

Approval of CAP for Finding 4

FTA finds that MBTA's approach to addressing Finding 4 in SD 22-9, which recommends that MBTA review the inspection and resident engineering resources needed to ensure compliance with MBTA safety rules through additional staffing, contractor resources, or a combination of approaches, adequately addresses FTA's recommended action. FTA approves this CAP for implementation.

Resubmission Required for Findings 1, 2 and 3

FTA requires resubmittal for portions of MBTA's CAPs for Findings 1, 2 and 3. Collectively, these three Findings require a workforce analysis and associated workforce planning, recruitment and hiring to ensure MBTA's capability to perform mission-critical operations, maintenance, capital project delivery and safety certification in a manner which ensures the safety of passengers, employees, contractors, and infrastructure.

As noted in the attached evaluation table, FTA has identified several areas where further information and clarification is needed including:

- the make-up, structure, roles and responsibilities, and resourcing of the working groups charged with overseeing and managing these CAPs;

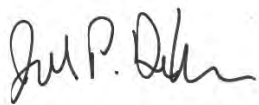
- MBTA's approach for collecting information from MBTA's frontline personnel and technical and executive leadership to support and inform the contractor's work for these CAPs;
- MBTA's approach for briefing MBTA's executive leadership team and the MBTA board and ensuring their ownership of the results of the contractor work managed by the designated working groups; and
- interim actions that MBTA may be taking to address non-compliance with existing safety procedures and plans discussed in FTA's findings.

FTA requests that MBTA revise and resubmit its CAPs for these three Findings to include the additional information requested in the evaluation table by no later than **Friday, November 4, 2022**.

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our CAP Reviewer, Cyrell R. McLemore, by phone at (770) 200-8022 or by email at cyrell.mclemore@dot.gov, or our SMI Coordinator, Erin Powell, by phone at (770) 200-8016 or by email at Erin.Powell@dot.gov, with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Erik Stoothoff, Acting Chief Operating Officer, MBTA
Ron Ester, Chief Safety Officer, MBTA
Katie Choe, Chief of Quality, Compliance and Oversight, MBTA
Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of Public Utilities



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1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

October 28, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Resubmittals Required for Corrective Action Plans in Response to Special Directive 22-10,
Prioritization of Safety Management Information

Dear Mr. Poftak,

Thank you and your team for submitting the Massachusetts Bay Transportation Authority's (MBTA) Corrective Action Plans (CAPs) for the Federal Transit Administration's (FTA) Special Directive (SD) 22-10, Prioritization of Safety Management Information. The MBTA submitted these CAPs on time as required in SD 22-10, addressing [FTA's six \(6\) findings and 17 required actions](#).

Resubmission Required for CAPs for Findings 1 through 6

As documented in the attached evaluation matrix, FTA requires resubmittal of MBTA's CAPs for Findings 1 through 6. Collectively, these findings required MBTA to revise both its strategic and tactical approaches to Safety Management System (SMS) implementation. At the strategic level, FTA required MBTA Executive Leadership to provide direct and explicit guidance to operations and maintenance management, as well as the Safety Department, for the identification and elevation of safety information necessary to prioritize resources to address safety risks in MBTA operations. At the tactical level, FTA required MBTA Executive Leadership to work with operations and maintenance management and the Safety Department to establish and integrate the necessary structures, processes, and tools to support leadership safety priorities and implementation of MBTA's SMS.

As previously discussed with representatives of MBTA's Safety Department and Quality, Compliance and Oversight Office (QCOO), FTA's evaluation of MBTA's proposed CAPs finds that they are logically structured and sequenced. FTA is requiring resubmittal of the CAPs because FTA finds that MBTA has not provided sufficient details on how the organization will:

- direct and manage safety risk in the interim while work on these CAPs is being completed,
- ensure safety risk information is presented to Executive Leadership for resource prioritization,
- coordinate updates to SMS processes, tools, and activities with updates to MBTA's Agency Safety Plan, and
- identify and monitor safety risk through safety assurance activities and event investigations.

As noted in the attached evaluation table, additional milestones should be included to clarify the accountabilities of Executive Leadership and their role in the development, implementation, and oversight of action items and CAPs for SD 22-10. Ultimately, Executive Leadership is accountable for MBTA's SMS and for defining the information and data used to support decision making, including the prioritization of safety risk.

The CAPs should also be revised to explain how MBTA's personnel, including the Safety Department, QCOO, Steering Committees, Working Groups, Departmental and Executive Leadership and contractors will engage with FTA and the SMI team in Bi-Weekly Meetings and during verification activities. The CAPs do not clearly indicate how this engagement will occur.

Given the scope of MBTA's proposed reliance on consultant support, FTA finds that additional milestones and action items are needed to ensure integration of consultant work into MBTA's safety management processes, activities, and outputs. Without this additional clarification, in the event of poor contractor performance or lack of dedicated MBTA oversight, these CAPs may be at risk for non-compliance or unsuccessful project delivery. FTA has requested additional milestones and actions in the attached evaluation matrix. **Please note that FTA will require that MBTA provide a presentation explaining the approach and the RFP or Task Order for consulting services to FTA two weeks prior to its release so that FTA may ensure the Findings are sufficiently addressed.**

As discussed previously with you, FTA remains concerned regarding the sufficiency of resources to oversee and manage both contractor and MBTA agency-wide work for these CAPs. Finally, MBTA has not provided sufficient information on how corrective actions will be integrated across the six findings (as well as related findings from other Special Directives).

To address these concerns FTA requires MBTA to resubmit its proposed CAPs for Findings 1 through 6 by Friday November 18, 2022. The revised CAPs must include additional action items that address how the agency will mitigate key safety concerns identified in FTA's SMI report in the interim while contractor or agency work proceeds. FTA has provided specific comments in the attached evaluation table to support development of these additional action items.

As part of the resubmittal of CAPs, MBTA must also include action items that demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change. MBTA also must submit a Resource Memorandum to demonstrate how the relevant MBTA departments, including the Safety Department and QCOO, will resource, manage, and oversee work and contractor activities to complete CAPs for Findings 1 through 6 – within the context of current accountabilities and responsibilities.

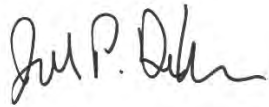
Also, please be advised that FTA will ask MBTA to provide a presentation regarding the

requirements to be included in the RFPs identified in the CAPs for Findings 1 through 6 during FTA's December on-site meetings (week of December 5, 2022),

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our SMI Coordinator, Erin Powell, by phone at (771) 200-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Erik Stoothoff, Acting Chief Operating Officer, MBTA
Ron Ester, Chief Safety Officer, MBTA
Katie Choe, Chief of Quality, Compliance and Oversight, MBTA
Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of Public Utilities



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Washington, DC 20590

SENT VIA EMAIL

October 7, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Resubmittals Required for Corrective Action Plans in Response to Special Directive 22-11, Effectiveness of Safety Communications

Dear Mr. Poftak,

Thank you and your team for submitting the Massachusetts Bay Transportation Authority's (MBTA) Corrective Action Plans (CAPs) for the Federal Transit Administration's (FTA) Special Directive (SD) 22-11, Effectiveness of Safety Communication. These CAPs address FTA's three (3) findings and seven (7) required actions:

Finding 1: MBTA has not established explicit and formal provisions to ensure safety information from safety committee results in a consistent outcome of documented, prioritized, and actionable safety information.

- FTA-22-MBTA-CAT3-1.A: MBTA must develop and describe, in the organization's SMS documentation, instructions regarding the conduct, recording, communication and follow up of the outcome consensus decisions specific for each of the following meetings - taking into consideration the nature (strategic or tactical) of each meeting:
 - Operations and Safety Biweekly call (currently every other Friday)
 - Operations and Safety weekly meeting (currently on Wednesdays)
 - Executive Safety Committee (ESC)
 - Safety Management Review Committee (SMRC)
 - Safety Management Working Groups (SMWGs)
 - Data Analysis Group (DAG)
 - Local Safety Committee Meetings
 - Joint Labor/Management Safety Committee (required by Bipartisan Infrastructure Law)
- FTA-22-MBTA-CAT3-1.B: In support of the above, MBTA must develop and describe, in

the organization's Safety Management System (SMS) documentation, a formal mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring.

Finding 2: MBTA has not documented explicit and formal provisions to ensure the participation of frontline employees in local safety committees as part of their job responsibilities in relation to the agency's SMS.

- FTA-22-MBTA-CAT3-2.A: MBTA must develop explicit and formal guidelines for the expected role and contribution of frontline employees to the local safety committee meetings.
- FTA-22-MBTA-CAT3-2.B: MBTA must develop instructions for the conduct of the meetings, including explicit departmental accountabilities for meeting outcome information capture, communication and follow up.

Finding 3: MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline.

- FTA-22-MBTA-CAT3-3.A: MBTA must expedite the development of an effective ESRP as a fundamental source of safety information for hazard identification and safety performance monitoring.
- FTA-22-MBTA-CAT3-3.B: As part of the development of an effective ESRP, MBTA must provide explicit direction to frontline employees on what to report and what not to report through the ESRP (including the safety hotline).
- FTA-22-MBTA-CAT3-3.C: As part of the development of an effective ESRP, MBTA must provide refresher training to stakeholder personnel on the role of employee safety reporting within SMS and the crucial contribution managers and supervisors play in the development of an effective safety reporting context.

MBTA submitted its CAPs by the deadline established in SD 22-11 (September 20, 2022), with one CAP for each finding, including associated required actions.

FTA Rejection of MBTA's CAPs for Findings 1, 2 and 3; Resubmission Required

FTA appreciates that MBTA proposes to conduct an extensive assessment and analysis to address the findings and required action specified in SD 22-11, allocating over \$4 million dollars in contractor services to review existing practices, complete gap analyses, and develop new charters, tools, and training. These CAPs lay out a thorough and thoughtful work plan for addressing MBTA's objectives.

However, the MBTA proposed timeline for full implementation extends into 2023 and does not address or include interim steps that plan for the management for the issues identified in SD 22-11. FTA finds that this additional information must be included in the CAPs to ensure mechanisms for

frontline and supervisory employees to access the MBTA's Safety Management System (SMS) and Safety Committee structure during CY 2023.

MBTA also is proposing an extensive program of contractor work to be managed and overseen by the Safety Department and the Quality, Compliance and Oversight Office (QCOO). FTA is concerned that these departments may not have the staff to adequately oversee this work. Therefore, FTA requires additional information from MBTA regarding the capacity of these departments to manage these contracts.

Finally, the CAPs propose contractor work products and activities that, once completed, must be effectively integrated into MBTA's organization and operations in order to resolve FTA's concerns. FTA requires additional details regarding how this transition will be accomplished, as described below and in the attached CAP evaluation matrix.

FTA requests that MBTA revise and resubmit certain CAPs to include the additional items as follows:

1. **Interim Plan for FTA-COM-22-001 and FTA-COM-22-002: By Friday, October 28, 2022,** FTA requests an interim plan for FTA-COM-22-001 and FTA-COM-22-002 that shows the actions that the MBTA will take in the interim (for CY 2023) to ensure that the Safety Meetings specified in the Agency Safety Plan (ASP) are conducted and that decisions and relevant safety information are recorded and followed up on, particularly for Local Safety Committees, as discussed in the SMI report.

CAPs FTA-COM-22-001 and FTA-COM-22-002 each contain an Action Item¹ that states "Revise the Transit Safety Plan (ASP) to reflect modifications to the safety meeting structure, procedures, and recordkeeping requirements," and shows an estimated end date of December 31, 2022, indicating this action will soon be underway. However, neither CAP specifies what modifications will be made to the "safety meeting structure, procedures and recordkeeping requirements" in the ASP for CY 2023, before the new process is developed and implemented.

FTA is concerned regarding a potential and significant reduction in opportunity for frontline employees to provide critical input on safety issues through the end of December 2023. Such a change would not address the intent of the FTA's finding, which is to ensure that MBTA employees, including frontline and supervisory personnel, have the opportunity to formally discuss safety issues and concerns as part of the MBTA's SMS and safety committee structure. This finding also ensures that MBTA's SMS has the structure in place and capability to identify, assess, and mitigate the safety risk associated with issues and concerns from frontline staff.

FTA requests this interim plan to understand how MBTA plans to modify this structure in its ASP and how these committees and related processes will be structured prior to the implementation of the new approach.

2. **Interim Plan for FTA-COM-22-003: By Friday, October 28, 2022,** FTA requests an interim

¹ For FTA-COM-22-001, Action Item 15. For FTA-COM-22-002, Action Item 8.

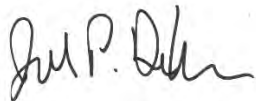
plan for FTA-COM-22-003 that explains how the MBTA will ensure that employees understand how to use the existing Employee Safety Reporting Program (Safety Hotline and other options), including what to report and what not to report, while the new approach is being developed and implemented. This interim plan must address items specified in FTA's attached evaluation table for this CAP.

3. Resource Memorandum: By Friday, October 28, 2022, for FTA-COM-22-001, FTA-COM-22-002, and FTA-COM-22-003, FTA requests a memorandum clarifying how MBTA's Safety Department and QCOO will oversee the work to be performed by the contractor(s) for these three CAPs, ensuring the adequacy of contractor work, coordination of multi-departmental review activities, and quality in meeting MBTA's objectives for the work. FTA remains concerned regarding the high vacancy rate in the Safety Department and FTA also recognizes that QCOO is a new office still being staffed. This information may be compiled in a single memo for the three CAPs (FTA-COM-22-001, FTA-COM-22-002, and FTA-COM-22-003), or separate memos may be issued for each CAP.
4. Transition Plan for FTA-COM-22-001, FTA-COM-22-002 and FTA-COM-22-003: By Friday, October 28, 2022, FTA requests a transition plan for FTA-COM-22-011, FTA-COM-22-002 and FTA-COM-22-033 to demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change. FTA prefers that separate transition plans are issued for FTA-COM-22-001, FTA-COM-22-002, and FTA-COM-22-003.

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our SMI Coordinator, Erin Powell, by phone at (202) 366-2164 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Ron Ester, Chief Safety Officer, MBTA
Katie Choe, Chief of Quality, Compliance and Oversight
Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of Public Utilities



Headquarters

1200 New Jersey Avenue, SE
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SENT VIA EMAIL

November 10, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Approval of Resubmitted Corrective Action Plans in Response to Special Directive 22-11, Effectiveness of Safety Communications

Dear Mr. Poftak,

Thank you and your team for submitting updated Corrective Action Plans (CAPs) to address comments from the Federal Transit Administration (FTA) regarding the initial CAP submittals from the Massachusetts Bay Transportation Authority (MBTA) to address Special Directive 22-11, Effectiveness of Safety Communication. FTA received this resubmittal on time as requested in FTA's response letter, dated October 7, 2022.

Approval of Resubmitted CAPs for Findings 1 through 3

FTA approves MBTA's resubmitted CAPs for Findings 1, 2, and 3. Collectively, these three findings require action from the MBTA to improve management of its safety committee process, employee safety reporting program, and safety promotion activities.

For Finding 1, MBTA's new Action Item 1.b addresses FTA's concern regarding how MBTA will manage its Safety Committee meetings in Calendar Year 2023 while the agency develops, assesses, and implements transformative enhancements. In this new action item, MBTA specifies its interim plan for improving Safety Committee meetings, updating, and circulating new procedures and meeting materials, and utilizing inhouse and contractor resources to directly participate in all meetings and review meeting minutes and logs for actionable items requiring escalation to appropriate management committees or initiation of safety risk management or safety assurance activities. Also, for Finding 1, FTA notes new Action Item 15.a, which states MBTA will update its Agency Safety Plan by December 31, 2022, with short term actions taken to enhance Safety Committee attendance and utility, while the agency undertakes and completes the study of final committee structures.

In response to Finding 2, MBTA included new Action Item 1.b to carry out the steps outlined in the MBTA's Interim Action Memo to increase frontline worker participation in the Safety Committee meetings by increasing awareness of the meetings, improving documentation and record keeping, and updating committee meeting procedures. This new Action Item also ensures that these improvements will be incorporated into MBTA's Agency Safety Plan update by December 31, 2022.

For Finding 3, MBTA included new Action Item 1.b which includes the development of a "Toolbox Talk" document summarizing the requirements of the existing Employee Safety Reporting Program and providing explicit directions and examples of what are appropriate items to report via the Safety Hotline. MBTA's interim action steps note that the Toolbox Talk is to be delivered to the workforce, physically posted in worksites, and adapted for display on internal MBTA video communications boards. Also, for Finding 3, new Action Item 3.b states that MBTA will collaborate with the Joint Labor- Management Safety Committee to review the updated processes and materials and collaborate on strategies to ensure frontline employee input.

Finally, for Findings 1, 2, and 3, MBTA identified additional actions being taken to ensure sufficient staff capacity, including the following:

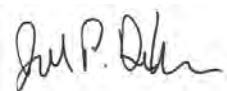
- fully staffing the Quality, Compliance, and Oversight Office (QCOO) by the end 2022;
- continuing to build the MBTA's Safety Department, with the hiring of at least 10 of 22 vacancies by the end of the year;
- hiring of a project management consultant to support QCOO, the Safety Department, and the MBTA Senior Directors ultimately responsible for the CAPs in executing on CAP activities and milestones; and
- solicitation of subject-matter expert contractors to work with MBTA staff to complete CAP activities and integrate them into MBTA processes and practices.

Based on FTA's analysis of MBTA's proposed CAPs for these findings, FTA finds that the resubmitted CAPs for Findings 1, 2 and 3 adequately address FTA's required action. **FTA approves MBTA's CAPs for Findings 1, 2, and 3 for implementation.**

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our SMI Coordinator, Erin Powell, by phone at (771) 200-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Ron Ester, Chief Safety Officer, MBTA
Katie Choe, Chief of Quality, Compliance and Oversight
Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department
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SENT VIA EMAIL

October 21, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Approval and Resubmittals Required for Corrective Action Plans in Response to Special Directive 22-12, Operating Conditions and Policies, Procedures, and Training

Dear Mr. Poftak,

Thank you and your team for submitting the Massachusetts Bay Transportation Authority's (MBTA) Corrective Action Plans (CAPs) for the Federal Transit Administration's (FTA) Special Directive (SD) 22-12, Operating Conditions and Policies, Procedures, and Training. The MBTA submitted these CAPs on time as required in SD 22-12, addressing [FTA's seven \(7\) findings and 19 required actions](#).

Approval of CAPs for Findings 4, 5, 6 and 7

FTA approves MBTA's CAPs for Findings 4, 5, 6, and 7. Collectively, these CAPs focus on the evaluation and enhancement of operations and maintenance training; the development of tools and checklists to support maintenance; the strengthening of the MBTA's mentoring program for rail transit employees; and the elimination of radio dead spots. Based on FTA's analysis of MBTA's proposed CAPs for these findings, FTA finds:

- MBTA's approach to addressing Finding 4 in SD 22-12, which requires MBTA to conduct a training needs assessment for rail transit operations and maintenance departments, to include emergency response training, and to implement the results, while considering the use of technology and information management tools, adequately addresses FTA's required action.
- MBTA's approach to addressing Finding 5 in SD 22-12, which requires MBTA to review its existing maintenance rules and procedures; identify opportunities for tools and checklists to support employees in carrying out maintenance rules and procedures, including frontline employee participation; and develop, distribute, maintain, and update these materials,

adequately addresses FTA's required action.

- MBTA's approach to addressing Finding 6 in SD 22-12, which requires MBTA to evaluate and enhance its existing rail transit employee mentoring program and to consider opportunities to support the professional development of rail transit operations personnel, adequately addresses FTA's required action.
- MBTA's approach to addressing Finding 7 in SD 22-12, which requires MBTA to confirm radio dead spots with frontline motorpersons and maintenance workers and improve the performance of its radio system in these dead spots, adequately addresses FTA's required action.

FTA approves MBTA's CAPs for Findings 4, 5, 6, and 7 for implementation.

Resubmission Required of CAPs or Findings 1, 2 and 3

FTA requires resubmittal of MBTA's CAPs for Findings 1, 2 and 3. Collectively, these three findings require MBTA to ensure each MBTA department identifies, reviews and addresses non-compliance with key rules and procedures critical to the safety of activities performed by the department, and also reports results to the Safety Department and Executive Leadership; to develop and implement an approach to monitoring operations and maintenance activities to enable the analysis and understanding of situations of non-compliance; and to develop and implement an independent quality assurance and quality control function.

Based on FTA's analysis of MBTA's proposed CAPs for these findings, FTA finds extended milestones for implementation of action items that push CAP completion for these findings into the end of Calendar Year 2025 and the first quarter of Calendar Year 2026. **Some of the action items identified in the CAPs, and some of the timeframes, may create substantial risk of non-compliance or unsuccessful project delivery without the opportunity for FTA to review the MBTA's progress in shorter intervals. FTA has requested additional milestones and actions in the attached evaluation matrix.**

FTA also finds the proposed CAPs lack milestones that address how critical safety issues identified in FTA's SMI report will be managed in the interim. FTA cannot approve these CAPs until **MBTA provides additional detail regarding actions underway immediately to address safety risk identified in the FTA's SMI report.**

Further, because MBTA proposes the extensive use of contractors, FTA finds that **additional milestones and action items are needed to ensure integration of consultant work into MBTA's operations and maintenance.** Finally, FTA is concerned about the **sufficiency of resources to oversee and manage both contractor and MBTA agency-wide work for these CAPs.**

FTA also needs to understand how MBTA's personnel, including QCOO, the Safety Department, Steering Committees, Working Groups, Departmental and Executive Leadership and contractors, **will engage with FTA and the SMI team in Bi-Weekly Meetings and during verification activities.** The CAPs do not clearly indicate how this engagement will occur.

To address these concerns, FTA requires MBTA to resubmit its proposed CAPs for Findings 1, 2

and 3 to include additional Action Items that address how the agency will mitigate key safety concerns identified in FTA's SMI report in the interim while contractor or agency work proceeds. FTA has provided specific comments in the attached evaluation table to support development of these additional Action Items.

FTA requires MBTA to include additional Action Items as part of the resubmittal of CAPs for Findings 1, 2, and 3 that demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change.

MBTA also must submit a Resource Memorandum to demonstrate how the relevant MBTA departments, including the Safety Department and the Quality, Compliance and Oversight Office (QCOO), will resource, manage, and oversee work and contractor activities to complete CAPs for Findings 1, 2, and 3 – within the context of current accountabilities and responsibilities.

Finally, FTA requires MBTA to submit an Engagement Plan to clarify how MBTA personnel, committees and working groups, and contractors will engage with FTA through the performance of these CAPs.

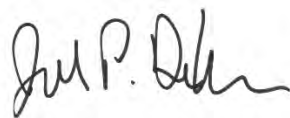
FTA requires that MBTA resubmit the proposed CAPs and provide the other required information by **Monday, November 14, 2022**.

Also, please be advised that for FTA's December on-site meetings (week of December 5, 2022), FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFPs identified in the CAPs for Findings 1, 2, and 3.

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our SMI Coordinator, Erin Powell, by phone at (771) 200-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Erik Stoothoff, Acting Chief Operating Officer, MBTA

Ron Ester, Chief Safety Officer, MBTA

Katie Choe, Chief of Quality, Compliance and Oversight, MBTA

Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of Public Utilities

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-9: Managing the Impact of Operations, Maintenance and Capital Projects Requirements on the Available Workforce

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
FTA-22-9-MBTA-CAT1-1	<p><u>Finding:</u> MBTA's staffing levels are not commensurate with the demand for human resources required to carry out current rail transit operations and maintenance in addition to executing capital program activities.</p> <p><u>Required Action:</u> MBTA must conduct and submit to FTA a workforce analysis and associated workforce planning to include:</p> <p>1. <i>Required activities that must be performed for rail transit operations, maintenance, and capital projects delivery:</i> A description of present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital project delivery through the next five fiscal years.</p> <p>2. <i>Required resources to perform mission-critical activities:</i> A description of the assignment of the</p>	<p>1. Develop a working group to lead consultant engagement for workforce assessment and five-year hiring plan: Establish a Workforce Assessment Working Group (WAWG) comprised of stakeholder groups that will work collectively to partner with, support, and oversee the consultant contracted to create the authority-wide workforce assessment and five-year hiring plan.</p>	10/15/2022	<p>Action Required</p> <p>FTA understands that the WAWG is designed to ensure MBTA's ownership and direction for the contractor work solicited for this CAP. Before approving this CAP, FTA needs to better understand the membership of the WAWG, including any Administrative, Executive and Technical Leadership, Safety Department, QCOO, and Union/Frontline Team Members, roles and responsibilities and resourcing for the WAWG to oversee the CAP.</p> <p>Please provide additional information on the WAWG to address these items in the CAP. Also please include how frequently the WAWG will meet and anticipated meeting structure and length.</p> <p>Finally, to ensure agency ownership and buy-in, please also note how the WAWG will periodically brief Executive Leadership and the MBTA Board on SD 22-9 activities.</p> <p><u>Note:</u> Please ensure meeting agendas and action items are developed and tracked. FTA will</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-9: Managing the Impact of Operations, Maintenance and Capital Projects Requirements on the Available Workforce

	necessary human resources to support present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital project delivery through the next five fiscal years per the description above.			review as part of its verification activities.	
	3. <i>Current staffing capabilities for mission-critical activities:</i> The results of an assessment of MBTA's ability to safely operate, maintain, and complete capital project delivery for its rail transit system at current service levels of workforce.	2. Procure consulting services: Issue an RFP for consulting services to review industry best practices, define scope of required actions to support day to day operations, maintenance, and capital support, identify required resources to support identified activities, evaluate current staffing levels to support mission-critical activities, and perform a safety risk assessment. Scope will also include the hiring plan specified in SD 22-9 Finding 2.	11/10/2022	Action Item Approved	
	4. <i>Safety case for mission-critical activities that can be performed within current and projected resources over the next five fiscal years:</i> The identification of safety risk associated with current staffing shortages and how	3. Strategic Planning Session: Conduct a strategic planning session for SD 22-9 Finding 1 CAP implementation with the WAWG identified in Actionable Item #1.	10/31/2022	Action Item Approved <u>Note:</u> Please document strategic planning session results and submit to FTA as part of this Action Item.	
		4. Onboard consultant: Onboard selected consultant.	1/17/2023	Action Item Approved	

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	they are or will be mitigated and any needed changes or reductions in activities.	5. Establish required activities and define key terms: Develop list of required activities that must be performed to support safe operations, maintenance, and capital project delivery. Establish and agree on the operational definitions of key terms, such as “mission-critical” and develop the criteria for assessing safety risk.	2/23/2023	Action Item Approved	
		6. Prepare and review first draft of workforce assessment: Consultant will prepare and deliver to the MBTA for review a first draft of the initial workforce assessment.	4/27/2023	Action Required Please include that the contractor will collect information from subject-matter expertise throughout the MBTA, including frontline and supervisory personnel, in developing the workforce assessment. Also, please clarify who within the MBTA will review and approve the draft and final workforce assessment and the role of the WAWG in supporting this activity. Action Item #10 clarifies that “MBTA leadership will formally sign off on the assessment.” Please clarify who “MBTA leadership” includes. Finally, for ultimate success, FTA believes that the MBTA Board also must understand and accept this	

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				assessment. Please indicate how they will confer their approval of this assessment.	
		7. Establish resource needs for mission- critical activities and current staffing capabilities for mission-critical activities: Consultant will complete and deliver to the MBTA a revised draft of the initial workforce assessment, establishing resource needs for mission-critical activities and assessing current staffing capabilities for mission-critical activities.	5/31/2023	Action Item Approved	
		8. Prepare and review first draft of safety risk assessment: Consultant will prepare and deliver to the MBTA a first draft of the workforce safety risk assessment for review by the MBTA.	7/31/2023	Action Required Clarify who at MBTA will review and approve the safety risk assessment (WAWG? Safety Department?) and how these reviews likely will be scheduled and managed (workshop or meeting?) and who has authority for final acceptance. Also, please clarify the role of the General Manager, Executive Leadership Team and MBTA Board in reviewing, commenting on and/or	

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				accepting the draft and final safety risk assessments.	
		9. Finalize safety risk assessment: Consultant will complete and deliver to the MBTA a revised draft of the workforce safety risk assessment.	8/31/2023	Action Required See comment above regarding FTA's request for addition clarification regarding roles and responsibilities for MBTA's WAWG, Safety Department and Executive Leadership Team.	
		10. Final MBTA internal review and sign-off of workforce assessment: MBTA senior leadership will review the workforce assessment and work with the consultant(s) to address any outstanding issues that may prevent successful utilization of the workforce assessment. Following successful finalization of the assessment, MBTA leadership will formally sign off on the assessment.	9/28/2023	Action Item Approved See comment for Action Item #6 above, requesting additional clarification on "MBTA leadership."	

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		11. CAP Verification: MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.	Ongoing	Action Item Approved	
FTA-22-9-MBTA-CAT1-2	<u>Finding:</u> MBTA has not demonstrated the organizational capacity to recruit and hire personnel to meet authorized staffing levels. <u>Required Action:</u> MBTA must develop and implement a recruitment and hiring plan to address findings from its workforce analysis and associated workforce planning for at least a five-year period, including how it will expand its capabilities for recruiting and hiring personnel to fill operations, maintenance, and capital project delivery positions.	1. Develop a working group to lead consultant engagement for workforce assessment and five-year hiring plan: Establish a Workforce Assessment Working Group (WAWG) comprised of stakeholder groups that will work collectively to partner with, support, and oversee the consultant contracted to create the authority-wide workforce assessment and five-year hiring plan.	12/15/2022	Action Required Please clarify if this is a separate WAWG from the WAWG established for the previous finding, or a sub-group, or the same group established for FTA-22-9-MBTA-CAT1-1. Also, please see FTA's comment on Action Item #1 from the previous finding regarding the composition, structure, and meeting schedule for the WAWG, and WAWG engagement with MBTA executive leadership and MBTA Board.	
		2. Procure consulting services: Issue an RFP for consulting services. Scope to review industry best practices and develop a five-year recruitment and hiring plan to support the workforce assessment developed under the corrective action plan for	11/10/2022	Action Item Approved	

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		SD 22-9 Finding 1 will be included in the procurement for consulting services undertaken as part of SD 22-9 Finding 1 corrective action plan.			
		3. Strategic Planning Session: Conduct a strategic planning session for SD 22-9 Finding 2 CAP implementation with the WAWG identified in Actionable Item #1.	12/15/2022	Action Item Approved	
		4. Onboard consultant: Onboard selected consultant.	1/17/2023	Action Item Approved	
		5. Review mid-year progress on FY23 Hiring Plan: The MBTA will monitor progress with the FY23 Hiring Plan and submit a copy of the Q1 and Q2 FY23 Hiring Plan. This will also include an overview of the Safety Prioritization Framework that was used to establish the hiring plan as well as supporting data used to establish monthly HR capacity targets. With the implementation of the first annual hiring plan, the MBTA will also submit a summary of lessons learned throughout the process. This summary will include an overview of	1/31/2023	Action Item Approved	

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		benefits, challenges, and useful metrics.			
		6. Review best practices: Conduct a review of hiring and recruiting best practices across transit agencies and other industries.	5/12/2023	Action Item Approved	
		7. Stakeholder engagement: Engage union leadership to identify areas for collaboration to address identified staffing needs.	8/18/2023	Action Item Approved	
		8. Prepare and review first draft of five-year hiring plan: Consultant will prepare and deliver to the MBTA a first draft of the five-year hiring plan. Draft is to include implementation plan to expand hiring, recruiting, and training capabilities, as needed, as well as documented processes to enable HR to sustainably maintain and update hiring plan moving forward.	12/1/2023	Action Item Approved	
		9. Finalize five-year hiring plan: Consultant will complete and deliver to the MBTA a revised draft of the five-year hiring plan.	1/15/2024	Action Item Approved	

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		10. CAP Verification: MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.	Ongoing	Action Item Approved	
FTA-22-9-MBTA-CAT1-3	<u>Finding:</u> Additional resources are needed to support MBTA's safety engineering and safety certification process for capital projects. <u>Required Action:</u> MBTA must modify safety engineering and certification requirements for its capital projects and vehicle procurements and ensure they are addressed through additional E&M and Safety Department staffing, contractor resources, or a combination of approaches. This may be done as part of the workforce analysis in Finding 1, or as part of a separate initiative.	1. Develop SMWG: Establish a Safety Management Working Group (SMWG) comprised of stakeholder groups that will inform, guide, and approve the work of this corrective action plan.	10/31/2022	Action Required Given that work on FTA-22-9-MBTA-CAT1-3 will not be completed until 6/30/2024, FTA requests additional information on what the MBTA will be doing in the interim to ensure safety certification for capital projects. Will there be additional contractor, E&M or Safety Department resources available to support the existing safety engineering and certification program through CY 2023 and into CY 2024? For example, is there an option for short term staffing to supplement safety engineering through contracted staff – as the MBTA proposes in Action Item #4 of FTA-22-9-MBTA-CAT1-4?	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22-9 Finding 3	11/30/2022	Action Item Approved	

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		CAP implementation with the working group identified in Actionable Item #1.			
		3. Procure Consulting Services: Develop and issue an RFP for consulting services to conduct a best practices review of safety engineering and certification activities, support the revision of the safety engineering and certification policy, develop and support training on the policy, and monitor the implementation of the policy.	12/19/2022	Action Item Approved <u>Note:</u> Please amend if contractor resources will also support existing program until it is updated.	
		4. Onboard Consultant: Onboard selected consultant.	3/3/2023	Action Item Approved	
		5. Best Practices Review: Conduct a best practices review that looks at safety engineering and certification practices inside and outside of the transit industry.	6/7/2023	Action Item Approved	
		6. Assess existing policy: Assess the existing Safety and Security Certification Policy and identify inconsistencies, needed changes and improvements to ensure that it is a process that can be utilized to verify a) safety-related requirements are incorporated into a project, b) the project is operationally	8/7/2023	Action Item Approved	

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		ready for revenue service, and c) the project is safe and secure for passengers, employees, public safety agencies, and the general public.			
		7. Update policy: Update the Safety and Security Certification Program to an agency-wide policy that will be used as the standard for all MBTA Capital Projects and Vehicle/System Procurements. It will address the issues identified in Actionable Item #6, as well as incorporate industry best practices.	10/6/2023	Action Item Approved	
		8. Workforce Assessment: Incorporate updated Safety Engineering and Certification Policy and procedures into the Workforce Assessment developed under SD 22-9 Finding #1 corrective action plan.	12/8/2023	Action Item Approved	
		9. Develop Training Materials: Develop training materials to ensure that all affected personnel are informed of the Safety and Security Certification Program requirements.	12/31/2023	Action Item Approved	

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		10. Recruitment and Hiring Plan: Incorporate updated Safety Engineering and Certification Policy and procedures into the Five-Year Recruitment and Hiring Plan developed under SD 22-9 Finding #2 corrective action Plan.	1/31/2024	Action Item Approved	
		11. Training of affected personnel: Training for all personnel involved in the Safety and Security Certification process.	6/30/2024	Action Item Approved	
		12. CAP Verification: MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	Ongoing	Action Item Approved	
FTA-22-9-MBTA-CAT1-4	<u>Finding:</u> MBTA requires additional oversight of contractor work sites. <u>Required Action:</u> FTA recommends that MBTA review the inspection and resident engineering resources needed to ensure	1. Establish Working Group: Establish a working group of internal stakeholders to review and guide implementation of the corrective action plan.	11/4/2022	Action Item Approved	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22- 9 Finding 4 implementation with the	12/7/2022	Action Item Approved	

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	compliance with MBTA safety rules related to the Right of Way to ensure the safety of personnel while in active work zones through additional staffing, contractor resources, or a combination of approaches.	working group established in Actionable Item #1.			
		3. Procure Consulting Services: Issue RFP or Task Order for consulting services to examine best practices for contractor oversight, review existing policies and procedures for contractor oversight related to right-of-way rules, and conduct a gap analysis of contractor oversight on MBTA projects.	12/31/2022	Action Item Approved	
		4. Short Term Staffing: Assess near term staffing needs and supplement through contracted staff as needed.	2/10/2023	Action Item Approved	
		5. Contractor Engagement: Engage contractors to enhance compliance with right-of-way rules and procedures.	3/15/2022	Action Item Approved	
		6. Onboard Consultant: Onboard selected consultant.	5/5/2023	Action Item Approved	
		7. Best Practices Review: Conduct a best practices review of contractor oversight procedures in Rights-of-Way.	7/10/2023	Action Item Approved	
		8. Review Oversight Policies and Procedures: Conduct a review of all policies and procedures related to	8/14/2023	Action Item Approved	

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		contractor oversight on the right-of-way, particularly focused on compliance with right-of-way safety rules.			
		9. Gap Analysis of Current MBTA Staff and Contractors: Conduct analysis of MBTA departments on Capital Projects to identify gaps in performance, staffing, roles and responsibilities. Will commence once best practices review is completed. Incorporate into Workforce Assessment conducted under SD 22-9 Finding #1 corrective action plan.	11/10/2023	Action Item Approved	
		10. Establish Recruitment and Hiring Plan: As documented in SD 22-9 Finding #1 corrective action plan, utilize adopted workforce assessment to develop a five-year strategic hiring and recruitment plan for positions deemed necessary to increase safety of personnel and assets on MBTA construction work sites.	3/15/2024	Action Item Approved	
		11. CAP Verification: MBTA departments will evaluate actionable items/deliverables before submission to FTA to	Ongoing	Action Item Approved	

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		confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.			
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Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
FTA-22-10-MBTA-CAT2-1	<u>Finding:</u> MBTA has not ensured that the necessary structures are in place to support effective implementation and operation of its SMS. <u>Required Action:</u> 1.A: MBTA must conduct a critical and comprehensive review of its entire SMS planning, implementation, and operational processes and activities to address the gaps discussed in this finding. 1.B: MBTA must update its SMS Implementation Plan to reflect the results of this review, including defined actions, timeframes, responsibilities, and expected outcomes.	1. Establish CAP Advisory Committee: Establish an advisory committee of internal stakeholders to review and guide implementation of the corrective action plan.	10/31/22	Action Required Provide FTA with a list of the identified internal stakeholders. Provide additional detail to explain how MBTA's CAP management personnel and, especially, Executive Leadership, will engage with FTA and the SMI team in meetings and during verification activities.	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22-10 Finding 1 CAP implementation with the advisory committee identified in Actionable Item #1.	12/31/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of this session.	
		3. Procure Consulting Services: Issue RFP or Task Order for consulting services to evaluate the Transit Safety Plan, SMS Implementation Plan, and SMS Implementation Project Plan in relation to safety management governance structure and incorporate changes into the relevant plan(s).	12/22/22	Action Required MBTA must provide a presentation explaining the approach and the RFP or Task Order for consulting services to FTA two weeks prior to its release.	
		4. Onboard Consultant: Onboard selected consultant.	2/20/23	Action Item Approved	

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Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				<u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		5. Review SMS Documents: Perform a comprehensive review and gap analysis of existing documents, processes, procedures, and tools to identify actionable steps requisite to the successful implementation of the SMS.	3/27/23	<p>Action Required</p> <p>Please revise the CAP to provide additional detail to address the specific deliverables for this item: developing a tool to guide the gap analysis, completing the gap analysis, and identifying actionable steps for SMS implementation. Also, please clarify how this last activity relates to item 6.</p> <p><u>Note:</u> FTA will ask MBTA to provide a copy of its gap analysis tool/activities.</p>	
		6. Identify Actions to Implement SMS: Identify clearly defined actionable steps required to fully implement the SMS.	5/19/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will ask MBTA to provide a copy of its action items.</p>	
		7. Revise SMS Project Planning: Specify responsible individuals, timelines, and outcomes in the SMS	6/8/23	Action Required	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		Implementation Project Plan for each SMS actionable step.		<p>Please provide additional detail in this action item (or add action items) to include:</p> <ul style="list-style-type: none"> • Submission of the SMS the Implementation Project Plan to the General Manager and Deputy General Manager for review, approval, and resourcing • Authorities, accountabilities, and responsibilities of MBTA personnel involved in managing and executing the project plan • MBTA's considerations and criteria for implementation sustainability. <p><u>Note:</u> FTA will ask MBTA to provide the plan for each actionable step.</p>	
		8. Develop Status Monitoring and Reporting: Develop ongoing status monitoring and reposting within the SMS safety management processes that provide project management controls to support resource allocation decision making.	6/28/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will ask MBTA to provide details on its status monitoring and reporting outputs.</p>	
		9. N/A – missing from CAP	N/A	N/A	
		10. Identify Tools and Processes for Data Collection, Analysis, and Monitoring: Identify	7/27/23	Action Required	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		tools and associated processes for the centralization of trends, assessments, and monitoring of hazards and safety risks.		Please provide additional detail related to identification activities and the source of reference. Please specify the deliverables and milestones, i.e., inventory and assessment.	
		11. Implement Tools and Processes for Data Collection, Analysis, and Monitoring: Implement tools and associated processes to ensure the centralization of trends, assessments, and monitoring of hazards and safety risks.	8/29/23	Action Required Please provide additional detail related to the implementation of tools including sign-off from Executive Management – with the intent to ensure cross-organization success. <u>Note:</u> FTA will ask MBTA to provide outputs from its data collection, analysis, and monitoring activities.	
		12. Assess Existing SMS Implementation: Perform, with the guidance of a stakeholder group, a comprehensive review of operational SMS activities, identify gaps in SMS understanding within business units, and socialize best practices related to SMS implementation.	9/29/23	Action Required Please revise the CAP to explain relationship between items 12 and 13 and the SMS gap analysis to be conducted under item 5 above. Please explain why this assessment is not occurring earlier in the process, to leverage operational input, taking into consideration business unit activities related to SMS.	
		13. Map Operational Process: Develop an operational process map for SMS implementation identifying roles and responsibilities,	10/26/23	Action Item Approved <u>Note:</u> FTA will ask MBTA to provide outputs from process mapping.	

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Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		process flows, and processes/linkages in need of further development.			
		14. Update Operational Process: Update operational processes and linkages to address gaps and weaknesses identified during the operational process mapping phase.	11/17/23	<p>Action Required</p> <p>Please provide additional details on how MBTA will integrate and manage the proposed updates to operational processes under this activity in conjunction with proposed procedural updates under SD-22-11 and 12.</p> <p>Also, please provide additional details on how the updated operational processes will be reflected in the MBTA's Transit Agency Safety Plan.</p>	
		15. Review Meeting Structure: Review existing meeting structure to support SMS implementation, including the SMS Working Group and key interdepartmental / executive safety meetings, and ensure that meeting membership, schedules, agenda items, and activities are adequate to support the standup and continued monitoring of the Authority's SMS.	12/15/23	<p>Action Required</p> <p>Please provide additional details on how MBTA will integrate this activity with the proposed assessment and changes to its safety committee structure under SD-22-11.</p>	

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Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		16. Update Meeting Structure: Revise existing meetings in accordance with the findings from the meeting structure review.	1/15/24	Action Required Please provide additional details on how MBTA will integrate this activity with the proposed changes to its safety committee structure under SD-22-11.	
		17. Update SMS Implementation and Project Plans: Revise the SMS Implementation Plan and SMS Implementation Project Plan.	2/2/24	Action Item Approved <u>Note:</u> FTA will ask MBTA to provide its SMS Implementation and Project Plans.	
		18. Update SMS Trainings: Perform a review of existing SMS training materials to ensure SMS principles and their accountabilities are defined.	3/1/24	Action Required Please provide additional detail regarding the specific deliverables and timeframes associated with this item. FTA would like to understand which trainings will be updated and/or developed and the milestone schedule.	
		19. Reissue SMS Trainings: Reassign all updated trainings to staff tasked with SMS responsibilities.	3/22/24	Action Required Please provide additional details related to how MBTA will carry out the training and ensure its effectiveness and sustainability.	
		20. CAP verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable	Ongoing	Action Item Approved <u>Note:</u> In coordination with item 14, please provide additional detail	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		evidence that the findings and the required action have been resolved, considering the scope and performance measures.		regarding how the updated SMS elements and training will be incorporated into the MBTA's Transit Agency Safety Plan.	
FTA-22-10-MBTA-CAT2-2	<u>Finding:</u> MBTA executive leadership does not receive prioritized and actionable information related to safety risks or shortcomings in safety risk mitigations. <u>Required Action:</u> MBTA leadership must: 2.1: Work with safety and operating department leads (including maintenance and engineering departments) to define explicit criteria for prioritizing safety risks. 2.2: Include explicit safety risk acceptance criteria into its Agency Safety Plan and/or reference documents. 2.3: Work with MBTA's Safety Department and operating department leads (including maintenance and engineering departments) to define how safety information must be presented to MBTA leadership	1. Establish CAP Advisory Committee: Establish an advisory committee of internal stakeholders to review and guide implementation of the corrective action plan.	10/31/22	Action Required Provide FTA with a list of the identified internal stakeholders. Provide additional detail to help FTA understand how MBTA's CAP management personnel and, especially, Executive Leadership, will engage with FTA and the SMI team in meetings and during verification activities.	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22-10 Finding 2 CAP implementation with the advisory committee identified in Actionable Item #1.	12/31/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of this session.	
		3. Procure Consulting Services: Issue RFP or Task Order for consulting services to evaluate the safety risk management process and incorporate changes into the Transit Safety Plan.	12/22/22	Action Required MBTA must provide a presentation explaining the approach and the RFP or Task Order for consulting services to FTA two weeks prior to its release.	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>in a prioritized and actionable manner.</p> <p>2.4: Require, and provide means for, operating department leads (including maintenance and engineering departments) to elevate proposed safety risk mitigations, including their status, that require MBTA leadership approval for resourcing. This must include safety risk mitigations deemed ineffective or inappropriate and that require executive level decision regarding the redirection of, or additional, resourcing.</p>	4. Onboard Consultant: Onboard selected consultant.	2/20/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.</p>	
		5. Develop Data Analysis Guidance: Develop formal methods and guidance for safety data analysis to ensure the proper interpretation of facts into usable safety information.	4/24/23	<p>Action Required</p> <p>Please provide additional detail regarding the specific deliverables and timeframes associated with this item. FTA would like to understand the steps MBTA will follow to develop formal methods and guidance for safety data analysis and the milestone schedule.</p> <p>FTA also would like to better understand how items 5 through 9 are related to items 5 through 9 in FTA-22-10-MBTA-CAT2-1.</p>	
		6. Define Safety Information for Escalation: Identify the types of safety information to escalate from the field to the next levels through the development of a safety	5/19/23	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		information evaluation and review process (see CAP 3).			
		7. Define Organizational Structure for Movement of Safety Information: Identify the process for the movement of safety information from the field to the next levels through the development of a safety evaluation and review process (see CAP 3).	6/22/23	Action Item Approved	
		8. Assess Safety Risk Prioritization/Process: Compile and review all existing tools and processes related to safety risk prioritization and the safety risk assessment process, including the safety risk assessment criteria.	7/7/23	Action Item Approved	
		9. Identify Gaps in the Safety Risk Prioritization/Process: Identify gaps in the existing tools and processes used to prioritize safety risks and perform safety risk assessments. Analyze variations in use of existing tools and processes and reasons for variation.	8/9/23	Action Item Approved <u>Note:</u> FTA will review the identified gaps to ensure consistency with FTA's findings and compliance with Part 673.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		10. Conduct Risk Prioritization Workshops: Plan and facilitate workshops with operations, maintenance, and engineering stakeholders to discuss criteria for prioritization of safety risks, process flows, and potential obstacles to and resolution of the implementation of new/expanded criteria.	9/14/23	<p>Action Required</p> <p>Please provide additional information regarding the number of workshops that will be conducted and how the MBTA will include frontline and leadership personnel.</p> <p><u>Note:</u> FTA may attend these workshops and will review agendas and meeting notes as well as developed process flows.</p>	
		11. Revise Risk Acceptance Procedure: Revise the risk assessment criteria and procedure, including the escalation process, to ensure its completeness, ease of use, and understanding among users.	10/13/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review the revised criteria and procedure.</p>	
		12. Create SMS Database SRM Module: Develop and launch the Civix Safety Risk Management module from its SMS database and familiarize management from key business units with the purpose and function of the centralized database for tracking of safety risk information as well as the status of mitigations.	2/2/24	<p>Action Required</p> <p>Please provide additional detail related to the development and incorporation of business requirements and MBTA's plan for testing the Civix SRM module.</p>	

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Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		13. Expand SMS Database Safety Assurance Module: Expand existing capabilities for risk mitigation monitoring by developing and deploying the Civix Safety Assurance module from its SMS database to support ongoing monitoring of the effectiveness of safety risk mitigations.	2/2/24	Action Item Approved <u>Note:</u> FTA will request a demonstration of the SMS database at incremental times as this work progresses.	
		14. Review Meeting Structure: Assess existing safety meeting structure to ensure that all management meetings incorporate risk-driven discussions of safety issues, that the safety risk assessment procedure and tools are used to prioritize and direct action on safety concerns, and that managers have opportunities to address ineffective safety risk mitigations.	11/13/23	Action Required Please provide additional details on how MBTA will integrate this activity with the proposed changes to its safety committee structure under SD-22-11.	
		15. Review SRM Training Materials: Review existing training related to the SRM process and assign updated training.	2/9/24	Action Item Approved	
		16. Update SRM Training Materials: Update existing training related to the SRM	3/8/24	Action Required	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		process and assign updated training.		Please provide additional details related to how MBTA will carry out the training and ensure its effectiveness. <u>Note:</u> FTA will review updated training.	
		17. Review Safety Assurance Training Materials: Review existing training related to the safety assurance process and assign updated training.	4/1/24	Action Item Approved	
		18. Update Safety Assurance Training Materials: Update existing training related to the safety assurance process and assign updated training.	4/28/24	Action Required Please provide additional details related to how MBTA will carry out the training and ensure its effectiveness. <u>Note:</u> FTA will review updated training.	
		19. Revise and Distribute Transit Safety Plan: Update and distribute the Transit Safety Plan.	7/1/24	Action Required Provide additional milestones and clarifications for how this review and update process will occur throughout the period of performance for the CAP.	
		20. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings	7/18/24	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		and this required action have been resolved, considering the scope and performance measures.			
FTA-22-10-MBTA-CAT2-3	<u>Finding:</u> MBTA Executive Management does not consistently ensure its decisions related to safety risks are based on safety data analysis or documented facts. <u>Required Action:</u> 3.A: MBTA must map its safety data flows and supporting processes. 3.B: MBTA must establish explicit accountabilities and responsibilities for safety data flows as a component of safety information management (collection, analysis, communication, storage, and retrieval of safety data). 3.C: MBTA must provide formal training in safety information management to relevant personnel. 3.D: MBTA must demonstrate that its executive management uses and promotes the usage of safety data analysis and/or	1. Establish CAP Advisory Committee: Establish an advisory committee of internal stakeholders to review and guide implementation of the corrective action plan.	10/31/22	Action Required Provide FTA with a list of the identified internal stakeholders. Provide additional detail to explain how MBTA's CAP management personnel and, especially, Executive Leadership, will engage with FTA and the SMI team in meetings and during verification activities.	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22-10 Finding 3 CAP implementation with the advisory committee identified in Actionable Item #1.	12/31/22	Action Item Approved <u>Note:</u> FTA may attend this session and will review agendas and meeting notes to assess implementation planning.	
		3. Procure Consulting Services: Issue RFP or Task Order for consulting services to evaluate existing data sources to facilitate development an explicit and formal safety data map.	12/22/22	Action Required MBTA must provide a presentation explaining the approach and the RFP or Task Order for consulting services to FTA two weeks prior to its release.	
		4. Onboard Consultant: Onboard selected consultant.	2/20/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	documented facts in decision-making related to safety risk.			<u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		5. Perform Data Inventory: Perform a comprehensive review of existing sources of safety data across the MBTA, including the basis for integration into Safety's SMS database.	1/3/23	Action Required Please provide additional detail regarding the specific deliverables and timeframes associated with this item. Please explain the steps MBTA will take to perform the data inventory and the milestone schedule. Please review the CAPs to explain how items 5 through 9 are related to items 5 through 9 in FTA-22-10-MBTA-CAT2-1.	
		6. Map Data Flow and Process: Develop an overall map of safety data sources, flows, and supporting processes, including all data types and processes necessary to support the SMS.	2/9/23	Action Item Approved <u>Note:</u> FTA will review safety data mapping.	
		7. Assess SMS Database Gap: In consultation with Civix, review the data flow and process map to identify gaps where the SMS database	3/16/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		currently may not be configured to support effective safety data management.			
		8. Improve SMS Database Capabilities: In consultation with Civix, ensure that all gaps identified during the comparison of the data flow map and SMS database capabilities are addressed via updates to the database software.	7/28/23	Action Required Please provide additional detail related to MBTA's testing criteria.	
		9. Identify Data Responsibilities: With the data flow and process maps as a guide, identify explicit accountabilities and responsibilities for all safety data flows, extending to data collection, analysis, communication, storage, and retrieval of data.	4/13/23	Action Item Approved	
		10. Document Responsibilities: Document accountabilities and responsibilities for safety data flows in the Transit Safety Plan, SMS database guidance, and related programs and procedures.	5/11/23	Action Item Approved <u>Note:</u> FTA will review updated accountabilities and responsibilities.	
		11. Inventory Training Materials: Perform a comprehensive	6/8/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		review of training materials to identify existing virtual trainings with relevancy to safety data flows and processes and SMS database use.		<u>Note:</u> FTA will review the safety data inventory.	
		12. Update Training Materials: Update and/or develop new virtual training materials to address gaps in existing trainings relative to the safety data flow map, ensuring that all management and staff receive explicit guidance regarding formal information management in the SMS database as well as their accountabilities and responsibilities related to safety data.	7/17/23	<p>Action Required</p> <p>Please provide additional details related to how MBTA will carry out the training and ensure its effectiveness.</p> <p><u>Note:</u> FTA will review updated training.</p>	
		13. Implement Executive Management Workshop: Facilitate a workshop with executive leadership regarding existing safety data analysis capabilities, gaps between existing activities and effective data/driven decision making, and opportunities for enhancements to safety data reports and products made available to senior leaders.	8/14/23	<p>Action Required</p> <p>Please clarify how and when Executive Management will provide direction on safety data needs to guide the safety data reporting process. The revised CAP should include a more explicit indication that Executive Leadership will provide criteria for safety information escalation and consistent reporting earlier in the process.</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				<u>Note</u> : FTA will review agendas and meeting notes to assess implementation of these sessions.	
		14. Review Safety Data Products: Informed by the results of the workshop and the safety data process mapping exercise, review existing safety data products including the monthly and annual Safety Data Analysis Report and daily/weekly data digests to identify opportunities for presentation of additional safety data analysis and data-supported facts.	9/12/23	Action Item Approved	
		15. Update Safety Data Products: Update and refine safety data products including the monthly and annual Safety Data Analysis Report and daily/weekly data digests to include expanded and clarified factual safety information with the goal of informing and supporting leadership risk management decisions.	11/8/23	Action Required Please clarify how and when Executive Management will review and provide comment on the safety data products. <u>Note</u> : FTA will review agendas and meeting notes to assess implementation of these sessions.	
		16. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable	11/24/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		evidence that the findings and this required action have been resolved, considering the scope and performance measures.			
FTA-22-10-MBTA-CAT2-4	<u>Finding:</u> MBTA's safety investigations and safety assurance activities do not consistently collect and analyze information on precursor factors. <u>Required Action:</u> 4.A: MBTA must update its Safety Assurance process to include monitoring of safety risk mitigations with a) compliance-based activities to provide the baseline for monitoring implementation status and b) performance-based activities to monitor the actual effectiveness of safety risk mitigations. 4.B: MBTA must prepare a monthly look-ahead schedule for prioritized safety risk monitoring activities that include safety risk mitigations and corrective actions in place to address MBTA's highest safety priorities.	1. Establish CAP Advisory Committee: establish an advisory committee of internal stakeholders to review and guide implementation of the corrective action plan.	10/31/22	Action Required Provide FTA with a list of the identified internal stakeholders. Provide additional detail to explain how MBTA's CAP management personnel and, especially, Executive Leadership, will engage with FTA and the SMI team in meetings and during verification activities.	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22-10 Finding 4 CAP implementation with the advisory committee identified in Actionable Item #1.	12/31/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of this session.	
		3. Procure Consulting Services: Issue RFP or Task Order for consulting services to evaluate the Transit Safety Plan, Risk Mitigation and Monitoring SOP, and Safety Event Investigation Manual in relation to mitigation monitoring and validation and safety investigation	12/22/22	Action Required MBTA must provide a presentation explaining the approach and the RFP or Task Order for consulting services to FTA two weeks prior to its release.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>4.C: MBTA must develop and document guidance, and deliver training for safety investigators that ensure the consideration of precursor factors in the analysis of the chain of events leading to a safety event (accident, incident, or occurrence), including but not limited to for example:</p> <ul style="list-style-type: none"> Suitability of resources available to frontline personnel for operational and maintenance activities Deficiencies in policies, procedures, rulebooks Outdated policies, procedures, and rulebooks Deficiencies/inadequacies in training shortcomings in supervision Deviations from procedures and rules reasons for lack of adherence to procedures and rules The limited success of discipline to address safety issues 	precursor factors and incorporate changes into the relevant plans.			
		4. Onboard Consultant: Onboard selected consultant.	2/20/23	Action Item Approved <u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		5. Review Tools and Processes for Risk Mitigation: Perform a comprehensive review of existing programs and standard operating procedures related to risk mitigation and monitoring, including Safety Department SOPs and external program documents such as the Safety Rules Compliance Program Manual.	3/30/23	Action Required Please provide additional detail to address the specific deliverables for this item: developing a tool to guide the comprehensive review and completing the review. Also, please clarify how this last activity relates to item 6. <u>Note:</u> FTA will ask MBTA to provide a copy of its review.	
		6. Update Tools and Processes for Risk Mitigation: Update Safety Department SOPs and external program documents in accordance with identified gaps.	5/4/23	Action Item Approved <u>Note:</u> FTA will review the updated Safety Department SOPs.	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		7. Identify Safety Assurance Activities: Identify safety assurance activities that ensure effective mitigations and completion of corrective actions.	6/8/23	Action Required Please provide additional detail to address the specific deliverables for this item. Also please explain how the MBTA will ensure the comprehensive identification of these activities.	
		8. Evaluate Capacity for Monitoring Risk Mitigations: Perform a review of existing Safety Department staff capacity for monitoring of safety risk mitigations and corrective actions to identify resources required to implement effective safety assurance activities.	7/17/23	Action Item Approved <u>Note:</u> FTA will review the capacity evaluation.	
		9. Define High Risk Mitigation and Corrective Action Criteria: Establish criteria that defines high risk mitigations and corrective actions that should be included in the safety assurance monitoring program.	8/21/23	Action Required Please provide additional detail to address the specific deliverables for this item. Also please explain how the MBTA will ensure the comprehensive identification of these activities.	
		10. Identify Safety Risk Monitoring Activities: Utilize Civix's Safety Assurance	9/26/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		modules within the SMS database to generate a one month look ahead report using defined criteria that identify high risk mitigations and corrective actions.			
		11. Schedule Safety Risk Monitoring Oversight: Schedule a monthly safety risk monitoring meeting, which utilizes the monthly look ahead report, to ensure timely oversight of safety risk mitigations and corrective actions.	11/1/23	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these meetings.	
		12. Develop Criteria for Risk Mitigation Activities: Establish, document, and implement explicit criteria to guide the application of safety assurance activities to risk mitigations, including the frequency and intensity of activities as well as the compliance- or performance-based nature of activities.	5/4/23	Action Required Please provide additional detail to address the specific deliverables for this item. Also please explain how the MBTA will ensure that criteria are comprehensive across the range of safety risk mitigations available to the MBTA.	
		13. Expand SMS Database Safety Assurance Module: Expand existing capabilities for risk mitigation monitoring by developing and deploying the Safety Assurance module of the Civix SMS database to	2/2/24	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		support ongoing monitoring of the effectiveness and completion of safety risk mitigations.			
		14. Review Investigation Tools: Perform a comprehensive review of existing program documentation to ensure precursors are adequately described to promote comprehensive safety investigation findings.	7/17/23	Action Required Please provide additional detail to address the specific deliverables for this item. Also please explain how the MBTA will ensure the comprehensive identification of precursors.	
		15. Update Investigation Tools: Update program documentation in accordance with identified gaps to ensure a complete list of precursors is specified for safety investigations.	8/21/23	Action Item Approved <u>Note:</u> FTA will review updated program documentation.	
		16. Update Investigation Trainings: Perform a review of existing investigation training materials to ensure precursors are adequately described such that they are appropriately selected during investigations.	10/3/23	Action Item Approved Please provide a list of the MBTA roles (and if they're staffed) that will participate in the review of the training materials. <u>Note:</u> FTA will review updated training.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		17. Reissue Investigation Trainings: Reassign all updated trainings to staff tasked with performing safety investigations and safety assurance activities to ensure proper selection of precursors.	11/16/23	Action Required Please provide additional details related to how MBTA will carry out the training and ensure its effectiveness. <u>Note:</u> FTA will review updated training.	
		18. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.	11/24/23	Action Item Approved	
FTA-22-10-MBTA-CAT2-5	<u>Finding:</u> MBTA's safety risk assessment guidance as part of its Safety Risk Management is ambiguous and has led to confusion among stakeholders regarding their responsibilities and authorities, which has created delays in carrying out safety risk assessments activities. <u>Required Action:</u>	1. Establish CAP Advisory Committee: Establish an advisory committee of internal stakeholders to review and guide implementation of the corrective action plan.	10/31/22	Action Required Provide FTA with a list of the identified internal stakeholders. Provide additional detail to explain how MBTA's CAP management personnel and, especially, Executive Leadership, will engage with FTA and the SMI team in meetings and during verification activities.	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22-10 Finding	12/31/22	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>5.A: MBTA must develop and document criteria for conducting safety risk assessments consistent with the basic principles of safety management and the tenants of SMS as conveyed in FTA's SMS guidance materials.</p> <p>5.B: MBTA must develop explicit direction for the ownership of safety risk assessments among the safety department and the operating departments. Documentation must include providing explicit roles, responsibilities, and thresholds of authority of each department involved.</p> <p>5.C: MBTA must include in the above criteria directives to ensure that operating departments including subject matter expertise, own safety risk assessments, while safety officials provide support for safety risk assessments and reports on results to Executive Leadership for safety resource allocation priorities.</p> <p>5.D: MBTA must expand its policy of establishing a predefined schedule of safety risk assessment workshops and</p>	5 CAP implementation with the advisory committee identified an actionable item #1.		<u>Note</u> : FTA will review agendas and meeting notes to assess implementation of this session.	
		3. Procure Consulting Services: Issue RFP or Task Order for consulting services to evaluate the safety risk assessment process and incorporate changes into the Transit Safety Plan.	12/22/22	Action Item Approved <u>Note</u> : FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFP prior to its release.	
		4. Onboard consultant: Onboard selected consultant.	2/20/23	Action Item Approved <u>Note</u> : FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		5. Define Criteria for Safety Risk Assessments: Develop criteria for conducting safety risk assessments utilizing FTA's SMS guidance materials, to ensure the safety risk assessment process is applied to all hazards where mitigations or corrective actions are required.	3/29/23	Action Required Please provide additional detail to address the specific deliverables for this item. How will the MBTA document these criteria?	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	develop criteria attuned with the nature of hazard identification (i.e., as they are identified), to expedite safety risk assessments to support prioritization for resource allocation.	6. Assess Roles and Responsibilities: Specify safety risk assessment roles, responsibilities, and thresholds of authority by department. Document these roles, responsibilities, and thresholds as appropriate, including in Safety, operations departments, and MBTA-wide policies and job responsibilities.	4/26/23	Action Item Approved	
		7. Assess SRM Personnel Support: Define appropriate staffing requirements to support safety risk assessments and incorporate into the safety risk assessment process.	5/24/23	Action Item Approved	
		8. Allocate Resources for SRM Workshops: Develop directives that apply to all departments that ensure the prioritization and allocation of required safety management resources for safety risk assessments.	6/22/23	Action Item Approved	
		9. Develop Risk Assessment Schedule: Develop and implement a defined schedule for risk assessment activities allowing for both expedited need-based	7/21/23	Action Item Approved <u>Note:</u> FTA will review the defined schedule.	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		assessments and planned assessments to create a comprehensive body of risk information incorporating critical functions and processes.			
		10. Engage Stakeholders to Identify Gaps in Training: Convene a stakeholder engagement group from all affected areas to understand gaps in training materials and training methods.	8/18/23	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of this session.	
		11. Update SRM Trainings: Update the training modules related to safety risk assessments based on results of the stakeholder engagements.	9/25/23	Action Item Approved <u>Note:</u> FTA will review updated training modules. Please provide a list of the MBTA roles (and if they're staffed) that will participate in the review of the training materials.	
		12. Assign SRM Trainings: Assign updated training modules to safety staff and external department stakeholders.	10/21/23	Action Required Please provide additional details related to how MBTA will carry out the training and ensure its effectiveness.	
		13. Revise Transit Safety Plan: Incorporate into the Transit Safety Plan modifications to the safety risk prioritization	12/31/23	Action Required Provide additional milestones and clarifications for how this review and	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		and safety risk assessment process.		update process will occur throughout the period of performance for the CAP.	
		14. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.	Ongoing	Action Item Approved	
FTA-22-10-MBTA-CAT2-6	<u>Finding:</u> MBTA safety information management tools (hazard log, safety risk mitigation log, etc.) do not fully support prioritization of resources to address safety risk and safety performance monitoring. <u>Required Action:</u> 6.A: MBTA must evaluate (and correct) the data contained in its hazard log and safety risk mitigation log for accuracy and relevancy to SMS. 6.B: MBTA must expedite the build out of its safety risk and safety risk mitigation monitoring information tools.	1. Establish CAP Advisory Committee: Establish an advisory committee of internal stakeholders to review and guide implementation of the corrective action plan.	10/31/22	Action Required Provide FTA with a list of the identified internal stakeholders. Provide additional detail to explain how MBTA's CAP management personnel and, especially, Executive Leadership, will engage with FTA and the SMI team in meetings and during verification activities.	
		2. Strategic Planning Session: Conduct a strategic planning session for SD 22-10 Finding 6 CAP implementation with the advisory committee identified in Actionable Item #1.	12/31/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of this session.	
		3. Procure Consulting Services: Issue RFP or Task Order for	12/22/22	Action Required	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>6.C: MBTA must demonstrate use of its safety information management tools to effectively prioritize its resources to address the results of:</p> <ul style="list-style-type: none"> Safety Risk Monitoring Safety Performance Monitoring 	consulting services to evaluate the safety risk management process and incorporate changes into the Transit Safety Plan.		MBTA must provide a presentation explaining the approach and the RFP or Task Order for consulting services to FTA two weeks prior to its release.	
		4. Onboard Consultant: Onboard selected consultant.	2/20/23	Action Item Approved <u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		5. Assess Existing Safety Data Tools and Processes: Compile and review all existing tools and processes used to document, track, and analyze safety data and monitor mitigations.	4/10/23	Action Required Please provide additional detail to address the specific deliverables for this item. Please explain how this review and compilation will be conducted and how MBTA will ensure its comprehensiveness. <u>Note:</u> FTA will ask MBTA to provide a copy of its gap analysis tool/activities.	
		6. Define SMS Requirements for Data Collection: Analyze safety risk monitoring tools	5/16/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		and records to ensure SMS requirements for tracking hazards are met; include requirements in Transit Safety Plan.			
		7. Review and Update Data Logs: Evaluate and revise the data contained in the hazard and safety risk mitigation logs for accuracy and relevancy to SMS requirements.	5/16/23	Action Item Approved	
		8. Build Out Data Tools: Expedite the build out of the safety risk and safety risk mitigation monitoring information tools using the defined SMS requirements.	11/15/23	Action Required Please modify Action Item to include interim Action Items and submit to FTA prior to initiation of Action Item.	
		9. Verify Effectiveness of Tools: Ensure safety information management tools provide the required information to effectively prioritize resources to address the results of Safety Risk Monitoring and Safety Performance Monitoring.	2/2/24	Action Item Approved	
		10. Review SMS Training Materials: Review and update existing training related to safety tracking and mitigation and monitoring	3/7/24	Action Required Please clarify if training material review will occur in this Action Item and the training update will occur in Action Item 11.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-10: Prioritization of Safety Management Information

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		effectiveness; assign updated training.		Please provide a list of the MBTA roles (and if they're staffed) that will participate in the review of the training materials.	
		11. Update SMS Training Materials: Review and update existing training related to safety risk tracking and mitigation and monitoring effectiveness; assign updated training.	4/5/24	Action Required Please provide additional details related to how MBTA will carry out the training and ensure its effectiveness. Note: FTA will review updated training.	
		12. Revise and Distribute Transit Safety Plan: Revise the Transit Safety Plan to reflect modifications to the safety risk management process.	12/31/22	Action Required Provide additional milestones and clarifications for how this review and update process will occur throughout the period of performance for the CAP.	
		13. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.	Ongoing	Action Item Approved	

**Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-11: Safety Communication**

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
FTA-COM-22-001	<p><u>Finding:</u></p> <p>MBTA has not established explicit and formal provisions to ensure safety information from safety committee results in a consistent outcome of documented, prioritized, and actionable safety information.</p> <p><u>Required Action:</u></p> <p>1.A: MBTA must develop and describe, in the organization's SMS documentation, instructions regarding the conduct, recording, communication and follow up of the outcome consensus decisions specific for each of the following meetings – taking into consideration the nature (strategic or tactical) of each meeting:</p> <ul style="list-style-type: none"> • Operations and Safety Biweekly call (currently every other Friday) • Operations and Safety weekly meeting (currently on Wednesdays) • Executive Safety Committee (ESC) • Safety Management Review Committee (SMRC) • Safety Management Working Groups (SMWGs) 	<p>1. Procure Consulting Services: Issue RFP or Task Order for consulting services to evaluate the safety meeting structure, develop instructions for the meetings, develop guidelines for the meeting content and outcomes, and how to incorporate the results into the SMS documentation.</p>	11/20/22	<p>Action Required</p> <p>MBTA proposed a timeline for the end of Calendar Year 2023 to fully address FTA's finding and required actions. The proposed CAP does not provide any detail on actions MBTA will take in the interim (prior to completion of consultant's work) to ensure that the Safety Meetings specified in the Agency Safety Plan (ASP) are conducted and that decisions and relevant safety information are recorded and followed up on, particularly for Local Safety Committees, as discussed in the SMI report.</p> <p>Since FTA found that these meetings were not occurring in compliance with the ASP, and that results were not documented and shared, FTA anticipates interim action to address this situation, which could include using contractor resources to support conduct of existing meetings or to support development of an interim plan prior to completion of the gap analysis and development and implementation of the new meeting structure by December 31, 2023.</p> <p>Action Item #15, which states "Revise the Transit Safety Plan to reflect modifications to the safety meeting structure, procedures, and recordkeeping requirements," shows an estimated end date of December 31, 2022, indicating this action will soon be underway. Action Item 15 does not specify what modifications will be made to the "safety meeting structure, procedures and</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-11: Safety Communication

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<ul style="list-style-type: none"> Data Analysis Group (DAG) Local Safety Committee Meetings Joint Labor/Management Safety Committee (required by Bipartisan Infrastructure Law) <p>1.B: In support of the above, MBTA must develop and describe, in the organization's SMS documentation, a formal mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring.</p>			<p>recordkeeping requirements” in the ASP for CY 2023, before the new process is developed and implemented.</p> <p>FTA is concerned regarding a potential and significant reduction in opportunity for frontline employees to provide critical input on safety issues through the end of December 2023. The intent of this finding is to ensure MBTA employees, including frontline and supervisory personnel, have the opportunity to discuss safety issues and concerns as a formal part of the MBTA’s SMS and safety committee structure. This finding also ensures, that, as a result of these discussions, MBTA’s SMS has the structure in place and capability to identify, assess and mitigate the safety risk associated with these issues and concerns.</p> <p>FTA also understands that the Safety Department (as of 9/23/22) has a vacancy rate of 28 percent, and currently may not have the resources to oversee either the conduct of the Safety Meetings or the contractor work required for this CAP. FTA remains extremely concerned regarding this situation. The Quality Compliance and Oversight Office (QCOO) also is new and still staffing up.</p> <p>To address these concerns, by Friday, October 28, FTA requires MBTA to resubmit its proposed CAP to include an interim plan that addresses how the agency will manage its Safety Committee structure and capabilities in CY 2023 (or until the new</p>	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				<p>approach is implemented) to ensure frontline employee participation as well as the identification and analysis of safety concerns discussed in these meetings. This interim plan must also explain how the interim approach will be documented in the Agency Safety Plan in effect for CY 2023.</p> <p>By Friday, October 28, MBTA also must submit a Resource Memorandum to demonstrate how the MBTA, including the Safety Department and QCOO, will manage and oversee work and contractor activities to complete this CAP.</p> <p>Finally, by Friday, October 28, MBTA must include a transition plan to demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change.</p>	
		2. Onboard Consultant: Onboard selected consultant.	2/20/23	Action Item Approved	
		3. Assess Existing Tools and Processes for Action Items: Compile and review all existing tools and processes used to document, track, and carry out action items from safety-related meetings.	3/20/23	Action Item Approved	
		4. Assess Existing Tools and Processes for Risk Assessment and Mitigation: Compile and review all	3/20/23	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		existing tools and processes used to perform hazard identification, safety risk assessment, corrective action planning, and risk mitigation monitoring during staff and management safety meetings.			
		5. Tools and Processes Gap Analysis: Identify gaps in the existing tools and processes used to document, track, and carry out action items from the safety-related meetings and tools and processes used to perform hazard identification, safety risk assessment, corrective action planning, and risk mitigation monitoring during safety meetings. Analyze variations in use of existing tools and processes and reasons for variation.	4/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will request a presentation on the results of this Tools and Process Gap Analysis.	
		6. Assess Existing Meeting Framework: Perform, with the assistance of a stakeholder group, a comprehensive review of the existing safety meeting structure, including meeting schedules, sequences, and attendees. Also assess the strategic and/or tactical	5/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will review the stakeholder group to ensure it is representative of frontline, supervisory and management personnel.	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		purpose of each meeting, and each meeting's suitability for supporting safety program implementation given current agenda topics and thematic content.			
		7. Best Practices Review of Safety Meetings: Complete a best practice review of safety meeting structure and procedures.	5/20/23	Action Item Approved	
		8. Safety Meetings Gap Analysis and Updated Structure Proposal: Identify existing gaps in the meeting framework's ability to support key SMS processes and demonstrated accountability of the Safety Department representative to document or report out the information discussed during the meetings while also defining requirement for employee safety concerns to be documented or acted upon by supervisors.	6/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will request a presentation on the results of the Safety Meetings Gaps Analysis and Updated Structure Proposal.	
		9. Stakeholder Engagement: Convene stakeholder group from all affected areas and get concurrence on any proposed safety meeting structure changes. Modify	7/20/23	Action Item Approved	

**Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		proposed structure if required based on areas of stakeholder feedback.			
		10. Establish Meeting Charters: Document and distribute to meeting stakeholders explicit meeting charters identifying the strategic and/or tactical nature of each meeting, goals and objectives for each management or staff working group, participants, and relationships with other safety meetings and processes.	8/20/23	Action Item Approved	
		11. Establish Unified Documentation Process: Establish uniform instructions for the conduct of meetings, including explicit departmental accountabilities for information capture and follow-up, as well as templates for meeting agenda development, meeting minutes, escalation and feedback procedures, and tracking of actionable items.	10/20/23	Action Item Approved	
		12. Establish Guidelines for Meetings: Establish a mechanism and associated	10/20/23	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring. Guidelines should include escalation and feedback procedures.			
		13. Identify and Train Facilitators: Identify permanent facilitators to monitor and support the performance of each safety meeting, define facilitators' role, and train these individuals in implementing the meeting procedures	11/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will require the list of permanent facilitators and observe training.	
		14. Implement Unified Documentation Process: Implement the system for documenting and tracking meeting action items with the support of facilitators and monitor implementation of this process to ensure all frontline and management meetings are properly documented and retained via a uniform and accessible	12/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will observe Safety Committee meetings and review MBTA's tracking of meeting action items.	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		document management system.			
		15. Revise and Distribute Transit Safety Plan: Revise the Transit Safety Plan to reflect modifications to the safety meeting structure, procedures, and recordkeeping requirements.	12/31/22	Action Required As part of its response for Action Item #1, by Friday, October 28, MBTA must resubmit its proposed CAP with an interim plan that addresses how the agency will manage the committee structure for its SMS until the new approach is implemented. FTA anticipates that this interim plan will be included or referenced in the revised Agency Safety Plan.	
		16. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and these required actions have been resolved, taking into account the scope and performance measures.	ongoing	Action Item Approved	
FTA-COM-22-002	<u>Finding:</u> MBTA has not documented explicit and formal provisions to ensure the participation of frontline employees in local safety committees as part of their job responsibilities in relation to the agency's SMS. <u>Required Action:</u> 2.A: MBTA must develop explicit and formal guidelines	1. Procure Consulting Services: Develop and execute an RFP for a consultant to develop explicit and formal guidelines for the expected role and contribution of frontline employees to the local safety committee meetings, and instruction for the conduct of the meetings including explicit departmental accountabilities for meeting	11/20/22	Action Required MBTA proposed a timeline for the end of Calendar Year 2023 to fully address FTA's finding and required actions. As noted for CAP FTA-COM-22-001, the proposed CAP for FTA-COM-22-002 does not provide any detail on actions MBTA will take in the interim (prior to completion of consultant's work) to ensure that the participation of the frontline employees in Safety Meetings as specified in the Agency Safety Plan (ASP).	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>for the expected role and contribution of frontline employees to the local safety committee meetings.</p> <p>2.B: MBTA must develop instructions for the conduct of the meetings, including explicit departmental accountabilities for meeting outcome information capture, communication and follow up.</p>	<p>outcome capture, communication and follow-up. (In conjunction with Finding 1 CAP.)</p>		<p>As noted in FTA's written correspondence on SD 22-11, accompanying this evaluation table, by Friday, October 28, FTA requires MBTA to resubmit its proposed CAP to include an interim plan that addresses how the agency will manage its Safety Committee structure and capabilities in CY 2023 (or until the new approach is implemented) to ensure frontline employee participation and how identified safety concerns will be documented and managed. This interim plan must also explain how the interim approach will be documented in the Agency Safety Plan in effect for CY 2023. This interim plan may be integrated into the interim plan developed for FTA-COM-22-001 or issued separately.</p> <p>By Friday, October 28, MBTA also must submit a Resource Memorandum to demonstrate how the MBTA, including the Safety Department and QCOO, will manage and oversee work and contractor activities to complete this CAP. This information may be compiled in a single memo for FTA-COM-22-001, FTA-COM-22-002, and FTA-COM-22-003, or separate memos may be issued.</p> <p>Finally, by Friday, October 28, MBTA must include a transition plan to demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change. FTA prefers that separate transition plans are issued for FTA-COM-22-001, FTA-COM-22-002, and FTA-COM-22-003.</p>	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		2. Onboard consultant: Onboard selected consultant	2/20/23	Action Item Approved	
		3. Establish Unified Meeting Process: Based on the assessment of existing tracking tools and the meeting framework visioning process, establish formal guidelines for the expected role and contribution of frontline employees in safety meetings and establish uniform instructions for the conduct of meetings, including explicit departmental accountabilities for information capture and follow-up.	6/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will request a meeting to discuss the results of this analysis and to review the guidelines with MBTA.	
		4. Update Training Materials: Review and update existing training related to frontline worker meeting participation and expectations and assign updated training to frontline employees.	8/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will observe training for frontline employees.	
		5. Implement Unified Documentation Process: Implement the new system for documenting and tracking meeting action items with the support of facilitators and monitor implementation of	7/20/23	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		this process to ensure all frontline and management meetings are properly documented and retained via a uniform and accessible document control system			
		6. Review Job Descriptions: Review job descriptions for frontline employees to ensure that safety meeting participation is explicitly identified as a component of employee duties.	10/20/23	Action Item Approved	
		7. Promote Local Safety Committee Participation: Work closely with Labor Relations and Unions to develop and distribute promotional materials related to the safety meeting process, including the benefits of participation and case studies highlighting impacts on the safety program.	10/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA likely will observe meetings to discuss promotion of participation in Local Safety Committees.	
		8. Revise Transit Safety Plan: MBTA will revise its Transit Safety Plan to reflect modifications to the safety meeting structure and recordkeeping requirements.	12/31/22	Action Required As part of its response for Action Item #1, by Friday, October 28, MBTA must resubmit its proposed CAP with an interim plan for how the agency will manage its safety committee structure and ensure employee participation for CY 2023. FTA anticipates that this interim	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				plan will be included or referenced in the revised Agency Safety Plan.	
		9. CAP Verification: MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	ongoing	Action Item Approved	
FTA-COM-22-003	<p><u>Finding:</u> MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline.</p> <p><u>Required Action:</u> 3.A: MBTA must expedite the development of an effective ESRP as a fundamental source of safety information for hazard identification and safety performance monitoring. 3.B: As part of the development of an effective ESRP, MBTA must provide explicit direction to frontline employees on what to report</p>	1. Procure Consulting Services: Issue an RFP or initiate a task order to evaluate the procedures and use of the existing ESRP and Maintenance request systems and evaluate and revise training.	11/15/22	<p>Action Required</p> <p>MBTA proposed a timeline of almost one year to fully address FTA's finding and required actions. The proposed CAP does not provide any detail on actions MBTA will take in the interim (prior to completion of consultant's work) to ensure effective employee safety reporting to address FTA's finding. Notably, Required Actions 3B and 3C can be acted upon immediately by MBTA Management, perhaps in coordination with MBTA's Labor Union Management, based on the existing ESRP specified in the Agency Safety Plan.</p> <p>As noted in FTA's written correspondence on SD 22-11, accompanying this evaluation table, by Friday, October 28, FTA requires MBTA to resubmit its proposed CAP to include an interim plan that addresses how the agency will respond to Required Actions 3B and 3C to ensure employees receive</p>	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>and what not to report through the ESRP (including the safety hotline).</p> <p>3.C: As part of the development of an effective ESRP, MBTA must provide refresher training to stakeholder personnel on the role of employee safety reporting within SMS and the crucial contribution managers and supervisors play in the development of an effective safety reporting context.</p>			<p>explicit direction on what to report and not to report using the existing ESRP (Safety Hotline). This interim plan must also explain how the interim approach will be documented in the Agency Safety Plan in effect for CY 2023.</p> <p>By Friday, October 28, MBTA also must submit a Resource Memorandum to demonstrate how the MBTA, including the Safety Department and QCOO, will manage and oversee work and contractor activities to complete this CAP. This information may be compiled in a single memo for FTA-COM-22-001, FTA-COM-22-002, and FTA-COM-22-003, or separate memos may be issued.</p> <p>Finally, by Friday, October 28, MBTA must include a transition plan to demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change. As part of the transition plan, please specify how MBTA Management will coordinate with Labor Union Management and Members in the update of ESRP related documents. FTA prefers that separate transition plans are issued for FTA-COM-22-001, FTA-COM-22-002, and FTA-COM-22-003.</p>	
		2. Onboard Consultant: Onboard selected consultant	2/15/23	Action Item Approved	
		3. Review and Update ESRP Guidance Documents: Perform a comprehensive	3/22/23	<p>Action Required</p> <p>See transition plan required above for Action Item 1: Please specify how MBTA</p>	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		review of existing program documentation and identify processes, workflows, and tools which will be established to guarantee the success of the ESRP.		Management will coordinate with Labor Union Management and Members in the update of ESRP related documents.	
		4. Monitor ESRP / SRM Integration: Ensure that ESRP inputs are fully integrated into the Authority's proactive Safety Risk Management process, including through clear provisions for hazard analysis and risk assessment.	4/23/23	Action Item Approved <u>Note:</u> As part of verification for this CAP item, FTA will review ESRP documentation related to ESRP use, management, inputs, and outputs, as well as elevation of safety concerns as specified in MBTA documents.	
		5. Support ESRP / SRM Integration: Establish the management review structure required to support adequate integration of the ESRP and SRM process, including promotion of the ESRP tools to employees, escalation of hazards, risk assessment, and consideration of ESRP inputs against larger background patterns and trends of hazards and risks sourced from other areas including workshops, JHAs, and oversight activities.	6/1/23	Action Item Approved	
		6. Review and Update ESRP Trainings: Update training	7/2/23	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		modules related to employee safety reporting.			
		7. Assign Updated ESRP Trainings: Issue and assign / reassign trainings related to the ESRP to key frontline employee groups.	8/6/23	Action Item Approved	
		8. Assess and Document Service Request Process: Evaluate the Authority's existing process for management of housekeeping and maintenance requests; document workflows, resources, and department integration necessary to manage these requests; and address gaps and root causes for maintenance requests being submitted to the ESRP.	10/31/23	Action Item Approved	
		9. Promote ESRP Reporting Criteria: Develop and deliver safety promotion materials related to the ESRP, including proper reporting of maintenance and housekeeping issues via other channels.	12/15/23	Action Item Approved	
		10. Promote ESRP Successes and its Role in the Hazardous Management Process: Develop and deliver safety	12/15/23	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		promotion materials related to the ESRP, including success stories related to employee hazard identification and the important role of the ESRP in MBTA's proactive hazard management process.			
		11. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	Ongoing	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
FTA-COM-22-001	<u>Finding:</u> MBTA has not established explicit and formal provisions to ensure safety information from safety committee results in a consistent outcome of documented, prioritized, and actionable safety information. <u>Required Action:</u> 1.A: MBTA must develop and describe, in the organization's SMS documentation, instructions regarding the conduct, recording, communication and follow up of the outcome consensus decisions specific for each of the following meetings – taking into consideration the nature (strategic or tactical) of each meeting: <ul style="list-style-type: none"> • Operations and Safety Biweekly call (currently every other Friday) • Operations and Safety weekly meeting (currently on Wednesdays) • Executive Safety Committee (ESC) • Safety Management Review Committee (SMRC) • Safety Management Working Groups (SMWGs) 	1a. Procure Consulting Services: Issue RFP or Task Order for consulting services to evaluate the safety meeting structure, develop instructions for the meetings, develop guidelines for the meeting content and outcomes, and how to incorporate the results into the SMS documentation.	11/20/22	Action Item Approved <u>Note:</u> FTA will ask MBTA review and discuss the requirements to be included in the RFP prior to its release.	
		1b. Implement Interim Action Plans: Carry out interim action steps outlined in 22-11 CAP resubmittal memorandum.	12/31/22	Action Item Approved <u>Note:</u> FTA will conduct activities to verify implementation of interim action steps.	
		2. Onboard Consultant: Onboard selected consultant.	2/20/23	Action Item Approved <u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		3. Assess Existing Tools and Processes for Action Items: Compile and review all existing tools and processes used to document, track, and carry out action items from safety-related meetings.	3/20/23	Action Item Approved <u>Note:</u> FTA will review results of this activity.	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<ul style="list-style-type: none"> Data Analysis Group (DAG) Local Safety Committee Meetings Joint Labor/Management Safety Committee (required by Bipartisan Infrastructure Law) <p>1.B: In support of the above, MBTA must develop and describe, in the organization's SMS documentation, a formal mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring.</p>	4. Assess Existing Tools and Processes for Risk Assessment and Mitigation: Compile and review all existing tools and processes used to perform hazard identification, safety risk assessment, corrective action planning, and risk mitigation monitoring during staff and management safety meetings.	3/20/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review results of this activity.</p>	
		5. Tools and Processes Gap Analysis: Identify gaps in the existing tools and processes used to document, track, and carry out action items from the safety-related meetings and tools and processes used to perform hazard identification, safety risk assessment, corrective action planning, and risk mitigation monitoring during safety meetings. Analyze variations in use of existing tools and processes and reasons for variation.	4/20/23	<p>Action Item Approved</p> <p><u>Note:</u> As part of verification for this Action Item, FTA will request a presentation on the results of this Tools and Process Gap Analysis.</p>	
		6. Assess Existing Meeting Framework: Perform, with the assistance of a stakeholder group, a comprehensive review of the existing safety meeting structure, including meeting schedules, sequences, and attendees. Also assess the strategic and/or tactical purpose of each meeting, and each meeting's suitability for	5/20/23	<p>Action Item Approved</p> <p><u>Note:</u> As part of verification for this Action Item, FTA will review the stakeholder group to ensure it is representative of frontline, supervisory and management personnel.</p>	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		supporting safety program implementation given current agenda topics and thematic content.			
		7. Best Practices Review of Safety Meetings: Complete a best practice review of safety meeting structure and procedures.	5/20/23	Action Item Approved	
		8. Safety Meetings Gap Analysis and Updated Structure Proposal: Identify existing gaps in the meeting framework's ability to support key SMS processes and demonstrated accountability of the Safety Department representative to document or report out the information discussed during the meetings while also defining requirement for employee safety concerns to be documented or acted upon by supervisors.	6/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will request a presentation on the results of the Safety Meetings Gaps Analysis and Updated Structure Proposal.	
		9. Stakeholder Engagement: Convene stakeholder group from all affected areas including frontline employees and get concurrence on any proposed safety meeting structure changes. Modify proposed structure if required based on areas of stakeholder feedback.	7/20/23	Action Item Approved	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		10. Establish Meeting Charters: Document and distribute to meeting stakeholders explicit meeting charters identifying the strategic and/or tactical nature of each meeting, goals and objectives for each management or staff working group, participants, and relationships with other safety meetings and processes.	8/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review meeting charters established for the safety committees.	
		11. Establish Unified Documentation Process: Establish uniform instructions for the conduct of meetings, including explicit departmental accountabilities for information capture and follow-up, as well as templates for meeting agenda development, meeting minutes, escalation and feedback procedures, and tracking of actionable items.	10/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review documentation process and results.	
		12. Establish Guidelines for Meetings: Establish a mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring. Guidelines should include escalation and feedback	10/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review safety committee meetings for consistency in the identification, tracking, reporting and analysis of safety concerns and the elevation and prioritization of safety risk.	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		procedures. Coordinated with Required Action 1b.			
		13. Identify and Train Facilitators: Identify permanent facilitators to monitor and support the performance of each safety meeting, define facilitators' role, and train these individuals in implementing the meeting procedures	11/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will require the list of permanent facilitators and observe training.	
		14. Implement Unified Documentation Process: Implement the system for documenting and tracking meeting action items with the support of facilitators and monitor implementation of this process to ensure all frontline and management meetings are properly documented and retained via a uniform and accessible document management system. Coordinated with Required Action 1b.	12/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will observe safety committee meetings and review MBTA's tracking of meeting action items.	
		15a. Revise and Distribute Transit Safety Plan: Revise the Transit Safety Plan to reflect near term expectations for safety meeting structure, procedures, and recordkeeping requirements in accordance with 22-11 CAP resubmittal memorandum.	12/31/22	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review MBTA's Transit Safety Plan.	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		15b. Revise and Distribute Safety Plan: Revise the Transit Safety Plan to reflect long term modifications to the safety meeting structure, procedures, and recordkeeping requirements.	9/1/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review MBTA's updated Transit Safety Plan.	
		16. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and these required actions have been resolved, taking into account the scope and performance measures.	ongoing	Action Item Approved	
FTA-COM-22-002	<u>Finding:</u> MBTA has not documented explicit and formal provisions to ensure the participation of frontline employees in local safety committees as part of their job responsibilities in relation to the agency's SMS. <u>Required Action:</u> 2.A: MBTA must develop explicit and formal guidelines for the expected role and contribution of frontline employees to the local safety committee meetings.	1a. Procure Consulting Services: Develop and execute an RFP for a consultant to develop explicit and formal guidelines for the expected role and contribution of frontline employees to the local safety committee meetings, and instruction for the conduct of the meetings including explicit departmental accountabilities for meeting outcome capture, communication and follow-up. (In conjunction with Finding 1 CAP.)	11/20/22	Action Item Approved <u>Note:</u> FTA will ask MBTA review and discuss the requirements to be included in the RFP prior to its release.	
		1b. Implement Interim Action Plan: Carry out interim action steps outlined in the SD 22-11 CAP resubmittal memorandum.	12/31/22	Action Item Approved <u>Note:</u> FTA will conduct activities to verify	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	2.B: MBTA must develop instructions for the conduct of the meetings, including explicit departmental accountabilities for meeting outcome information capture, communication and follow up.			implementation of interim action steps.	
		2. Onboard consultant: Onboard selected consultant	2/20/23	Action Item Approved <u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		3. Establish Unified Meeting Process: Based on the assessment of existing tracking tools and the meeting framework visioning process, establish formal guidelines for the expected role and contribution of frontline employees in safety meetings and establish uniform instructions for the conduct of meetings, including explicit departmental accountabilities for information capture and follow-up.	6/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will request a meeting to discuss the results of this analysis and to review the guidelines with MBTA.	
		4. Update Training Materials: Review and update existing training related to frontline worker meeting participation and expectations and assign updated training to frontline employees.	8/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will observe training for frontline employees.	

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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		5. Implement Unified Documentation Process: Implement the new system for documenting and tracking meeting action items with the support of facilitators and monitor implementation of this process to ensure all frontline and management meetings are properly documented and retained via a uniform and accessible document control system	7/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review documentation process and results.	
		6. Review Job Descriptions: Review job descriptions for frontline employees to ensure that safety meeting participation is explicitly identified as a component of employee duties.	10/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review job descriptions for frontline employees to ensure that safety committee participation is included.	
		7. Promote Local Safety Committee Participation: Work closely with Labor Relations and Unions to develop and distribute promotional materials related to the safety meeting process, including the benefits of participation and case studies highlighting impacts on the safety program.	10/20/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will observe meetings to discuss promotion of participation in Local Safety Committees.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-11: Safety Communication

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		8a. Revise Transit Safety Plan: Revise the Transit Safety Plan to reflect near term expectations for safety meeting structure, procedures, and recordkeeping requirements in accordance with 22-11 CAP resubmittal memorandum.	12/31/22	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review MBTA's Transit Safety Plan.	
		8b. Revise Transit Safety Plan: Revise the Transit Safety Plan to reflect long term modifications to the safety meeting structure, procedures, and recordkeeping requirements.	9/1/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review MBTA's updated Transit Safety Plan.	
		9. CAP Verification: MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	ongoing	Action Item Approved	
FTA-COM-22-003	<u>Finding:</u> MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline. <u>Required Action:</u>	1a. Procure Consulting Services: Issue an RFP or initiate a task order to evaluate the procedures and use of the existing ESRP and Maintenance request systems and evaluate and revise training.	11/15/22	Action Item Approved <u>Note:</u> FTA will ask MBTA review and discuss the requirements to be included in the RFP prior to its release.	
		1b. Implement Interim Action Plans: Carry out interim action steps	12/31/22	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-11: Safety Communication

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>3.A: MBTA must expedite the development of an effective ESRP as a fundamental source of safety information for hazard identification and safety performance monitoring.</p> <p>3.B: As part of the development of an effective ESRP, MBTA must provide explicit direction to frontline employees on what to report and what not to report through the ESRP (including the safety hotline).</p> <p>3.C: As part of the development of an effective ESRP, MBTA must provide refresher training to stakeholder personnel on the role of employee safety reporting within SMS and the crucial contribution managers and supervisors play in the development of an effective safety reporting context.</p>	outline in SD 22-11 CAP resubmittal memorandum.		<u>Note:</u> FTA will conduct activities to verify implementation of interim action steps.	
		2. Onboard Consultant: Onboard selected consultant	2/15/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.</p>	
		3a. Review and Update ESRP Guidance Documents: Perform a comprehensive review of existing program documentation and identify processes, workflows, and tools which will be established to guarantee the success of the ESRP.	3/22/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will assess results of the review and the processes, workflows, and tools that will be established for the ESRP.</p>	
		3b. Joint Management-Labor Safety Committee Review of ESRP Materials: Present proposed updates to ESRP processes, workflows, and tools to joint management-labor safety committee; incorporate updates in response to feedback as needed.	4/7/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will verify how MBTA Management coordinates with Labor Union Management and the Safety Committee in the update of ESRP related documents.</p>	
		4. Monitor ESRP / SRM Integration: Ensure that ESRP inputs are fully	4/23/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-11: Safety Communication

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		integrated into the Authority's proactive Safety Risk Management process, including through clear provisions for hazard analysis and risk assessment.		<u>Note:</u> As part of verification for this CAP item, FTA will review ESRP documentation related to ESRP use, management, inputs, and outputs, as well as elevation of safety concerns as specified in MBTA documents.	
		5. Support ESRP / SRM Integration: Establish the management review structure required to support adequate integration of the ESRP and SRM process, including promotion of the ESRP tools to employees, escalation of hazards, risk assessment, and consideration of ESRP inputs against larger background patterns and trends of hazards and risks sourced from other areas including workshops, JHAs, and oversight activities.	6/1/23	Action Item Approved	
		6. Review and Update ESRP Trainings: Update training modules related to employee safety reporting.	7/2/23	Action Item Approved	
		7. Assign Updated ESRP Trainings: Issue and assign / reassign trainings related to the ESRP to key frontline employee groups.	8/6/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-11: Safety Communication

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		8. Assess and Document Service Request Process: Evaluate the Authority's existing process for management of housekeeping and maintenance requests; document workflows, resources, and department integration necessary to manage these requests; and address gaps and root causes for maintenance requests being submitted to the ESRP.	10/31/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review results of the analysis regarding maintenance requests being submitted to the ESRP.	
		9. Promote ESRP Reporting Criteria: Develop and deliver safety promotion materials related to the ESRP, including proper reporting of maintenance and housekeeping issues via other channels.	12/15/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review safety promotion materials related to ESRP.	
		10. Promote ESRP Successes and its Role in the Hazardous Management Process: Develop and deliver safety promotion materials related to the ESRP, including success stories related to employee hazard identification and the important role of the ESRP in MBTA's proactive hazard management process.	12/15/23	Action Item Approved <u>Note:</u> As part of verification for this Action Item, FTA will review safety promotion materials related to ESRP.	
		11. CAP Verification: Evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable	Ongoing	Action Item Approved	

**Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-11: Safety Communication**

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.			

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
FTA-22-MBTA-CAT4-1	<p><u>Finding:</u></p> <p>Documented operating and maintenance rules and procedures are not implemented as required.</p> <p><u>Required Actions:</u></p> <p><i>FTA-22-MBTA-CAT4-1.A</i></p> <p>Each operating and maintenance department must establish a group to review department-wide information on levels of non-compliance with key rules and procedures critical to the safety of activities performed by the department.</p> <p><i>FTA-22-MBTA-CAT4-1.B</i></p> <p>Each department must establish and act on a prioritized list of most frequently violated rules and procedures with the most significant potential safety consequences.</p> <p><i>FTA-22-MBTA-CAT4-1.C</i></p> <p>Each department must develop and implement approaches, which could include audits, use of checklists and guides, campaigns, and training, to improve compliance.</p> <p><i>FTA-22-MBTA-CAT4-1.D</i></p>	<p>1. Establish a Steering Committee of internal stakeholders to review and guide implementation of the corrective action plan.</p>	10/31/22	<p>Action Required</p> <p>For this CAP, MBTA has proposed a timeline for the end of Calendar Year 2025 to address FTA's finding and required actions and also will be using contractors and a Steering Committee to complete a significant portion of the work.</p> <p>FTA is concerned about this two-year timeframe and requires MBTA to revise this CAP to include interim Action Items the MBTA will take to address the serious safety concerns identified in the SMI report in the interim while contractor work and other activities are being performed over the next two years.</p> <p>FTA also needs to understand how MBTA's personnel, including QCOO, the Safety Department, Steering Committees, Working Groups, Departmental and Executive Leadership and contractors, will engage with FTA and the SMI team in Bi-Weekly Meetings and during verification activities. The CAPs do not clearly indicate how this engagement will occur.</p> <p>Furthermore, as discussed in response to CAPs proposed for SD 22-11 and SD 22-9, FTA also</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>Each department must report to the Safety Department monthly on its compliance with identified key rules and procedures critical to the safety of activities performed by the department.</p> <p><i>FTA-22-MBTA-CAT4-1.E</i></p> <p>The Safety Department must review and audit these reports and compile a monthly compliance report for MBTA's executive leadership team.</p> <p><i>FTA-22-MBTA-CAT4-1.F</i></p> <p>Each department must continue to review safety data to assess effectiveness of actions and to improve compliance with safety rules and procedures.</p>			<p>requires inclusion of additional Action Items to clarify how proposed actions completed by the contractor or MBTA working groups will be integrated and absorbed into existing MBTA internal roles and responsibilities.</p> <p>Finally, in order to understand the MBTA's approach to resourcing this CAP, FTA requires additional information on the MBTA personnel resources available to manage, monitor and oversee implementation and integration of this CAP into MBTA's operations and maintenance. FTA is particularly interested in the resources available in the Quality, Compliance and Oversight Office (QCOO), the Safety Department, the Steering Committee, and the Rules Compliance Working Groups (RCWGs).</p> <p>To address these items FTA requires MBTA to resubmit its proposed CAP for FTA-22-MBTA-CAT4-1 to include additional Action Items that address how the agency will mitigate the safety concerns identified in FTA's SMI report in the interim until such contracted projects are complete (or until the new approach is implemented). FTA</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				<p>has provided specific comments in the Action Items in this evaluation table for FTA-22-MBTA-CAT4-1 to support development of these additional Action Items.</p> <p>MBTA must also submit a Resource Memorandum to demonstrate how the relevant MBTA departments, including the Safety Department and QCOO, will resource, manage, and oversee work and contractor activities to complete this CAP – within the context of current accountabilities and responsibilities.</p> <p>MBTA must also update its CAP for FTA-22-MBTA-CAT4-1 to include additional Action Items that will demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change.</p> <p>Finally, MBTA must submit an Engagement Plan to clarify how MBTA personnel, committees and working groups, and contractors will engage with FTA through the performance of these CAPs.</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		2. Conduct a strategic planning session for SD 22-12 Finding 1 CAP implementation with the RCWG identified in Actionable Item #1.	11/30/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.	
		3. Issue an RFP for consulting services to evaluate the MBTA's current rules, procedures and policies; identifying best practices/ industry standards for reducing violations/improving compliance; recommending revisions and updating MBTA manuals and documents while working concurrently with the working groups for each department	12/20/22	Action Item Approved <u>Note:</u> FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFP prior to its release.	
		4. E&M will establish a Rules Compliance Working Group (RCWG) comprised of employees who perform the work (Superintendents, Supervisors, Instructors) at all levels, MBTA construction logistics and MBTA Safety, for each department. Operations will establish a Rules Compliance Working Group (RCWG) comprised of employees who perform the work (Operator, Supervisors, Instructors) at all levels and	12/31/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		MBTA Safety, for each operating line/department. Required action 1A			
		5. Develop process to begin reporting monthly rules violations to Safety.	Ongoing/continuous	Action Item Approved <u>Note:</u> FTA will review reports to Safety as part of its verification activities for this Action Item.	
		6. Onboard selected consultant.	2/28/23	Action Item Approved <u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		7. Each RCWG will compile a list of key rules and procedures critical to the safety of activities performed by their department. Consultant will support and facilitate; aid in identifying industry consensus on safety critical tasks for Operations and Maintenance. Coordinate this activity with the critical activities list for SD 22-9 and CAPs 2 and 5 for 22-12.	5/31/23	Action Required Due to the proposed seven (7) month period between Action Item #7 and Action Item #8, MBTA must revise this action item to identify the interim activities that will be performed to ensure that this CAP stays on track and successfully identifies key rules and procedures for each MBTA department. While industry consensus may be helpful, MBTA must ensure focus on MBTA operations and maintenance and	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				<p>ensure input from frontline, supervisory and technical personnel, as well as leadership.</p> <p>Finally, must explain why it will take 7 months to identify key operating and maintenance rules and procedures critical to the safety of activities performed by the MBTA department.</p>	
		<p>8. Review all recorded data (violations, safety incidents) from 2019-2022 to identify and categorize the most frequently violated rules/procedures. Consultant to analyze data to create list of most violated rules, procedures and policies Required action 1B</p>	12/31/23	<p>Action Required</p> <p>MBTA must modify this Action Item to ensure that a review of the recorded data is not limited to just violations and safety incidents but takes advantage of dashboards and management reporting tools in each department that may have safety impact (i.e., speed restrictions, cables in water, hours of service/overtime, to ensure instances where required maintenance activities may not be performed or performed completely).</p>	
		<p>9. Review Safety Rules Compliance Program (SRCP). Assess current tools to document compliance. Determine how to improve compliance, documentation</p>	5/31/24	<p>Action Required</p> <p>MBTA must update this Action Item to indicate if this activity is being performed by the Steering Committee, the RCWG or the consultant, and explain why this</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		and implement industry best practices.		activity is occurring so long after the issuance of the Special Directive. Also, MBTA must add additional Action Items to document what the MBTA will be doing in the interim for its SRCP.	
		10. Develop criteria/metric for acceptable level of compliance. Develop audits, checklists and guides, campaigns, and training to document compliance. Refer to SD 22-4 CAP 2, SD 22-5 CAP 3 for updates to SRCP for ROW Safety and Train movements.	12/31/24	Action Required MBTA must revise this Action Item and create additional milestones that are specific to the items called out in this Action Item. MBTA must also indicate how their delivery will be staggered between 5/31/24 and 12/31/24. <u>Note:</u> As part of verification for this Action Item, FTA will request to review the criteria established by MBTA.	
		11. Develop a dashboard on compliance with key rules, procedures & policies. Required action 1D Required action 1E	Ongoing/continuous	Action Item Approved	
		12. Safety will develop a process to report SR Compliance to Executive Leadership.	Ongoing/continuous	Action Required	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				MBTA must provide a more detailed schedule for this Action Item that includes milestone schedule and implementation schedule.	
		13. MBTA Safety, Operations training & VM Training and E&M Training to work with consultant who will develop SRCP training material and will ensure that all affected personnel are informed of the SRCP. Coordinate this effort with SD 22-12 CAP 4 implementation.	2/28/25	Action Required Given its six-month duration, MBTA must revise this Action Item to provide more detailed milestones and timelines for completion of this Action Item.	
		14. The MBTA will provide training for all personnel in appropriate MBTA departments in phases. Refer to SD 22-12 CAP 4 for details on updates to MBTA training for Operations and Maintenance.	8/31/25	Action Item Approved <u>Note:</u> FTA will observe this training.	
		15. Safety will distribute the materials developed to improve compliance (SRCP) in phases as training is accomplished. This distribution will include an acknowledgement of receipt. Required action 1C	9/31/25	Action Required MBTA must modify the Action Item to include the interim actions MBTA will take and the actions underway to improve compliance before the due date for this Action Item.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		16. Upon establishment of the revised SRCP, MBTA Safety will review monthly the violations and compliance dashboard and will establish a consistent method for auditing regularly to ensure program is effective. Required action 1F	Ongoing/continuous	Action Item Approved	
		17. MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	12/31/25	Action Item Approved	
FTA-22-12-MBTA-CAT4-2	<u>Finding:</u> MBTA does not monitor operations, including the conditions of the operating environment, to identify the reasons for deviations between formal, established standards, rules and procedures, and actual operations and maintenance practices. <u>Required Action:</u>	1. Establish a Steering Committee of internal stakeholders to review and guide implementation of the corrective action plan.	10/31/22	Action Required For this CAP, MBTA has proposed the extensive use of contractors and a timeline for the first quarter of Calendar Year 2026 to fully address FTA's finding and required actions. FTA is concerned regarding this approach and timeframe, and requires MBTA to revise this CAP to include additional action items that	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	MBTA must develop, document, and communicate a mechanism to monitor operations, and provide training to stakeholder safety and operating personnel on this mechanism, to enable the analysis and understanding of situations of non-compliance.			<p>identify the interim actions the MBTA will take to address the serious safety concerns identified in the SMI report while contractor work and other activities are being performed to address FTA-22-MBTA-CAT4-2. Furthermore, as discussed in response to CAPs proposed for SD 22-11 and SD 22-9, FTA also requires inclusion of additional Action Items to clarify how proposed actions completed by the contractor or MBTA working groups will be integrated and absorbed into existing MBTA internal roles and responsibilities.</p> <p>FTA requires MBTA to resubmit its proposed CAP to include additional Action Items that address how the agency will mitigate FTA's identified concerns in the interim until such contracted projects are complete (or until the new approach is implemented). FTA has provided specific comments in the Action Items in this evaluation table to support development of these additional Action Items.</p> <p>MBTA must also submit a Resource Memorandum to demonstrate how the relevant MBTA departments, including the Safety Department</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				<p>and QCOO, will resource, manage, and oversee work and contractor activities to complete this CAP – within the context of current accountabilities and responsibilities.</p> <p>MBTA must include additional Action Items to demonstrate how contractor work, once completed, will be integrated into MBTA's organization and operations to ensure long-term change.</p> <p>FTA will also requires an Engagement Plan to clarify how MBTA personnel, committees and working groups, and contractors will engage with FTA through the performance of these CAPs.</p>	
		2. Conduct a strategic planning session for SD 22-12 Finding 2 CAP implementation with the WG identified in Actionable Item #1.	11/30/22	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.</p>	
		3. Develop and issue RFP to include assistance gathering data to evaluate deviations from the rules to inform MBTA decisions; assist in development of compliance	12/20/22	<p>Action Item Approved</p> <p><u>Note:</u> FTA will ask MBTA to provide a presentation regarding the</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		process and tracking/reporting non-conformance; analyze results.		requirements to be included in the RFP prior to its release.	
		4. Onboard selected consultant	5/31/23	Action Item Approved <u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		5. Establish a Rules Review Working Group (RRWG) comprised of employees at all levels plus System-Wide Accessibility and MBTA Safety, including OSH, for each operating line/department. Note: Interdependent with work in SD 22-12 CAP 1 around SRCP	5/31/24	Action Required MBTA must explain why this milestone is projected to be 12 months after the consultant is on-boarded. MBTA must revise this Action Item to provide additional milestones and interim actions regarding the steps the MBTA will take to stand up these committees and the number of committees. For example, will they be staggered in creation during the 12 months?	
		6. RRWGs, in concert with QCOO, consultant and systemwide departmental representatives, will review SCRP data on deviations from formal/official procedures.	9/30/24	Action Required MBTA must revise this action item to ensure that the review is not limited to SCRP data but includes other relevant operations and	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				maintenance data, as well as observations of normal operations and maintenance conducted and documented by Supervisors and Superintendents.	
		7. RRWGs in concert with QCOO, consultant and systemwide departmental representatives, will analyze data to determine the root cause for deviation from formal/official rules and standards. Determine what/if needs to change – the rules, the actual practice, or other factors. Identify obstacles/dynamics that may be contributing to noncompliance.	12/31/24	Action Required Given that this milestone is two years away, MBTA must revise this action item to provide interim milestones indicating how the MBTA RRWGs will conduct these assessments, i.e., will the RRWP pilot an approach, or will implementation be staggered across RRWGs?	
		8. Develop reporting mechanism/dashboard using compliance data. Use dashboard to track compliance and identify trends in noncompliance.	Ongoing/ in perpetuity	Action Item Approved	
		9. Operations and RRWG will use root cause analysis to establish cadence and thresholds of noncompliance to trigger review of rules.	Ongoing/in perpetuity	Action Required MBTA must revise this action item to provide additional milestones. MBTA must explain the milestones and processes to ensure the RRWGs are implemented and how and when they will use “root cause analysis” to review rules.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		10. Establish a process for rule review and change when trends/issue of noncompliance are identified. Capture revisions using DMS established in CAP 3.	3/31/25	Action Required MBTA must revise this action item to include interim milestones regarding the development of this process.	
		11. Identify key Safety and Operations stakeholders and train in process for rule review.	10/31/25	Action Item Approved	
		12. Using the improved SRCP (from CAP 1), MBTA Safety and Operations will review the violations and compliance dashboard monthly and regularly audit the SRCP to monitor its effectiveness.	3/1/26	Action Required MBTA must revise this action item to ensure that MBTA Safety and Operations review will not be limited to violations / compliance dashboard and SRCP data but will include other relevant operations and maintenance data, as well as observations of normal operations and maintenance conducted and documented by Supervisors and Superintendents.	
		13. MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.	3/1/26	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
FTA-22-12-MBTA-CAT4-3	<u>Finding:</u> MBTA's QA/QC program is not sufficiently independent from the activities it oversees. <u>Required Action:</u> <i>FTA-22-MBTA-CAT4-3.A</i> MBTA must develop and administer a QA/QC program to independently oversee of ongoing QA/QC activities. <i>FTA-22-MBTA-CAT4-3.B</i> MBTA must ensure that the QA/QC functions are independent of the functions of the Safety department and report directly to the GM. <i>FTA-22-MBTA-CAT4-3.C</i> MBTA must develop a formal QA/QC procedure that details the oversight of and accountability and roles and responsibilities for QA/QC programs provided by railcar manufacturers and MBTA consultants related to quality control of its railcars and subcomponents. <i>FTA-22-MBTA-CAT4-3.D</i> MBTA must ensure that the MBTA QA/QC independent	1. The MBTA will establish a Quality Management Working Group (QMWG) comprised of stakeholder groups involved in the oversight, support, and management of processes in need of auditing.	12/1/22	Action Required MBTA must re-submit this CAP with additional Action Items that demonstrate how MBTA is addressing the safety concerns identified in FTA-22-12-MBTA-CAT4-3 while work is being completed by the contractor and MBTA. In addition, MBTA must include an Engagement Plan to clarify how MBTA personnel, committees and working groups, and contractors will engage with FTA through the performance of these CAPs.	
		2. Conduct a strategic planning session for SD 22-12 Finding 3 CAP implementation with the QMWG identified in Actionable Item #1.	1/31/23	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.	
		3. Identify consulting resources which will support <ul style="list-style-type: none"> • Current Status Assessment • Developing structure and governance for QC system • Best Practices Review for transit and adjacent 	2/28/23	Action Item Approved <u>Note:</u> FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFP prior to its release.	

Corrective Action Plan (CAP) Evaluation Matrix
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Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	group is staffed with a sufficient SMEs in necessary disciplines to ensure a complete and thorough understanding of the responsibilities under the purview of railcar maintenance and engineering.	<ul style="list-style-type: none"> industries outside of transit SOP and document development Quality Management Dashboard Document Management System design and specifications 			
		4. Onboard selected consultant	5/31/23	Action Item Approved	
		5. Perform benchmarking and internal assessment to determine the current state of QM audit program.	9/1/23	Action Required MBTA must revise this action item to include additional milestones and Action Items that explain how MBTA will address the concerns identified in FTA's SMI report between now and 9/1/23.	
		6. Establish the scope of quality audit activities by each department to be addressed by the CAP; Develop the Quality Management Plan which will establish key activities & processes, oversight & stakeholders, policies, and department vision. Determine safety critical processes to be audited.	12/31/23	Action Required MBTA must revise this action item to provide additional milestones and Action Items that clarify how this will be managed. Will the scoping of quality audit activities be staggered or will they be established in a single document or approach?	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		Required action 3.A Building a Quality Management Program		Also, MBTA must include any activities related to organization model and staffing plan.	
		<p>7.</p> <p>7a With QM department scope established, identify which short-term goals can be supported by existing staff. This would include which key processes and which type of audits (documentation, process observation, etc.).</p> <p>If gaps exist to cover short-term needs:</p> <ul style="list-style-type: none"> Adjust staffing plan to include additional resources Identify 3rd party resources to support specific audits 	2/1/24	<p>Action Required</p> <p>MBTA must revise this action item to include interim milestones regarding the identification of these goals and assessment of gaps for staffing.</p>	
		<p>7b Identify key roles needed to support creation and support of Document Management System (DMS); developing standards to govern naming, review cycle, review level triggers, document hierarchy, interdependency and criticality for all rules,</p>	3/1/24	<p>Action Required</p> <p>MBTA must revise this action item to include interim milestones regarding the identification of roles and the creation of the DMS.</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		SOPs & manuals that govern Operations and Maintenance.			
		8. Stakeholder departments to develop and sign off on their respective SOPs to enable documentation audits. Required action 3.C Processes/Procedures	8/1/24	Action Required MBTA must revise this action item to include interim milestones regarding this activity. In addition, MBTA must revise this action item to address whether SOPs be developed through pilot process or staggered or all together.	
		9. 9a Quality Management team will execute the auditing program of all safety critical maintenance activities and additional processes agreed upon by Capital Programs and Transportation.	2/28/25	Action Required MBTA must revise this action item to clarify accountability. FTA is concerned that MBTA is allowing Capital Programs and Transportation to dictate auditable safety critical elements. The Quality Management team must be independent and should consult with all stakeholders. The Quality Management team must maintain accountability for decisions related to selection, timing, and scope of auditing activities.	
		9b Create a central repository for all documents that govern operating conditions. Procure a DMS that will be a universally	2/28/25	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		accessible repository for all governing documents.			
		10. Develop Executive QM Dashboard (Monthly Report) and establish monthly update meeting with GM's office. Required action 3.B Independent Oversight	2/28/25	Action Item Approved	
		11. Identify resource needs for a fully staffed Quality Management Program and develop a five-year staffing and hiring plan. Required action 3.D Staffing and Expertise	2/28/25	Action Required 3.D requires that MBTA QA/QC is independent and staffed with SMEs in the necessary disciplines. MBTA must revise this action item to clarify how MBTA will ensure the independence of the QA/QC group.	
		12. MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, considering the scope and performance measures.	3/1/25	Action Item Approved	
FTA-22-12-MBTA-CAT4-4	Finding: Technical training for operations and maintenance departments is under-resourced and decentralized, without sufficient	1. MBTA will develop a TWG to assess training needs. This working group will include members from Transportation, Maintenance, Safety, Security & Emergency	11/1/22	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>resources and direction, and relies significantly on on-the-job training (OJT) which is informal and lacks oversight. Emergency response training is poorly integrated into overall training program.</p> <p><u>Required Action:</u></p> <p><i>FTA-22-MBTA-CAT4-4.A</i> MBTA must conduct a training needs assessment for rail transit operations and maintenance departments, to include emergency response training. This assessment should identify training that needs to be updated, developed, and supported with additional resources.</p> <p><i>FTA-22-MBTA-CAT4-4.B</i> MBTA must implement the results of the training needs assessment.</p> <p><i>FTA-22-MBTA-CAT4-4.C</i> MBTA must consider opportunities and adopt technology and other resources to support training development and training management and record-keeping.</p>	Management, System-Wide Accessibility, HR, and IT.			
		2. Conduct a strategic planning session for SD 22-12 Finding 4 CAP implementation with the RCWG identified in Actionable Item #1.	11/30/22	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.</p>	
		3. Migrate all current training documentation and tracking into the LMS (Learning Hub)	10/1/24	<p>Action Item Approved</p> <p><u>Note:</u> FTA will periodically review migration of training and documentation into the LMS.</p>	
		4. Issue RFP for consulting services. This consulting engagement will be divided into 3 phases: (1) gap analysis, (2) content creation/revision, (3) Implementation of training programs.	1/15/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFP prior to its release.</p>	
		5. Onboard selected consultant	4/1/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.</p>	
		6. MBTA will complete a third-party gap analysis and benchmarking of training in operations. This includes but is not limited to the following	6/30/23	<p>Action Item Approved</p> <p><u>Note:</u> FTA will ask MBTA to provide a presentation regarding the results of this assessment.</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		items: available training content, in-person and OJT training programs, resources (human, technology, and physical space), organizational structure, etc. Required Action 4A			
		7. MBTA will review gap analysis and prioritize changes to current training programs. MBTA will establish a plan to address.	7/31/23	Action Item Approved	
		8. Develop a labor model and org structure to sustainably support operations training. This should include instructor resources, content development, LMS administration, etc. This will also include identifying space and technology needs to support ongoing training activities. Required action 4C	4/30/24	Action Item Approved <u>Note 1:</u> The labor model and organization structure should apply to both operations and maintenance training. <u>Note 2:</u> FTA will request periodic updates regarding the status of this activity.	
		9. Develop additional content needed to formalize training for all critical operations roles. Required Action 4B	2/1/24	Action Item Approved	
		10. Issue RFP for consulting services. This consulting engagement will be divided	3/1/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		into 4 phases: (1) recommendation for required resources and organization, (2) LMS governance structure, (3) Learning path development and governance, (4) Steady-state training reviews and governance.		<u>Note:</u> FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFP prior to its release.	
		11. Onboard selected consultant	4/15/23	Action Item Approved	
		12. Review current org structure and propose a governance structure including (1) headcount and roles for centralized training, (2) structure for training governance and review, (3) development of learning paths by role	7/1/23	Action Item Approved <u>Note:</u> For the Operations Training component of this assessment, MBTA must ensure coordination with activities underway for SD 22-7 (FTA-LC-22-002, Action Item #3)	
		13. Develop training plan documentation for critical roles across operations and maintenance.	5/1/24	Action Item Approved	
		14. MBTA will develop a sustainable solution for reviewing and updating training plans and aligning on agency priorities for training	1/1/24	Action Item Approved	
		15. Develop metrics to measure success for each training division and create	5/1/24	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		dashboards to display those metrics.			
		16. MBTA will ensure front line staff have improved access to training curriculum by assessing potential digital solutions for each area of operations	11/1/24	Action Item Approved	
		17. MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	11/1/24	Action Item Approved	
FTA-22-12-MBTA-CAT4-5	<u>Finding:</u> MBTA lacks formal resource manuals in key maintenance areas and does not currently provide employees with checklists or other tools to support training and implementation of maintenance rules and procedures. <u>Required Actions:</u> FTA-22-MBTA-CAT4-5.A In coordination with required actions already underway to address FTA's Special Directive	1. Establish a working group of internal stakeholders to review and guide implementation of the corrective action plan aligned with SD 22-4 CAP 6.	11/30/22	Action Item Approved	
		2. Conduct a strategic planning session for SD 22-12 Finding 5 CAP implementation with the working group identified in Actionable Item #1.	12/15/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.	
		3. Issue RFP or Task Order for consulting services to support documenting or digitizing	2/28/23	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	<p>22-7, the MBTA must review its existing maintenance rules and procedures; identify opportunities for tools and checklists to support employees in carrying out maintenance rules and procedures; and develop, distribute, maintain, and update these materials.</p> <p><i>FTA-22-MBTA-CAT4-5.B</i></p> <p>MBTA must include frontline maintenance personnel in the development evaluation of these tools and checklists.</p>	<p>maintenance/repair instructions, identify opportunities for checklists and tools and assist with appropriate systems to aggregate and update digital resources.</p>		<p><u>Note:</u> FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFP prior to its release.</p>	
		<p>4. Onboard selected consultant</p>	<p>4/30/23</p>	<p>Action Item Approved</p> <p><u>Note:</u> FTA will review the executed contract for the selected consultant to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.</p>	
		<p>5. Catalog the preventive maintenance and inspection procedures performed by E&M departments.</p>	<p>12/31/22</p>	<p>Action Item Approved</p>	
		<p>6. Work with E&M and VM personnel and equipment OEMs to update/determine step by step instructions to be performed for each Safety and System Critical preventive maintenance task performed internally or by vendors and execute plan to transition to digital records.</p>	<p>10/31/23</p>	<p>Action Item Approved</p> <p><u>Note:</u> FTA will expect updates during each Bi-Weekly Meeting for SD 22-12 regarding development of these instructions until their completion.</p>	
		<p>7. Incorporate new/updated maintenance/repair procedures and instructions and verification tests into</p>	<p>12/31/23</p>	<p>Action Item Approved</p> <p><u>Note:</u> FTA will request period demonstrations of this</p>	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		EAMS to better assist frontline personnel and improve record keeping.		incorporation as part of on-site activities in Calendar Year 2023.	
		8. Identify mobile EAMS platform functionality improvements to ensure PMI digitization adoption at all levels	1/31/24	Action Item Approved	
		9. Engage frontline staff to identify reference material, hardware configuration, and applications needed to improve work efficiency Required action 5.B	8/31/23	Action Item Approved <u>Note:</u> FTA expects to observe elements of this engagement during on-site activities.	
		10. Develop training for the various procedures and tasks. Training program should include detailed step by step instructions and verification tests for the procedures/tasks themselves, as well as how to complete these in EAMS using tablets. Training development will incorporate roles and responsibilities and training frequency. Training development will be aligned with requirements established in SD 22-12 CAP 4 .	10/1/24	Action Item Approved	
		11. The MBTA will continue to acquire and distribute tablets for maintenance personnel.	6/30/24	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		12. MBTA will implement the new training program to all applicable staff.	Ongoing	Action Item Approved	
		13. The MBTA will establish mobile access to the central repository of reference documentation to support work force knowledge of current requirements and facilitate periodic documentation review as established by SD 22-12 CAP 3 and referenced in step 9. Required action 5.A	6/30/24	Action Item Approved	
		14. The E&M department will determine a process for approving changes to the maintenance procedures, EAMS software and training program based on feedback from E&M personnel. Additionally, E&M will determine a process and frequency to review these programs in their entirety to ensure they remain effective and up to date as established in SD 22-12 CAP 2 . E&M will maintain performance metrics as a tool to measure success of this action plan and to guide maintenance and training program adjustments.	6/30/24	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		15. MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	6/30/24	Action Item Approved	
FTA-22-12-MBTA-CAT4-6	<u>Finding:</u> Due to workforce turnover, MBTA's new motorpersons and officials no longer have access to mentoring from experienced motorpersons and officials (inspectors, chief inspectors, and supervisors). <u>Required Actions:</u> MBTA must evaluate expanding its existing mentoring program from Bus Transit Operations to include new part-time and full-time rail transit operators or consider establishing a mentoring program specific to rail transit operations. In its evaluation, MBTA should consider opportunities and resources to support the professional development of rail transit operations personnel.	1. The MBTA will develop a cross-departmental MWG. This working group will include members from Transportation, the Training School, Safety, Labor Relations, and HR.	11/30/22	Action Item Approved.	
		2. Conduct a strategic planning session for SD 22-12 Finding 6 CAP implementation with the working group identified in Actionable Item #1.	12/31/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.	
		3. Issue RFP or Task Order for consulting services to support evaluating mentorship program	2/28/23	Action Item Approved <u>Note:</u> FTA will ask MBTA to provide a presentation regarding the requirements to be included in the RFP prior to its release.	
		4. Onboard selected consultant	4/30/23	Action Item Approved <u>Note:</u> FTA will review the executed contract for the selected consultant	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
				to verify the scope of work and qualifications of the selected contractor to assure their ability to provide these activities.	
		5. Gather materials from peer transit agencies to review and model rail transit professional development programs and identify key components and similarities.	7/1/23	Action Item Approved	
		6. The MBTA will review career pathways and on-the-job training for MBTA rail operations as well as different skill sets needed (both soft and technical). Match skills sets to program components identified in peer review. Identify gaps that require further development from MBTA.	9/1/23	Action Item Approved	
		7. Analyze current and budgeted headcount for rail transit positions in relation to career trajectories to establish overall need, program size, participation logistics and additional staffing needs.	11/1/23	Action Item Approved	
		8. Based on the tasks above, the MBTA will develop and present a proposal for mentorship of rail operations staff to MBTA Senior	12/20/23	Action Item Approved <u>Note:</u> Through CY 2023, FTA will confirm that MBTA Senior Leadership is directly engaged in	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		Leadership. This proposal will include a) a high-level overview of content, b) a draft implementation plan, c) definition of success, and d) any additional resources needed. (FTA SD 22-12, CAP 4, Item 9)		the development of the mentoring program. FTA expects that by the end of Calendar Year 2023, Senior Leadership would be aware of the proposed approach and ready to approve.	
		9. MBTA will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	12/20/23	Action Item Approved	
FTA-22-12-MBTA-CAT4-7	<u>Finding:</u> Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA operations and maintenance. <u>Required Actions:</u> FTA-22-MBTA-CAT4-7.A MBTA must confirm radio dead spots with frontline motorpersons and maintenance workers.	1. Radio Work Group will develop and compile a plan of action.	11/4/22	Action Item Approved	
		2. Establish a regular meeting between SWR, the OCC and MCC	11/4/22	Action Item Approved <u>Note:</u> FTA will review agendas and meeting notes to assess implementation of these sessions.	
		3. Review the list of (18) Weak Spots reported, with the Radio Work Group discuss and assign personnel for site survey. Required Action 7.a	11/4/22	Action Item Approved	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
	FTA-22-MBTA-CAT4-7.B MBTA must improve the performance of its radio system in these dead spots.	4. All 18 Weak Spots to be surveyed by assigned staff and report needed equipment to complete repair.	11/4/22	Action Item Approved	
		5. Assigned Radio Staff will make the needed repairs after clearance of ROW.	11/4/22	Action Item Approved	
		6. Prepare an after-action report (AAR), Technicians are to complete the AAR, complete with a description of work, and completed testing results from Spectrum Analyzer and photos of repairs as required.	12/5/22	Action Item Approved <u>Note:</u> FTA will include follow-up verification for this AAR as part of FTA's December on-site activities (week of December 5, 2022).	
		7. An AAR will establish a baseline record. These results will be compiled from the field by the Systemwide Radio Techs. Reports are to be forwarded to Safety, OCC Operations, and Sr. Staff. Required Action 7.b	3/30/23	Action Item Approved <u>Note:</u> FTA will include follow-up verification for this AAR as part of FTA's on-site activities in April of 2023.	
		8. Compile all previous MBTA Radio SOP documentation and update procedures as warranted.	11/1/23	Action Item Approved	
		9. Radio Technicians will re-test and verify the noted weak spot areas on a Quarterly basis and Annually during the SWR Preventive Maintenance	10/30/24	Action Item Approved <u>Note:</u> FTA will request to review radio test reports.	

Corrective Action Plan (CAP) Evaluation Matrix
Special Directive 22-12: Training and Policies

Identification Number	Finding and Required Action	Proposed CAP Items	Proposed Due Dates	FTA Comments	MBTA Response (if needed)
		program (PM), scheduled for April-2023. An after-action report (AAR) will be completed and will be forwarded to Safety, OCC Operations and Sr. Staff.			
		10. MBTA departments will evaluate actionable items/deliverables before submission to FTA to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the scope and performance measures.	10/30/24	Action Item Approved	

Paige Sopher

From: Catsos, Michael
Sent: Friday, December 30, 2022 4:09 PM
To: 'DeLorenzo, Joe (FTA)'; 'elliott.shepherd@dot.gov'; 'erin.powell@dot.gov'
Cc: 'Cyrell.McLemore@dot.gov'; Ester, Ronald; Stoothoff, Erik; Hicks, Steve; Choe, Katie; Sandberg, Meredith; Vance, Natasha; Annabelle Boyd
Subject: Closure Request Memo - SD 22-4 CAP 9

All,

MBTA has uploaded a Corrective Action Plan Closure Request Memorandum for Special Directive 22-4 CAP 9 to the FTA file transfer site for review:

- FTA-22-4-MBTA-TRA-9 CAP Closure Request Memo

This item and future CAP Closure Request Memos may be found in the newly-created "CAP Closure Requests" folder within the main MBTA Requested Documents directory.

Please let me know if you have any questions.

Thank you,
Mike Catsos

Michael Catsos
Director of SMS and Safety Oversight
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com



Paige Sopher

From: Hammond, Alexander (FTA) <alexander.hammond@dot.gov>
Sent: Wednesday, January 12, 2022 2:56 PM
To: Poftak, Steve
Cc: O'Hara, Mary Ann; Connolly, Joe; Pagliuca, Joe; Bateman, Traci; Butler, Peter (FTA); LaMacchia, Christopher (FTA); smensah@samlin CPA.com; Evans Bannor; Muhlangar, Michelle (FTA); Keamy, Matthew (FTA); "'Rosemary Womack' <r.womack@rmw-associates.com>" <'Rosemary Womack'; 'Samuel Abanyie'
Subject: FMO Final Report and Cover Letter
Attachments: MBTA FMO Final Report Cover Letter FY2021.pdf; MBTA - Final Report Full Scope Review.pdf

Good Afternoon,

Please find the attached letter from Peter Butler, FTA Region 1 Administrator, transmitting the Financial Management Oversight Review Final Report. Please feel free to reach out to me if you have any questions.

Thank you,

Alex Hammond
General Engineer
Federal Transit Administration – Region 1
55 Broadway
Cambridge, MA 02142
617-494-2304
alexander.hammond@dot.gov

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Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, Acting MassDOT Secretary & CEO
Steve Poftak, General Manager



SENT VIA EMAIL

April 19, 2022

Mr. Joseph DeLorenzo
Associate Administrator & Chief Safety Officer
Office of Transit Safety and Oversight
Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Subject: Safety Management Inspection

Dear Mr. DeLorenzo:

We are in receipt of your letter via email dated April 14, 2022 and acknowledge receipt of your email of the same date. As has been previously communicated, Mr. Ronald Ester, our Chief Safety Officer, will be the point of contact for your team. The MBTA welcomes the opportunity of working collaboratively and sharing our safety practices and the progress that we have made since the Safety Panel Report was issued in December 2019. That Panel was comprised of three leading safety and transit experts: Ray LaHood, former Secretary of the U.S. Department of Transportation, Carolyn Flowers, former CEO of the Public Transit for Charlotte Area Transit System, and former COO of the Los Angeles County Metropolitan Transportation Authority and Carmen Bianco, the former President of the New York City Transit system. At that time, the Panel stated that the MBTA performs the necessary core functions to be considered a relatively safe system but that improvements were necessary and required.

The safety of our riders and our workforce is the highest priority at the MBTA. Our team of highly qualified and dedicated professionals has been steadfast in its commitment to implement our Safety Management System (SMS)

“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.” *

and the recommendations of the Safety Panel Report while working closely with the Department of Public Utilities, our State Safety Oversight Agency (“SSOA”).

The MBTA is currently in Phase 2 of 3 of its SMS Implementation Plan. In this phase, for example, we are working to improve and promote the MBTA’s voluntary, confidential, and non-

* 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.

punitive employee reporting program. Additionally, we are identifying and looking to strengthen our existing Safety Risk Management (SRM) tools for hazard tracking and risk assessments. These safety initiatives are in line with many of the Safety Panel Report's recommendations.

The Safety Panel Report made a total of 34 recommendations, which contain 61 individual corrective actions. They are broken down into 6 categories.

- Safety Risk Management
- Safety Promotion
- Safety Policy
- Safety Culture
- Safety Assurance
- Financial Review

We have been working diligently to implement these recommendations and have completed and are actively monitoring 69 percent of them, with 31 percent in progress. Moreover, since FY19, the MBTA has increased the Safety Departments' budget by 80 percent. Our budgeted headcount for safety related positions is 50 positions with 9 current vacancies. This represents a 95 percent increase in our active headcount since January 2018.

The MBTA's Board of Directors and its leadership have made significant progress implementing the Safety Panel Report's recommendations, but we recognize that we can do better, and we are committed to work with our Federal, State and local partners to make the system even safer for our riders and employees.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Steve Poftak', with a stylized, cursive script.

Steve Poftak
General Manager

cc: Peter Butler, Regional Administrator, FTA Region 1
Elizabeth Cellucci, Director of Transportation Oversight, Massachusetts Department of Public Utilities
Jamey Tesler, Massachusetts DOT Secretary and Chief Executive
Betsy Taylor, Chair, MBTA Board of Directors
Ronald Ester, Chief Safety Officer, MBTA



U.S. Department
of Transportation
**Federal Transit
Administration**

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617-494-2055
617-494-2865 (fax)

July 11, 2022

Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza, Suite 3830
Boston, MA 02116

RE: Green Line Type 10 Core Capacity Eligibility

Dear Mr. Poftak:

Thank you for your letter on June 27, 2022, outlining the MBTA's proposed approach for procuring new Green Line Type 10 Rail Cars. We understand that the MBTA intends to execute a base contract for 102 vehicles to replace the aging high-floor Type 7 and partial low-floor Type 8 fleets. The MBTA wishes to ensure that the option on that contract for additional vehicles to be procured in the future which will support increased capacity in connection with the Green Line Transformation project would remain eligible for funding under the Capital Investment Grant Core Capacity program.

The FTA does not have any concerns with the proposed approach. The MBTA may exercise an option to procure additional vehicles as part of the Green Line Transformation Core Capacity project once pre-award authority has been established, which can happen after all review required under the National Environmental Policy Act (NEPA) is complete and the project has received FTA authorization to advance out of Project Development into Engineering.

As design of these rail cars continues, I encourage you to continue to support your staff as they coordinate with our Office of Civil Rights to ensure that the vehicle design complies with the Americans with Disabilities Act (ADA). Our Regional Civil Rights Officer will be reaching out to your staff soon to schedule a meeting to review specific questions they have about the accessibility of these new vehicles and the specific requirements of the ADA.

We look forward to working with the MBTA on this project.

Sincerely,

Peter Butler
Regional Administrator

Paige Sopher

From: Powell, Erin (FTA) <erin.powell@dot.gov>
Sent: Tuesday, December 6, 2022 2:29 PM
To: Poftak, Steve
Cc: Butler, Peter (FTA); Gonneville, Jeffrey D.; Stoothoff, Erik; Ester, Ronald; Choe, Katie; Cellucci, Elizabeth (DPU)
Subject: FTA Response to Special Directives 22-9, 22-10, and 22-12 (Resubmittal Required)
Attachments: SD 22-9, SD 22-10, SD 22-12 CAP 12.06.2022 Response Letter (Resubmit Required).pdf

Mr. Steve Poftak,

Sent on behalf of Joe DeLorenzo, please find the attached FTA Response to Special Directives 22-9, 22-10, and 22-12 requiring resubmittal and an additional submittal of a PMP and an Integrated Master Scheduled.

Please confirm receipt and let me know if you have any questions.

Very respectfully,

Erin Powell
SMI Coordinator
771-200-8016

CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.

ID	Page	Finding and Required Action	Response Type	MBTA Feedback
1	6	“FTA also observed that, since the 2019 Safety Review Panel (SRP), MBTA’s executive leadership team has taken action to address select findings from the SRP report, such as new management initiatives and programs focused on the performance and tracking of preventive maintenance inspections, hiring for key technical positions, enhancement of the agency’s Safety Rules Compliance Program (SRCP) to support safety assurance, establishment of the MBTA’s Employee Safety Reporting Program (ESRP), and new safety event investigation capabilities.”	Correction	Though expanded since 2019, the employee reporting program did exist prior the Safety Panel Report.
2	6	Also, since fiscal year 2019, MBTA has increased the Safety Department’s budget by 80 percent	Correction	74%
3	6	FTA took this action in part because during the SMI it found that MBTA does not have sufficient capabilities for identifying priorities to address safety concerns from the agency’s operations, maintenance, and capital delivery programs.	Recommendation	The term “capital delivery” is used throughout. We recommend "capital project delivery" be used to eliminate any confusion since one of teams within Capital Programs is called Capital Delivery.
4	6	Footnote 5: The FY 2022 budgeted headcount for safety related positions is 50 positions with 9 vacancies. This represents a 95 percent increase in active headcount since January 2018.	Question	What was the documentation source and date range used for this calculation
5	11	“...a December 17, 2021, rollaway train at Cabot Yard that seriously injured three workers.”	Correction	None of the injuries meet the NTD definition of a serious injury.
	14	A low-speed collision on at a Green Line platform that inadvertently coupled the two trains together and caused a passenger evacuation toward Park station (June 14)	Clarification	While MBTA did have to manage Orange Line, Green Line and Shuttle Bus Operations during the incident, the Government Center Garage is not an MBTA project or asset.
6				
	15	As noted in Figure 1, since the beginning of calendar year 2020, MBTA also experienced a higher rate of collision on its heavy rail transit mode than the industry average.	Question	Incident data classification seems to be inconsistent. Narrative and 2020 data seems to indicate that Vehicle to Vehicle and Vehicle to Fixed Object collisions are being counted and Collisions with persons are being excluded (as presented the 2020 data in the graph does not include any collision with person), however for 2021 there were no qualifying incidents in April, October, or November (in April, there were 2 collisions with person that, if counted, would have resulted in a rate of 126, but it seems only one was counted).
7				
8	16	For mainline derailments, which have been a long-standing concern for the MBTA, the data depicted in Figures 2 and 3 also show how MBTA’s safety performance compared to industry average during the 7-year period between 2015 and 202	Question	This chart is misleading, as most of the heavy rail derailments in 2020 and 2021 were high rail vehicles used during maintenance and construction, not revenue vehicles. This was also a change to reporting criteria. This is true on light rail as well. Additionally, hi-rail derailment reporting did not start until partway into the CY16 reporting period so the data is not consistent across the presented data set
	18	The MBTA is overseen by the MBTA Board of Directors, which replaced the Fiscal and Management Control Board in 2021	Clarification	Under the MBTA's enabling act, Chapter 161A of the Massachusetts Laws, as amended in July 2021, the MBTA is governed and its corporate powers exercised by a seven-member board of directors. The MBTA Board consists of : the Secretary of Transportation for the Commonwealth, who serves ex officio, one person appointed by by the MBTA Advisory board who shall have municipal government experience in the service area constituting the MBTA and experience in transplantation operations, transportation planning, housing policy, urban planning or public or private finance; and five persons appointed by the Governor, one of whom shall have experience in safety, one of whom shall have experience in transportation operations, one of whom shall have experience in public or private finance, one of whom shall be a rider as defined n the Enabling Act and a resident of an environmental justice population, and one selected from a list of three persons recommended by the president of the Massachusetts State Labor Council, AFL-CIO. Additionally, not less than two of the appointed members shall also be members of the board of directors of MassDOT. The statue also required the board to establish subcommittees which shall include at a minimum a subcommittee on: (i) safety, health and environment; (ii) planning and workforce development; and (iii) audit and finance.
9				
10	18	MBTA top-level leadership includes the General Manager, Deputy General Manager, and MBTA Board of Directors.	Recommendation	Add brief bio’s for all of GMS direct reports or remove the DGM bio as to no single one particular direct report
11	19,21,23,28	Light Rail (heritage trolley) service from Ashmont to Mattapan (considered part of the Red Line)	Clarification	Internally Mattapan line is managed by Light Rail Operations and maintained by Light Rail Maintenance
12	21	The CRRC and MBTA are working to retrofit the new No. 14 vehicles due to undercarriage issues identified after a March 2021 derailment of one of these vehicles and other issues that require a software upgrade.	New Information	DPU closed CAP to replace all Side Bearer Pads on April 6, 2022 after MBTA provided evidence of completion. On August 15, 2022, MBTA Safety received notification that the software upgrades were complete.
13	22	The Blue Line fleet is maintained at Orient Heights Yard.	Recommendation	Include Blue Line Vehicle Chart
14	22	The MBTA maintains its Green Line fleet at Riverside and Reservoir Yards	Correction	The report states that the MBTA maintains its Green line fleet at Riverside and Reservoir Yards. Correction: The MBTA maintains its Green Line fleet at Riverside, Reservoir and the GLX Vehicle Maintenance Facility (VMF)
15	22	The MBTA Chief Mechanical Officer, who leads MBTA’s rail maintenance activities, reports to the Deputy General Manager of Operations	Correction	The MBTA Chief Mechanical Officer, who leads MBTA’s maintenance activities, reports to the Chief of Transit Services who reports to the Deputy General Manager. (As of 8/16/2022 the position reports to acting COO)
16	23	Table 2: MBTA Rail Transit Vehicle Maintenance Activities Identified in the 2018 MBTA Fleet Management Plan	Correction	Type 9 vehicles are missing
17	25	The MBTA’s TFM Department is responsible for the maintenance and inspection of physical structures throughout the system, including buildings, passenger stations and rail facilities, parking garages, bridges, tunnels, culverts, and retaining walls	Clarification	TFM conducts independent inspections on the Transit core (Not Commuter Rail) in addition to Capital Delivery (CD). Bridge Inspections and Load ratings are being conducted on the Transit core (240 transit, pedestrian and highway). The bridge inspections and load ratings are being done by CD as an augmentation to the TFM lead inspections. CD performs all load ratings, TFM does not carry out this function. CD conducts routine/in-depth bridge inspections every 5 years, and load ratings every 10 years for Transit rail structures to remain in regulatory compliance.

		Footnote 15: Open programs listed on MBTA’s Building a Better T website listed in reverse order, oldest to newest		
18	26		Clarification	CIP is the exhaustive list of MBTAs Capital Program https://cdn.mbta.com/sites/default/files/2022-05/2022-05-26-fy23-27-mbta-final-cip-public-document-accessible.pdf
19	28	GLPTS	Correction	Letters are out of order: GLTPS (Green Line Train Protection System)
20	32	Over the last four years, the MBTA’s capital budget has grown four-fold, from approximately \$500 million in fiscal Year 2018 to over \$2 billion in fiscal Year 2022	Correction	In FY2018 the MBTA's capital program spent \$875M on both reliability/modernization and expansion projects. This information is published in MassDOT's Tracker, which can be found here, https://www.massdottracker.com/wp/?p=4537 . The MBTA's spend target for FY22 was \$2B , with an actual spend of \$1.6B.
21	32	Since 2019, the MBTA’s rail transit organization has averaged a 10-percent vacancy rate from budgeted positions with key technical and supervisory positions averaging 20 to 35 percent	Question	What is the data source, job classifications and time period that were was used for these calculations
	32	However, interviews conducted with a range of personnel throughout the MBTA’s organization indicate that the rail transit system may be between 1,500 and 2,000 positions short in managing its current level of activity	Clarification	Is this personnel shortfall for rail operations only or authority wide. Is this an increase in addition to budgeted vacancies or from active headcount
22	32	Additionally, MBTA personnel reported that “repairers” on the Red and Orange Lines have not yet attended training	Correction	Orange Line Rail Repairers have attended training on new CRRC railcars. Red Line Rail Repairers have not started yet due to low car count (rail motorpersons are currently being trained)
23	33	MBTA has not completed any of these corrective actions, nor has DPU required MBTA to complete these actions	Clarification	MBTA has begun working on but not completed these action items
24	33	In January 2022, MBTA’s leadership team and Board of Directors took the unprecedented step of transferring an additional \$500 million from the MBTA’s operating budget to its capital budget.	Correction	A total of \$480M was transferred to the Capital Program. \$20M in "Employee Recruitment and Retention Initiatives" advanced key employee focused initiatives, including recruitment and retention, on the operating budget
25	33	the April 22, 2022 event when an aging door assembly malfunctioned and a train took power with a passenger trapped between its door panels	Correction	Incident occurred April 10, 2022
26	35	For the last five years, the MBTA’s budgeted positions have exceeded its actual active workforce by approximately 7 to 10 percent	Question	What is the data source, job classifications and time period that were was used for these calculations
27	36	Challenges with pay equity between supervisory and hourly employees eligible for overtime that make promotions to supervisory positions less attractive because officials may earn less and work the same hours	Clarification	"Officials" at the MBTA refers to a group of titles, all of which are hourly and eligible for overtime. It is difficult to get officials to take salaried positions because they can work the same or fewer hours as a salaried worker and make more money than the salaried worker. Recommendation to change the first "supervisory" to "salaried" and change "officials" to "salaried workers."
28	37	The MBTA was unable to provide safety certification plans as requested for the Green Line Wayside Signal, Green Line B Branch Consolidation, and Green Line D Branch Track and Signal capital projects, among others	Update	No formal document request was found for the noted Safety Certification plans. MBTA will submit the requested documentation as part of final submission
29	37	For example, the new Green Line Type 9 rail cars, included just four (4) Certifiable Items List (CIL) elements	Update	MBTA will submit supplemental documentation as part of final submission
30	37	the MBTA was unable to produce any records showing the results of review made by the Safety Department on the certification packages for these vehicles beyond the signature for concurrence.	Update	No formal document request was found for these items. MBTA will submit the requested documentation as part of final submission
31	General	Findings 5, 9, 10, 12	Question to bring up at 8am meeting	Many findings relate to MBTA’s incomplete and ongoing stand-up of Safety Risk Management and Safety Assurance activities rooted in SMS implementation. However, FTA’s own guidance, including responses to comments during the rulemaking process for 49 CFR Part 673, states that “the full implementation of SMS may take...in some cases years to mature in large multi-modal transit agencies.” MBTA’s implementation of SMS has matured at a rate commensurate with the organization’s size and scope of operations, and neither MBTA’s interviews with FTA’s SMI facilitators nor the SMS Implementation Plan itself have characterized MBTA’s progress through Phases 2 and 3 of implementation up to this point as complete. Given the long-established and widely-held understanding that SMS implementation is a complex, multi-year process and is not yet expected to be complete, FTA should clarify the basis for SMS-related findings, including whether any of the findings represent instances of non-compliance with applicable regulations.
32	40	“After interviews and document reviews, FTA concluded that, beyond the definition of the roles and responsibilities above, the MBTA has not established a safety management governance structure that includes: Clear descriptions of SMS accountabilities, authorities, and responsibilities for other positions within the MBTA organization.”	Clarification	This information is covered within the MBTA SMS Leadership Responsibilities Training.
33	42	“FTA concluded that the structures necessary for effective SMS implementation and operation are not yet in place within MBTA.23 Important gaps exist in the following areas: ...	Clarification	There are multiple training related to SMS including: SMS Fundamentals, MBTA SMS Leadership Responsibilities, Safety Risk Management at the MBTA, & Participating in a Local Safety Committee.
34		relevant and appropriate training on key SMS processes for involved personnel. “		

43	MBTA has established a structure of safety committees and meetings to facilitate safety information sharing. During interviews, MBTA’s Deputy General Manager (DGM) and Chief Safety Officer (CSO) presented the timing and frequency of safety meetings (including formal safety committee meetings) as follows	Clarification	The “4th meeting each month” is to discuss open CAPs, rather than “open items”. This is a duplicate with the first listed Monthly meeting. CAPs are also not a primary topic of the bi-weekly Safety and Operations Coordination Meeting. The “Executive safety performance review” is formally titled the “Executive Safety Performance Management Session” Additional safety meetings: Bus Accident Reduction Committee and Subway Accident Reduction Committee meetings include a review of the SDAR / safety trends, Code 1 Committee meetings, SRCP Committee meetings
35			
36	452. MBTA leadership must include explicit safety risk acceptance criteria in its Agency Safety Plan and/or reference documents	Clarification	Risk Acceptance is covered in Section 5.2.5.4 of the Transit Safety Plan - as well as in the MBTA SMS Leadership Accountabilities training and SRM materials provided to outside departments
37	47The Safety Department does conduct internal safety audits; however, the scope of the audits for 2021 were not aligned with known safety concerns and their safety risk mitigations.	Clarification	In 2022, MBTA performed Internal Audits in compliance with the MDPU Program Standard, as documented in 220 CMR 151.05.
38	47FTA learned that the Maintenance of Way Department (MOW) tries to piggyback on capital projects to utilize the track time allocated to those projects	Clarification	MOW doesn't exclusively piggyback on capital projects but request access for its own maintenance activities. Additionally, the term "straight track replacement" would be better stated "solely track replacement" so that it does not imply rail only improvements. Capital projects consistently conducts full depth replacements when track is replaced. E&M/MOW routinely replace rail only when improvements are done MBTA has no record of a formal document request for these items. The event is under investigation and all contributing factors to the event are in the process of being identified.
39	48FTA requested that MBTA’s safety officials collect and submit data related to organizational factors that may have influenced conditions for each event and, for two of the events, additional data and analysis on related system components. At the time of this report, MBTA has not yet responded to these requests.	Correction	
	“3. MBTA must develop and document guidance, and deliver training for safety investigators that ensure the consideration of precursor factors in the analysis of the chain of events leading to a safety event (accident, incident, or occurrence), including but not limited to, for example: <ul style="list-style-type: none">• Suitability of resources available to frontline personnel for operational and maintenance activities• Deficiencies in policies, procedures, rulebooks• Outdated policies, procedures, and rulebooks• Deficiencies/inadequacies in training• Shortcomings in supervision• Deviations from procedures and rules• Reasons for lack of adherence to procedure and rules• The limited success of discipline to address safety issues.”		This is contained in the Safety Event Investigation Training. Supplementary documents to be provided: Accident investigation virtual training courses and supporting materials.
40			
41	50FTA did not receive a list of safety risk assessment workshop topics or priorities, or a schedule for upcoming workshops from the Chief Safety Officer.	Correction	MBTA Safety does maintain a list of planned safety risk assessment workshops, including background information compiled by Safety for review by outside departments. These documents were not formally requested by FTA in the follow-up to the interview process, so it is not accurate to characterize them as not received. Supplementary documents to be provided: Draft Safety Risk Management worksheets prepared prior to FTA SMI.
42	50FTA did not receive a list of safety risk assessment workshop topics or priorities, or a schedule for upcoming workshops from the Chief Safety Officer.	Question	The narrative highlights that MBTA did not provide a schedule of safety risk assessment workshops, but goes on to state in the following paragraph that “a schedule of safety risk assessment workshops is counterintuitive to the situational nature of hazard identification and is inconsistent with the basic principles of safety management.” Request that FTA clarify expectations around the creation and maintenance of a schedule for these activities.
	53FTA also found instances where the likelihood and severity ratings, as well as the safety risk indexing, did not correspond to MBTA’s safety risk assessment Agency Safety Plan requirements	Clarification	MBTA's Risk Assessment Matrix changed in 2020, moving from a hazard severity of Catastrophic to Negligible to Catastrophic to Low
43			
44	58Most reports received through the Safety Hotline during 2020 were related to violations of mask protocols because of requirements put in place to address the COVID-19 pandemic	Correction	Most reports were related to COVID policy and procedures, not specifically mask violations.
45	59FTA analyzed the Safety Hotline log and noted that more than 70% of reports are anonymous which may indicate a weakness in the program as MBTA is unable to follow up with workers on reported concerns	Correction	Reports in in the Safety Hotline log are de-identified and reporting information is maintained separately by the ESRP analyst. As a result, it is not possible to infer the percentage of anonymous reports from the log provided.
	59FTA reviewed the Safety Hotline log and found that only a small percentage of reports are about safety concerns and most reports do not rise above the level of individual location “housekeeping” issues or complaints	Clarification	FTA states that the prevalence of housekeeping and maintenance calls to the Safety Hotline indicates a failure by management to provide direction on proper use of the hotline. This statement, and the full narrative for Finding 13, does not accurately convey the nature and fundamental cause of this issue. As documented in Safety’s hotline records themselves, the overwhelming majority of maintenance- and housekeeping-related calls to the Hotline were previously reported to the Maintenance Control Center on one or more occasions with no result. Callers then refer these issues to the Hotline as a system of last resort, with the understanding that Safety can sometimes compel follow-up from outside departments.
46			MBTA has developed and delivered trainings which comprehensively address the issue of how and where to report safety issues, and frontline MBTA employees are versed in these requirements. The SMS Fundamentals for All Employees course, developed prior to the SMI and delivered to frontline employees across operations and maintenance, includes both guidance and scenario-based quizzes on where to report different types of safety, operational, and maintenance issues. The quizzes must be completed for an employee to pass the course.
47	59"FTA did not see evidence (neither during discussions with employees nor through a review of the Safety Hotline log) that frontline employees receive sufficient and formal guidance on what to report and, most importantly, what not to report through the safety hotline."	Clarification	

48	70	approximately 10 years ago removed a step in the progression to full-time (FT) motorperson (previously, new hires would move from part time (PT) motorperson in yard, to PT train attendant in revenue service to PT motorperson operating revenue service to FT motorperson over an approximately 2- year period	Correction	The career ladder was Part Time Train Attendant to Part Time Yard Motorperson then Part Time Motorperson. From there employees would go Full time to Train Attendant then Full time motorperson. Additional clarification: 2 year progression was based on seniority and fluctuated on attrition and needs.
	70	In addressing these challenges, numerous MBTA personnel at all levels of the agency noted that MBTA’s bus operations has a mentorship program that many new bus operators find beneficial. There was strong support for establishing a similar program for rail transit operations. MBTA leadership also noted that they are considering the option of establishing a new instructor position assigned formally to each heavy rail line to work with new PT and FT motorpersons	Correction	There is no such mentorship program in Bus Operations. There is an agency wide mentorship program that anyone can participate in. There is an Instructor assigned to each district to investigate accidents. As a result, Operators see them and frequently ask questions regarding how to handle specific situations. When Instructors conclude their accident investigations, they will always provide reinstruction when accidents are found to be preventable. There is a requirement that when a new Bus Operator is released from Training, their first two days are operated with a more senior bus operator on board (Light Rail has a similar process). Lastly, the Training School regularly offers programs about specific issues (e.g., proper way to make a left turn, importance of seat belts, etc.) and there is a lot of opportunity for engagement on any issues of concern.
	72	FTA finds that the DPU is actively engaged in overseeing MBTA’s safety event investigations and has expanded the number of corrective actions issued to the MBTA to address findings from these investigations (from 4 in 2019, to 12 in 2020, to 42 in 2021).	Correction	MBTA created these CAPs and submitted them to MDPU for acceptance. MDPU did not issue them. The increase in corrective action activity was a result of MBTA action, not DPU.

SAFETY MANAGEMENT INSPECTION

Massachusetts Bay Transportation Authority
Massachusetts Department of Public Utilities



U.S. Department of Transportation
Federal Transit Administration

Final Report

August 31, 2022

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Acronyms List

AC	Alternating Current
AFL-CIO	American Federation of Labor and Congress of Industrial Organizations
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
DAG	Data Analysis Group
DC	Direct Current
E&M	Engineering and Maintenance
ESC	Executive Safety Committee
ESRP	Employee Safety Reporting Program
FTA	Federal Transit Administration
GEC	General Engineering Consultant
GM	General Manager
MBTA	Massachusetts Bay Transportation Authority
DPU	Massachusetts Department of Public Utilities
NTD	National Transit Database
OCC	Operations Control Center
OEM	Original Equipment Manufacturer
PMI	Preventive Maintenance Inspection
QA/QC	Quality Assurance / Quality Control
ROW	Right-of-Way
RWP	Roadway Worker Protection
SDAR	Safety Data Analysis Report
SMCWG	Safety Management Certification Working Group
SMWG	Safety Management Working Group
SMI	Safety Management Inspection
SMRC	Safety Management Review Committee
SMS	Safety Management Systems
SOP	Standard Operating Procedure
SRA	Safety Risk Assessment
SRM	Safety Risk Management
SRP	Safety Review Panel
SSO	State Safety Oversight
SSOA	State Safety Oversight Agency

Executive Summary

This report documents the results of the Safety Management Inspection (SMI) performed by the Federal Transit Administration (FTA) of the Massachusetts Bay Transportation Authority (MBTA) rail transit system operations and maintenance programs and MBTA's State Safety Oversight (SSO) agency, the Massachusetts Department of Public Utilities (DPU), between April 14 and June 30, 2022. The SMI reviewed the MBTA's rail transit system, which comprises the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not review the MBTA's bus transit or commuter rail system.

FTA conducted this SMI in response to the pattern of safety incidents at the MBTA, including safety issues such as derailments, train collisions, grade crossing fatalities, and other incidents involving both MBTA employees and passengers. In addition, FTA launched the SMI after considering MBTA's safety performance as monitored through data reported to the National Transit Database (NTD) and assessing DPU's implementation of its SSO program.

- **MBTA Safety Performance:** Safety data show that, from January 1, 2019, through April 2022, MBTA experienced a higher overall rate of reportable safety events¹, particularly on its heavy rail mode, and a higher rate of derailments on both heavy and light rail modes, than its peers and the total rail transit industry average. MBTA's recent safety events also indicate an increase in severity, from minor property damage, brief service disruptions, and minor injuries in 2019 and 2020, to more significant property damage, extended service disruptions, and more serious passenger injuries requiring hospitalization in 2021. In April 2022, a railcar door entrapment resulted in a passenger fatality.
- **DPU Oversight Program:** In October 2019, FTA conducted a triennial audit of DPU's SSO program, issuing 16 findings of non-compliance. At the time of the SMI, seven findings from this 2019 triennial audit remained open.² FTA continues to monitor the technical capacity of DPU's staff to perform safety oversight and the organizational resources and support that DPU commits to its SSO program.

To address concerns with MBTA's safety performance and ensure comprehensive safety oversight for the MBTA rail transit system, FTA notified the MBTA and DPU on April 14, 2022, that it would conduct an SMI utilizing its safety authority established at 49 U.S.C. 5329(f).

¹ As defined in the [NTD](#).

² These findings addressed the need for procedures to oversee specific roadway worker protection and track maintenance issues; for increased capabilities and capacity to oversee the identification and analysis of MBTA safety concerns and hazards; for needed improvements in the investigation and root-cause analysis of accidents; and for requiring and overseeing MBTA's development of corrective action plans to address safety deficiencies and concerns.

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Major SMI Activities

FTA's SMI activities focused on:

- MBTA data, information, and initiatives beginning in January 2020,
- MBTA's compliance with its internal safety rules and procedures,
- MBTA's compliance with Federal safety rules, including the Public Transportation Safety Certification Training Program regulation, [49 CFR part 672](#), the Public Transportation Agency Safety Plan regulation, [49 CFR part 673](#), and with DPU's SSO program, as required in FTA's SSO regulation at [49 CFR part 674](#),
- MBTA's compliance with DPU's program standard at [220 CMR 151.00](#),
- how MBTA's established processes, procedures, tools, and resources function to support safety decision-making and the evaluation of safety risk, and
- the role of the DPU in overseeing MBTA's safety performance.

FTA's SMI covered all rail transit and safety disciplines, and included a review of rail transit operations, training, vehicle maintenance, signals and train control, track and track access, capital project delivery, traction power, facilities, and safety management. Between April 14 and June 30, 2022, FTA requested and reviewed documents, managed a series of virtual interviews, conducted three weeks of on-site inspections at MBTA rail transit facilities, and engaged in extensive follow-up to identify areas where MBTA must make improvements to ensure the continued safety of its passengers, workers, and system infrastructure.

SMI Observations

Throughout the SMI, FTA assessed MBTA's safety management capabilities and capacity as well as the effectiveness of DPU's oversight of MBTA. FTA observations provide context for findings discussed in the report. The following discussion highlights these observations.

FTA observed that MBTA's executive leadership team supported FTA's activities throughout the SMI. In interviews and field observations, MBTA's leadership team and other staff engaged in candid discussions with FTA regarding safety performance challenges and needed improvements. At all levels of the organization, from the frontline through supervision and middle management to senior technical leadership, FTA found support for executive leadership and appreciation for the stability of having a consistent MBTA leadership team in place since January 1, 2019.³

³ Numerous interviewees described challenges experienced from January 1, 2010, to December 31, 2018, when MBTA had nine different general managers in nine years.

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FTA also observed that, since the 2019 Safety Review Panel⁴ (SRP), MBTA's executive leadership team has taken action to address select findings from the SRP report, such as new management initiatives and programs focused on the performance and tracking of preventive maintenance inspections, hiring for key technical positions, enhancement of the agency's Safety Rules Compliance Program (SRCP) to support safety assurance, enhancement of the MBTA's Employee Safety Reporting Program (ESRP), and new safety event investigation capabilities. Also, since fiscal year 2019, MBTA has increased the Safety Department's budget by 74 percent.⁵

Organizational Deficiencies Requiring Immediate Action

FTA's SMI identified interim findings of organizational deficiencies and operational concerns that needed immediate action in advance of this report. As a result, FTA issued four special directives to MBTA on June 15, 2022, addressing key safety concerns that had not yet received urgent attention from MBTA or DPU:

- [Needed repairs to MBTA's track infrastructure and enhancements in the management of maintenance information \(Special Directive 22-4\).](#)
- [Lack of policies, procedures and training for the securement and movement of disabled trains in rail transit yards \(Special Directive 22-5\).](#)
- [Fatigue management and lapsed certifications for dispatchers in the Operations Control Center \(Special Directive 22-6\).](#)
- [Hours of work violations and lapsed certification for rail transit operations personnel \(Special Directive 22-7\).](#)

FTA took this action in part because during the SMI it found that MBTA does not have sufficient capabilities for identifying priorities to address safety concerns from the agency's operations, maintenance, and capital project delivery programs. Throughout the SMI, FTA found that while MBTA leadership was aware of many of the issues raised in the special directives they had not evaluated the information as is necessary to effectively assess systemwide safety and prioritize action.

FTA also issued a special directive (Special Directive 22-8) to DPU requiring additional oversight activities in these areas because FTA found DPU has not used its authority to ensure the identification and resolution of safety issues at MBTA. Despite MBTA's recent safety performance, FTA determined that DPU has not been actively engaged in overseeing the MBTA's Safety Management System (SMS), including safety risk management and safety assurance activities. While DPU has the authority to require MBTA to take expedited action to

⁴ In 2019, MBTA's Fiscal Management and Control Board (FMCB) convened a safety review panel (SRP) to take a comprehensive review of the MBTA's safety performance, safety leadership, and culture.

⁵ The FY 2022 budgeted headcount for safety related positions is 50 positions with 9 vacancies. This represents a 95 percent increase in active headcount since January 2018.

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implement its SMS and address other safety concerns, the agency rarely invokes its authority to compel such action.

FTA also issued the special directives because MBTA and DPU have been slow to complete corrective actions to address safety concerns, averaging almost two years to close a CAP (Corrective Action Plan). Persons interviewed in the SMI process articulated concerns about MBTA leadership's lack of urgency to address safety deficiencies in a timely manner. MBTA's frontline workers expressed a lack of confidence that safety issues, once reported, would be addressed. In addition, senior technical leadership expressed similar concerns, providing numerous examples where operational or maintenance issues with potential safety impacts had been raised but were not addressed, as agency resources were unavailable or focused on other areas.

Balancing Safety-Critical Operations and Maintenance with Effort to Deliver Capital Projects

FTA observed that MBTA is not effectively balancing safety-critical operations and maintenance activities with its efforts to deliver capital projects. This lack of balance is at the center of many of MBTA's safety challenges. Over the last four years, the MBTA's capital budget has grown four-fold⁶, yet MBTA is still recovering from the impact of funding cuts from 2015 to 2019 to the MBTA's operations and maintenance budget which resulted in a reduction in hundreds of millions of dollars and hundreds of positions. MBTA has taken steps to hire new personnel and expanded its Capital Program Office. Nevertheless, many of the requirements associated with capital projects, including initial engineering, schedule management, track access requirements, flagging, testing, and acceptance, are managed with existing operations and maintenance staff which has stressed staff and required the excessive use of overtime.

FTA found that budgeted positions do not reflect the true measure of required staff levels because they do not consider the additional responsibilities associated with capital project delivery and often are calculated to rely on overtime to cover staff vacations and training.

MBTA leadership reported that they have not taken corrective action to address concerns regarding the impact of capital projects on the day-to-day safe operations of the MBTA due to the challenges and uncertainties of the COVID-19 public health emergency. During this same period MBTA aggressively moved forward with its \$2 billion per year capital program supported largely by existing and overtime resources from the agency's operations and maintenance departments and contractors.

In January 2022, MBTA's leadership team and board of directors took the unprecedented step of transferring an additional \$500 million from the MBTA's operating budget to the capital budget. In interviews, MBTA's leadership explained their objective for the agency to build its

⁶ Over the last four years, the MBTA's capital budget has more than doubled, from approximately \$875 million in fiscal year 2018 to over \$2 billion in fiscal year 2022.

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way into enhanced capacity, safer, and more reliable passenger service and a better state of repair through an aggressive program of capital projects. While the agency is focused on this priority, its aging assets and infrastructure continue to deteriorate and fail. For example, the July 21, 2022, train fire on the transit bridge over the Mystic River was caused when a rusted sill panel fell off a rail transit train and contacted the third rail.

The combination of overworked staff and aging assets has resulted in the organization being overwhelmed, chronic fatigue for key positions in the agency, lack of resources for training and supervision, and leadership priorities that emphasize meeting capital project demands above passenger operations, preventive maintenance, and even safety.

Challenges with SMS Implementation

FTA observed that MBTA's approach to implementing SMS lacks sufficient detail and explicit direction from MBTA's leadership. MBTA has not developed the necessary tools and capabilities to support the management of safety risk. As a result, MBTA has been unable to prioritize safety risk and, subsequently, resources to mitigate safety risk. MBTA's lack of effective safety risk management has been compounded by the DPU's at times inadequate safety oversight. The DPU has responsibility to enforce the MBTA's Public Transportation Safety Plan (PTASP), which implements SMS. The DPU has not consistently required or enforced timely assessment and mitigation of safety risk for passenger operations to prevent organizational blindness to emerging safety concerns.

FTA also observed that MBTA lacks effective safety reporting and formal mechanisms to support and assure the communication of safety issues from the frontline to senior leadership. For example, MBTA established local safety committees as a primary venue through which it receives safety information from frontline personnel. During interviews and records review, however, FTA learned that local safety committee meetings often do not have frontline representation due to staffing shortages and that there is no documented requirement for the Safety Department representative to report, synthesize, or address the items and information discussed during the meetings. While the Safety Department has undertaken several new initiatives to facilitate cross-department discussion regarding safety issues, MBTA leadership has not created a structured communication process to address safety issues.

During the on-site portion of the SMI, all levels of the organization, from leadership to frontline workers, expressed surprise and occasional alarm at the MBTA's declining safety performance but tended to view incidents as "one of a kind" or "freak accidents" rather than the result of systemic failures in operating procedures, training, staffing, and supervision. Pressure points identified in interviews and on-site inspections, such as lack of staffing and supervision, lack of enforcement of safety rules, lack of track access for critical repairs, and excessive overtime, were generally dismissed as inevitable and normal work conditions. There was little awareness that key mitigations previously put in place to reduce safety risk, including safety procedures,

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staffing resources, and supervision, may no longer be as effective as they once were because resources have been strained so significantly over the last few years.

SMI Finding Categories for MBTA Requiring Action

FTA's SMI report focuses on four categories of actions necessary to strengthen MBTA's safety posture and improve its safety management capabilities:

- **Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce:** FTA found that an organizational focus on capital projects has diverted management attention and resources from the agency's operations and maintenance, allowing the agency to operate a level of service that is not adequately staffed, trained, supervised, or maintained. In addition, existing staffing levels and capabilities do not provide adequate safety oversight for the design, construction, and testing of new capital projects and do not support widespread safety certification of these projects, which is an industry standard practice. MBTA also has experienced a series of construction safety events due to the lack of oversight of worksites. To ensure that the system remains safe for both passengers and workers, and to support the safety of MBTA's projects and worksites, FTA issues four findings requiring additional assessment and resource prioritization for operations and maintenance activities.
- **Category 2 – Prioritization of safety management information:** FTA found limited evidence that MBTA has adopted SMS practices in the field to support the identification, analysis, and prioritization of safety information. To ensure this critical capability, FTA issues six findings requiring enhanced and expedited implementation of the agency's SMS, including the development of procedures, safety management training, safety risk assessment, and safety assurance activities to enhance the organization's capability to identify safety concerns and to prioritize action to mitigate safety risk.
- **Category 3 – Effectiveness of safety communication:** FTA found that there is a lack of routine, consistent, and meaningful communication regarding safety issues across departments and with frontline workers. To address this concern, FTA issues three findings requiring improvements in the MBTA's management of its safety committee process, employee safety reporting program, and safety promotion activities.
- **Category 4 – Operating conditions and policies, procedures, and training:** FTA found several areas where MBTA is not meeting its own written requirements; does not have adequate procedures, processes, or requirements; does not have adequate training, coordination, and supervision; and does not have independent quality assurance and quality control (QA/QC) capabilities. FTA also found instances where procedures are well-documented and available but are not followed or enforced, and where workers were required to perform specific activities but were not given the resources or guidance necessary to complete the work. Conversely, FTA found outdated procedures

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and a lack of operational assessments to ensure revisions accurately capture changes in the system and required work practices. To address these concerns, FTA issues seven findings requiring additional monitoring of rail transit operations, new Quality Assurance/Quality Control capabilities, and new training and procedures.

SMI Findings for DPU Requiring Action

FTA also established a category of findings for DPU necessary to strengthen its oversight program:

- **Category 5 – Safety oversight of MBTA rail transit system:** FTA found that DPU has not been actively engaged in overseeing MBTA's SMS implementation. To ensure that DPU fulfills its statutory oversight requirements and maintains its Federal SSO program certification, FTA issues four findings requiring DPU to re-assess its staffing, technical capacities, capabilities, and authorities to conduct engaged and independent safety oversight. FTA also requires DPU to adopt and oversee implementation of Corrective Action Plans developed by the MBTA and approved by FTA to address the findings and required actions identified in this SMI.

Introduction

The Federal Transit Administration (FTA) administers a national program to advance safe, reliable, and equitable transit service throughout the United States. The FTA works to make transit safer through policy development, safety data collection and analysis, safety risk assessment, safety regulatory and oversight programs, information sharing, promotion of effective practices, and funding that supports safety.

This report documents the results of the Safety Management Inspection (SMI) that FTA performed of the Massachusetts Bay Transportation Authority (MBTA) rail transit system, and its State Safety Oversight (SSO) agency, the Massachusetts Department of Public Utilities (DPU), from April 14 to June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system, which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA conducted this SMI to address:

- an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury/fatality events significantly exceeding industry average and peer-based assessments, and
- deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

Over the last year, the MBTA has experienced several serious rail transit safety events including a July 30, 2021, Green Line collision on the B Branch that injured 27; a September 28, 2021, derailment at Broadway Station that resulted in significant damage to track and a railcar; a December 17, 2021, rollaway train at Cabot Yard that injured three workers; and an April 10, 2022, door dragging incident that resulted in the death of a passenger. Analysis of safety data reported by the MBTA to the National Transit Database (NTD), for the period January 1, 2020, through April 30, 2022, shows numbers and rates of derailments and collisions on the MBTA rail transit system that far exceed industry average and the safety performance of MBTA's peer transit systems.

Over the last two-and-a-half years, the DPU has been unable to close findings from FTA's 2019 triennial SSO audit, which was conducted to ensure the capacity and capability of the SSO agency to carry out its program in compliance with FTA's SSO regulation at [49 CFR part 674](#) and

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DPU's program standard at [220 CMR 151.00](#). In April 2022, seven of 16 findings remained open.⁷

To address concerns with MBTA's safety performance and to ensure comprehensive oversight for the MBTA rail transit system, FTA notified the MBTA and DPU on April 14, 2022, that it would conduct an SMI. FTA began the SMI with a kick-off meeting with MBTA and DPU on April 21, 2022, and an extensive document request, which was completed by MBTA on April 29, 2022.

Focus of FTA's SMI

FTA's SMI focused on assessing MBTA's compliance with its internal safety rules and procedures as well as compliance with key Federal safety rules, including the Public Transportation Agency Safety Plan regulation, [49 CFR part 673](#), the Public Transportation Safety Certification Training Program regulation, [49 CFR part 672](#), and with DPU's SSO program, as required in FTA's SSO regulation at [49 CFR part 674](#) and DPU's program standard at [220 CMR 151.00](#).

FTA also reviewed how established processes, procedures, tools, and resources at the MBTA function to support safety decision-making and the evaluation of safety risk. As part of this larger assessment, FTA also evaluated MBTA's implementation of its Safety Management System (SMS). Finally, FTA assessed the role of the DPU in overseeing MBTA's safety performance through the implementation of its SSO program.

In 2019, MBTA's Fiscal Management and Control Board (FMCB) convened a safety review panel (SRP) to take a comprehensive review of the MBTA's safety performance, safety leadership, and culture. The SRP issued its [Safety Review Panel \(SRP\) Final Report](#) in December 2019. As a result of this past report, FTA's SMI activities focused on MBTA data, information, and initiatives beginning in January 2020. FTA also evaluated MBTA's activities to address the 34 recommendations and 61 individual corrective actions resulting from the SRP's assessment. Many of the corrective actions developed to address SRP findings included actions related to MBTA's SMS, required by FTA's 49 CFR part 673 and DPU's program standard.

In conducting the SMI, FTA focused on operations, training, vehicle maintenance, signals and train control, track, track access and capital project delivery, traction power, facilities, capital projects, and safety management. FTA requested and reviewed over 1,500 documents; conducted over 200 interviews with MBTA staff, including executive leadership, technical leadership, mid-level management, supervision, frontline employees, union leadership and

⁷ These findings addressed the need for procedures to oversee specific roadway worker protection and track maintenance issues; for increased capabilities and capacity to oversee the identification and analysis of MBTA safety concerns and hazards; for needed improvements in the investigation and root-cause analysis of accidents; and for requiring and overseeing MBTA's development of corrective action plans to address safety deficiencies and concerns.

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representatives from DPU's SSO program; and conducted dozens of field inspections of MBTA's Operations Control Center, stations and maintenance facilities, track, signal and train control systems, traction power infrastructure, and vehicles.

FTA rode the entire MBTA rail transit system and conducted head-car ride observations on portions of the Green Line. FTA also inspected track on the Green and Orange Lines and visited the locations of recent safety events as well as major capital projects, including the Green Line Extension project and the Green Line Train Protection System project.

FTA inspected each major rail transit yard and vehicle maintenance facility, including Cabot Yard, Caddigan Yard, Green Line Extension Vehicle Maintenance Facility, Reservoir Yard, Riverside Yard, Wellington Yard, and Orient Heights Yard. FTA also reviewed numerous data pulls and reports from MBTA's information management systems, including its Enterprise Asset Management (EAM) system, its maintenance information management system (Trapeze), and systems in the Operations Control Center (ISIS) and Safety Department.

FTA Urgent Special Directives

As a result of observations made while still on-site, FTA identified safety concerns and unsafe conditions at MBTA that required immediate action. On June 15, 2022, FTA issued four [Special Directives](#) to MBTA:

- Special Directive [22-4](#): Track Access and Maintenance
- Special Directive [22-5](#): Securement of Disabled Trains
- Special Directive [22-6](#): Operations Control Center (OCC)
- Special Directive [22-7](#): Lapsed Certifications

FTA also issued Special Directive [22-8](#): State Safety Oversight to DPU to compel its oversight of MBTA's corrective actions to address the pattern of safety incidents and interim safety findings identified in the Special Directives.

While developing this SMI report, FTA has continued to work with the MBTA and DPU to oversee the actions required to address these Special Directives through daily submittals, bi-weekly meetings, and an on-site follow-up inspection during the week July 18-22, 2022. FTA also has established a routine schedule of meetings and on-site activities to continue to assess MBTA's and DPU's implementation of corrective actions required by these directives throughout the rest of the year.

MBTA Safety Performance During SMI

FTA also monitored MBTA's safety performance during the SMI, when the agency experienced a number of incidents, including:

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- Derailment at Kendall Station (April 23),
- Three derailments of construction equipment in a diversion work zone near Airport Station (May 7-9, 2022)
- Red Line train rollaway at Cabot Yard (May 28)
- Red Line train rollaway from Braintree Station onto the mainline for about 1/3 of a mile (May 30)
- Collision between two trains on the Green Line that sent four MBTA transit workers to the hospital (June 1)
- A low-speed collision on at a Green Line platform that inadvertently coupled the two trains together and caused a passenger evacuation toward Park station (June 14)
- A partial suspension of service on the Orange and Green Lines due to a structural issue at the Government Center Garage⁸ on (June 23)

In addition, during the time of FTA's on-site SMI, the new China Railway Rolling Stock Corporation (CRRC) Orange and Red Line railcars were removed from service twice due to sheared bolts on a train brake unit (on May 19) and a battery failure that resulted in an explosion (June 21).

FTA reviewed MBTA's activities to investigate and manage these events and to develop and implement corrective actions to prevent their recurrence. FTA also observed DPU's role in overseeing and approving these event investigation activities and reports.

FTA Immediate Action Letter

Following the completion of the SMI, MBTA continued to experience safety incidents:

- A serious burn injury to a contractor at a diversion work site (July 19)
- A train fire and passenger evacuation over the Mystic River on the Orange Line (July 21)
- A Red Line train rollaway from Braintree Station onto the mainline (July 25)

In response to the July 25 unintended train movement on the Red Line, in which a two-car train with diminished braking capacity rolled out of a rail yard and onto the Red Line for approximately 800 feet, FTA issued an Immediate Action Letter requiring the MBTA to conduct a safety standdown to review procedures for the safe coupling/uncoupling of railcars and to develop and implement checklists for rail vehicle safety inspections and circle checks. MBTA implemented the safety standdown required by the Immediate Action Letter on July 30, 2022.

⁸ Government Center Garage is not an MBTA asset or project and is being managed by a third party.

FTA’s Authority and Need for SMI

FTA’s Role in Public Transportation Safety Oversight

FTA manages a National Public Transportation Safety Program to improve the safety of public transportation systems that receive Federal financial assistance under Chapter 53 of title 49, United States Code, through administration of the Public Transportation Safety Program at 49 U.S.C. § 5329. FTA’s safety program includes safety regulations, technical assistance, training, and safety data collection and analysis. For rail transit agencies, FTA also certifies and monitors SSO agencies charged with overseeing and enforcing compliance with agency safety plans required in [49 CFR part 673](#) and SSO program standards required in 49 CFR part 674.

FTA’s Authority to Conduct an SMI and Issue Special Directives

The framework for Federal transit safety oversight and enforcement is specified in FTA’s Public Transportation Safety Program and FTA’s implementing regulation at [49 CFR part 670](#). The FTA’s authority to conduct inspections, such as an SMI, and any supporting inspections, audits, examinations, or testing, is specified at 49 U.S.C. § 5329(f) and 49 CFR [§ 670.11](#). The FTA has authority to issue Special Directives in certain situations, including when FTA identifies unsafe conditions and practices exists such that there is a substantial risk of death or personal injury, or damage to property or equipment, as specified in 49 CFR [§ 670.27](#).

Need for SMI at MBTA

FTA monitors the safety performance of the rail transit industry through data reported to the National Transit Database (NTD) and the State Safety Oversight Reporting (SSOR) tool.

Recent data shows that, from January 1, 2020, through April 30, 2022, MBTA experienced a decline in safety performance. Over this period, MBTA experienced a higher overall rate of reportable safety events, particularly on its heavy rail mode, and a higher rate of derailments on both heavy and light rail modes than its peers and the total rail transit industry average. As noted in Figure 1, since the beginning of calendar year 2020, MBTA also experienced a higher rate of collision on its heavy rail transit mode than the industry average.

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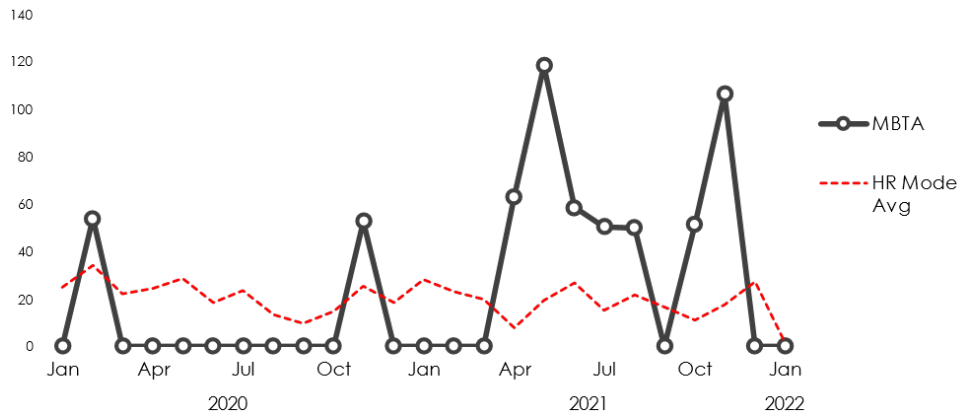


Figure 1: Heavy Rail Mainline Collision Rate (per 100 million vehicle revenue miles (VRM)), Calendar Year (CY) 2020 to CY 2021

Figure 1 includes collisions between a rail transit vehicle (revenue service or non-revenue service) and any person, vehicle, or other object, where a threshold for accident investigation was met, as specified in 49 CFR Part 674. Suicides and non-transit collisions (e.g., collisions between privately owned vehicles in a transit parking lot) are excluded.⁹ All data is sourced from the NTD and reported according to the reporting requirements established in the [NTD Safety and Security reporting manual](#).

Specifically for light rail collisions, the entire U.S. light rail industry reported 13 revenue service rail-to-rail collisions between 2017 and 2021, resulting in 48 injuries. MBTA was responsible for 5 (38%) of these collisions and 45 (94%) of the associated injuries.

For mainline derailments, which have been a long-standing concern for the MBTA, the data depicted in Figures 2 and 3 also show how MBTA's safety performance compared to industry average during the 7-year period between 2015 and 2021.¹⁰ During this time, MBTA has consistently experienced a higher rate of light rail derailment than industry average and a higher rate of heavy rail derailment than industry average since 2016, with a sharp increase in 2020.

⁹ Figure 1 compares collisions per 100 million (M) vehicle revenue miles (VRM) reported by MBTA's heavy rail mode to the aggregate number of collisions per 100M VRM at all heavy rail modes under FTA safety jurisdiction

¹⁰ Note: Data for Calendar Year 2021 is incomplete due to a lag in reporting data.

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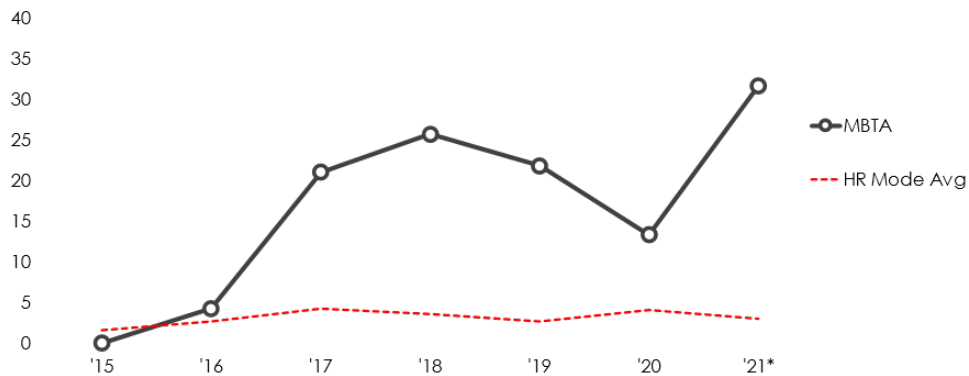


Figure 2: Heavy Rail Mainline Derailment Rate (per 100 million VRM), CY 2015 to CY 2021

Figures 2 and 3 include all events reported to NTD as a mainline derailment, including both rail revenue and non-revenue vehicles, such as hi-rail vehicles. Yard derailments and derailments reported as collisions or other event types per NTD reporting policy are excluded.¹¹

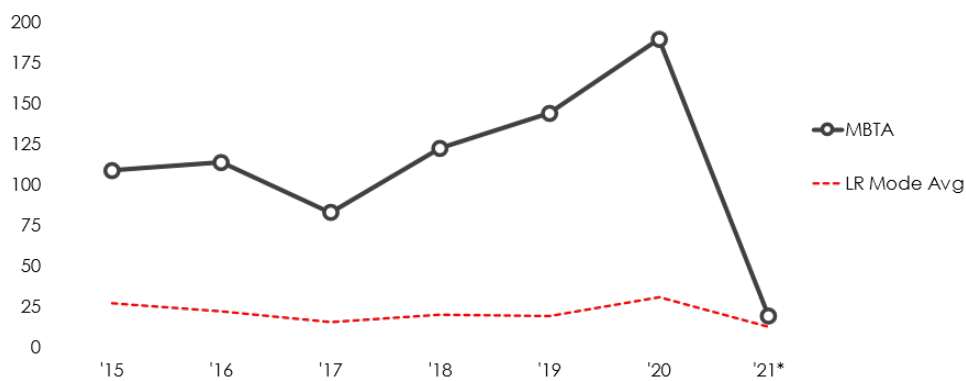


Figure 3: Light Rail Mainline Derailment Rate (per 100 million VRM), CY 2015 to CY 2021¹²

MBTA's recent safety events also indicate an escalation in the severity of safety events, from minor property damage, brief service disruptions, and minor injuries in 2019 and 2020, to more significant property damage, extended service disruptions, and more serious passenger injuries requiring hospitalization in 2021. In April 2022, this escalation continued with an April 10, 2022, railcar door entrapment incident that resulted in a passenger fatality.

¹¹ Figure 2 compares mainline derailments per 100M VRM reported by MBTA's heavy rail mode to the aggregate number of mainline derailments per 100M VRM at all heavy rail modes under FTA safety jurisdiction.

¹² Figure 3 compares mainline derailments per 100M VRM reported by MBTA's light rail mode to the aggregate number of mainline derailments per 100M VRM at all light rail modes under FTA safety jurisdiction.

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Concerns with Performance of SSO Program Administered by DPU

The DPU is the SSO designated by the Commonwealth of Massachusetts as the agency responsible for overseeing rail fixed guideway safety in the Commonwealth of Massachusetts, pursuant to 49 CFR § 674.11. As set forth in Section 12(a) of Title XXII, Chapter 159 of the Massachusetts General Laws, DPU has the power to supervise and regulate the transportation or carriage of persons or property, or both, by railroads, street railways, electric railroads, and trackless trolleys between points within the Commonwealth of Massachusetts.

In exercise of its oversight authority, DPU can take actions including review and oversight of Corrective Action Plans (CAPs) submitted by MBTA. In October 2019, FTA conducted an audit of DPU's SSO program, issuing 16 findings of non-compliance, nine of which have been closed. The DPU submitted CAPs to FTA to address the seven findings that remain open. However, FTA has not closed these remaining findings because DPU has not yet demonstrated positive safety outcomes at MBTA with their proposed and implemented CAPs. FTA continues to monitor the technical capacity of DPU's staff to perform safety oversight and the organizational resources and support that DPU commits to its SSO program.

MBTA Rail Transit System and DPU Organization

Overview

The MBTA is one of the oldest public transit systems and the fourth largest in the United States. A division of the Massachusetts Department of Transportation (MassDOT), the MBTA provides heavy and light rail, bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island.

The MBTA was integrated into MassDOT in 2009. Previously, the MBTA was an individual department within the Commonwealth of Massachusetts.

MBTA Organization

Under the MBTA's enabling act, Chapter 161A of the Massachusetts Laws, as amended in July 2021, the MBTA is governed, and its corporate powers exercised, by a seven-member board of directors. The MBTA Board consists of:

- the Secretary of Transportation for the Commonwealth, who serves *ex officio*,
- one person appointed by the MBTA Advisory board who shall have municipal government experience in the service area constituting the MBTA and experience in transportation operations, transportation planning, housing policy, urban planning or public or private finance, and
- five persons appointed by the Governor, one of whom shall have experience in safety, one of whom shall have experience in transportation operations, one of whom shall have experience in public or private finance, one of whom shall be a rider as defined in the Enabling Act and a resident of an environmental justice population, and one selected from a list of three persons recommended by the president of the Massachusetts State Labor Council, American Federation of Labor and Congress of Industrial Organizations (AFL–CIO).

The statute also requires the MBTA Board to establish subcommittees, including, at a minimum, a subcommittee on: (i) safety, health, and environment; (ii) planning and workforce development; and (iii) audit and finance.

Additionally, not less than two of the appointed members must also serve as members of the Board of Directors of MassDOT. The Secretary of Transportation chairs the MassDOT Board and reports to the Governor.

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MBTA top-level administrative leadership includes the General Manager, Deputy General Manager and Executive Management Team. The General Manager oversees MBTA’s operations and leads the Executive Management Team.

DPU Organization

The DPU’s Transportation Oversight Division is an adjudicatory agency under the Massachusetts’ Executive Office of Energy and Environmental Affairs and serves as the SSO agency designated by the Commonwealth of Massachusetts to oversee rail fixed guideway safety in the Commonwealth, including the MBTA.

The DPU is overseen by the three-member Commonwealth Utilities Commission appointed by the Secretary of the Executive Office of Energy and Environmental Affairs with approval by the Governor. The Secretary designates one of the Commissioners as Chairman.

Figure 4 shows the relative positions of the MBTA and DPU’s Transportation Oversight Division within the Office of the Governor.

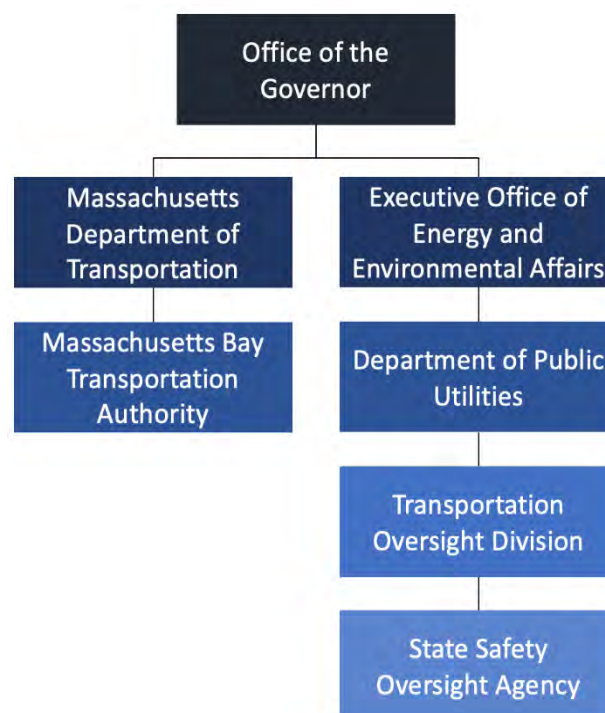


Figure 4: Location of the MBTA and the DPU within the Office of the Governor

MBTA Rail Transit System Characteristics

The MBTA rail transit system includes three heavy rail lines (Red, Orange, and Blue Lines) and two light rail lines (Green Line and the Mattapan High Speed Trolley Line).

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Rail Transit Line	Power	Number of Stations and Mileage	Average Weekday Trips ¹³	
			2019	2021
Red Line Heavy Rail service from Alewife to Ashmont and Braintree	Third rail	22 Stations 22.5 mi	273,003	125,000
Light Rail (heritage trolley) service from Ashmont to Mattapan (considered part of the Red Line) ¹⁴	Overhead catenary system (OCS)	8 Stations 2.5 mi		
Orange Line Heavy Rail service from Oak Grove to Forest Hills	Third rail	20 Stations 11 mi	218,000	104,000
Blue Line Heavy rail from Wonderland to Bowdoin	OCS (Wonderland to Airport Station) Third rail (Airport Station to Bowdoin)	12 Stations 6 mi	74,000	41,000
Green Line ¹⁵ Light rail service with four active branches from Union and Lechmere Stations: <ul style="list-style-type: none"> • B Branch – Boston College • C Branch – Cleveland Circle • D Branch – Riverside • E Branch – Heath Street 	OCS	65 Stations 5 Stations under construction 23.7 mi active track 3 mi under construction	185,000	94,000

Table 1: MBTA Rail Transit Line Characteristics

¹³ Service information reported to the FTA [National Transit Database](#).

¹⁴ While considered part of the Red Line, within MBTA, the Mattapan line is managed by Light Rail Operations and maintained by Light Rail Maintenance.

¹⁵ The Green Line Extension (GLX) project is underway and has already extended the northern end of the Green Line from Lechmere to Union Square in Somerville and will further expand the Green Line to College Avenue in Medford. The Union Square Branch of the GLX opened for service on March 21, 2022.

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Prior to the Coronavirus Disease 2019 (COVID-19) public health emergency, MBTA provided approximately 750,000 passenger trips each weekday on its rail transit system. In March 2022, the rail transit system averaged approximately 350,000 daily passengers, or almost 49 percent of its pre-COVID-19 ridership.

Rail Transit Lines

The MBTA's rail transit operates over four lines called the Red, Orange, Blue, and Green Lines.

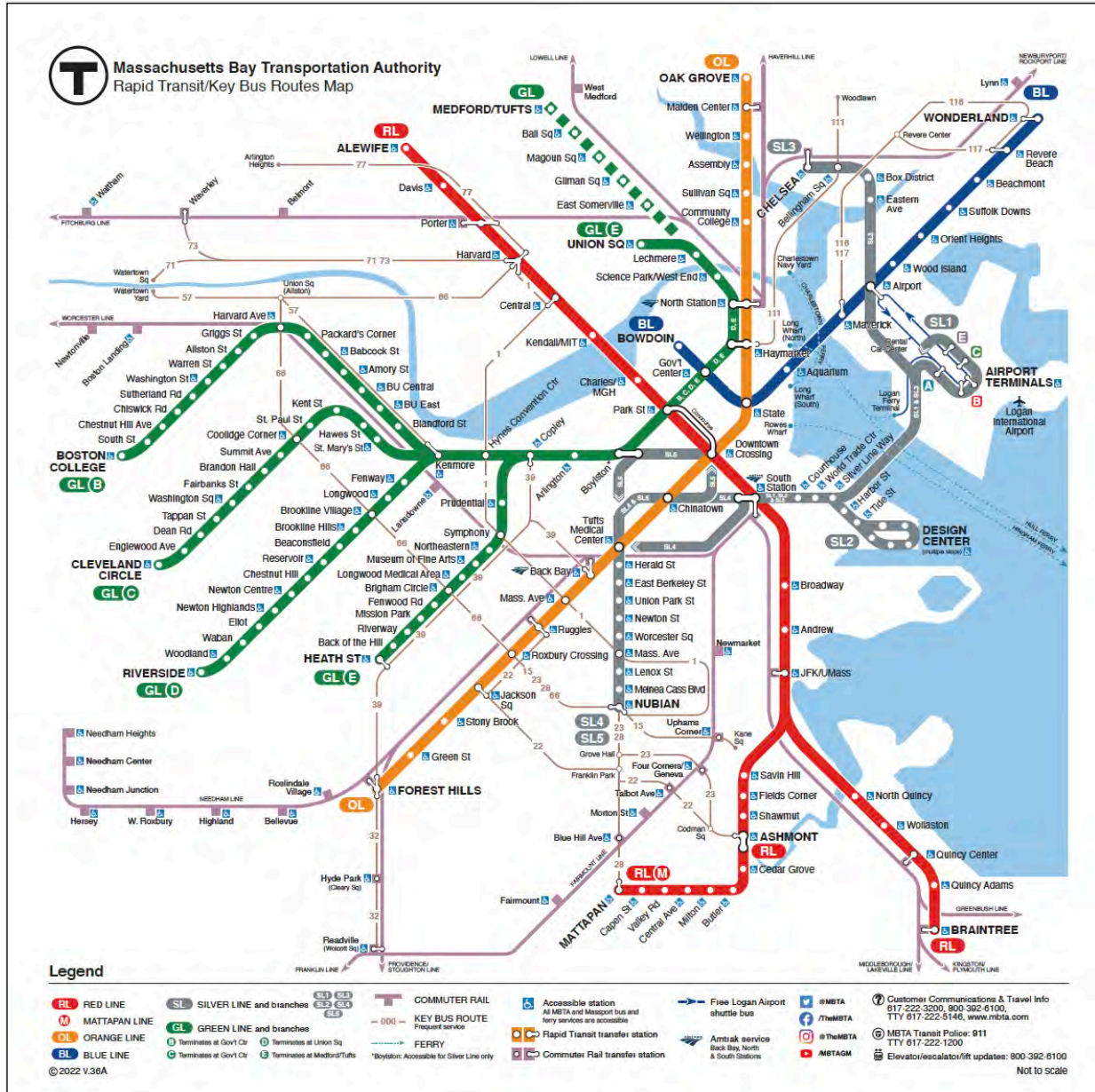


Figure 5: MBTA Rail Transit System Map

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Each of the four MBTA rail lines has its own rail cars, maintenance facilities, and rail maintenance vehicles.

Red Line

The MBTA maintains its Red Line vehicle fleet at Cabot and Codman Yards, which are both undergoing upgrades and expansion. The 68 Number 1 vehicles manufactured in 1968 are the second oldest vehicles currently operating in the system. The overall oldest vehicles are the 6 active 1944 Pullman-Standard PCC vehicles used for trolley service. When taking mid-life overhauls into account, the No. 1 vehicles are the second oldest from mid-life overhaul or manufacture, for vehicles that have not yet been overhauled.¹⁶

Red Line Vehicles

- 68** No. 1 Pullman-Standard vehicles (manufactured 1968, mid-life overhaul 1985)
- 58** No. 2 Urban Transportation Development Corporation (UTDC) vehicles (1987)
- 82** No. 3 Bombardier vehicles (1994)
- 8** No. 4 CRRC vehicles – delivery ongoing

Trolley Service

- 10 (6 in use)** Pullman-Standard PCC vehicles (1944, mid-life 1999)

The MBTA is replacing the Red Line fleet with 252 new vehicles, which will increase the total fleet by 34 railcars. While the new fleet manufacturer, China Railway Rolling Stock (CRRC), is accelerating production for final delivery scheduled in 2024, so far, only one six-car Red Line train and two additional single cars have been delivered. Most of the Red Line's older fleet will remain in service during the delivery period.

Orange Line

The MBTA maintains its Orange Line fleet at Wellington Yard, which is also undergoing expansion and upgrade. The MBTA is wholly replacing the Orange Line fleet with CRRC vehicles assembled in the CRRC's Springfield, Massachusetts factory. The CRRC and MBTA are working to retrofit the new No. 14 vehicles due to undercarriage issues identified after a March 2021 derailment of one of these vehicles and other issues that require a software upgrade.¹⁷ As a result, much of the older Orange Line fleet, the oldest fleet when considering mid-life overhauls, remains in service.

Orange Line Vehicles

- 114** No. 12 Hawker Siddley Canada vehicles (1980)
- 60** No. 14 CRRC vehicles – delivery ongoing

¹⁶ The oldest vehicles considering mid-life overhauls are the Orange Line No. 12 Hawker Siddley Canada vehicles, manufactured in 1980, that have not received a mid-life overhaul.

¹⁷ MBTA and DPU continue to resolve and monitor this issue. DPU closed the corrective action plan requiring replacement of all Side Bearer Pads on April 6, 2022 after MBTA provided evidence of completion. On August 15, 2022, MBTA Safety received notification that the software upgrades were complete.

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Blue Line

The Blue Line fleet is maintained at Orient Heights Yard. The Blue Line is undergoing a series of tunnel and track improvements.

Blue Line Vehicles

94 No. 5 Siemens vehicles (2008)

Green Line

The MBTA maintains its Green Line fleet at Riverside and Reservoir Yards and the Green Line Maintenance Facility. The Green Line is undergoing significant upgrades, including track and signal replacements, track and intersection upgrades, and installation of the Green Line Train Protection System (GLTPS).

The GLTPS uses vehicle-borne and wayside equipment to monitor and actively intervene in vehicle operations when the system detects certain conditions. This system is intended to prevent train-to-train collisions, red light overruns, and overspeed. The system can also send alerts to the operator of certain conditions. The \$212 million contract is slated for completion in late 2023.

Green Line Vehicles

101 Type 7 Kinki Sharyo vehicles (**91** manufactured 1986, mid-life 2016 and **20** manufactured 1997, mid-life 2018)

84 Type 8 Ansaldo Breda vehicles (manufactured 1996, mid-life 2016)

24 Type 9 Construcciones y Auxillar de Ferrocarriles (CAF) (2018)

Rail Operations Control Center (OCC)

The MBTA rail OCC is part of the agency's OCC and Training Department, overseen by the Chief of Operations, Strategy, Policy, and Oversight, who reports to the Deputy General Manager of Operations. The MBTA has two rail OCCs, one of which serves as a backup and was used during the COVID-19 public health emergency to allow for social distancing.

The OCC has consoles for dispatchers, supervisors, a police liaison, a Public Information Officer, and the Power System Maintenance Department (PSM). Together, these positions direct and monitor rail operations, including revenue service, maintenance and inspection activities, and emergency response.

Rail Transit Fleet Maintenance

The MBTA Chief Mechanical Officer, who leads MBTA's maintenance activities, reports to the Chief of Transit Services, who reports to the Deputy General Manager. Preventive and other maintenance activities for MBTA's rail transit fleet are largely carried out by vehicle type.

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Rail Transit Line	Lifecycle Management Strategy/Activity¹⁸	Frequency
Red Line	Preventive Maintenance (PM) Inspections No. 1 and 2 cars	8,500 mi or 90 days
	PM Inspections No. 3 cars	15,000 mi
	PM Inspections No. 4 cars	12,000 mi or 90 days ¹⁹
	PM Inspections Heritage Trolley cars	30 days
	Heating, Ventilation, and Air Conditioning (HVAC) System Inspection	Varies
Orange Line	PM Inspections No. 12 cars	12,000 mi or 90 days
	PM Inspections No. 14 cars	12,000 mi or 90 days ²⁰
	HVAC System Inspections	Quarterly
	Extensive PM Program	Annual
Blue Line	PM Inspections No. 5 cars	6,000 mi (partial) and 12,000 mi (full)
	HVAC System Inspections	12,000 mi
Green Line	PM Inspections No. 7 cars	7,500 mi or 90 days
	PM Inspections No. 8 cars	90 days
	PM Inspection No. 9 cars	90 days
	HVAC System Inspections	Annual
	Air Compressor Inspections	Annual

Table 2: MBTA Rail Transit Vehicle Maintenance Activities Identified in the 2018 MBTA Fleet Management Plan

The MBTA also performs routine part replacement and maintenance campaigns as needed to maintain reliability and performance.

Rail Transit Infrastructure

The Engineering and Maintenance (E&M) directorate is responsible for the physical infrastructure of the rail transit system, including the inspection and maintenance of facilities,

¹⁸ Strategies/activities are identified in MBTA's 2018 Fleet Management Plan.

¹⁹ The 2018 Fleet Management Plan states that this car will follow the same plan as the Blue Line when delivered. These cars had not been delivered at the date of the Plan.

²⁰ The 2018 Fleet Management Plan states that this car will follow the same plan as the Blue Line when delivered. These cars had not been delivered at the date of the Plan.

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power, maintenance of way, and signals. The E&M directorate reports to the Chief Engineer, who reports to the Deputy General Manager of Operations.

Maintenance of Way (MOW)

The MBTA MOW Department is responsible for all rail transit system track, including track for both revenue and non-revenue service. This includes inspections, preventive and corrective maintenance, and capital improvement and construction. MOW also performs trash removal, pothole repair, snow removal, and landscaping.

MOW is responsible for inspecting 178 miles of active track and 803 switches. These inspections are conducted in accordance with:

- DPU's 220 Code of Massachusetts Regulations (CMR) 151.00,
- MBTA Agency Safety Plan,
- MBTA Light Rail Transit Track Maintenance and Safety Standards, and
- MBTA Heavy Rail Transit Track Maintenance and Safety Standards.

Rail Transit Mode	MOW Activity	Frequency
Heavy Rail	Heavy Rail Passenger-Service Track	Twice per week, with at least one calendar day interval between inspections
	Heavy Rail Yard and Storage Track Inspection	Weekly, with at least three calendar days interval between inspections, or before use, if track is used less than once a week
	Internal Rail Defects Inspection	At least once per year
Light Rail	Light Rail Yard and Storage Track Inspection	Weekly, with at least three calendar days interval between inspections, or before use, if track is used less than once a week
	Light Rail Passenger-Service Track Inspection	Three times per week, with at least one calendar day interval between inspections
	Internal Rail Defects Inspection	At least once per year

Table 3: Frequency of MOW Inspection Activities

Power System Maintenance (PSM)

The MBTA's PSM Department is responsible maintaining and inspecting all equipment used to generate and distribute power across the transit agency. This includes:

- Gas-generated power plant and generator control system,
- Bulk power yard,
- Two switching stations and two power control centers,

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- 200 miles of alternating current (AC) cabling and AC duct bank system
- 1,000 miles of direct current (DC) cabling and DC duct bank system
- 47 traction power substations and 96 unit substations,
- 125 miles of overhead catenary system, and
- Power Supervisory Control and Data Acquisition system.

PSM Activity	Frequency
DC Circuit Breaker Routine Maintenance	Twice per year or as required
Transformer Maintenance	Once per year or as required
AC Switchgear Assembly Maintenance	Once every three years or as required
Rectifier Substation Maintenance	Twice per year, or as required
Filter Maintenance	Twice per year
AC Feeder Tests	Once per month
DC Feeder Tests	Once per week
Overhead Wire Preventive Maintenance	Every eight to 26 weeks, depending on type and location)
Overhead Wire Head System Video Car Inspection	Quarterly

Table 4: Frequency of Key PSM Activities

Transit Facilities Maintenance (TFM)

The MBTA's TFM Department is responsible for the maintenance and inspection of physical structures throughout the system, including buildings, passenger stations and rail facilities, parking garages, bridges, tunnels, culverts, and retaining walls.²¹ The MBTA performs these activities in compliance with State and national standards, codes, guidance, and as directed by the agency's insurance company. The MBTA owns and maintains approximately 46.2 miles of tunnels. The MBTA's tunnel assets include walls, utility lines, ceilings, signage, de-watering equipment, ventilation systems, and electrical and lighting systems.

Asset	TFM Activity	Frequency
Station / Facility	Detailed System Inspections	Monthly
Bridges	Routine Bridge Inspections	Bi-Annually
	In-Depth Bridge Inspection	Every 5 years

²¹ Capital Delivery also conducts elements of MBTA's bridge inspection program, including routine/in-depth bridge inspections every 5 years, and load ratings every 10 years.

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Asset	TFM Activity	Frequency
	Bridge Load Rating (Structural Analysis)	Every 10 years

Table 5: Frequency of Key TFM Activities

Signal and Communications Maintenance (SCM)

The MBTA’s SCM Department maintains and inspects signaling systems for all four rail transit lines. This includes the Operations Control Center (OCC) software and all wiring and physical hardware used in the systems’ communications networks. Signal assets under SCM include track circuits, wiring, bonds, switches, third rail heaters, and instrument houses/wayside cases. MBTA’s communications assets include telephone hardware, fiber optic cables, call boxes, public address systems, customer communication alarms, and message boards.

SCM Activity	Frequency
Relay Testing	Once every two and four years
Track Circuit Testing	Once every two years
Switch Obstruction Testing	Monthly
Automatic Train Stop Testing	Monthly
Ground Testing	Monthly
Track Mapping	Monthly

Table 6: Key SCM Signal Activities

Capital Program

The MBTA released its latest five-year [Capital Investment Plan \(CIP\) for FY23-27](#) in May 2022. As described, the CIP “includes \$9.6B in investments to improve our core infrastructure and advance key expansion initiatives [and] includes the procurement and overhauls of subway cars, buses, and commuter rail locomotives and coaches; the repair, rehabilitation, and replacement of bridges and tunnels; improvements to passenger facilities, including accessibility upgrades; modernization of bus maintenance facilities; and critical track, signal, and power upgrades.” Of this \$9.6B, an estimated \$7.5B will be spent on safety-related projects.

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Capital Program²²	Line	Status
Back Bay Station Improvements <i>Ventilation improvements</i>	Orange Line	Construction
Beachmont Improvements <i>Tower replacement</i>	Blue Line	Construction
Station Brightening <i>General maintenance</i>	All lines	Implementation
Orange Line Maintenance Work <i>Track maintenance</i>	Orange Line	Implementation
Blue Line Maintenance Work <i>Track maintenance</i>	Blue Line	Construction
North Quincy Garage and Development <i>Garage construction</i>	Red Line	Construction
South Station Tower One Interlocking Project <i>Updates to existing equipment</i>	Red Line	Final Design
Longfellow Approach Viaduct Rehabilitation <i>Infrastructure repair and replacement</i>	Red Line	Design
Alewife Garage Repairs <i>Infrastructure repair and replacement</i>	Red Line	Construction
South Shore Garages <i>Garage rehabilitation</i>	Red Line	Construction
System-Wide Accessibility Improvements <i>Upgrades to infrastructure for accessibility</i>	Red Line Orange Line Green Line	Various
Forest Hills Station Improvements <i>Upgrades to infrastructure for accessibility and rehabilitation</i>	Orange Line	Conceptual Design

²² Open programs listed on MBTA's [Building a Better T](#) website listed in reverse order, oldest to newest.

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Capital Program²²	Line	Status
Red Line Maintenance <i>Track maintenance</i>	Red Line	Implementation
Downtown Crossing Accessibility Phase I <i>Upgrades to infrastructure for accessibility</i>	Red Line Orange Line	Design
South Station Transportation Center Improvements <i>Upgrades to infrastructure</i>	Red Line	Construction
Harbor Tunnel Infrastructure Improvements <i>Infrastructure rehabilitation</i>	Blue Line	Construction
Dorchester Avenue Bridge Replacement <i>Bridge replacement</i>	Red Line	Construction
Elevator Accessibility Upgrades <i>Elevator rehabilitation and replacement</i>	Red Line Orange Line Green Line	Design
Suffolk Downs Pedestrian Bridge <i>Structural repairs</i>	Blue Line	Construction
Mattapan Line Transformation	Red Line	Scoping
Green Line Extension	Green Line	Construction
Ruggles Station Improvements <i>Structural repairs and accessibility improvements</i>	Orange Line	Construction
Oak Grove Station Accessibility Improvements <i>Upgrades to infrastructure for accessibility</i>	Orange Line	Construction

Table 7: Open MBTA Capital Programs²³

²³ Complete list of capital programs can be found [here](#).

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In addition to these individual programs, MBTA is currently executing transformational programs on its Red, Orange, and Green lines.

Transformation Program	Projects In Progress
Red Line ²⁴	Signal upgrades
	New vehicles
	Cabot Yard and Maintenance Facility updates
	Codman Yard expansion and improvements
	Alewife crossover improvements
Orange Line ²⁵	Track and signal upgrades
	Vehicle replacement
	Wellington Yard updates
	Wellington Vehicle Maintenance Facility updates
	Traction Power Substation Upgrades
Green Line ²⁶	GLTPS
	Track upgrades
	Hynes Station accessibility improvements
	Solar-powered e-ink signs
	D Branch Station accessibility improvements
	Newton Highlands Station accessibility improvements
	Symphony Station accessibility improvements

Table 8: MBTA Line Transformational Programs

²⁴ All information from [MBTA Red Line Transformation Program](#).

²⁵ All information from [MBTA Orange Line Transformation Program](#).

²⁶ All information from [MBTA Green Line Transformation Program](#).

Findings and Required Actions

FTA made 20 total findings in four categories addressed to the MBTA. To ensure that FTA's SMI findings are resolved, FTA is issuing four Special Directives (22-9 through 22-12) that identify required actions to be completed by MBTA.

- **Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce:** FTA found that an organizational focus on capital projects has diverted management attention and resources from the agency's operations and maintenance, allowing the agency to operate a level of service that is not adequately staffed, trained, supervised, or maintained. In addition, existing staffing levels and capabilities do not provide adequate safety oversight for the design, construction, and testing of new capital projects and do not support widespread safety certification of these projects, which is an industry standard practice. MBTA also has experienced a series of construction safety events due to the lack of oversight of worksites. To ensure that the system remains safe for both passengers and workers, and to support the safety of MBTA's projects and worksites, FTA issues four findings requiring additional assessment and resource prioritization for operations and maintenance activities.
- **Category 2 – Prioritization of safety management information:** FTA found limited evidence that MBTA has adopted SMS practices in the field to support the identification, analysis, and prioritization of safety information. To ensure this critical capability, FTA issues six findings requiring enhanced and expedited implementation of the agency's SMS, including the development of procedures, safety management training, safety risk assessment, and safety assurance activities to enhance the organization's capability to identify safety concerns and to prioritize action to mitigate safety risk.
- **Category 3 – Effectiveness of safety communication:** FTA found that there is a lack of routine, consistent, and meaningful communication regarding safety issues across departments and with frontline workers. To address this concern, FTA issues three findings requiring improvements in the MBTA's management of its safety committee process, employee safety reporting program, and safety promotion activities.
- **Category 4 – Operating conditions and policies, procedures, and training:** FTA found several areas where MBTA is not meeting its own written requirements; does not have adequate procedures, processes, or requirements; does not have adequate training, coordination, and supervision; and does not have independent quality assurance and quality control (QA/QC) capabilities. FTA also found instances where procedures are well-documented and available but are not followed or enforced, and where workers were required to perform specific activities but were not given the resources or guidance necessary to complete the work. Conversely, FTA found outdated procedures

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and a lack of operational assessments to ensure revisions accurately capture changes in the system and required work practices. To address these concerns, FTA issues seven findings requiring additional monitoring of rail transit operations, new Quality Assurance/Quality Control capabilities, and new training and procedures.

In addition, FTA made four findings related to the DPU's oversight of MBTA's rail transit system. To ensure that FTA's SMI findings are resolved, FTA is issuing Directive 22-13 to DPU which identifies corrective actions to be completed by DPU.

- **Category 5 – Safety oversight of MBTA rail transit system:** FTA found that DPU has not been actively engaged in overseeing MBTA's SMS implementation. To ensure that DPU fulfills its statutory oversight requirements and maintains its Federal SSO program certification, FTA issues four findings requiring DPU to re-assess its staffing, technical capacities, capabilities, and authorities to conduct engaged and independent safety oversight. FTA also requires DPU to adopt and oversee implementation of Corrective Action Plans developed by the MBTA and approved by FTA to address the findings and required actions identified in this SMI.

These five categories of concern and the resulting findings are discussed below, including:

- the focus of the category,
- the finding,
- the situation as documented by FTA's SMI for each finding, and
- the required corrective action.

Category 1: Managing the Impact of Operations, Maintenance and Capital Projects Requirements on the Available Workforce

Focus

FTA reviewed the resources available to support the safe operation and maintenance of the MBTA's legacy rail transit system and to manage the MBTA's \$2 billion annual capital project budget. FTA reviewed the extent to which the MBTA's capital initiatives are facilitated with existing MBTA personnel, which requires the sharing of critical operations and maintenance resources. FTA also assessed the extent to which resources have been stretched to serve multiple functions, including the extent to which MBTA resources have been used to oversee the safety of construction sites for capital projects, incorporate safety engineering and certification into capital projects, and ensure safety sign-off prior to the placement of capital projects into passenger service. Finally, FTA examined the extent to which staffing assessments and workload analyses have been authorized and completed to address staffing impacts and challenges associated with the significant increase in the MBTA's capital budget.

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Finding 1. MBTA’s staffing levels are not commensurate with the demand for human resources required to carry out current rail transit operations and maintenance in addition to expanding capital program activities.

Situation

FTA’s SMI determined that the MBTA is not effectively balancing safety-critical operations and maintenance activities with its efforts to deliver capital projects. This lack of balance is at the center of many of the MBTA’s safety challenges.

Over the last four years, the MBTA’s capital budget has more than doubled, from approximately \$875 million in fiscal Year 2018 to over \$2 billion in fiscal Year 2022. At the same time, the MBTA is still recovering from the long-standing impact of funding cuts made in 2015-2019 to the MBTA’s operations and maintenance budget, which resulted in a reduction in hundreds of millions of dollars and hundreds of positions.

Since 2020, the MBTA’s transit organization (agency-wide) has averaged a 10-percent vacancy rate from budgeted positions. For example, MBTA’s Transit Workforce Staffing Report by Department (budgeted vs actual) for fiscal year 2022 (beginning July 1, 2021) shows 5,554 active employees for 6,349 budgeted positions - a staffing gap of 795 positions or 12.5 percent. For fiscal year 2021 (beginning July 1, 2020), there were 5,537 active employees for 6,279 budgeted positions – a staffing gap of 742 position or 11.8 percent. So far in fiscal year 2023 (beginning July 1, 2022), there are 5,781 active employees for 6,679 budgeted positions, or a staffing gap of 898 positions or 13.4 percent.

In addition, specifically for MBTA’s rail transit system, over the last two years, some key technical and supervisory positions have averaged 20 to 35 percent vacancy rates, including Operations Control Center dispatchers and supervisors, signal technicians, vehicles repairers, and traction power technicians.

Interviews with MBTA personnel at all levels of the agency indicate that budgeted positions, which have increased under MBTA’s current leadership team, do not reflect the true measure of required staff levels because they do not consider the additional responsibilities associated with capital project delivery. In some instances, required staff levels are calculated to rely on overtime to cover staff vacations and training. Interviews with a range of personnel throughout the MBTA’s organization indicate that the overall MBTA transit system may be between 1,500 and 2,000 active positions short in managing its current level of activity.

The Rail Vehicle Maintenance Department provides an example of the impact of staffing shortages. The Rail Vehicle Maintenance Department is responsible for managing the heavy and light rail transit fleets and schedules and conducts periodic inspections, mid-life overhauls, annual services/preventative maintenance, and component overhauls along with discretionary, targeted campaigns to maintain rail vehicle performance. During interviews and inspections,

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MBTA personnel reported high staff vacancies, ranging between 15 and 30 percent, for “repairers” for both heavy and light rail vehicles. MBTA noted that these vacancies impact both preventive and corrective maintenance activities, and as a result, vehicles required for service, particularly on the Red Line, were not available for roll-out.²⁷ Additionally, MBTA personnel reported that “repairers” on the Red Line have not yet attended training on the new CRRC railcars, further exacerbating limitations in their availability to service the rail cars. Overtime is currently being used to offset gaps in resource scheduling to the extent feasible. Whenever issues or concern emerge with the performance of MBTA’s aging fleet or new vehicles, MBTA’s “repairers” fall further behind as they must manage these issues through new maintenance inspections or campaigns.

The 2019 SRP report indicated that the emphasis on delivering capital projects could come at the expense of efforts to maintain the existing system, conduct required preventive maintenance inspections and repairs, and carry out day-to-day operations. The 2019 SRP report issued three recommendations and four corrective actions on this topic, directing MBTA to conduct a zero-based budgeting analysis of each MBTA department and to identify the appropriate level of resources needed to ensure the safe delivery of service, management of preventive maintenance, and support for capital project delivery. MBTA has begun working on but not completed any of these corrective actions, nor has DPU required MBTA to complete these actions.

MBTA reported that, due to the challenges and uncertainties of the COVID-19 public health emergency, they have not taken corrective action on these items. Nevertheless, during this same period, MBTA aggressively moved forward with its \$2 billion-per-year capital program, supported largely by existing and overtime resources from the agency’s operations and maintenance departments and contractors. In January 2022, MBTA’s leadership team and Board of Directors took the unprecedented step of transferring an additional \$500 million from the MBTA’s operating budget to its capital budget.²⁸

FTA’s SMI found that MBTA’s leadership is focused on using longer-term capital projects to “build the agency” out of many of the challenges of a legacy system. However, as discussed in FTA’s Special Directive 22-4, key elements of this approach are significantly impacting preventive maintenance inspections and repairs for the aging system, exacerbating the deterioration of aging infrastructure and assets that are not the focus of the capital program.

FTA also found that MBTA lacks resources to adequately manage its \$2 billion capital program and complete capital projects on time and without need for retrofits and workarounds. This situation has resulted in deteriorated assets, whether rail transit vehicles, track, switches,

²⁷ MBTA policy is that vehicles requiring preventive maintenance inspections or workorders are not placed in revenue service.

²⁸ A total of \$480M was transferred to the Capital Program, while \$20M was identified for "Employee Recruitment and Retention Initiatives" advanced employee-focused initiatives, including recruitment and retention.

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stations, facilities, or other elements, remaining in service longer than intended with additional maintenance needs. These assets are vulnerable to failure in new and potentially unexpected ways, such as the September 28, 2021 safety event, when a piece of a restraining rail assembly came loose on the track outside of Broadway station and derailed a train; the April 10, 2022 event when an aging door assembly malfunctioned and a train took power with a passenger trapped between its door panels, resulting in a fatality; or the July 21, 2022 train fire on the transit bridge over the Mystic River, where a rusty sill panel fell off a rail transit train and contacted the third rail.

The chronic lack of personnel resources to address requirements for operations, maintenance, and capital projects results in a situation where the organization is overwhelmed, there is chronic fatigue in key positions in the agency, there is a lack of support for training and supervision, and limited professional development is available for the MBTA's workforce. In this environment, emphasizing capital project demands above passenger operations and preventive maintenance can negatively impact the safety culture of the agency. FTA found that unwritten norms have emerged that emphasize a "get it done and go" mentality over following safety rules or ensuring compliance with minimum safety standards, particularly when staff are working 12 to 16-hour days, six days a week.

At this critical juncture, FTA is requiring the MBTA to conduct a workforce analysis to determine the level of operations, maintenance, and capital project delivery that its workforce can sustain, particularly in key technical, supervisory, and engineering positions. This assessment must be conducted in concert with work underway as part of FTA's Special Directive 22-6 to address staffing, training, and qualification for the Operations Control Center and to manage maintenance work plans developed to address backlogs in FTA's Special Directive 22-4.

The objective of this analysis is to ensure that the MBTA defines what level of organizational service it can provide with its available staffing for at least the next five fiscal years. However, the MBTA's workforce analysis should include and define assumptions regarding attrition, employee retention, hiring and recruitment, and training and qualification for operating, maintenance, and capital project delivery activities for at least the next fiscal five years. The MBTA has access to numerous contractors and specialists in a range of technical disciplines who may be helpful in supporting this analysis.

As the MBTA addresses the findings below, FTA urges the MBTA to use the data assessed to establish its fiscal year 2023 hiring plan²⁹ to support the required workforce analysis for the next five fiscal years.

²⁹ See [MBTA General Manager Report, July 19, 2022](#), beginning on Slide 7

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Finding	Required Action
<p>Finding 1: MBTA’s staffing levels are not commensurate with the demand for human resources required to carry out current rail transit operations and maintenance in addition to expanding capital program activities.</p>	<p>MBTA must conduct and submit to FTA a workforce analysis and associated workforce planning to include:</p> <ol style="list-style-type: none"> 1. <i>Required activities that must be performed for rail transit operations, maintenance, and capital projects delivery:</i> A description of present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years. 2. <i>Required resources to perform mission-critical activities:</i> A description of the assignment of the necessary human resources to support present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years per the description above. 3. <i>Current staffing capabilities for mission-critical activities:</i> The results of an assessment of MBTA’s ability to safely operate, maintain, and complete capital project delivery for its rail transit system at current service levels of workforce. 4. <i>Safety case for mission-critical activities that can be performed within current and projected resources over the next five fiscal years:</i> The identification of safety risk associated with current staffing shortages and how they are or will be mitigated and any needed changes or reductions in activities.

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Finding 2. MBTA has not demonstrated the organizational capacity to recruit and hire personnel to meet authorized staffing levels.

Situation

For the last five years, the MBTA's budgeted positions have exceeded its actual active workforce by approximately 7 to 10 percent.³⁰ The agency also is experiencing significant attrition and retirement of seasoned personnel, with a large cohort of MBTA's technical and supervisory personnel now eligible for retirement. As discussed in Finding 1, vacancies in technical positions affect the safety of MBTA's operations, maintenance, and capital project delivery.

FTA notes that MBTA's leadership team has established a strategic hiring plan³¹ for fiscal year 2023. This plan sets a goal of hiring over 2,000 workers, including 330 workers funded by the capital budget and 1,759 workers funded by the operating budget in fiscal year 2023. Nearly 900 of those positions across both capital and operating are existing vacancies, and another 447 positions would be added to last year's budget. The plan also estimates that in fiscal year 2023, MBTA will need to backfill another 744 positions to cope with attrition as workers retire or resign. This level of hiring would more than double last year's hiring initiative where MBTA officials reported hiring approximately 800 new employees in fiscal year 2022, but with attrition and retirements saw a net gain of only 100 employees.

The MBTA's fiscal year 2023 strategic hiring plan may offset some of these challenges, but only if it is successfully executed with a focus on filling positions with safety impact for the agency. During interviews with FTA, MBTA personnel at all levels discussed the challenges of recruiting and hiring. Challenges included:

- Issues regarding how new vehicle operators are brought into the agency – vehicle operators are required to begin as part-time operators in rail yards and are often required to stay part-time for two years or more before beginning full-time employment. During this time, employees make \$22.21 per hour for 30 hours per week.³² Waiting for two years before full-time employment is a deterrent to accepting this type of position.
- Challenges with pay equity between salaried and officials eligible for overtime that make promotions to salaried positions less attractive because officials may earn less and work the same hours.

³⁰ Budgeted positions from FY 2019 through FY 2023 totaled 31,099 (across 5 years) with 28,197 active positions during this same time, for an approximately 9 percent vacancy rate over the five-year period.

³¹ See [MBTA General Manager Report, July 19, 2022](#), beginning on Slide 7.

³² During operator training, trainees are paid \$16.66/hour, 40 hours/week for eight weeks of training. After training, new hires start at \$22.21/hour, 30 hours/week, with the potential to advance to 40 hours/week after two years or so. Signing bonuses and benefits are also available.

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- Work schedules that strongly encourage significant overtime each week and may require it for certain classifications.
- Retirement eligibility makes it difficult to keep veteran employees and retain institutional knowledge.
- MBTA's focus on internal hiring and promotion, which limits the labor pool for both technical positions and advancement within the MBTA's organization.
- Lack of partnership with local universities and community colleges to attract talent to the MBTA.

Finding	Required Action
Finding 2: MBTA has not demonstrated the organizational capacity to recruit and hire personnel to meet authorized staffing levels.	MBTA must develop and implement a recruitment and hiring plan to address findings from its workforce analysis and associated workforce planning for at least a five-year period, including how it will expand its capabilities for recruiting and hiring personnel to fill operations, maintenance, and capital project delivery positions.

Finding 3. Additional resources are needed to support MBTA's safety engineering and safety certification process for capital projects.

Situation

MBTA's Agency Safety Plan defines safety certification as "a process used to verify safety-related requirements are incorporated into a project, thereby demonstrating that it is operationally ready for revenue service and safe and secure for passengers, employees, public safety agencies, and the general public." MBTA's Agency Safety Plan also incorporates by reference MBTA's Safety Certification Program (SAFE 1.09.00), as the guiding document outlining MBTA's safety certification process.

The MBTA's safety certification program requires MBTA's Safety Department to review all facilities and system designs for safety input. For most capital projects, MBTA's Engineering and Maintenance (E&M) functions are responsible for safety engineering including project design, compliance with safety and security certification, workplace safety, and supervision of E&M projects.

Documents and records shared by the MBTA reveal a minimal safety certification process for most capital projects. The MBTA was unable to provide formal safety certification plans as requested for the Green Line Wayside Signal, Green Line B Branch Consolidation, and Green

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Line D Branch Track and Signal capital projects, among others.³³ Interviews confirmed that most capital projects do not have a dedicated safety certification plan, instead relying on Certified Item Lists (CILs) (the individual items in the capital project subject to additional review and verification through safety certification) and the certification letter to the General Manager.

CILs are typically minimal and do not include many industry-standard items. For example, the new Green Line Type 9 rail cars, included just four (4) Certifiable Items List (CIL) elements for braking. At many transit agencies, the CIL for a rail transit vehicle may contain hundreds or thousands of items, focused on electrical wiring, electronic subcomponents, propulsion, door controls, wheel and wheel assemblies, accessibility features and climate controls, to name a few major categories. As a result, the Green Line Type 9 rail car CIL does not include elements commonly expected in such documentation. In addition, even though the Safety Department is a final signatory on capital project and vehicle certifications, FTA did not find any records showing the results of review made by the Safety Department on the certification packages for these vehicles beyond the signature for concurrence.

Due to staffing shortages, MBTA Safety Department personnel and other MBTA personnel are not always available to support safety engineering and safety certification reviews or system designs. Several MBTA personnel interviewed indicated that additional support from the Safety Department for these reviews, if it were available, would greatly support that implementation of the agency's safety certification program. Interviews also indicated that there is a shortage of Safety Department and other MBTA personnel to support project engineering, start-up, and testing activities. The lack of available personnel can also impact testing and acceptance schedules as well as the activities that can be performed.

For example, interviews with MBTA's Capital Transformation team revealed that Green Line D Branch track and signal contractor had consistently been denied access for several scheduled work outages due to a lack of MBTA personnel necessary to support access. This results in needless delays and can place pressure on the completion of safety critical tests and verification activities.

Interviews at all levels of the organization also revealed significant resource concerns with MBTA engineering and maintenance personnel needed to support safety engineering and safety certification for projects. MBTA personnel reported that Design-Bid-Build projects do not have Project Management contract support, and instead rely on availability of MBTA resources. Limited resources supporting the safety certification review for MBTA Capital Transformation have impacted schedule and oversight, and completed projects have extensive punch-list items that can take months to complete.

³³ MBTA provided safety certification CILs for these three projects, which included 38 items tracked for Green Line Train Protection System, 33 items for Green Line D Branch Track and Signal Replacement (listed as examples for information only), and 12 CILs for the Green Line / B Line Station Consolidation and Accessibility Improvements.

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FTA requires MBTA to expand resources devoted to safety engineering and safety certification.

Finding	Required Action
Finding 3: Additional resources are needed to support MBTA's safety engineering and safety certification process for capital projects.	MBTA must modify safety engineering and certification requirements for its capital projects and vehicle procurements and ensure they are addressed through additional E&M and Safety Department staffing, contractor resources, or a combination of approaches. This may be done as part of the workforce analysis in Finding 1, or as part of a separate initiative.

Finding 4. MBTA requires additional oversight of contractor work sites.

Situation

The MBTA conducts a range of capital projects to replace, upgrade and expand infrastructure elements on its rail transit system. Many of these projects include active worksites on MBTA property that are managed by contractors according to work, and safety plans approved by the MBTA. While on MBTA property, all persons are required to follow MBTA safety rules such as requirements for flagging and right-of-way personal protective equipment. Many of these contractor managed worksites are accessed by MBTA employees and vehicles as part of normal operations (e.g., the MBTA will continue to use yards that are under construction to house or repair out of service vehicles). Therefore, during the SMI, FTA reviewed several safety events that occurred at contractor worksites on MBTA property, including derailments of work vehicles, electrocutions, fire and smoke events, burns, and falls and found instances of noncompliance with MBTA safety rules. As a result of these reviews, FTA finds that additional supervision at MBTA's contractor work sites would be beneficial to ensure compliance with MBTA's safety requirements.

Finding	Recommended Action
Finding 4: MBTA requires additional oversight of contractor work sites.	FTA recommends that MBTA review the inspection and resident engineering resources needed to ensure compliance with MBTA safety rules related to the Right of Way to ensure the safety of personnel while in active work zones through additional staffing, contractor resources, or a combination of approaches.

Category 2: Prioritization of Safety Management Information

Focus

Category 2 addresses how the MBTA's SMS supports the management of safety concerns. FTA focused on the organizational structures, processes, and procedures in place to effectively support the collection, analysis, and movement of safety data and information to support the prioritization of resources to address safety risk. FTA included an assessment of MBTA's safety management capabilities as it relates to:

- Safety management governance structure,
- Safety management accountabilities, authorities, and responsibilities,
- Resources and staffing allocated to SMS processes, activities, and tools,
- Criteria for assessing and elevating safety risk and establishing and monitoring safety risk mitigations,
- Training of personnel to support their role and responsibilities within the SMS,
- Analysis and movement of safety data and information, and
- Systems and tools in place to support safety management activities and decision making.

Finding 5. MBTA has not ensured that the necessary structures are in place to support effective implementation and operation of its SMS.

Situation

MBTA's Agency Safety Plan specifies a multi-year implementation period for its SMS. This approach is documented in the MBTA's SMS Implementation Plan, a high-level document that describes how the MBTA will implement SMS across its system. MBTA employees and contractors are required to comply with policies and procedures as they are implemented during the SMS phases contained within this plan. The DPU approved the MBTA's Agency Safety Plan and monitors the SMS Implementation Plan.

To assess the status of SMS implementation, FTA reviewed MBTA's SMS implementation plan. FTA found that the SMS implementation plan lacks basic project management principles, including actionable details. MBTA did not provide any documentation reflecting the overall SMS implementation plan or detailed discrete tasks, timeframes, and responsibilities.

FTA found that the MBTA last updated its SMS Implementation Plan in late 2021. In the plan, the MBTA established roles and responsibilities for SMS implementation, including:

- "Accountable Executive – [who is] accountable for ensuring MBTA's SMS is effectively implemented throughout the MBTA's transit rail, bus, and paratransit services. The Accountable Executive is accountable for ensuring action is taken, as necessary, to address substandard performance in the agency's SMS."

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- “Chief Safety Officer/SMS Executive – [who is] an adequately trained individual who has responsibility for safety and reports directly to the Accountable Executive. The Chief Safety Officer is responsible for SMS implementation activities and approving each Exit SMS Phase Criteria – Checklist” (allowing the movement from one phase to the next).
- “SMS Steering Committee [within the Safety Management Executive Review Committee (SMRC)] ... responsible for setting the overall SMS implementation strategy and ensuring resources were allocated to support SMS implementation.”
- “SMS Transition Task Team - was responsible for implementing the Steering Committee’s strategy in the most effective means practical.”

After interviews and document reviews, including discussion regarding MBTA’s SMS training program, FTA concluded that, beyond the definition of the roles and responsibilities above, the MBTA has not established a safety management governance structure that includes:

- Clear descriptions of SMS accountabilities, authorities, and responsibilities for other positions within the MBTA organization, nor
- Explicit descriptions of the coordination required across positions with different accountabilities, authorities, and responsibilities to ensure effective SMS operation.

In interviews and field observations, FTA found that information provided in SMS training had not widely permeated the organization. Also, to assess the status of SMS implementation FTA requested, but did not obtain, minutes or records of action from meetings related to SMS implementation activities. During interviews, SMS implementation tasks were presented in general terms, with limited details related to timelines or responsibilities for tasks and outcomes.

FTA found that the lack of detail in the plan and missing meeting documentation makes it unlikely that MBTA executives and managers can determine the extent of SMS implementation and the integration of SMS processes and activities effectively into its operations. Effective implementation of an SMS requires adherence to defined actions, timeframes, responsibilities, and expected outcomes.

As a result, FTA observed gaps among MBTA leadership knowledge regarding SMS processes, activities, and their role within the SMS. FTA found that MBTA leadership, from executives through managers to supervisors, did not have a clear understanding of their role in SMS. During field activities when discussing SMS, MBTA officials’ answers were general and lacking in detail and examples. It was evident to FTA that neither MBTA staff nor contractors could readily articulate how MBTA’s SMS (and Agency Safety Plan) requirements related to their programs and activities.

MBTA’s leadership demonstrated a lack of familiarity with safety risk management principles. For example, when discussing available safety reporting channels in safety risk management most MBTA leaders interviewed by the FTA were aware only of the Employee Safety Hotline.

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Other avenues of obtaining safety information, such as Local Safety Committees, SRM workshops, data analysis groups specified in the Agency Safety Plan, hazard logs, and routine review of normal operations and maintenance were never identified. Significantly, many MBTA leaders indicated that it was solely the responsibility of the Safety Department to identify safety concerns.

FTA interpreted the lack of familiarity with safety risk management principles overall as a symptom of the ineffectiveness in MBTA's approach to engage key stakeholders with the agency's established safety risk assessment or safety risk mitigation activities.

FTA finds that the imbalance in the allocation of resources between operations and capital project oversight, discussed in Category 1 above, also negatively impacted MBTA's SMS implementation planning and plan execution.

For effective SMS implementation and operation, the Accountable Executive (MBTA's General Manager) must set specific expectations for SMS outcomes, as well as provide adequate resources for SMS implementation activities to ensure the integration of the management system into day-to-day operations. Importantly, the Accountable Executive must set expectations regarding how the SMS generates and prioritizes safety information, and the type of safety information executive leadership needs to support safety risk resource allocation decisions. This should be done in a similar fashion to how any other management system within MBTA supports pertinent risk allocation decisions. The Accountable Executive's direction and focus drive implementation of the SMS and, ultimately, its day-to-day operation.

FTA concluded that the structures necessary for effective SMS implementation and operation are not yet in place within MBTA.³⁴ FTA also did not observe field implementation of MBTA's SMS training program. Important gaps exist in the following areas:

- formality in SMS planning,
- detail in SMS implementation tasks, individuals responsible, timelines, and outcomes.
- ongoing status monitoring and reporting that would provide project management controls to support resourcing decisions,
- safety management governance structure that ensures MBTA executives are provided with prioritized and actionable safety information for safety risk resource allocation decision making,
- incorporation of safety management processes under SMS at the executive level in a manner commensurate with the management processes of the management systems of other business functions.
- centralization trending, assessment, and monitoring of hazards and safety risks, and
- relevant and appropriate training on key SMS processes for involved personnel.

³⁴ DPU's review of MBTA's Agency Safety Plan did not identify or document gaps along the lines of those discovered by FTA. See Category 5 for findings related to DPU.

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The above gaps impact the ability of MBTA to ensure:

- its SMS is implemented and integrated into agency-wide risk management processes and tools, and
- safety management information is timely and actionable to support prioritization of resource allocation decisions to address safety risk.

While recognizing that the implementation of SMS is a complex and multi-year progressive process, the evidence available to FTA indicates ineffective performance of the components of SMS already implemented.

Findings 5 through 9, below, highlight shortcomings in MBTA's organizational arrangements and executive direction that must be addressed for effective SMS implementation.

Finding	Required Action
Finding 5: MBTA has not ensured that the necessary structures are in place to support effective implementation and operation of its SMS.	<ol style="list-style-type: none">1. MBTA must conduct a critical and comprehensive review of its entire SMS planning, implementation, and operational processes and activities to address the gaps discussed in this finding.2. MBTA must update its SMS Implementation Plan to reflect the results of this review, including defined actions, timeframes, responsibilities, and expected outcomes.

Finding 6. MBTA executive leadership does not receive prioritized and actionable information related to safety risks or shortcomings in safety risk mitigations.

Situation

MBTA has established a structure of safety committees and meetings to facilitate safety information sharing. During interviews, MBTA's Deputy General Manager (DGM) and Chief Safety Officer (CSO) presented the timing and frequency of safety meetings (including formal safety committee meetings) as follows:

- Daily
 - 7:45am DGM Operations call starts with Safety Hotline calls/notifications, safety performance review, and incidents and worker injuries reports for the previous day
 - Safety Snapshot emailed to management

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- Three meetings per month with affected departments to discuss prior week's safety incidents, performance, and Hotline calls (4th meeting each month to discuss open CAPs)
- Bi-weekly meetings with Operations to discuss safety concerns and open items/CAPs
- Monthly
 - Management of affected Departments meet to review open CAPs/CAP compliance
 - Executive safety performance review with affected department managers, GM, and DGM
 - Safety Data Analysis Report (SDAR) review which includes safety trends
 - MBTA Board safety subcommittee reviews presentation of SDAR
 - Code 1 Committee meetings (fire and smoke events)
 - SRCP Committee meetings

MBTA's executive leadership engages in the daily review of reported safety concerns. FTA found that the daily DGM Operations call demonstrates a commitment from management to discuss frontline employee reported concerns. FTA acknowledges MBTA executive management's desire to acquire a general awareness of the information reported through the Safety Hotline.

FTA did not find evidence that, from a safety management perspective, these committees and meetings generate actionable safety information, in terms of the explicit identification of safety priorities, to effectively support the escalation of priorities to executive leadership. FTA finds that the difference between safety data (facts) and safety information (interpretation of the facts to support action) is not evident in MBTA's SMS processes. MBTA Leadership cannot effectively prioritize resources to address safety concerns without clear safety information.

FTA found that MBTA safety data analysis and subsequent reporting primarily focuses on outcome (lagging) data. SDAR are presented at various executive meetings, including the monthly report to the MBTA Board safety subcommittee. Committee members and managers receive raw data from small datasets that, while not unimportant, are limited in scope from a safety management perspective (i.e., reliability and performance data and lagging safety data).

The SDAR provides exclusively outcome data that needs additional levels of analysis to become truly actionable information (outcome data reflects symptoms as opposed to causes or sources of safety problems). This is historical safety data and leads only to generalized and limited action. For example, FTA observed during a Board subcommittee meeting on safety that if a safety target is missed ("in the red") for three consecutive months then the Safety Department must report on remedial actions being taken during the next meeting with the Board. However, this structure means that actions are proposed only after a four-month lag period.

FTA is concerned about the lack of prioritization applied to safety concerns. A tenet of an effective SMS is the presentation of safety information to senior management in such a manner

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that they can quickly and accurately make decisions related to the prioritization of resources to address safety risk. FTA acknowledged the candor from MBTA executives who confirmed that while they believe they are current with safety concerns they also believe that information is not prioritized by safety risk nor is it presented in a manner that is easily actionable (i.e., analyzed data presented in a manner that clearly depicts the actions and/or decisions needed from executive management).

FTA also finds that MBTA's executive leadership has yet to provide explicit direction regarding the type of safety information it requires or the necessary organizational structures to support the movement of safety data (transformed into actionable safety information) from the field to the Board room. MBTA's executive leadership has not established and communicated its priorities to guide the collection, analysis, and reporting of safety information. The result of this absence is that MBTA senior managers across the agency are left without priorities, or must establish their own, to guide analysis efforts.

FTA determined from interviews and document reviews that in the absence of direction MBTA leadership and managers receive raw, unanalyzed safety data as opposed to prioritized information to support strategic decisions related to safety resource allocation. This conclusion was confirmed during interviews with managers within multiple MBTA operating and maintenance departments. The consequence of this situation is that in MBTA's safety management processes, raw data has become the currency of MBTA safety reporting and, by extension, MBTA's safety risk decision making. Under this framework everything becomes a safety priority, overwhelming supervisors, managers, senior managers, and executive management, and resources are allocated to address symptoms rather than causes of safety concerns.

Finding	Required Action
Finding 6: MBTA executive leadership does not receive prioritized and actionable information related to safety risks or shortcomings in safety risk mitigations.	<p>MBTA leadership must:</p> <ol style="list-style-type: none">1. Work with safety and operating department leads (including maintenance and engineering departments) to define explicit criteria for prioritizing safety risks.2. Include explicit safety risk acceptance criteria in its Agency Safety Plan and/or reference documents.3. Work with MBTA's Safety Department and operating department leads (including maintenance and engineering departments) to define how safety

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Finding	Required Action
	<p>information must be presented to MBTA leadership in a prioritized and actionable manner.</p> <p>4. Require, and provide means for, operating department leads (including maintenance and engineering departments) to elevate proposed safety risk mitigations, including their status, that require MBTA leadership approval for resourcing. This must include safety risk mitigations deemed ineffective or inappropriate and that require executive level decision regarding the redirection of, or additional, resourcing.</p>

Finding 7. MBTA Executive Management does not consistently ensure its decisions related to safety risks are based on safety data analysis or documented facts.

Situation

Another impact of the gap identified in Finding 6 above is that in the absence of analyzed data, and therefore actionable information, decision makers must significantly lean on subject matter experts instead of safety information. During interviews and document reviews, FTA identified that MBTA primarily relies on corporate memory and management experience as the means to support decision making related to safety concerns and safety risk. FTA appreciates the role that both corporate memory and experience play during safety risk management and safety assurance activities; however, MBTA was unable to provide evidence of safety analyses to support decisions made to assess and/or mitigate safety risk.

FTA found that the failure of executive leadership to require the presentation of safety data analyses meant that MBTA was conducting safety risk assessments to support safety risk mitigation decisions in the absence of actionable information. This failure was demonstrated in the safety risk assessment of events involving rail car uncoupling in rail yards (including several runaway trains), vehicle derailments, and OCC dispatcher staffing challenges.

FTA observed that limited accountability is placed on operating groups and the Safety Department to provide executive management with information that factually substantiates safety risk assessments and the development of safety risk mitigation strategies or provide executive leadership actionable information for safety resource allocation decision making.

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MBTA's organizational safety currency does not yet include data compiled, analyzed, and prioritized into information.

In the absence of pertinent safety data at the operational level, and actionable information at the executive level, the MBTA lacks the necessary parameters to measure the effectiveness of its safety risk mitigations.

Finding	Required Action
Finding 7: MBTA Executive Management does not consistently ensure its decisions related to safety risks are based on safety data analysis or documented facts.	<ol style="list-style-type: none">1. MBTA must map its safety data flows and supporting processes.2. MBTA must establish explicit accountabilities and responsibilities for safety data flows as a component of safety information management (collection, analysis, communication, storage, and retrieval of safety data).3. MBTA must provide formal training in safety information management to relevant personnel.4. MBTA must demonstrate that its executive management uses and promotes the usage of safety data analysis and/or documented facts in decision-making related to safety risk.

Finding 8. MBTA's safety investigations and safety assurance activities do not consistently collect and analyze information on precursor factors.

Situation

As mentioned under Finding 5, MBTA's ability to utilize data from proactive safety management (such as monitoring safety performance and safety risk mitigation effectiveness or expanding safety investigations to collect accident precursor data) is primarily limited to its Safety Hotline and safety rules compliance checks. The Safety Department does conduct internal safety audits; however, the scope of the audits for 2021 were not aligned with known safety concerns and their safety risk mitigations.³⁵ There did not appear to be direction from MBTA executive or

³⁵ While MBTA performed Internal Audits in compliance with the DPU Program Standard, as documented in 220 CMR 151.05, in 2022, Section 220 CMR 151.05 does not preclude MBTA from including identified safety concerns that have resulted in accidents or organizational deficiencies in implementation of safety requirements.

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safety leadership to ensure the limited Safety Department resources for conducting safety assurance activities were prioritized to address high-profile safety. In addition, MBTA leadership has not provided explicit direction to its operating departments that supports ongoing safety data collection related to the effectiveness of safety risk mitigations. FTA understands that MBTA is in the process of developing its safety assurance activities and sees this finding as an opportunity for MBTA moving forward.

FTA also found that operating departments do not routinely collect data to monitor safety concerns. Based on interviews and records reviews, FTA found this to be primarily a symptom of the lack of sufficient resources for operations and maintenance needs and a lack of consistent processes for determining safety priorities. As a result, MBTA relies on information from safety accidents, incidents, and occurrences to identify weaknesses or shortcomings in safety risk mitigations instead of aligning its safety monitoring, auditing, and compliance activities with data-driven safety management priorities.

For example, as addressed in Special Directive 22-4, FTA observed that with respect to track maintenance, most of the work orders that were generated and closed focused on addressing red conditions (i.e., eliminating speed restrictions is the priority). FTA determined that MBTA does not have the resources to perform corrective maintenance for green and most yellow defects. Yellow conditions may be addressed as part of other projects or activities, but this is opportunistic and based on scheduled capital projects. FTA found that yellow defects can exist in combinations of conditions that collectively could result in red conditions (e.g., track component failures or derailments). Also, under certain circumstances, yellow and green conditions can rapidly deteriorate if left unaddressed.

FTA learned that the Maintenance of Way Department (MOW) tries to “piggyback” on capital projects to utilize the track time allocated to those projects to obtain access for its own maintenance activities. However, capital projects tend to emphasize rail replacement for easy and high-percentage on-time and on-budget delivery while MOW has several key locations that need renewal and/or replacement that do not fit these categories.

FTA observed that MBTA has invested heavily in the digitization of its records and is beginning to see the benefits of this transition away from paper records. Digitalization of records can support MBTA in the documentation and audit of inspections as well as with maintenance planning. MBTA has developed a series of codes to document defects by geographic location on the system through use of its MaxTrax application which allows for more precise defect tracking. This approach may allow MBTA to align its safety monitoring, auditing, and compliance activities with data-driven safety priorities.

FTA also reviewed over 100 safety event investigation reports completed by MBTA from 2019 through July 2022 and found that MBTA has greatly improved its investigation fact finding

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process. FTA observed improvement in the level of detail, analysis, and identification of probable cause and contributing factors included in the investigation reports.

While there have been improvements, FTA observed gaps that remain in the safety event data collection process and opportunities for additional data and fact finding beyond information provided by MBTA’s Safety Department during interviews and document submissions. During onsite SMI activities, MBTA experienced serious safety events including the loss of the tread break unit (TBU) from a new Orange Line vehicle, two uncoupling events in the yard leading to a runaway train, a train-to-train collision on the Green Line, and an unintentional coupling while in service, also on the Green Line.

Finding	Required Action
<p>Finding 8: MBTA’s safety investigations and safety assurance activities do not consistently collect and analyze information on precursor factors.</p>	<ol style="list-style-type: none"> 1. MBTA must update its Safety Assurance process to include monitoring of safety risk mitigations with a) compliance-based activities to provide the baseline for monitoring implementation status and b) performance-based activities to monitor the actual effectiveness of safety risk mitigations. 2. MBTA must prepare a monthly look-ahead schedule for prioritized safety risk monitoring activities that include safety risk mitigations and corrective actions in place to address MBTA's highest safety priorities. 3. MBTA must develop and document guidance, and deliver training for safety investigators that ensure the consideration of precursor factors in the analysis of the chain of events leading to a safety event (accident, incident, or occurrence), including but not limited to, for example: <ul style="list-style-type: none"> • Suitability of resources available to frontline personnel for operational and maintenance activities

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Finding	Required Action
	<ul style="list-style-type: none"> • Deficiencies in policies, procedures, rulebooks • Outdated policies, procedures, and rulebooks • Deficiencies/inadequacies in training Shortcomings in supervision • Deviations from procedures and rules Reasons for lack of adherence to procedure and rules • The limited success of discipline to address safety issues

Finding 9. MBTA’s safety risk assessment guidance as part of its Safety Risk Management is ambiguous and has led to confusion among stakeholders regarding their responsibilities and authorities, which has created delays in carrying out safety risk assessments activities.

Situation

FTA reviewed MBTA documentation related to safety risk assessments. This included MBTA’s “Agency Safety Plan,” “SRM [safety risk management] SOP,” the completed safety risk assessment “SRM -13: Motorperson Situational Awareness,” and MBTA’s “Safety Assessment Decision Tool.” In addition, FTA reviewed MBTA’s various hazard logs and held discussions with MBTA officials involved in, or responsible for an element of, safety risk assessments.

FTA noted that MBTA has begun and completed at least two formal safety risk assessment workshops³⁶ and MBTA’s Chief Safety Officer indicated that more workshops are being scheduled. The formal safety risk assessment workshops follow an extensive process, laid out in the “SRM SOP.” However, because of the absence of a formal process to establish safety risk priorities, there are no criteria for determining the topic of a safety risk assessment workshop. FTA did not receive a list of safety risk assessment workshop topics or priorities, or a schedule for upcoming workshops from the Chief Safety Officer. Though the Safety Department does maintain a list of planned safety risk assessment workshops, key MBTA executives could not confirm the existence of a schedule for safety risk assessments. Given the high-profile safety events and concerns raised by FTA in its Special Directives issued in June 2022, FTA anticipated

³⁶ MBTA officials indicated that four others had been conducted, however, FTA has still yet to receive related documentation as requested.

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that MBTA would have considered the allocation of safety management resources for safety risk assessments as a priority.

At the strategic level, safety risk assessments must be a direct and immediate response to the identification of hazards and hazard identification is an on-going activity that does not necessarily follow a prescribed pattern. Therefore, a schedule of safety risk assessment workshops is counterintuitive to the situational nature of hazard identification and is inconsistent with the basic principles of safety management.

FTA observed confusion amongst MBTA officials related to the purpose, how, and when safety risk assessments should be conducted as well as regarding responsibilities for conducting safety risk assessments. For example, during interviews FTA learned that:

- There remains confusion regarding the scope of safety risk management, as indicated by a perceived conflict in the allocation of resources to either capital improvements or to “safety” rather than the integrated allocation of resources towards safety risk mitigations that would be jointly owned and managed by operating groups.
- There is a perception that safety risk assessment is exclusively within the purview of the Safety Department. On multiple occasions, interviewees indicated that the Safety Department conducts the safety risk assessments. However, in conversations with Safety Department officials, FTA learned that operating departments are responsible for performing safety risk assessments (as would be anticipated).
- Hazards are typically identified, and mitigations or corrective actions are applied, without safety risk assessments.
- Safety risk assessments (not including contracted activities within capital projects) at MBTA are primarily based on expert opinion and corporate memory as opposed to data.

Though MBTA uses the safety risk assessment workshops as a formal means for assessing risk, safety risk assessment can also be done informally. An example of the informal nature of assessing safety risk is illustrated by MBTA’s response to FTA’s Special Directive 22-6 (OCC). FTA required MBTA to assess required staffing changes related to dispatchers and hours of service. MBTA took immediate action to address OCC dispatcher, supervisor, and manager work schedules. Although FTA understands that MBTA had very little time to make its adjustments in OCC staffing to address the critical nature of the Special Directive, FTA did not receive a formal safety risk assessment from MBTA to explain the proposed staffing changes. FTA would have expected to see a safety risk assessment detailing the parameters for the assessment of safety risk related to staffing decisions and ultimate increase in service headways, and the parameters to monitor the appropriateness of the safety risk assessment and the efficacy of the staffing changes proposed.

According to MBTA’s Agency Safety Plan, Section 6.3.1.1 of MBTA Configuration Management and Control Program requires that, “MBTA develop a process to evaluate and approve proposed changes, as well as document and analyze the efficacy of implemented changes to

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the public transportation system and/or safety critical elements of the Authority’s system, including operations, processes, administrative policies and procedures, rules, infrastructure, vehicles, and training.” However, in response to Special Directive 22-6, MBTA submitted documentation depicting analysis that incorporated “the experience and knowledge of the OCC management team when they worked as dispatchers, supervisors, and/or trainers. They...crafted this process with institutional understanding, rules, guidelines, and procedures to perform an informal SRM.” It must be clarified that under existing FTA guidance, “informal SRM” does not exist. MBTA’s submittal went on to state that the revised staffing plan was “formally drawn up and reviewed initially with [MBTA’s] Chief Safety Officer who offered advice about staffing levels and hours of service.”

FTA believes that MBTA will benefit from defining explicit direction related to identifying criteria for conducting safety risk assessments that is consistent with the basic principles and tenets of SMS. MBTA must also define explicitly related accountabilities, roles and responsibilities, outcomes, and deliverables for safety risk assessments. MBTA may also benefit from investigating whether a designated safety risk committee, with accompanying rules, policies, and procedures, could help formalize its current process.

Finding	Required Action
<p>Finding 9: MBTA’s safety risk assessment guidance as part of its Safety Risk Management is ambiguous and has led to confusion among stakeholders regarding their responsibilities and authorities, which has created delays in carrying out safety risk assessments activities.</p>	<ol style="list-style-type: none"> 1. MBTA must develop and document criteria for conducting safety risk assessments consistent with the basic principles of safety management and the tenets of SMS as conveyed in FTA’s SMS guidance materials. 2. MBTA must develop explicit direction for the ownership of safety risk assessments among the Safety Department and the operating departments. Documentation must include providing explicit roles, responsibilities, and thresholds of authority of each department involved. 3. MBTA must include in the above criteria directives to ensure that operating departments including subject matter expertise, own safety risk assessments, while safety officials provide support for safety risk assessments and reports on results to Executive Leadership for safety resource allocation priorities.

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Finding	Required Action
	<p>4. MBTA must expand its policy of establishing a pre-defined schedule of safety risk assessment workshops and develop criteria attuned with the nature of hazard identification (I.e., as they are identified), to expedite safety risk assessments to support prioritization for resource allocation.</p>

Finding 10. MBTA safety information management tools (hazard log, safety risk mitigation log, etc.) do not fully support prioritization of resources to address safety risk and safety performance monitoring.

Situation

MBTA leadership committed substantial resources to digitize operations and maintenance data from hard copy materials. FTA observed the improvements in operations and maintenance data tools that provide MBTA officials the opportunity for efficiencies in management, analysis, and monitoring activities. MBTA officials indicated that they are waiting for the implementation of CIVIX’s enterprise agency software platform, which includes a Transit Safety & Operations Compliance System (TSOCS) solution. MBTA’s Safety Department indicated that, unlike their current system, the TSOCS will help integrate safety data (such as hazards, occurrences in operations, and leading indicators) to support a proactive approach to safety data management. MBTA officials explained that the TSOCS will allow the Safety Department to access regular and actionable maintenance data that may support identification and analysis related to data such as preventative maintenance records and status and asset management condition data. In addition, MBTA officials indicated that the TSOCS will allow for compilation, analysis, assessment, and reporting of safety risk.

FTA found that the Safety Department has limited direct access to operations and maintenance data and primarily relies on the receipt of Microsoft Excel workbooks. The lack of integration between data sets results in substantial manual entry of data such as CAP implementation and status, accident investigation activity and document tracking, and analysis and trending. During interviews, MBTA officials indicated that there is a lack of interaction between operations and safety departments to discuss strategies and tactics for improving data accessibility.

Currently, the Safety Department maintains different logs designed to support hazard identification, employee safety reporting, safety risk assignment, and safety risk mitigation monitoring. FTA found that occasionally the logs contain information related to the same hazardous condition meaning that the Safety Department is manually entering singular data

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points into multiple sheets. FTA also found instances where the likelihood and severity ratings, as well as the safety risk indexing, did not correspond to MBTA’s safety risk assessment Agency Safety Plan requirements. This could be due to the duplicate manual entry of similar data or a lack of sufficient internal training on the safety risk assessment process.

The department recently stood up a spreadsheet for tracking safety risk mitigations and a web database tool, “Knack.” This tool allows for very quick creation of new forms and simple databases to support activities such as safety rules compliance checks and general observations and anyone in the Safety Department can access Knack from their computer or phone.

As previously discussed, MBTA currently lacks an integrated plan that defines outcomes for safety management activities and that includes utilization of safety data-related tools. The lack of necessary leadership direction and data integration negatively impacts the Safety Department’s ability to analyze, prioritize, and report on safety data in a timely manner. The current suite of tools requires a level of manual entry and data manipulation beyond Safety Department resource capacity.

MBTA would benefit from developing business requirements for CIVIX and other safety data tools to ensure that safety data information needs, and workflows are integrated into the implementation of its safety information management systems.

Finding	Required Action
Finding 10: MBTA safety information management tools (hazard log, safety risk mitigation log, etc.) do not fully support prioritization of resources to address safety risk and safety performance monitoring.	<ol style="list-style-type: none">1. MBTA must evaluate (and correct) the data contained in its hazard log and safety risk mitigation log for accuracy and relevancy to SMS.2. MBTA must expedite the build out of its safety risk and safety risk mitigation monitoring information tools.3. MBTA must demonstrate use of its safety information management tools to effectively prioritize its resources to address the results of:<ul style="list-style-type: none">• Safety Risk Monitoring• Safety Performance Monitoring

Category 3: Effectiveness of Safety Communication

Focus

FTA focused on the organizational structures, processes, and procedures in place to support effective communication of safety information throughout the organization including safety committees, the employee safety reporting program, labor unions, and the MBTA Board.

Finding 11. MBTA has not established explicit and formal provisions to ensure safety information from safety committees results in a consistent outcome of documented, prioritized, and actionable safety information.

Situation

As mentioned in Findings 5 and 6, MBTA has an elaborate structure of safety committees and groups to facilitate safety information sharing discussion of safety topics, including:

- Executive Safety Committee (ESC)
 - Deliberates on the recommendations and requests for approval from the Safety Management Review Committee (SMRC)
- Safety Management Review Committee
 - May direct the formation of committees and/or working groups to evaluate safety-related matters and report back to the SMRC.
- Safety Management Working Groups (SMWG)
 - Meets to discuss cross-departmental safety issues and to review findings, recommendations, and trends escalated from mode- and department-specific Data Analysis Groups (DAGs).
- Data Analysis Groups
 - Meetings are scheduled and facilitated by a Deputy Director within the Safety Department
 - Meet to review safety performance indicators and trends that are aggregated by data analysts and that may be elevated from the Local Safety Committee
- Local Safety Committees (discussed under Finding 12)

During interviews, FTA was able to confirm MBTAs commitment that committee and group meetings are convened as scheduled. FTA obtained detailed anecdotal information of the items discussed during the meetings and learned that the safety committee and group meetings are a primary venue for safety-related decisions.

Through interviews and records reviews, FTA also learned that safety information from these meetings (that may include presentations, safety data, and analysis) is not formally captured within MBTA, either by the Safety Department or by other function. FTA found this to be a fundamental flaw in the outcome of the meetings. MBTA could not provide meeting minutes or

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other documentation regarding safety issues raised and discussed or records of safety decisions to demonstrate a formal process for managing the outcomes of these discussions. MBTA explained this gap by indicating that this formal process is still “work in progress” and that there is not a consistent format or platform for capturing and communicating the information. Based on this, FTA found that the communication regarding the outcomes of the discussions of the meetings is informal at best.

Given FTA’s findings related to shortcomings in safety data prioritization and presentation (findings 7 and 10), FTA finds that the absence of outcome documentation from the meetings can lead to:

- subsequent actions that are left to interpretation and individual departmental prioritization,
- absence of clearly assigned departmental responsibilities regarding implementation and monitoring of actions, and
- undefined timeframes for actions.

Finding	Required Action
<p>Finding 11: MBTA has not established explicit and formal provisions to ensure safety information from safety committee results in a consistent outcome of documented, prioritized, and actionable safety information.</p>	<p>1. MBTA must develop and describe, in the organization's SMS documentation, instructions regarding the conduct, recording, communication and follow up of the outcome consensus decisions specific for each of the following meetings - taking into consideration the nature (strategic or tactical) of each meeting:</p> <ul style="list-style-type: none"> • Operations and Safety Biweekly call (currently every other Friday) • Operations and Safety weekly meeting (currently on Wednesdays) • Executive Safety Committee (ESC) • Safety Management Review Committee (SMRC) • Safety Management Working Groups (SMWGs) • Data Analysis Group (DAG) • Local Safety Committee Meetings • Joint Labor/Management Safety Committee (required by Bipartisan Infrastructure Law)

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Finding	Required Action
	2. In support of the above, MBTA must develop and describe, in the organization's SMS documentation, a formal mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring.

Finding 12. MBTA has not documented explicit and formal provisions to ensure the participation of frontline employees in local safety committees as part of their job responsibilities in relation to the agency's SMS.

Situation

MBTA has established local safety committees, which are smaller workforce groups based on work location, as a primary forum to receive safety information from frontline personnel. These forums provide an avenue for workers to share, and the agency to obtain, information on the safety performance of the agency in the field. During interviews and records review, FTA learned that:

- a representative of the Safety Department attends the meetings,
- local safety committee meetings often do not have frontline representation (FTA confirmed this with Safety Department officials and Local 589 union members and union leadership),
- staffing shortages prevent frontline employee participation because they are scheduled for work during meetings,
- there is no demonstrated accountability of the Safety Department representative to document or report out the information discussed during the meetings,
- there are challenges in ensuring issues are captured because of a lack of departmental accountability, and
- frontline personnel provide information to supervisors who serve as their proxies, but there is no requirement for employee safety concerns to be documented or acted upon by supervisors.

Finding	Required Action
Finding 12: MBTA has not documented explicit and formal provisions to ensure the	1. MBTA must develop explicit and formal guidelines for the expected role and

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Finding	Required Action
<p>participation of frontline employees in local safety committees as part of their job responsibilities in relation to the agency's SMS.</p>	<p>contribution of frontline employees to the local safety committee meetings.</p> <p>2. MBTA must develop instructions for the conduct of the meetings, including explicit departmental accountabilities for meeting outcome information capture, communication and follow up.</p>

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Finding 13. MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline.

Situation

In 2019, MBTA established its Employee Safety Reporting Program (ESRP). MBTA's Agency Safety Plan states that "MBTA's voluntary, confidential, non-punitive³⁷ employee reporting program allows for the submission of information related to observed hazards, sole-source safety events, or inadvertent errors without an associated legal or administrative requirement to report. Reported information should be used solely to support the enhancement of safety" and "Voluntary reporting is non-punitive because it affords protection to reporters, thereby ensuring the continued availability of such information to support continuous improvements in safety performance."

MBTA established the following methods for employees to report safety concerns:

- Safety Hotline: (617) 222-SAFE (7233).
- Safety Notification email: SafetyNotification@mbta.com.
- Direct reporting to an MBTA Safety official.
- Form B "Notification to MBTA Safety;" forward to MBTA Safety office or fax form to: (617) 222-5127.

During interviews with MBTA officials, FTA learned:

- The Safety Hotline is the most frequent source of information for MBTA on daily safety concerns observed or experienced by frontline personnel.
- MBTA's Safety Department (primarily management) considers the Safety Hotline as a reliable source of safety information.
- De-identified employee Safety Hotline reports from the previous day are shared during the 7:45am daily Deputy General Manager Operations call.
- In 2019, when the ESRP was first established, the MBTA received 2-3 employee reports per month. At the time of FTA's SMI, MBTA averaged 20-25 employee Safety Hotline reports per month.
- Most reports received through the Safety Hotline during 2020 were related to COVID-19 protocols and concerns over face mask requirements put in place to address the COVID-19 pandemic.
- A safety analyst is assigned to the ESRP full-time, fields calls (typically voicemail messages) and emails and enters reports into an ESRP log. The safety analyst follows up

³⁷ Except in cases where the reports indicate the likelihood of criminal activity, substance abuse, suspected use of prohibited substances, falsification of employee report, or willful disregard for safety.

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with employees (if the employee provided identifying information) and directs de-identified reports to appropriate departments/individuals for follow-up.

- MBTA’s Safety Department works actively to encourage employees to report, protect employee confidentiality (through de-identification), and maintain employee anonymity in all interactions with other MBTA departments

FTA observed, and MBTA officials agreed, that the MBTA’s ESRP is in actual practice largely limited to the Safety Hotline. FTA analyzed the Safety Hotline log and noted that many of the reports are anonymous which may indicate a weakness in the program as MBTA is unable to follow up with workers on reported concerns. The 20 to 25 Safety Hotline reports per month for an organization of the size of MBTA may indicate a reluctance or skepticism in the safety reporting environment.

Frontline employees have the option to report safety concerns verbally to supervisors who must then elevate the report to the Safety Department. However, there is no established procedure nor controls that ensure that all reports verbally submitted to supervisors are elevated through the system. FTA finds that this creates the probability for loss of potentially valuable safety information and results in under-reporting. One Safety Department official anecdotally indicated that holding small meetings in the field with frontline employees (e.g., during breaks, etc.) yields more detailed information related to safety than is received through the Safety Hotline. While these small meetings may serve as a supplemental form of safety reporting, it raises questions regarding the status of MBTA’s ESRP. The same official indicated a belief that the Safety Department management overvalues the information that the Safety Hotline yields.

FTA reviewed the Safety Hotline log and found that only a small percentage of reports are about safety concerns and most reports do not rise above the level of individual location “housekeeping” issues or complaints. MBTA indicated that it has conducted ESRP training and consistently promotes the program; however, FTA did not see evidence (neither during discussions with employees nor through a review of the Safety Hotline log) that frontline employees have clarity or instruction on what to report and, most importantly, what not to report through the safety hotline. This potentially generates a situation of “noise versus signal” in the Safety Hotline log, in which the log contains many reports, but those reports contain scarce actionable safety information. The large number of reports (the “noise”) make it difficult to isolate actionable safety information (the “signal”).

FTA finds that an over-reliance on the Safety Hotline, the likelihood of safety information not rising beyond supervisory ranks, and the lack of actionable safety information are an outcome of safety reporting concerns. FTA finds that relying on the Safety Hotline as it is currently used at MBTA is not sufficient to provide the benefits that an effective and efficient ESRP may bring to the safety management processes of an agency.

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Finding	Required Action
Finding 13: MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline.	<ol style="list-style-type: none"> 1. MBTA must expedite the development of an effective ESRP as a fundamental source of safety information for hazard identification and safety performance monitoring. 2. As part of the development of an effective ESRP, MBTA must provide explicit direction to frontline employees on what to report and what not to report through the ESRP (including the safety hotline). 3. As part of the development of an effective ESRP, MBTA must provide refresher training to stakeholder personnel on the role of employee safety reporting within SMS and the crucial contribution managers and supervisors play in the development of an effective safety reporting context.

Category 4: Operating conditions and policies, procedures, and training:

Focus

FTA reviewed MBTA’s implementation of required safety, operations, maintenance, and capital project delivery rules and procedures. FTA also reviewed how the MBTA assesses its own compliance with its procedures and how the agency determines when operating and maintenance practices are no longer working or need to be revised to reflect new conditions, new technology, or different approaches for completing work. FTA’s SMI also assessed the extent to which training supports MBTA employees in understanding rules and carrying out work safety and “as written” in MBTA procedures. Finally, FTA examined the extent to which MBTA has devoted resources to training and professional development of MBTA’s workforce.

Finding 14. Documented operating and maintenance rules and procedures are not implemented as required.

Situation

Throughout the SMI, FTA observed instances where employees were not complying with required safety, operations, and maintenance rules and procedures. Many of these instances of non-compliance are noted in FTA’s Special Directives 22-4, 22-5, 22-6, and 22-7. For example,

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FTA noted violations in right of way safety rules and vehicle operating rules, preventive maintenance inspections that were not completed as required, inappropriate storage of chemicals in rail yards, an unlocked signal on the right of way, incomplete repairs, and rule violations in readying trains for moves in the rail yard. FTA also observed a rail transit vehicle speeding through a work zone.

In addition, FTA reviewed over 100 final investigation reports completed for major safety events experienced at the MBTA between January 1, 2019, and April 29, 2022. In over 85 percent of these reports MBTA identified non-compliance with at least one safety, operating, or maintenance rule as a primary or contributing cause of the accident. Review of these reports also reveals the frequent use of unvetted and ad hoc shortcuts in work practices, outdated procedures that have not kept paces with changes in work environments, violations of safety rules to meet deadlines or vehicle counts, and lack of time and resources to review and update rules and procedures to align them with system changes. Finally, FTA found that MBTA does not use many tools, including checklists, to support implementation of key operating and maintenance procedures in the Operations Control Center (OCC) and rail yards.

MBTA's current activities to monitor compliance with operating and maintenance rules include requirements that supervisors monitor daily job duties for operations and maintenance employees, though most departments do not require formal documentation of this monitoring activity. FTA found that supervisors have a range of responsibilities at the MBTA and do not always have time to complete this monitoring or to follow-up with employees regarding their performance. In interviews across operations and maintenance departments, MBTA staff and supervisors indicated that due to a lack of supervisory personnel and officials, it was challenging to provide frontline personnel, particularly new MBTA hires, with additional support and oversight that they may need to understand and comply with all rules, given the complexity of MBTA's operating environment.

MBTA conducts a Safety Rules Compliance Program or SRCP, as discussed in several other findings. Training instructors monitor how MBTA employees carry out work and MBTA hires contractors to support independent quality assurance/quality control for specific activities, including rail vehicle maintenance and condition assessments for safety critical infrastructure.

Nevertheless, FTA finds that more can be done to identify safety-critical rules and procedures, to support MBTA personnel in understanding these requirements and how to comply with them, and to monitor the overall performance of the agency in complying with these procedures. FTA finds a lack of consistency in how compliance with operating and maintenance rules is monitored across departments.

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Finding	Required Action
<p>Finding 14: Documented operating and maintenance rules and procedures are not implemented as required.</p>	<ol style="list-style-type: none"> 1. Each operating and maintenance department must establish a group to review department-wide information on levels of non-compliance with key rules and procedures critical to the safety of activities performed by the department. 2. Each department must establish and act on a prioritized list of most frequently violated rules and procedures with the most significant potential safety consequences. 3. Each department must develop and implement approaches, which could include audits, use of checklists and guides, campaigns, and training, to improve compliance. 4. Each department must report to the Safety Department monthly on its compliance with identified key rules and procedures critical to the safety of activities performed by the department. 5. The Safety Department must review and audit these reports and compile a monthly compliance report for MBTA's executive leadership team. 6. Each department must continue to review safety data to assess effectiveness of actions and to improve compliance with safety rules and procedures.

Finding 15. MBTA does not monitor operations, including the conditions of the operating environment, to identify the reasons for deviations between formal, established standards, rules and procedures, and actual operations and maintenance practices.

Situation

The primary source of MBTA's internal oversight of its operations is the Safety Rules Compliance Program. As with any compliance program, MBTA's program aims to detect and eliminate deviations from rules, standard operating procedures, and so forth. This is aligned with the historical view of safety compliance programs, which hold that strictly following established rules and procedures guarantees safety and that non-compliances are *per se* causes of accidents.

Recent history, however, indicates that generally when an agency investigates safety events from an organizational perspective it finds many instances of non-compliance due to "traditional" causes (lack of discipline, knowledge, or skills, etc.) as well as other reasons for non-compliance linked to organizational challenges or deficiencies such as:

- lack-of or inappropriate resources to do the job,
- rules that have become obsolete,
- procedures that have become difficult, if not impossible, to execute in real time or due to changes in the operating conditions, and
- similar reasons associated with the organization and not with individuals.

FTA found there are reasons beyond one-off non-compliance for employee deviations from policies and procedures. For example, FTA observed that MBTA's Right of Way (ROW) Safety Rule Book has not been updated since 2014. However, in a dynamic and constantly changing environment such as with public transportation operations and maintenance activities, it is likely that safety conditions in the ROW have changed. Therefore, deviations from the ROW Safety Rule Book should be expected. FTA found numerous procedures and rulebooks that were out of date during its document review and interviews with frontline employees and managers.

In the absence of updated rules, rulebooks, procedures, or resources frontline personnel devise informal practices to get the job done. However, because these informal practices are workarounds of existing formal rules and procedures, these practices have not been verified as "safe" under the lens of strict compliance. In such situations, tolerance for shortcuts, optimizations, and even violation of safety rules may become the norm given service pressure, aging infrastructure, and outdated procedures. Therefore, actions by managers and supervisors to eliminate deviations from procedures (i.e., non-compliances) through discipline may seem inconsistent with previous passive approval.

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For this reason, an SMS framework oversight of operations starts with observing compliance as the baseline and extends to monitoring performance to understand the actual reasons for deviations from the baseline.

FTA, during interviews and document review, found that MBTA's oversight of its operations rarely extends beyond monitoring compliance. FTA observed limitations in MBTA's Safety Rules Compliance Program, in terms of providing actionable information to address safety risk.

Specifically, FTA found that:

- The focus on enforcement and ensuring procedures are being followed/complied with identifies very few instances of violation or non-conformance (for example, less than 10 incidents out of over 20,000 annual observations). This cannot be considered as an effective "return on investment" in terms of identifying safety risk and suggests a probable misallocation of resources.
- Most observations of operations are limited in scope and focus on single items (door operations, berthing in stations, announcements, etc.). This approach to observation of procedures - piecemeal and without context - yields negligible information with value for safety risk management.
- MBTA audits are randomly conducted and are also often focused on a single item.
- MBTA adjusts its scheduled compliance checks based on feedback from multiple, but not prioritized, sources including observations from supervisors (which may be opinions) and incidents (reaction to the latest problem). This suggests a probable misallocation of resources towards safety concerns that may be of relatively smaller significance when compared to a dataset containing precursor information and based on safety risk prioritization efforts.
- MBTA monthly reviews the total number of compliance checks, the types of checks, and violations observed. MBTA did not demonstrate any use of the conclusions that these reviews generate, or their relevance for safety risk management.
- The checklist for in-service ride evaluations consists of 44 items, which summarize operator rules collated into 5 categories: ROW, Service Stops, Observance of General Rules, Road Operation, and Intersection Operation. FTA was advised that all 44 items did not necessarily need to be reviewed in a ride evaluation, and that there is discretion regarding which rules are reviewed. FTA finds that MBTA must evaluate whether observers should have discretion or if it should provide explicit parameters for choosing or discarding items to be evaluated.

Finding	Required Action
Finding 15: MBTA does not monitor operations, including the conditions of the operating environment, to identify the reasons for deviations between formal, established standards, rules and procedures,	MBTA must develop, document, and communicate a mechanism to monitor operations, and provide training to stakeholder safety and operating personnel on this mechanism, to enable the analysis

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Finding	Required Action
and actual operations and maintenance practices.	and understanding of situations of non-compliance.

Finding 16. MBTA's QA/QC program is not sufficiently independent from the activities it oversees.

Situation

The MBTA uses a QA/QC program to support maintenance and engineering activities. The MBTA states in its Preventive Maintenance Inspection (PMI) and Documentation Policy that it employs three separate quality verification processes:

- The Inspection Foreman randomly selects inspection tasks at the completion of the rail car inspection to verify the activity complied with the inspection procedure.
- A Superintendent Quality Control Audit occurs once per quarter and requires a team approach (i.e., a foreperson, a repair person, and an executive (or their designee)).
- The Quality Department performs quality control audits monthly. These audits are also conducted using a team approach like that of the Superintendent Audit (i.e., comprising a foreperson, a repair person, a Superintendent (or designee) and a member of the Quality Department).

While not discussed in the PMI and Documentation Policy, monthly reports for Preventive Maintenance Inspection audits from the MBTA's General Engineering Consultant (GEC) contractor were provided to FTA. These inspections provide findings, but the inspections are limited to one vehicle per month from each of the four lines. FTA noted that the tracking log provided with these monthly inspection reports did not include any re-inspection dates or activities to address the findings.

FTA could not verify that the various levels of inspection verification audits include a documented QA/QC procedure or manual to guide the activities or explain how nonconformance findings are logged, tracked, and resolved. The current process for quality control auditing, selecting random vehicles or activities on an infrequent basis, lacks a daily ongoing assessment of the rail vehicles that would assure that rail vehicles with safety critical nonconformances stay out of revenue service. This process for quality control auditing is almost entirely performed by personnel reporting to rail vehicle maintenance management, thus lacking the independence necessary for an effective QA/QC program.

MBTA delegates the rail car acquisition program QA/QC to the rail car manufacturer and the MBTA's program management consultant. A QA/QC Plan for MBTA's oversight of these processes was not provided to FTA (QA/QC manuals from the rail car manufacturer and contractor were provided). Not unlike the preventive maintenance policy, the rail car

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acquisition process lacks an MBTA-specific documented QA/QC program with procedures and roles and responsibilities for an independent internal group to report directly to the highest levels of MBTA management.

MBTA primarily delegates its quality management program to contractors and frontline supervisors that only verify adherence to maintenance procedures on a random basis. MBTA would benefit from QA/QC program administration by independent entities that report directly to MBTA's upper management (such as the Safety Department function) because operating and engineering departments have competing priorities that may conflict with effective QA/QC oversight.

Finding	Required Action
Finding 16: MBTA's QA/QC program is not sufficiently independent from the activities it oversees.	<ol style="list-style-type: none">1. MBTA must develop and administer a QA/QC program to independently oversee of ongoing QA/QC activities.2. MBTA must ensure that the QA/QC functions are independent of the functions of the Safety department and report directly to the GM.3. MBTA must develop a formal QA/QC procedure that details the oversight of and accountability and roles and responsibilities for QA/QC programs provided by railcar manufacturers and MBTA consultants related to quality control of its railcars and subcomponents.4. MBTA must ensure that the MBTA QA/QC independent group is staffed with a sufficient SMEs in necessary disciplines to ensure a complete and thorough understanding of the responsibilities under the purview of railcar maintenance and engineering.

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Finding 17. Technical training for operations and maintenance departments is under-resourced and decentralized, without sufficient resources and direction, and relies significantly on on-the-job-training (OJT) which is informal and lacks oversight. Emergency response training is poorly integrated into overall training program.

Situation

Technical training for maintenance personnel is embedded within each technical department (vehicle engineering, maintenance of way, signal and train control, communications, facilities, traction power, etc.). MBTA's OCC and Training Department trains all operations personnel and provides right of way (ROW) safety training. MBTA's Human Resources and Labor Relations Department also provide or support other administrative training and orientation for new employees. Finally, MBTA's Safety Department provides certain environmental, occupational safety, and general safety training.

FTA generally found that while strong technical courses have been developed in many areas, there are insufficient resources available to provide enough offerings to adequately train and refresh personnel. Operations personnel face significant challenges in establishing professional service standards, utilizing different adult learning strategies, and taking advantage of technology to bring the field into the classroom. As a result, there is a great reliance on informal, on-the-job training which is not standardized or overseen.

The MBTA also faces challenges in managing training data. While the agency can pull information that tracks the status of the training of its employees, this data must be pulled from various management systems including Cornerstone, PeopleSoft, spreadsheets, and paper documents. To keep on top of data management the MBTA's OCC and Training Department commits a full-time trainer to review and update scheduling, individual record status, and documentation. This is a labor-intensive process that if made more efficient could free up the use of the trainer presently assigned to this work.

As discussed in Category 1, the lack of personnel resources, including instructors, restricts the MBTA's ability to onboard new personnel. At the time of the SMI MBTA's Training Department proposed staffing levels did not address the need to train the new hires budgeted for fiscal year 2023. FTA found that given the importance of training to MBTA's personnel issues, MBTA should consider additional support for the Training Department to keep up with regular training requirements, conduct more frequent enforcement operational reviews, provide mentoring services to motorpersons, dedicate trainers who focus on accident prevention training, find a data management technical and/or personnel solution that does not divert a full-time trainer from the Training Department's daily operations, and keep up with other unscheduled eventualities such as emergencies, accidents, and other unforeseen issues that divert the attention of training staff from their regular duties.

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Based on interviews, records reviews, and field observations conducted across several technical disciplines, FTA found that MBTA has no agency-wide strategy for technical training to ensure the proficiency of MBTA personnel and that many gaps in training exist for operations and maintenance departments. FTA found that training is under-resourced and fractured and that MBTA relies heavily on on-the-job training.

Finally, FTA’s SMI found outdated emergency procedures and training. Review of over 100 safety event investigation reports dating back to January 1, 2019, indicates inconsistencies in emergency response and the way that the agency is managing emergencies.

Finding	Required Action
Finding 17: Technical training for operations and maintenance departments is under-resourced and decentralized, without sufficient resources and direction, and relies significantly on on-the-job-training (OJT) which is informal and lacks oversight. Emergency response training is poorly integrated into overall training program.	<ol style="list-style-type: none">1. MBTA must conduct a training needs assessment for rail transit operations and maintenance departments, to include emergency response training. This assessment should identify training that needs to be updated, developed, and supported with additional resources.2. MBTA must implement the results of the training needs assessment.3. MBTA must consider opportunities and adopt technology and other resources to support training development and training management and record-keeping.

Finding 18. MBTA lacks formal resource manuals in key maintenance areas and does not currently provide employees with checklists or other tools to support training and implementation of maintenance rules and procedures.

Situation

In Special Directive 22-7, FTA identified lapsed annual re-certifications for rail transportation personnel as an immediate safety concern. FTA found that MBTA could do more to effectively train and certify personnel responsible for the movement of railcars, including updating out-of-date rules and procedures and providing additional tools and resources to support the ability of operations personnel to respond in an emergency. As a result, FTA directed MBTA to “create, review, and/or update its training materials to include:

- Training and certification manuals for each rail transit line, to include manuals for operators and supervisors.
- Updated rulebooks for all train lines, enforce version control.

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- A compilation of temporary and permanent orders.”

FTA also required MBTA “to make training materials available electronically and ensure that employees who have enrolled for training have completed the training.”

Throughout the SMI, FTA observed similar issues with a lack of resources and materials for some maintenance workers in the maintenance of way, power systems maintenance and transit facilities maintenance departments. The MBTA should review existing maintenance rules and procedures in these three departments and identify and implement opportunities to develop checklists, tools, resources, and manuals that may help employees perform their work and help to standardize training.

Finding	Required Action
Finding 18: MBTA lacks formal resource manuals in key maintenance areas and does not currently provide employees with checklists or other tools to support training and implementation of maintenance rules and procedures.	<ol style="list-style-type: none"> 1. In coordination with required actions already underway to address FTA’s Special Directive 22-7, the MBTA must review its existing maintenance rules and procedures; identify opportunities for tools and checklists to support employees in carrying out maintenance rules and procedures; and develop, distribute, maintain, and update these materials. 2. MBTA must include frontline maintenance personnel in the development evaluation of these tools and checklists.

Finding 19. Due to workforce turnover, MBTA’s new motorpersons and officials no longer have access to mentoring from experienced motorpersons and officials (inspectors, chief inspectors, and supervisors).

Situation

MBTA is in the process of hiring hundreds of new motorpersons to replace those who are retiring or leaving through attrition and to support the promotion of veteran motorpersons to other positions within the rail transit system. As the MBTA addresses FTA’s SMI findings under Category 1, additional hiring will be necessary.

Due to current staffing shortage on-call supervisors are used as operators for weekends and evenings. In interviews, MBTA’s rail transit leadership acknowledges that some new operators seem to be struggling in maintaining a balance between learning MBTA heavy rail operations

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and preserving a focus on safety. Interviewed MBTA officials identified a range of possible reasons for this:

- high number of new motorpersons and new officials means that sometimes it is the “new teaching the new” because veterans are no longer on the system,
- limited number of supervisors and challenges in actively modeling and mentoring for new motorpersons means that new motorpersons may not always pick up the best habits and practices,
- elimination of the train attendant position approximately 10 years ago removed a step in the progression to full-time (FT) motorperson (previously, new hires would move from part time (PT) train attendant to PT yard motorperson to PT motorperson operating revenue service to FT train attendant then to FT motorperson over an approximately 2-year period³⁸ – now PT motorpersons move directly from operating in the yard to operating revenue service), and
- different learning styles and experiences of younger new hires may require more practical/hands-on training in heavy rail operations (perhaps more like light rail and bus training).

In addressing these challenges, numerous MBTA personnel at all levels of the agency noted that MBTA’s bus operations implements mentoring activities that many new bus operators find beneficial. There was strong support for bringing these practices to rail transit operations. MBTA leadership also noted that they are considering the option of establishing a new instructor position assigned formally to each heavy rail line to work with new PT and FT motorpersons.

Finding	Required Action
Finding 19: Due to workforce turnover, MBTA’s new motorpersons and officials no longer have access to mentoring from experienced motorpersons and officials (inspectors, chief inspectors, and supervisors).	MBTA must evaluate expanding its existing mentoring program from Bus Transit Operations to include new part-time and full-time rail transit operators or consider establishing a mentoring program specific to rail transit operations. In its evaluation, MBTA should consider opportunities and resources to support the professional development of rail transit operations personnel.

³⁸ Length of time to FT motorperson status fluctuated based on seniority, attrition and needs; 2 years is an approximate average.

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Finding 20. Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA operations and maintenance.

Situation

FTA reviewed over 100 safety event investigation reports between January 1, 2019, and April 29, 2022, and identified several events where poor radio quality was identified as a contributing factor in the event. Interviews with frontline operations, maintenance, and OCC personnel highlighted the following key locations where radio quality does not consistently support effective radio communications:

Blue Line

Bowdoin Station

Green Line

Beacon junction

Hynes to Kenmore (switch#61) WB

Arlington to Boylston EB

Haymarket Station to Government Center WB

Orange Line

Oak Grove Station

Red Line

Alewife yard

Alewife Crossover to platform

Between Porter and Davis north and south

Kendall, southbound end

South Station, southbound end

Ashmont to Shawmut

Fields Corner, middle of platform southbound

Quincy Center, Platform

Radio communications are critical to the safety of the MBTA's rail transit service and FTA finds that more must be done to improve radio quality in these locations.

Finding	Required Action
Finding 20: Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA operations and maintenance.	<ol style="list-style-type: none">1. MBTA must confirm radio dead spots with frontline motorpersons and maintenance workers.2. MBTA must improve the performance of its radio system in these dead spots.

Category 5: Safety Oversight of MBTA's Rail Transit System

Focus

FTA's SMI reviewed the organization, staffing, and technical capacity of the DPU to oversee a rail transit agency of the size and complexity of the MBTA. FTA's SMI also assessed the financial and legal relationship between DPU and the MBTA. FTA evaluated DPU's actions to oversee implementation of the MBTA's Agency Safety Plan and SMS. FTA also assessed opportunities for DPU's SSO program to conduct more active and engaged oversight of MBTA's rail transit system.

Finding 21: DPU does not use its available resources as effectively as it could to support field observations, audits, and inspections of MBTA's rail transit system to identify safety deficiencies and require their immediate resolution.

Situation

The State Safety Oversight (SSO) regulation requires that each State demonstrate that it has determined an appropriate staffing level for the SSO agency commensurate with the number, size, and complexity of the rail transit system(s) in the State. As part of FTA's 2019 SSO audit, FTA found that DPU did not have a staffing level commensurate with the actual oversight needs of the MBTA. The FTA required DPU to develop, submit, and implement a revised workload assessment that reflects an appropriate staffing level for overseeing the MBTA, a revised technical training plan, and a plan for hiring and training personnel and/or contractors to fill the identified staffing needs.

Since that time, DPU has expanded both its staff and the agency's technical capacity to conduct oversight activities. The DPU has a full-time SSO Director and six full-time equivalent (FTE) field staff, including two Compliance Officers, three Engineers, and one Auditor. The DPU also has considerable engagement from DPU's Director of Transportation Oversight and, more recently, from DPU's Chairman. DPU also has access to contractor resources to provide additional expertise in rail transit disciplines.

While DPU has significantly increased its staff from 2019, many DPU employees are relatively new and still learning SSO requirements and activities. Agency activities have focused on onboarding, training, and building competency in MBTA systems and requirements. The DPU is still working to address FTA's 2019 findings more fully regarding staffing and technical capacity, including recruiting two more engineers, two auditors, three compliance officers, one assistant director, and one Rail Specialist at a director level. Many of these positions have been added to DPU's budget in the last year.

FTA's SMI finds that DPU does not use its available resources as effectively as it could to support field observations, audits, and inspections of MBTA's rail transit system to identify safety deficiencies and require their immediate resolution. FTA finds that the DPU is actively

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engaged in overseeing MBTA's safety event investigations and has overseen an expanded number of corrective actions submitted by MBTA to address findings from these investigations (from 4 in 2019, to 12 in 2020, to 42 in 2021). However, FTA remains concerned that the DPU has not utilized its existing regulatory and statutory enforcement authority to ensure the timely resolution and closure of the related Corrective Action Plans.

Finding	Required Action
Finding 21: DPU does not use its available resources as effectively as it could to support field observations, audits, and inspections of MBTA's rail transit system to identify safety deficiencies and require their immediate resolution.	<ol style="list-style-type: none">1. DPU must update its workload assessment to reflect the results of the SMI and address FTA's Special Directives 22-8 and 22-13.2. DPU must match its resources to those identified in its updated workload assessment.3. DPU must update its technical training plan, and, if bringing on new resources, must develop a plan for hiring and training personnel and/or contractors to fill the identified staffing needs.4. DPU must review and update its processes and thresholds for using its existing enforcement authority to ensure timely resolution of CAPs or other required actions for safety.

Finding 22: DPU must examine and ensure its organizational and legal independence from the MBTA.

Situation

The DPU is overseen by a three-member Commonwealth Utilities Commission appointed by the Secretary of the Executive Office of Energy and Environmental Affairs with approval by the Governor. The Secretary designates one of the Commissioners as Chairman. The DPU's SSO Program Manager reports to the Director for Transportation Oversight, who reports to the Department's Chairman.

The SSO regulation requires an SSOA to be financially and legally independent from any rail transit system under its oversight jurisdiction, unless the Administrator has issued a waiver of

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this requirement. During the initial SSO certification review, FTA verified DPU’s independence from MBTA through review of enabling legislation and organizational charts for both agencies. A series of on-site interviews indicated multiple reporting layers between DPU’s SSO Program and the Governor’s Office and showed MBTA as a separate legal division of the Massachusetts Department of Transportation, overseen by the Fiscal Management and Control Board (FMCB).

FTA reviewed DPU’s independence from MBTA again during the 2019 SSO audit. Since that time however, the FMCB has been replaced by a new Board for MBTA, consisting of seven members, including the Secretary of Transportation, who reports directly to the Governor. The remaining Board Members are appointed by the Governor.

As a result, FTA finds that DPU must review its independence from MBTA, given shared agency reporting relationships to the Governor and the Governor’s role in appointing MBTA Board Members and approving DPU’s three-member Commonwealth Utilities Commission.

Finding	Required Action
Finding 22: DPU must examine and ensure its organizational and legal independence from the MBTA.	DPU must complete a legal assessment regarding its organizational independence from MBTA. This assessment must include review of organizational mechanisms, including recusals, limited reporting relationships, and other features that provide legal separation between the two agencies and ensure DPU’s independence to take enforcement action against MBTA.

Finding 23: DPU has not validated MBTA’s fatigue management approach for rail transit officials and maintenance and engineering personnel.

Situation

Per 220 CMR 151.00, and in compliance with 49 CFR Part 674, DPU is responsible for establishing minimum standards for rail safety practices and procedures to be used by the MBTA. The DPU has issued minimum safety standard for track inspection, track maintenance, and the use of portable electronic devices while on duty.

A major finding of FTA’s SMI relates to the excessive hours worked by MBTA personnel throughout the rail transit agency. FTA’s Special Directives 22-6 and 22-7 focus on this issue for rail transit motorpersons and MBTA personnel working in the Operations Control Center.

To ensure that this potential safety concern is addressed for other classifications of employees at the MBTA, including rail transit officials, infrastructure maintenance and engineering

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personnel, and vehicle maintenance and engineering personnel, FTA directs DPU to use its oversight authority to assess this issue and require needed and appropriate corrective actions. Current MBTA work hours for these positions include the following:

Employees	Maximum Work Hours per Day	Required Time Off Between Shifts	Maximum Overtime Hours per Week³⁹
MBTA Officials			
Instructor	20 hours	4 hours	24 hours
Yardmaster	20 hours	4 hours	24 hours
Chief Inspector	20 hours	4 hours	24 hours
Inspectors	20 hours	4 hours	24 hours
Infrastructure Maintenance and Engineering			
Maintenance of Way	16 within a 24-hour period	6 hours	24 hours
Transit and Facilities	16 within a 24-hour period	6 hours	24 hours
Power System Maintenance	16 within a 24-hour period	6 hours	24 hours
Signals and Communication	16 within a 24-hour period	6 hours	24 hours
Vehicle Maintenance and Engineering			
Repairers	16 within a 24-hour period	8 hours	24 hours
Foreperson	16 within a 24-hour period	8 hours	24 hours
Car Cleaner	16 within a 24-hour period	8 hours	24 hours
Vehicle Engineers	16 within a 24-hour period	6 hours	24 hours maximum with Supervisor authorization

Table 9. Current MBTA Hours of Service Limitations

Finding	Required Action
Finding 23: DPU has not validated MBTA's fatigue management approach for rail transit officials and maintenance and engineering personnel.	DPU must conduct an assessment and determine if additional action is required. If DPU finds that additional action is needed to reduce service hours to ensure the safety of MBTA employees and passengers, then DPU

³⁹ May be overridden by Supervisor in an emergency or any unforeseen situation in which service is required to ensure public safety or to prevent unreasonable interruptions of service.

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Finding	Required Action
	must use its own authority to require this action.

Finding 24: DPU has not demonstrated an ability to address safety issues and concerns identified during FTA’s SMI.

Situation

As set forth in Section 12 of Title XXII, Chapter 159 of the Massachusetts General Laws, the DPU has the power to supervise and regulate the transportation or carriage of persons or property, or both, by railroads, street railways, electric railroads, and trackless trolleys between points within the Commonwealth of Massachusetts. In exercise of its oversight authority, DPU can take actions including review of Corrective Action Plans (CAPs) submitted by MBTA and oversight of MBTA’s implementation of corrective actions.

FTA expects DPU to carry out its oversight program using its authority, while working with FTA and MBTA to ensure that the safety findings and required actions identified as part of this SMI, and documented in Special Directives 22-9 through 22-12, are addressed and resolved in a timely manner.

To complete this work, FTA expects DPU to:

- adopt FTA’s findings and required actions, to the extent such adoption is necessary to ensure DPU oversight and closeout of these items in coordination with FTA;
- review and approve Corrective Action Plans submitted by MBTA to address Special Directives 22-9 through 22-12;
- oversee MBTA’s implementation of these corrective actions; to verify and close-out implementation of corrective actions, in coordination with FTA; and
- use its authority to issue Orders, or undertake any other action or enforcement proceeding authorized under State law, including judicial actions authorized under Sections 16 and 40 of Title XXII, Chapter 159 of the Massachusetts General Laws, as necessary to ensure completion of verifiable corrective action by the MBTA.

Finding	Required Action
Finding 24: DPU has not demonstrated an ability to address safety issues and concerns identified during FTA’s SMI.	<ol style="list-style-type: none"> 1. DPU must adopt FTA’s findings and required actions in Special Directives 22-9 through 22-12. 2. DPU must, in coordination with the FTA, require, review, and approve corrective action plans from MBTA to address FTA’s findings and required actions in Special Directives 22-9, 22-10, 22-11 and 22-12, and oversee the timely implementation and close-out of these CAPs.

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Finding	Required Action
	3. DPU must identify the specific activities that it will undertake to ensure MBTA’s completion of the required actions, a milestone schedule for completion of MBTA’s required actions, and the parties at DPU and MBTA responsible for completing the required actions.

Appendix – List of Findings and Required Actions

Findings and Required Actions for the MBTA

Finding	Required Action
<i>Category 1 – Managing the Impact of Operations, Maintenance, and Capital Project Requirements on the Existing Workforce</i>	
Finding 1: MBTA’s staffing levels are not commensurate with the demand for human resources required to carry out current rail transit operations and maintenance in addition to expanding capital program activities.	<p>MBTA must conduct and submit to FTA a workforce analysis and associated workforce planning to include:</p> <ol style="list-style-type: none"> <i>Required activities that must be performed for rail transit operations, maintenance, and capital projects delivery:</i> A description of present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years. <i>Required resources to perform mission-critical activities:</i> A description of the assignment of the necessary human resources to support present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years per the description above. <i>Current staffing capabilities for mission-critical activities:</i> The results of an assessment of MBTA’s ability to safely operate, maintain, and complete capital project delivery for its rail transit system at current service levels of workforce. <i>Safety case for mission-critical activities that can be performed within current and projected resources over the next five fiscal years:</i> The identification of safety risk associated with current staffing shortages and how they are or will be mitigated and any needed changes or reductions in activities.
Finding 2: MBTA has not demonstrated the organizational capacity to recruit and hire personnel to meet authorized staffing levels.	MBTA must develop and implement a recruitment and hiring plan to address findings from its workforce analysis and associated workforce planning for at least a five-year period, including how it will expand its capabilities for recruiting and hiring personnel to fill operations, maintenance, and capital project delivery positions.

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Finding	Required Action
Finding 3: Additional resources are needed to support MBTA's safety engineering and safety certification process for capital projects.	MBTA must modify safety engineering and certification requirements for its capital projects and vehicle procurements and ensure they are addressed through additional E&M and Safety Department staffing, contractor resources, or a combination of approaches. This may be done as part of the workforce analysis in Finding 1, or as part of a separate initiative.
Finding 4: MBTA requires additional oversight of contractor work sites.	FTA recommends that MBTA review the inspection and resident engineering resources needed to ensure compliance with MBTA safety rules related to the Right of Way to ensure the safety of personnel while in active work zones through additional staffing, contractor resources, or a combination of approaches.
Category 2 – Prioritization of Safety Management Information	
Finding 5: MBTA has not ensured that the necessary structures are in place to support effective implementation and operation of its SMS.	<ol style="list-style-type: none"> 1. MBTA must conduct a critical and comprehensive review of its entire SMS planning, implementation, and operational processes and activities to address the gaps discussed in this finding. 2. MBTA must update its SMS Implementation Plan to reflect the results of this review, including defined actions, timeframes, responsibilities, and expected outcomes.
Finding 6: MBTA executive leadership does not receive prioritized and actionable information related to safety risks or shortcomings in safety risk mitigations.	<p>MBTA leadership must:</p> <ol style="list-style-type: none"> 1. Work with safety and operating department leads (including maintenance and engineering departments) to define explicit criteria for prioritizing safety risks. 2. Include explicit safety risk acceptance criteria in its Agency Safety Plan and/or reference documents. 3. Work with MBTA's Safety Department and operating department leads (including maintenance and engineering departments) to define how safety information must be presented to MBTA leadership in a prioritized and actionable manner. 4. Require, and provide means for, operating department leads (including maintenance and engineering departments) to elevate proposed safety risk mitigations, including their status, that require MBTA leadership

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Finding	Required Action
	approval for resourcing. This must include safety risk mitigations deemed ineffective or inappropriate and that require executive level decision regarding the redirection of, or additional, resourcing.
Finding 7: MBTA Executive Management does not consistently ensure its decisions related to safety risks are based on safety data analysis or documented facts.	<ol style="list-style-type: none"> 1. MBTA must map its safety data flows and supporting processes. 2. MBTA must establish explicit accountabilities and responsibilities for safety data flows as a component of safety information management (collection, analysis, communication, storage, and retrieval of safety data). 3. MBTA must provide formal training in safety information management to relevant personnel. 4. MBTA must demonstrate that its executive management uses and promotes the usage of safety data analysis and/or documented facts in decision-making related to safety risk.
Finding 8: MBTA's safety investigations and safety assurance activities do not consistently collect and analyze information on precursor factors.	<ol style="list-style-type: none"> 1. MBTA must update its Safety Assurance process to include monitoring of safety risk mitigations with a) compliance-based activities to provide the baseline for monitoring implementation status and b) performance-based activities to monitor the actual effectiveness of safety risk mitigations. 2. MBTA must prepare a monthly look-ahead schedule for prioritized safety risk monitoring activities that include safety risk mitigations and corrective actions in place to address MBTA's highest safety priorities. 3. MBTA must develop and document guidance, and deliver training for safety investigators that ensure the consideration of precursor factors in the analysis of the chain of events leading to a safety event (accident, incident, or occurrence), including but not limited to, for example:

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	<ul style="list-style-type: none"> • Suitability of resources available to frontline personnel for operational and maintenance activities • Deficiencies in policies, procedures, rulebooks • Outdated policies, procedures, and rulebooks • Deficiencies/inadequacies in training Shortcomings in supervision • Deviations from procedures and rules Reasons for lack of adherence to procedure and rules • The limited success of discipline to address safety issues
<p>Finding 9: MBTA’s safety risk assessment guidance as part of its Safety Risk Management is ambiguous and has led to confusion among stakeholders regarding their responsibilities and authorities, which has created delays in carrying out safety risk assessments activities</p>	<ol style="list-style-type: none"> 1. MBTA must develop and document criteria for conducting safety risk assessments consistent with the basic principles of safety management and the tenets of SMS as conveyed in FTA’s SMS guidance materials. 2. MBTA must develop explicit direction for the ownership of safety risk assessments among the Safety Department and the operating departments. Documentation must include providing explicit roles, responsibilities, and thresholds of authority of each department involved. 3. MBTA must include in the above criteria directives to ensure that operating departments including subject matter expertise, own safety risk assessments, while safety officials provide support for safety risk assessments and reports on results to Executive Leadership for safety resource allocation priorities. 4. MBTA must expand its policy of establishing a pre-defined schedule of safety risk assessment workshops and develop criteria attuned with the nature of hazard identification (I.e., as they are identified), to expedite safety risk assessments to support prioritization for resource allocation.
<p>Finding 10: MBTA safety information management tools (hazard log, safety risk mitigation log, etc.) do not</p>	<ol style="list-style-type: none"> 1. MBTA must evaluate (and correct) the data contained in its hazard log and safety risk mitigation log for accuracy and relevancy to SMS

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Finding	Required Action
fully support prioritization of resources to address safety risk and safety performance monitoring.	<p>2. MBTA must expedite the build out of its safety risk and safety risk mitigation monitoring information tools.</p> <p>3. MBTA must demonstrate use of its safety information management tools to effectively prioritize its resources to address the results of:</p> <ul style="list-style-type: none"> • Safety Risk Monitoring • Safety Performance Monitoring
Category 3: Effectiveness of Safety Communication	
Finding 11: MBTA has not established explicit and formal provisions to ensure safety information from safety committee results in a consistent outcome of documented, prioritized, and actionable safety information.	<p>3. MBTA must develop and describe, in the organization's SMS documentation, instructions regarding the conduct, recording, communication and follow up of the outcome consensus decisions specific for each of the following meetings - taking into consideration the nature (strategic or tactical) of each meeting:</p> <ul style="list-style-type: none"> • Operations and Safety Biweekly call (currently every other Friday) • Operations and Safety weekly meeting (currently on Wednesdays) • Executive Safety Committee (ESC) • Safety Management Review Committee (SMRC) • Safety Management Working Groups (SMWGs) • Data Analysis Group (DAG) • Local Safety Committee Meetings • Joint Labor/Management Safety Committee (required by Bipartisan Infrastructure Law) <p>4. In support of the above, MBTA must develop and describe, in the organization's SMS documentation, a formal mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring.</p>
Finding 12: MBTA has not documented explicit and formal provisions to ensure the participation of frontline employees in local safety committees as part	<p>1. MBTA must develop explicit and formal guidelines for the expected role and contribution of frontline employees to the local safety committee meetings.</p> <p>2. MBTA must develop instructions for the conduct of the meetings, including explicit departmental accountabilities</p>

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Finding	Required Action
of their job responsibilities in relation to the agency's SMS.	for meeting outcome information capture, communication and follow up.
Finding 13: MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline.	<ol style="list-style-type: none"> 1. MBTA must expedite the development of an effective ESRP as a fundamental source of safety information for hazard identification and safety performance monitoring. 2. As part of the development of an effective ESRP, MBTA must provide explicit direction to frontline employees on what to report and what not to report through the ESRP (including the safety hotline). 3. As part of the development of an effective ESRP, MBTA must provide refresher training to stakeholder personnel on the role of employee safety reporting within SMS and the crucial contribution managers and supervisors play in the development of an effective safety reporting context.
<i>Category 4: Operating conditions and policies, procedures, and training:</i>	
Finding 14: Documented operating and maintenance rules and procedures are not implemented as required.	<ol style="list-style-type: none"> 1. Each operating and maintenance department must establish a group to review department-wide information on levels of non-compliance with key rules and procedures critical to the safety of activities performed by the department. 2. Each department must establish and act on a prioritized list of most frequently violated rules and procedures with the most significant potential safety consequences. 3. Each department must develop and implement approaches, which could include audits, use of checklists and guides, campaigns, and training, to improve compliance. 4. Each department must report to the Safety Department monthly on its compliance with identified key rules and procedures critical to the safety of activities performed by the department. 5. The Safety Department must review and audit these reports and compile a monthly compliance report for MBTA's executive leadership team.

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Finding	Required Action
	6. Each department must continue to review safety data to assess effectiveness of actions and to improve compliance with safety rules and procedures.
Finding 15: MBTA does not monitor operations, including the conditions of the operating environment, to identify the reasons for deviations between formal, established standards, rules and procedures, and actual operations and maintenance practices.	MBTA must develop, document, and communicate a mechanism to monitor operations, and provide training to stakeholder safety and operating personnel on this mechanism, to enable the analysis and understanding of situations of non-compliance.
Finding 16: MBTA's QA/QC program is not sufficiently independent from the activities it oversees.	<ol style="list-style-type: none"> 1. MBTA must develop and administer a QA/QC program to independently oversee of ongoing QA/QC activities. 2. MBTA must ensure that the QA/QC functions are independent of the functions of the Safety department and report directly to the GM. 3. MBTA must develop a formal QA/QC procedure that details the oversight of and accountability and roles and responsibilities for QA/QC programs provided by railcar manufacturers and MBTA consultants related to quality control of its railcars and subcomponents. 4. MBTA must ensure that the MBTA QA/QC independent group is staffed with a sufficient SMEs in necessary disciplines to ensure a complete and thorough understanding of the responsibilities under the purview of railcar maintenance and engineering.

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Finding	Required Action
<p>Finding 17: Technical training for operations and maintenance departments is under-resourced and decentralized, without sufficient resources and direction, and relies significantly on on-the-job-training (OJT) which is informal and lacks oversight. Emergency response training is poorly integrated into overall training program.</p>	<ol style="list-style-type: none"> 1. MBTA must conduct a training needs assessment for rail transit operations and maintenance departments, to include emergency response training. This assessment should identify training that needs to be updated, developed, and supported with additional resources. 2. MBTA must implement the results of the training needs assessment. 3. MBTA must consider opportunities and adopt technology and other resources to support training development and training management and record-keeping.
<p>Finding 18: MBTA lacks formal resource manuals in key maintenance areas and does not currently provide employees with checklists or other tools to support training and implementation of maintenance rules and procedures.</p>	<ol style="list-style-type: none"> 1. In coordination with required actions already underway to address FTA's Special Directive 22-7, the MBTA must review its existing maintenance rules and procedures; identify opportunities for tools and checklists to support employees in carrying out maintenance rules and procedures; and develop, distribute, maintain, and update these materials. 2. MBTA must include frontline maintenance personnel in the development evaluation of these tools and checklists.
<p>Finding 19: Due to workforce turnover, MBTA's new motorpersons and officials no longer have access to mentoring from experienced motorpersons and officials (inspectors, chief inspectors, and supervisors).</p>	<p>MBTA must evaluate expanding its existing mentoring program from Bus Transit Operations to include new part-time and full-time rail transit operators or consider establishing a mentoring program specific to rail transit operations. In its evaluation, MBTA should consider opportunities and resources to support the professional development of rail transit operations personnel.</p>
<p>Finding 20: Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA</p>	<ol style="list-style-type: none"> 1. MBTA must confirm radio dead spots with frontline motorpersons and maintenance workers. 2. MBTA must improve the performance of its radio system in these dead spots.

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Finding	Required Action
operations and maintenance.	

Findings and Required Actions for the DPU

Finding	Required Action
<i>Category 5: Safety Oversight for MBTA's Rail Transit System</i>	
Finding 21: The DPU does not use its available resources as effectively as it could to support field observations, audits, and inspections of MBTA's rail transit system to identify safety deficiencies and require their immediate resolution.	<ol style="list-style-type: none"> 1. DPU must update its workload assessment to reflect the results of the SMI and address FTA's Special Directives 22-8 and 22-13. 2. DPU must match its resources to those identified in its updated workload assessment. 3. DPU must update its technical training plan, and, if bringing on new resources, must develop a plan for hiring and training personnel and/or contractors to fill the identified staffing needs. 4. DPU must review and update its processes and thresholds for using its existing enforcement authority to ensure timely resolution of CAPs or other required actions for safety.
Finding 22: DPU must examine and ensure its organizational and legal independence from the MBTA.	DPU must complete a legal assessment regarding its organizational independence from MBTA. This assessment must include review of organizational mechanisms, including recusals, limited reporting relationships, and other features that provide legal separation between the two agencies and ensure DPU's independence to take enforcement action against MBTA.
Finding 23: DPU has not validated MBTA's fatigue management approach for rail transit officials and maintenance and engineering personnel.	DPU must conduct an assessment and determine if additional action is required. If DPU finds that additional action is needed to reduce service hours to ensure the safety of MBTA employees and passengers, then DPU must use its own authority to require this action.
Finding 24: DPU has not demonstrated an ability to address safety issues and concerns identified during FTA's SMI.	<ol style="list-style-type: none"> 1. DPU must adopt FTA's findings and required actions in Special Directives 22-9 through 22-12.

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Finding	Required Action
	<p>2. DPU must, in coordination with FTA, require, review, and approve corrective action plans from MBTA to address FTA’s findings and required actions in Special Directives 22-9, 22-10, 22-11 and 22-12, and oversee the timely implementation and close-out of these CAPs.</p> <p>3. DPU must identify the specific activities that it will undertake to ensure MBTA’s completion of the required actions, a milestone schedule for completion of MBTA’s required actions, and the parties at DPU and MBTA responsible for completing the required actions.</p>

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-9, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

**Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority
Related to Managing the Impact of Operations, Maintenance, and Capital Project Requirements on the Existing Workforce**

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-9 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies four findings requiring action that the MBTA must take to address FTA's findings. The findings and required actions outlined in this Special Directive will assist the MBTA in focusing its attention on balancing demands from operations and capital projects with workforce capacity and capability to inform resource prioritization.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail, bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted an SMI of the MBTA rail transit system management, operations, and maintenance programs between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system,

which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 1 and is based on FTA's determination that the MBTA is not effectively balancing safety-critical operations and maintenance activities with its efforts to deliver capital projects. This lack of balance is at the center of many of the MBTA's safety challenges.

FTA found that an organizational focus on capital projects has diverted management attention and resources away from the agency's operations and maintenance, allowing the agency to operate a level of service that is not adequately staffed, trained, supervised, or maintained. In addition, existing staffing levels and capabilities do not provide adequate safety oversight for the design, construction, and testing of new capital projects and do not support widespread safety certification of these projects, which is an industry standard practice. MBTA also has experienced a series of construction safety events due to the lack of oversight of worksites.

Resources for Operations and Maintenance

Over the last four years, the MBTA's capital budget has more than doubled, from approximately \$875 million in fiscal year 2018 to over \$2 billion in fiscal year 2022. At the same time, the MBTA is still recovering from the long-standing impact of funding cuts made in 2015-2019 to the MBTA's operations and maintenance budget, which resulted in a reduction in hundreds of millions of dollars and hundreds of positions.

Since 2020, MBTA's transit organization has averaged a 10-percent vacancy rate from budgeted positions with key technical and supervisory positions averaging 20 to 35 percent vacancy rates. For example, MBTA's Transit Workforce Staffing Report by Department (budgeted vs actual) for fiscal year 2022 (beginning July 1, 2021) shows 5,554 active employees for 6,349 budgeted positions - a staffing gap of 795 positions or 12.5 percent. For fiscal year 2021 (beginning July 1, 2020), there were 5,537 active employees for 6,279 budgeted positions - a staffing gap of 742 position or 11.8 percent. So far in fiscal year 2023 (beginning July 1, 2022), there are 5,781 active employees for 6,679 budgeted positions, or a

staffing gap of 898 positions or 13.4 percent.

In addition, specifically for MBTA's rail transit system, over the last two years, some key technical and supervisory positions have averaged 20 to 35 percent vacancy rates, including Operations Control Center dispatchers and supervisors, signal technicians, vehicles repairers, and traction power technicians.

Interviews with MBTA personnel at all levels of the agency indicate that budgeted positions, which have increased under MBTA's current leadership team, do not reflect the true measure of required staff levels because they do not consider the additional responsibilities associated with capital project delivery. In some instances, required staff levels are calculated to rely on overtime to cover staff vacations and training. Interviews with a range of personnel throughout the MBTA's organization indicate that the overall MBTA transit system may be between 1,500 and 2,000 active positions short in managing its current level of activity.

For the last five years, the MBTA's budgeted positions have exceeded its actual active workforce by approximately 7 to 10 percent.¹ The agency also is experiencing significant attrition and retirement of seasoned personnel, with a large cohort of MBTA's technical and supervisory personnel now eligible for retirement. Vacancies in technical positions affect the safety of MBTA's operations, maintenance, and capital project delivery.

FTA notes that MBTA's leadership team has established a strategic hiring plan for fiscal year 2023. This plan sets a goal of hiring over 2,000 workers, including 330 workers funded by the capital budget and 1,759 workers funded by the operating budget in fiscal year 2023. The MBTA's fiscal year 2023 strategic hiring plan may offset some of these challenges, but only if it is successfully executed with a focus on filling positions with safety impact for the agency.

FTA's SMI found that MBTA's leadership is focused on using longer-term capital projects to "build the agency" out of many of the challenges of a legacy system. However, as discussed in FTA's Special Directive 22-4, key elements of this approach are significantly impacting preventive maintenance inspections and repairs for the aging system, exacerbating the deterioration of aging infrastructure and assets that are not the focus of the capital program.

MBTA reported that, due to the challenges and uncertainties of the COVID-19 public health emergency, they have not completed action to address previous findings regarding the need to assess staffing needs for operations and maintenance. Nevertheless, during this same period, MBTA aggressively moved forward with its \$2 billion-per-year capital program, supported largely by existing and overtime resources from the agency's operations and maintenance departments and contractors. In January 2022, MBTA's leadership team and Board of Directors took the unprecedented step of transferring an additional \$500 million from the MBTA's operating budget to its capital budget.

FTA also found that MBTA lacks resources to adequately manage its \$2 billion capital program and complete capital projects on time and without need for retrofits and workarounds. This situation has

¹ Budgeted positions from FY 2019 through FY 2023 totaled 31,099 (across 5 years) with 28,197 active positions during this same time, for an approximately 9 percent vacancy rate over the five-year period.

resulted in deteriorated assets, whether rail transit vehicles, track, switches, stations, facilities, or other elements, remaining in service longer than intended with additional maintenance needs. These assets are vulnerable to failure in new and potentially unexpected ways, such as the September 28, 2021 safety event, when a piece of a restraining rail assembly came loose on the track outside of Broadway station and derailed a train; the April 22, 2022 event when an aging door assembly malfunctioned and a train took power with a passenger trapped between its door panels, resulting in a fatality; or the July 21, 2022 train fire on the transit bridge over the Mystic River, where a rusty sill panel fell off a rail transit train and contacted the third rail.

Emphasizing capital project demands above passenger operations and preventive maintenance can negatively impact the safety culture of the agency. FTA found that unwritten norms have emerged that emphasize a “get it done and go” mentality over following safety rules or ensuring compliance with minimum safety standards, particularly when staff are working 12 to 16-hour days, six days a week.

Resources for Safety Certification

MBTA’s Agency Safety Plan defines safety certification as “a process used to verify safety- related requirements are incorporated into a project, thereby demonstrating that it is operationally ready for revenue service and safe and secure for passengers, employees, public safety agencies, and the general public.” MBTA’s Agency Safety Plan also incorporates by reference MBTA’s Safety Certification Program (SAFE 1.09.00), as the guiding document outlining MBTA’s safety certification process.

The MBTA’s safety certification program requires MBTA’s Safety Department to review all facilities and system designs for safety input. For most capital projects, MBTA’s Engineering and Maintenance (E&M) functions are responsible for safety engineering including project design, compliance with safety and security certification, workplace safety, and supervision of E&M projects.

Documents and records shared by the MBTA reveal a minimal safety certification process for most capital projects. The MBTA was unable to provide safety certification plans as requested for the Green Line Wayside Signal, Green Line B Branch Consolidation, and Green Line D Branch Track and Signal capital projects, among others. In addition, even though the Safety Department is a final signatory on capital project and vehicle certifications, the MBTA was unable to produce any records showing the results of review made by the Safety Department on the certification packages for these vehicles beyond the signature for concurrence.

Interviews also indicated that there is a shortage of Safety Department and other MBTA personnel to support project engineering, start-up, and testing activities. The lack of available personnel can also impact testing and acceptance schedules as well as the activities that can be performed. For example, interviews with MBTA’s Capital Transformation team revealed that Green Line D Branch track and signal contractor had consistently been denied access for several scheduled work outages due to a lack of MBTA personnel necessary to support access. This results in needless delays and can place pressure on the completion of safety critical tests and verification activities.

Resources to Oversee Contractor Safety

The MBTA conducts a range of capital projects to replace, upgrade and expand infrastructure elements on its rail transit system. Many of these projects include active worksites on MBTA property and many

of these contractor managed worksites are accessed by MBTA employees and vehicles as part of normal operations (e.g., the MBTA will continue to use yards that are under construction to house or repair out of service vehicles). Therefore, during the SMI, FTA reviewed several safety events that occurred at contractor worksites on MBTA property, including derailments of work vehicles, electrocutions, fire and smoke events, burns, and falls and found instances of noncompliance with MBTA safety rules. As a result of these reviews, FTA finds that additional supervision at MBTA's contractor work sites is necessary to ensure compliance with MBTA's safety requirements.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 1: Managing the Impact of Operations, Maintenance, and Capital Project Requirements on the Existing Workforce			
Findings		Tracking #	Required Actions
Finding 1	MBTA's staffing levels are not commensurate with the demand for human resources required to carry out current rail transit operations and maintenance in addition to expanding capital program activities.	FTA-22-MBTA-CAT1-1	<p>MBTA must conduct and submit to FTA a workforce analysis and associated workforce planning to include:</p> <ol style="list-style-type: none"> 1. <i>Required activities that must be performed for rail transit operations, maintenance, and capital projects delivery:</i> A description of present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years. 2. <i>Required resources to perform mission-critical activities:</i> A description of the assignment of the necessary human resources to support present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years per the description above. 3. <i>Current staffing capabilities for mission-critical activities:</i> The results of an assessment of MBTA's ability to safely operate, maintain, and complete capital project delivery for its rail transit system at current service levels of workforce. 4. <i>Safety case for mission-critical activities that can be performed within current and projected resources over the next five fiscal years:</i> The identification of safety risk associated with current staffing shortages and how they are or will be mitigated and any needed changes or reductions in activities.

Category 1: Managing the Impact of Operations, Maintenance, and Capital Project Requirements on the Existing Workforce

Findings		Tracking #	Required Actions
Finding 2	MBTA has not demonstrated the organizational capacity to recruit and hire personnel to meet authorized staffing levels.	FTA-22-MBTA-CAT1-2	MBTA must develop and implement a recruitment and hiring plan to address findings from its workforce analysis and associated workforce planning for at least a five-year period, including how it will expand its capabilities for recruiting and hiring personnel to fill operations, maintenance, and capital project delivery positions.
Finding 3	Additional resources are needed to support MBTA's safety engineering and safety certification process for capital projects.	FTA-22-MBTA-CAT1-3	MBTA must modify safety engineering and certification requirements for its capital projects and vehicle procurements and ensure they are addressed through additional E&M and Safety Department staffing, contractor resources, or a combination of approaches. This may be done as part of the workforce analysis in Finding 1, or as part of a separate initiative.
Finding 4	MBTA requires additional oversight of contractor work sites.	FTA-22-MBTA-CAT1-4	FTA recommends that MBTA review the inspection and resident engineering resources needed to ensure compliance with MBTA safety rules related to the Right of Way to ensure the safety of personnel while in active work zones through additional staffing, contractor resources, or a combination of approaches.

Thirty (30) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-10, Notice No. 1]

**Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670
Required Actions to Address Findings from the Federal Transit Administration Safety
Management Inspection Conducted at the Massachusetts Bay Transportation Authority
Related to Prioritization of Safety Management Information**

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-10 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies six findings requiring action that the MBTA must take to enhance and expedite implementation of the agency's SMS, including the development of procedures, safety management training, safety risk assessment, and safety assurance activities to build the organization's capability to identify safety concerns and to prioritize action to mitigate safety risk.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight (SSO) Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted an SMI of the MBTA rail transit system management, operations, and maintenance programs, between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system, which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four (4) categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 2 and is based on FTA's determination that MBTA has not implemented Safety Management System (SMS) practices in the field that support the identification, analysis, and prioritization of safety information. FTA found that MBTA has not developed the necessary tools and capabilities to support the management of safety risk. As a result, MBTA has been unable to prioritize safety concerns and, subsequently, resources to mitigate safety risk.

SMS Implementation

To assess the status of SMS implementation, FTA reviewed MBTA's SMS implementation plan. FTA found that the SMS implementation plan lacks basic project management principles, including actionable details. FTA found that the lack of detail in the plan makes it unlikely that MBTA executives and managers can determine the extent of the integration of SMS processes and activities within its operations. FTA found that MBTA leadership, from executives through managers to supervisors, did not have a clear understanding of their role in SMS. During field activities, when discussing SMS, MBTA officials' answers were general and lacking in detail and examples.

While recognizing that the implementation of SMS is a complex and multi-year progressive process, the evidence available to FTA indicates ineffective performance of the components of SMS already implemented. FTA found that the imbalance in the allocation of resources between operations and capital project oversight, discussed in Special Directive 22-9, also negatively impacted MBTA's SMS implementation planning and plan execution. For effective SMS implementation and operation, the Accountable Executive (MBTA's General Manager) must set specific expectations for SMS outcomes, as well as provide adequate resources for SMS implementation activities to ensure the integration of the management system into day-to-day operations. FTA did not find evidence that the Accountable Executive set expectations regarding how the SMS generates and prioritizes safety information and did not specify the type of safety information needed to support safety risk resource allocation decisions for MBTA's operations and maintenance.

Prioritized and Actionable Safety Information

FTA found that MBTA's executive leadership has yet to provide explicit direction regarding the type of safety information it requires and has not established the necessary organizational structures to support the movement of safety data from the field to the Board room. FTA determined from interviews and document reviews that, in the absence of direction, MBTA leadership and managers receive raw, unanalyzed safety data as opposed to prioritized information to support strategic decisions related to safety resource allocation.

FTA identified that MBTA primarily relies on corporate memory and management experience, rather than an analysis of safety information, as the means to support decision making related to safety concerns and safety risk. FTA appreciates the role that both corporate memory and experience play during safety risk management and safety assurance activities; however, MBTA was unable to provide evidence of safety analyses to support decisions made to assess and/or mitigate safety risk.

FTA also observed that limited accountability is placed on operating groups and the Safety Department to provide executive management with information that factually substantiates safety risk assessments and the development of safety risk mitigation strategies or provide executive leadership actionable information for safety resource allocation decision making. MBTA's organizational safety currency does not yet include data compiled, analyzed, and prioritized into information.

Collection and Analysis of Safety Information

FTA reviewed over 100 safety event investigation reports completed by MBTA from 2019 through July 2022 and found that MBTA has greatly improved its investigation fact finding process. FTA observed improvement in the level of detail, analysis, and identification of probable cause and contributing factors included in the investigation reports. While there have been improvements, FTA observed gaps that remain in the safety event data collection process and opportunities for additional data and fact finding beyond information provided by MBTA's Safety Department during interviews and document submissions.

FTA also found that operating departments do not routinely collect data to monitor safety concerns. Based on interviews and records reviews, FTA found this to be primarily a symptom of a lack of sufficient resources for operations and maintenance needs and a lack of consistent processes for determining safety priorities. As a result, MBTA relies on information from safety accidents, incidents, and occurrences to identify weaknesses or shortcomings in safety risk mitigations instead of aligning its safety monitoring, auditing, and compliance activities with data-driven safety management priorities.

FTA found that the Safety Department has limited direct access to operations and maintenance data and primarily relies on the receipt of Microsoft Excel workbooks. The lack of integration between data sets results in substantial manual entry of data such as CAP implementation and status, accident investigation activity and document tracking, and analysis and trending. During interviews, MBTA officials indicated that there is a lack of interaction between operations and safety departments to discuss strategies and

tactics for improving data accessibility.

Currently, the Safety Department maintains different logs designed to support hazard identification, employee safety reporting, safety risk assignment, and safety risk mitigation monitoring. FTA found that occasionally the logs contain information related to the same hazardous condition meaning that the Safety Department is manually entering singular data points into multiple sheets. FTA also found instances where the likelihood and severity ratings, as well as the safety risk indexing, did not correspond to MBTA's safety risk assessment Agency Safety Plan requirements. This could be due to the duplicate manual entry of similar data or a lack of sufficient internal training on the safety risk assessment process.

As previously discussed, MBTA currently lacks an integrated plan that defines outcomes for safety management activities and that includes utilization of safety data-related tools. The lack of necessary leadership direction and data integration negatively impacts the Safety Department's ability to analyze, prioritize, and report on safety data in a timely manner. The current suite of tools requires a level of manual entry and data manipulation beyond Safety Department resource capacity.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
Finding 1	MBTA has not ensured that the necessary structures are in place to support effective implementation and operation of its SMS.	FTA-22-MBTA-CAT2-1.A	MBTA must conduct a critical and comprehensive review of its entire SMS planning, implementation, and operational processes and activities to address the gaps discussed in this finding.
		FTA-22-MBTA-CAT2-1.B	MBTA must update its SMS Implementation Plan to reflect the results of this review, including defined actions, timeframes, responsibilities, and expected outcomes.
Finding 2	MBTA executive leadership does not receive prioritized and actionable information related to safety risks or shortcomings in safety risk mitigations.	FTA-22-MBTA-CAT2-2	<p>MBTA leadership must:</p> <ol style="list-style-type: none"> 1. Work with safety and operating department leads (including maintenance and engineering departments) to define explicit criteria for prioritizing safety risks. 2. Include explicit safety risk acceptance criteria in its Agency Safety Plan and/or reference documents. 3. Work with MBTA's Safety Department and operating department leads (including maintenance and engineering departments) to define how safety information must be presented to MBTA leadership in a prioritized and actionable manner. 4. Require, and provide means for, operating department leads (including maintenance and engineering departments) to elevate proposed safety risk mitigations, including their status, that require MBTA leadership approval for resourcing. This must include safety risk mitigations deemed ineffective or inappropriate and that require executive level decision regarding the redirection of, or additional, resourcing.

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
Finding 3	MBTA Executive Management does not consistently ensure its decisions related to safety risks are based on safety data analysis or documented facts.	FTA-22-MBTA-CAT2-3.A	MBTA must map its safety data flows and supporting processes.
		FTA-22-MBTA-CAT2-3.B	MBTA must establish explicit accountabilities and responsibilities for safety data flows as a component of safety information management (collection, analysis, communication, storage, and retrieval of safety data).
		FTA-22-MBTA-CAT2-3.C	MBTA must provide formal training in safety information management to relevant personnel.
		FTA-22-MBTA-CAT2-3.D	MBTA must demonstrate that its executive management uses and promotes the usage of safety data analysis and/or documented facts in decision-making related to safety risk.

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
Finding 4	MBTA's safety investigations and safety assurance activities do not consistently collect and analyze information on precursor factors.	FTA-22-MBTA-CAT2-4.A	MBTA must update its Safety Assurance process to include monitoring of safety risk mitigations with a) compliance-based activities to provide the baseline for monitoring implementation status and b) performance-based activities to monitor the actual effectiveness of safety risk mitigations.
		FTA-22-MBTA-CAT2-4.B	MBTA must prepare a monthly look-ahead schedule for prioritized safety risk monitoring activities that include safety risk mitigations and corrective actions in place to address MBTA's highest safety priorities.
		FTA-22-MBTA-CAT2-4.C	<p>MBTA must develop and document guidance, and deliver training for safety investigators that ensure the consideration of precursor factors in the analysis of the chain of events leading to a safety event (accident, incident, or occurrence), including but not limited to, for example:</p> <ul style="list-style-type: none"> • Suitability of resources available to frontline personnel for operational and maintenance activities • Deficiencies in policies, procedures, rulebooks • Outdated policies, procedures, and rulebooks • Deficiencies/inadequacies in training Shortcomings in supervision • Deviations from procedures and rules Reasons for lack of adherence to procedure and rules • The limited success of discipline to address safety issues

Category 2: Prioritization of Safety Management Information

Findings		Tracking #	Required Actions
Finding 5	MBTA's safety risk assessment guidance as part of its Safety Risk Management is ambiguous and has led to confusion among stakeholders regarding their responsibilities and authorities, which has created delays in carrying out safety risk assessments activities.	FTA-22-MBTA-CAT2-5.A	MBTA must develop and document criteria for conducting safety risk assessments consistent with the basic principles of safety management and the tenets of SMS as conveyed in FTA's SMS guidance materials.
		FTA-22-MBTA-CAT2-5.B	MBTA must develop explicit direction for the ownership of safety risk assessments among the Safety Department and the operating departments. Documentation must include providing explicit roles, responsibilities, and thresholds of authority of each department involved.
		FTA-22-MBTA-CAT2-5.C	MBTA must include in the above criteria directives to ensure that operating departments including subject matter expertise, own safety risk assessments, while safety officials provide support for safety risk assessments and reports on results to Executive Leadership for safety resource allocation priorities.
		FTA-22-MBTA-CAT2-5.D	MBTA must expand its policy of establishing a pre-defined schedule of safety risk assessment workshops and develop criteria attuned with the nature of hazard identification (I.e., as they are identified), to expedite safety risk assessments to support prioritization for resource allocation.

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
Finding 6	MBTA safety information management tools (hazard log, safety risk mitigation log, etc.) do not fully support prioritization of resources to address safety risk and safety performance monitoring.	FTA-22-MBTA-CAT2-6.A	MBTA must evaluate (and correct) the data contained in its hazard log and safety risk mitigation log for accuracy and relevancy to SMS.
		FTA-22-MBTA-CAT2-6.B	MBTA must expedite the build out of its safety risk and safety risk mitigation monitoring information tools.
		FTA-22-MBTA-CAT2-6.C	MBTA must demonstrate use of its safety information management tools to effectively prioritize its resources to address the results of: <ul style="list-style-type: none"> • Safety Risk Monitoring • Safety Performance Monitoring

Forty-five (45) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-11, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to the Effectiveness of Safety Communication

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-11 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies three findings requiring action that the MBTA must take to improve MBTA's management of its safety committee process, employee safety reporting program, and safety promotion activities.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail, bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight (SSO) Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted a SMI of the MBTA rail transit system management, operations, and maintenance programs, between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system, which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's

SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four (4) categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 3 and is based on FTA’s determination that there is a lack of routine, consistent, and meaningful communication regarding safety issues across departments and with frontline workers.

Safety Committee Follow Up

In its Agency Safety Plan and supporting procedures, MBTA documented a structure of safety committees and groups to facilitate information sharing of safety topics. During interviews, FTA was able to confirm that committee and group meetings are convened as scheduled. FTA obtained detailed anecdotal information of the items discussed during the meetings, but learned that safety information from these meetings (that may include presentations, safety data, and analysis) is not formally recorded, either by the Safety Department or by other committee function. MBTA could not provide documentation of safety issues raised and discussed, nor records of safety decisions or actions. MBTA also could not provide documentation to demonstrate a formal process for managing the outcomes of these discussions.

MBTA has established local safety committees, which are smaller workforce groups based on work location, as a primary forum to receive safety information from frontline personnel. These forums provide an avenue for workers to share, and the agency to obtain, information on the safety performance of the agency in the field. During interviews and records review, FTA learned that:

- local safety committee meetings often do not have frontline representation (FTA confirmed this with Safety Department officials and Local 589 union members and union leadership),
- staffing shortages prevent frontline employee participation because they are scheduled for work during meetings,
- there is no demonstrated accountability of the Safety Department representative to document or report out the information discussed during the meetings,
- frontline personnel provide information to supervisors who serve as their proxies, but there is no requirement for employee safety concerns to be documented or acted upon by supervisors.

Given FTA’s findings related to shortcomings in safety data prioritization and presentation (Special Directive 22-10), FTA finds that the absence of outcome documentation from local safety committee

meetings can lead to:

- subsequent actions that are left to interpretation and individual departmental prioritization,
- absence of clearly assigned departmental responsibilities regarding implementation and monitoring of actions, and
- undefined timeframes for actions.

Employee Safety Reporting Program

In 2019, MBTA established its Employee Safety Reporting Program (ESRP). MBTA's Agency Safety Plan states that "MBTA's voluntary, confidential, non-punitive employee reporting program allows for the submission of information related to observed hazards, sole-source safety events, or inadvertent errors without an associated legal or administrative requirement to report. Reported information should be used solely to support the enhancement of safety. and "Voluntary reporting is non-punitive because it affords protection to reporters, thereby ensuring the continued availability of such information to support continuous improvements in safety performance."

FTA observed, and MBTA officials agreed, that the MBTA's ESRP is in actual practice largely limited to the Safety Hotline. FTA analyzed the Safety Hotline log and noted that many of the reports are anonymous which may indicate a weakness in the program as MBTA is unable to follow up with workers on reported concerns. The 20 to 25 Safety Hotline reports per month for an organization of the size of MBTA may indicate a reluctance or skepticism in the safety reporting environment.

Frontline employees have the option to report safety concerns verbally to supervisors who must then elevate the report to the Safety Department. However, there is no established procedure nor controls that ensure that all reports verbally submitted to supervisors are elevated through the system. FTA finds that this creates the probability for loss of potentially valuable safety information and results in under-reporting.

FTA reviewed the Safety Hotline log and found that only a small percentage of reports are about safety concerns and most reports do not rise above the level of individual location "housekeeping" issues or complaints. MBTA indicated that it has conducted ESRP training and consistently promotes the program; however, FTA did not see evidence (neither during discussions with employees nor through a review of the Safety Hotline log) that frontline employees have clarity or instruction on what to report and, most importantly, what not to report through the safety hotline. This potentially generates a situation where the Safety Hotline log contains many reports, but those reports contain scarce actionable safety information. The large number of reports make it difficult to isolate actionable safety information.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 3: Effectiveness of Safety Communication			
Findings		Tracking #	Required Actions
Finding 1	MBTA has not established explicit and formal provisions to ensure safety information from safety committee results in a consistent outcome of documented, prioritized, and actionable safety information.	FTA-22-MBTA-CAT3-1.A	<p>MBTA must develop and describe, in the organization's SMS documentation, instructions regarding the conduct, recording, communication and follow up of the outcome consensus decisions specific for each of the following meetings - taking into consideration the nature (strategic or tactical) of each meeting:</p> <ul style="list-style-type: none"> • Operations and Safety Biweekly call (currently every other Friday) • Operations and Safety weekly meeting (currently on Wednesdays) • Executive Safety Committee (ESC) • Safety Management Review Committee (SMRC) • Safety Management Working Groups (SMWGs) • Data Analysis Group (DAG) • Local Safety Committee Meetings • Joint Labor/Management Safety Committee (required by Bipartisan Infrastructure Law)
		FTA-22-MBTA-CAT3-1.B	In support of the above, MBTA must develop and describe, in the organization's SMS documentation, a formal mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring.

Category 3: Effectiveness of Safety Communication			
Findings		Tracking #	Required Actions
Finding 2	MBTA has not documented explicit and formal provisions to ensure the participation of frontline employees in local safety committees as part of their job responsibilities in relation to the agency's SMS.	FTA-22-MBTA-CAT3-2.A	MBTA must develop explicit and formal guidelines for the expected role and contribution of frontline employees to the local safety committee meetings.
		FTA-22-MBTA-CAT3-2.B	MBTA must develop instructions for the conduct of the meetings, including explicit departmental accountabilities for meeting outcome information capture, communication and follow up.
Finding 3	MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline.	FTA-22- MBTA-CAT3-3.A	MBTA must expedite the development of an effective ESRP as a fundamental source of safety information for hazard identification and safety performance monitoring.
		FTA-22-MBTA-CAT3-3.B	As part of the development of an effective ESRP, MBTA must provide explicit direction to frontline employees on what to report and what not to report through the ESRP (including the safety hotline).
		FTA-22-MBTA-CAT3-3.C	As part of the development of an effective ESRP, MBTA must provide refresher training to stakeholder personnel on the role of employee safety reporting within SMS and the crucial contribution managers and supervisors play in the development of an effective safety reporting context.

Twenty (20) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-12, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to Operating Conditions and Policies, Procedures, and Training

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-12 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies seven (7) findings requiring action that the MBTA must take to improve MBTA's management of its operating and maintenance policies, monitoring of rail transit operations, Quality Assurance/Quality Control capabilities, and training and procedures.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail, bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight (SSO) Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted a Safety Management Inspection (SMI) of the MBTA rail transit system management, operations, and maintenance programs, between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system, which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four (4) categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 4 and is based on FTA's determination there are numerous inconsistencies between MBTA operating conditions and practices and the agency's written policies, procedures, practices, and training.

Compliance with Rules and Procedures

FTA observed instances where employees were not complying with required safety, operations, and maintenance rules and procedures. FTA's Special Directives 22-4, 22-5, 22-6, and 22-7 document instances of non-compliance. For example, FTA noted violations in right of way safety rules and vehicle operating rules, preventive maintenance inspections that were not completed as required, inappropriate storage of chemicals in rail yards, an unlocked signal on the right of way, incomplete repairs, and rule violations in readying trains for moves in the rail yard. FTA also observed a rail transit vehicle speeding through a work zone.

FTA also found instances where procedures are well-documented and available but are not followed or enforced, and where workers were required to perform specific activities but were not given the resources or guidance necessary to complete the work. Conversely, FTA found outdated procedures and a lack of operational assessments to ensure revisions accurately capture changes in the system and required work practices.

FTA reviewed over 100 final investigation reports completed for major safety events experienced at the MBTA between January 1, 2019, and April 29, 2022. In over 85 percent of these reports MBTA identified non-compliance with at least one safety, operating, or maintenance rule as a primary or contributing cause of the accident. Review of these reports also reveals the frequent use of unvetted and ad hoc shortcuts in work practices, outdated procedures that have not kept paces with changes in work environments, violations of safety rules to meet deadlines or vehicle counts, and lack of time and resources to review and update rules and procedures to align them with system changes. Finally, FTA found that MBTA does not use many tools, including checklists, to support implementation of key operating and maintenance procedures in the Operations Control Center (OCC) and rail yards.

Monitoring Operations

MBTA's current activities to monitor compliance with operating and maintenance rules include requirements that supervisors monitor daily job duties for operations and maintenance employees, though most departments do not require formal documentation of this monitoring activity. FTA found that supervisors have a range of responsibilities at the MBTA and do not always have time to complete this monitoring or to follow-up with employees regarding their performance. In interviews across operations and maintenance departments, MBTA staff and supervisors indicated that due to a lack of supervisory personnel and officials, it was challenging to provide frontline personnel, particularly new MBTA hires, with additional support and oversight that they may need to understand and comply with all rules, given the complexity of MBTA's operating environment.

MBTA conducts a Safety Rules Compliance Program or SRCP, but FTA finds that more can be done to identify safety-critical rules and procedures, to support MBTA personnel in understanding these requirements and how to comply with them, and to monitor the overall performance of the agency in complying with these procedures. FTA also finds a lack of consistency in how compliance with operating and maintenance rules is monitored across departments.

QA/QC Program

The MBTA uses a QA/QC program to support oversight of vehicle maintenance and engineering activities. These inspections provide findings, but the inspections are limited to one vehicle per month from each of the four lines. FTA noted that the tracking log provided with these monthly inspection reports did not include any re-inspection dates or activities to address the findings. This process for quality control auditing is almost entirely performed by personnel reporting to rail vehicle maintenance management, thus lacking the independence necessary for an effective QA/QC program.

MBTA also delegates the rail car acquisition program QA/QC to the rail car manufacturer and the MBTA's program management consultant. A QA/QC Plan for MBTA's oversight of these processes was not provided to FTA (QA/QC manuals from the rail car manufacturer and contractor were provided). Not unlike the preventive maintenance policy, the rail car acquisition process lacks an MBTA-specific documented QA/QC program with procedures and roles and responsibilities for an independent internal group to report directly to the highest levels of MBTA management.

Technical Training

Technical training for maintenance personnel is embedded within each technical department (vehicle engineering, maintenance of way, signal and train control, communications, facilities, traction power, etc.). MBTA's OCC and Training Department trains all operations personnel and provides right of way (ROW) safety training. MBTA's Human Resources and Labor Relations Department also provide or support other administrative training and orientation for new employees.

FTA generally found that while strong technical courses have been developed in many areas, there are

insufficient resources available to provide enough offerings to adequately train and refresh personnel. Operations personnel face significant challenges in establishing professional service standards, utilizing different adult learning strategies, and taking advantage of technology to bring the field into the classroom. As a result, there is a great reliance on informal, on-the-job training which is not standardized or overseen.

Based on interviews, records reviews, and field observations conducted across several technical disciplines, FTA also found that MBTA has no agency-wide strategy for technical training to ensure the proficiency of MBTA personnel and that many gaps in training exist for operations and maintenance departments. FTA found that training is under-resourced and fractured and that MBTA relies heavily on on-the-job training.

FTA's SMI found outdated emergency procedures and training. Review of over 100 safety event investigation reports dating back to January 1, 2019, indicates inconsistencies in emergency response and the way that the agency is managing emergencies.

MBTA is in the process of hiring hundreds of new motorpersons to replace those who are retiring or leaving through attrition and to support the promotion of veteran motorpersons to other positions within the rail transit system. In interviews, MBTA's rail transit leadership acknowledges that some new operators seem to be struggling in maintaining a balance between learning MBTA heavy rail operations and preserving a focus on safety. In addressing these challenges, numerous MBTA personnel at all levels of the agency noted that MBTA's bus operations has a mentorship program that many new bus operators find beneficial.

Performance of Radio System

Finally, interviews with frontline operations, maintenance, and OCC personnel highlighted several key locations where radio quality does not consistently support effective radio communications. Radio communications are critical to the safety of the MBTA's rail transit service and FTA finds that more must be done to improve radio quality in these locations.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 4: Operating Conditions and Policies, Procedures, and Training			
Findings		Tracking #	Required Actions
Finding 1	Documented operating and maintenance rules and procedures are not implemented as required.	FTA-22-MBTA-CAT4-1.A	Each operating and maintenance department must establish a group to review department-wide information on levels of non-compliance with key rules and procedures critical to the safety of activities performed by the department.
		FTA-22-MBTA-CAT4-1.B	Each department must establish and act on a prioritized list of most frequently violated rules and procedures with the most significant potential safety consequences.
		FTA-22-MBTA-CAT4-1.C	Each department must develop and implement approaches, which could include audits, use of checklists and guides, campaigns, and training, to improve compliance.
		FTA-22-MBTA-CAT4-1.D	Each department must report to the Safety Department monthly on its compliance with identified key rules and procedures critical to the safety of activities performed by the department.
		FTA-22-MBTA-CAT4-1.E	The Safety Department must review and audit these reports and compile a monthly compliance report for MBTA's executive leadership team.
		FTA-22-MBTA-CAT4-1.F	Each department must continue to review safety data to assess effectiveness of actions and to improve compliance with safety rules and procedures.

Category 4: Operating Conditions and Policies, Procedures, and Training			
Findings		Tracking #	Required Actions
Finding 2	MBTA does not monitor operations, including the conditions of the operating environment, to identify the reasons for deviations between formal, established standards, rules and procedures, and actual operations and maintenance practices.	FTA-22-MBTA-CAT4-2	MBTA must develop, document, and communicate a mechanism to monitor operations, and provide training to stakeholder safety and operating personnel on this mechanism, to enable the analysis and understanding of situations of non-compliance.
Finding 3	MBTA's QA/QC program is not sufficiently independent from the activities it oversees.	FTA-22-MBTA-CAT4-3.A	MBTA must develop and administer a QA/QC program to independently oversee of ongoing QA/QC activities.
		FTA-22-MBTA-CAT4-3.B	MBTA must ensure that the QA/QC functions are independent of the functions of the Safety department and report directly to the GM.
		FTA-22-MBTA-CAT4-3.C	MBTA must develop a formal QA/QC procedure that details the oversight of and accountability and roles and responsibilities for QA/QC programs provided by railcar manufacturers and MBTA consultants related to quality control of its railcars and subcomponents.
		FTA-22- MBTA-CAT4-3.D	MBTA must ensure that the MBTA QA/QC independent group is staffed with a sufficient SMEs in necessary disciplines to ensure a complete and thorough understanding of the responsibilities under the purview of railcar maintenance and engineering.

Category 4: Operating Conditions and Policies, Procedures, and Training			
Findings		Tracking #	Required Actions
Finding 4	Technical training for operations and maintenance departments is under-resourced and decentralized, without sufficient resources and direction, and relies significantly on on-the-job-training (OJT) which is informal and lacks oversight. Emergency response training is poorly integrated into overall training program.	FTA-22-MBTA-CAT4-4.A	MBTA must conduct a training needs assessment for rail transit operations and maintenance departments, to include emergency response training. This assessment should identify training that needs to be updated, developed, and supported with additional resources.
		FTA-22-MBTA-CAT4-4.B	MBTA must implement the results of the training needs assessment.
		FTA-22-MBTA-CAT4-4.C	MBTA must consider opportunities and adopt technology and other resources to support training development and training management and record-keeping.
Finding 5	MBTA lacks formal resource manuals in key maintenance areas and does not currently provide employees with checklists or other tools to support training and implementation of maintenance rules and procedures.	FTA-22-MBTA-CAT4-5.A	In coordination with required actions already underway to address FTA's Special Directive 22-7, the MBTA must review its existing maintenance rules and procedures; identify opportunities for tools and checklists to support employees in carrying out maintenance rules and procedures; and develop, distribute, maintain, and update these materials.
		FTA-22-MBTA-CAT4-5.B	MBTA must include frontline maintenance personnel in the development evaluation of these tools and checklists.
Finding 6	Due to workforce turnover, MBTA's new motorpersons and officials no longer have access to mentoring from experienced motorpersons and officials (inspectors, chief inspectors, and supervisors).	FTA-22-MBTA-CAT4-6	MBTA must evaluate expanding its existing mentoring program from Bus Transit Operations to include new part-time and full-time rail transit operators or consider establishing a mentoring program specific to rail transit operations. In its evaluation, MBTA should consider opportunities and resources to support the professional development of rail transit operations personnel.

Category 4: Operating Conditions and Policies, Procedures, and Training			
Findings		Tracking #	Required Actions
Finding 7	Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA operations and maintenance.	FTA-22-MBTA-CAT4-7.A	MBTA must confirm radio dead spots with frontline motorpersons and maintenance workers.
		FTA-22-MBTA-CAT4-7.B	MBTA must improve the performance of its radio system in these dead spots.

Thirty-five (35) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-4, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to Track Maintenance

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-4 to require the Massachusetts Bay Transportation Authority (MBTA) to address ongoing safety concerns at MBTA and interim findings uncovered during FTA's Safety Management Inspection (SMI) that was initiated in April 2022. This Special Directive mandates that MBTA take nine required actions in three distinct categories related to maintenance of way (MOW). These required actions are to address deficiencies in personal protective equipment (PPE) and right of way (ROW) safety; to correct defective track conditions; and to address management practices that negatively impact track repair.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

In response to MBTA's continued safety challenges, FTA decided in April 2022 to conduct a Safety Management Inspection (SMI) of MBTA. This Special Directive is based on the MBTA's ongoing safety issues and on the interim findings of FTA's SMI, which began in April 2022 and is still in progress. FTA is issuing this Special Directive while the SMI remains in progress because the SMI has revealed several serious safety issues that warrant immediate corrective action.

In 2021 and so far in 2022, MBTA has experienced several safety events resulting from deferred maintenance of assets in a poor state of repair, including six mainline derailments in 2021 (related to track, switches and/or vehicle conditions); accidents involving escalators and station facilities in poor condition; and safety events stemming from disabled trains, defective switches, and damaged equipment or tools in yards or maintenance facilities. MBTA's Engineering and Maintenance (E&M) Directorate serves as the primary custodian for the MBTA's physical infrastructure, including track, signals and communications, power, and facilities on the Red Line, Orange Line, Blue Line, and Green Line.

As a result of interviews, records reviews, on-site observations, and inspections conducted during part of the SMI, FTA finds that MBTA's E&M Directorate does not receive sufficient track access and resources to conduct a proactive inspection and maintenance program for MBTA's aging infrastructure. Further, while the E&M Directorate has a committed team working to transition the MBTA's paper-based recordkeeping system to digital records, the MBTA has not adequately resourced this transition; as a result, the agency does not have access to quality data regarding the state of its infrastructure to support safety decision making, maintenance planning, and selection of capital projects.

FTA further finds that while MBTA has a newly established and growing \$2 billion annual capital projects program, it spends just over \$70 million per year on the safety-critical MOW activities performed by the E&M Directorate. These critical activities include 24/7 emergency response to infrastructure failures; daily preventative maintenance and corrective repairs; inspections of safety critical infrastructure, such as track, switches, signals, stations, structures, and power system components; assistance for capital construction; and support for vehicle maintenance.

MBTA's E&M Directorate performs most of its critical activities, except for inspection of facilities and at-grade system components, during the nighttime maintenance window. Currently, that window affords only between two and two-and-a-half hours of track access. In that window of time, MBTA's MOW team may, for example, be able to replace 6 to 12 ties or 80 restraining rail bolts, complete inspections of individual power or signal system assets, or repair a section of a station platform or a rail joint. While the maintenance needs of the system are far greater than those addressable in the short nighttime maintenance windows, MBTA has, to date, not scheduled more substantial track access for MOW activities, even though it does schedule diversions and surges for capital projects.

Failures in aging work trains and other equipment further limit the ability of MOW personnel to access some of the MBTA's more challenging locations with equipment and supplies needed to perform corrective maintenance. For example, the SMI revealed that MBTA's Green Line work train has been inoperable for at least 8 months. In addition, MBTA lacks the capability to perform thermite welds, forcing it to rely on contractors to tie in rail, and it struggles in maintaining a crew to operate its production tamper. Some E&M divisions struggle with the performance of preventive maintenance inspections, and there is concern that aging assets may be deteriorating without a clear plan in place for corrective maintenance or renewal.

Records reviewed by FTA indicate that, under these conditions, between January 1, 2021 and April 29, 2022, MBTA has a growing backlog of open (4,195) and pending (12,423) defects related to track, signals and communication, power, and facilities. As reported in April and May of 2022, MBTA has almost 10

percent of its heavy rail track and over two miles of light rail track (mostly in the Central Subway) under speed restrictions. As part of the SMI, FTA inspected track on the Orange Line south of Tufts Medical Center Station that has been subject to speed restrictions since 2019. FTA found that portions of track displayed evidence of excessive wear and defects. These conditions were, in turn, managed through gauge rods, some of which showed signs of corrosion.

FTA further determined that MBTA focuses almost exclusively on addressing “red” condition defects – the most serious defects with the potential for failure, and which may require speed restrictions or removal of infrastructure elements from service. This focus on “red” conditions is due to both lack of track access and staffing shortages that leave some technical and supervisory positions with staffing vacancies approaching 20 percent. Focusing almost exclusively on “red” conditions leaves the MBTA rail system vulnerable to multiple risks. First, the system is exposed to the risk of undetected deterioration in restricted assets that potentially renders them out-of-service. Second, the system faces the risk that combinations of conditions in the less severely assessed “yellow” category collectively could approach an out-of-service condition.

These issues are compounded by inconsistent compliance with inadequate policies. For example, during the SMI, FTA found that MBTA has not established consistent PPE requirements for ROW access. In addition, FTA determined that MOW personnel and contractors do not consistently follow MBTA’s established PPE requirements or ROW safety procedures.

This Special Directive identifies nine required actions that the MBTA must take to address systemic MOW deficiencies requiring corrective action. FTA and DPU will oversee MBTA activity to implement these safety-critical required actions across its system.

As MBTA works to improve the quality of its MOW programs, the findings and required actions outlined in this Special Directive will assist the agency in focusing its attention on safety-critical priorities as it addresses these immediate concerns.

Additionally, FTA will work with DPU and MBTA to review and revise all pre-existing corrective action plans as appropriate to ensure that MBTA continues to make timely progress towards building and maintaining a robust safety culture within the agency.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 1: Personnel Safety			
Findings		Required Actions	
Finding 1	MBTA has not established consistent PPE requirements for ROW access.	FTA-TRA-22-001	MBTA must establish consistent PPE requirements for ROW personnel access. Personnel is inclusive of all employees, contractors, oversight, or other individuals

			who access the rail system and facilities.
Finding 2	MOW personnel and contractors do not consistently follow MBTA's established PPE requirements or ROW safety procedures.	FTA-TRA-22-002	MBTA must implement and document consistent MOW compliance with ROW safety procedures, including PPE requirements for all personnel. Personnel is inclusive of all employees, contractors, oversight, or other individuals who access the rail system and facilities
Category 2: Required Track Maintenance			
Findings		Required Actions	
Finding 3	The curved track section on the Orange Line between the Tufts Medical Center and Back Bay Stations (both north- and south-bound) has been under speed restriction for an extended period dating back to 2019 due to excessive wear and defects.	FTA-TRA-22-003	MBTA must correct the track defects between Tufts Medical Center and Back Bay Stations on both north- and south-bound tracks.
Category 3: Management Practices			
Findings		Required Actions	
Finding 4	MBTA does not provide adequate time to complete necessary MOW maintenance activities.	FTA-TRA-22-004	MBTA must document its MOW maintenance needs and develop and implement a schedule to ensure adequate track access to meet maintenance requirements.
Finding 5	MBTA's MOW departments have growing maintenance needs.	FTA-TRA-22-005	MBTA must develop and implement work plans to address MOW maintenance needs and manage on-going MOW workload.
Finding 6	MBTA's data on MOW defects and work order status is insufficient to guide management planning.	FTA-TRA-22-006	MBTA must expedite and sufficiently resource the transition to its new Enterprise Asset Management (EAM) system. In the meantime, MBTA must formalize and implement procedures and protocols to ensure the MOW managers and MOW inspectors share information and establish data-driven maintenance priorities.
Finding 7	MBTA's MOW department is not providing prioritized and actionable information to	FTA-TRA-22-007	MBTA must develop and implement a process and reporting procedure that accurately communicates the number, severity, and significance of MOW defects to Executive

	Executive Leadership regarding the condition of MBTA's assets and infrastructure.		Leadership.
Finding 8	MBTA reports 9.6% of heavy rail track is under a speed restriction due to track defects and over two miles of Green Line track also are speed restricted. MBTA's management accepts an unsustainable level of speed restrictions due to deferred maintenance.	FTA-TRA-22-008	MBTA must develop and implement a special maintenance repair plan to reduce the percentage of system track that is under a speed restriction.
Finding 9	MBTA's Green Line work train has been inoperable for at least 8 months.	FTA-TRA-22-009	MBTA must restore Green Line work train capabilities.

Thirty (30) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA and DPU that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to conduct bi-weekly meetings with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In

reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: June 15, 2022

A handwritten signature in blue ink, appearing to read "Veronica Vanterpool".

Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-5, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to Vehicle Securement of Disabled Trains

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-5 to require the Massachusetts Bay Transportation Authority (MBTA) to address ongoing safety concerns at MBTA and interim findings uncovered during FTA's Safety Management Inspection (SMI) that was initiated in April 2022. This Special Directive mandates that MBTA undertake three required actions within its system to address the pattern of safety incidents and interim safety findings concerning unintended and uncontrolled train movements by disabled trains in maintenance facilities and rail yards.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone 202-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

In response to MBTA's continued safety challenges, FTA decided in April 2022 to conduct a Safety Management Inspection (SMI) of MBTA. This Special Directive is based on the MBTA's ongoing safety issues and on the interim findings of FTA's SMI, which began in April 2022 and is still in progress. FTA is issuing this Special Directive while the SMI

remains in progress because the SMI has revealed several serious safety issues that warrant immediate corrective action.

Since January 1, 2021, the MBTA has reported five runaway train events that happened in yards or during maintenance-related movements. Two of these events occurred during FTA's SMI.

Date	Line	Status	Substantial Damage	Injuries	Probable Cause	CAP Developed	Corrective Action
2/28/21	Orange	Maintenance Recovery	No	None	Procedure not followed	None	None
9/28/21	Red	Maintenance Recovery	No	None	Insufficient Procedure	Yes	Develop and train new procedure
12/17/21	Red	Yard	Yes	3	Insufficient Procedure	Yes	Develop and train new procedure
5/28/22	Red	Yard	TBD	0	Pending	TBD	TBD
5/30/22	Red	Yard	TBD	0	Pending	TBD	TBD

These events raise serious safety concerns. Failure to properly secure disabled trains, including trains with insufficient brakes or propulsion systems, and failure to properly secure disabled trains in yards and maintenance facilities is a significant safety risk. Disabled trains may not be able to make moves directed by yard dispatchers or other personnel and may not be able to apply required braking or propulsion utilizing routine movement and securement methods, creating an increased likelihood of unintended and uncontrolled movements, resulting in collisions with other trains, equipment, or personnel injuries or fatalities.

In addition, these events amplify the need for clear procedures, training, and supervision on the management of disabled trains to prevent unintended train movement. During the course of the SMI, however, FTA found that MBTA does not have or use specific procedures for yard movements of rail vehicles with known or suspected defective brakes or propulsion equipment. In addition, MBTA does not adequately train personnel on the policies and procedures to safely move and secure rail cars with known or suspected defective brakes or propulsion equipment, nor does it verify that personnel consistently use policies and procedures for movement of trains that do not have working brakes and working propulsion equipment.

This Special Directive identifies three required actions that MBTA must take to ensure safe movement of disabled trains in maintenance facilities and rail yards. FTA and DPU will oversee MBTA activity to implement these safety-critical required actions across its system.

As MBTA works to improve the quality of its programs, the findings and required actions outlined in this Special Directive will assist the agency in focusing its attention on safety-critical priorities as it addresses these immediate concerns.

Additionally, FTA will work with DPU and MBTA to review and revise all pre-existing corrective action plans as appropriate to ensure that MBTA continues to make timely progress towards building and maintaining a robust safety culture within the agency.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category I: Vehicle Securement Policies, Procedures and Compliance			
Finding		Required Actions	
Finding 1	MBTA does not have or use specific procedures for yard movements of rail vehicles with known or suspected defective brakes or propulsion equipment.	FTA-VSC-22-001	MBTA must develop and implement specific written procedures for yard movements of rail vehicles with known or suspected defective brakes or propulsion equipment.
Finding 2	MBTA does not adequately train personnel on the policies and procedures to safely move and secure rail cars with known or suspected defective brakes or propulsion equipment.	FTA-VSC-22-002	MBTA must develop training and train personnel on the policies and procedures to safely move rail vehicles with known or suspected defective brakes or propulsion equipment. Personnel is inclusive of all employees, contractors, oversight, or other individuals who access the rail system and facilities.
Finding 3	MBTA does not verify that personnel consistently use policies and procedures for movement of trains that do not have working brakes and working propulsion equipment.	FTA-VSC-22-003	MBTA must create and implement a compliance program to ensure personnel consistently and accurately use policies and procedures for yard movements of rail vehicles with known or suspected defective brakes or propulsion equipment. Personnel is inclusive of all employees, contractors, oversight, or other individuals who access the rail system and facilities.

Fifteen (15) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA and DPU that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone

schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to conduct bi-weekly meetings with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: June 15, 2022

A handwritten signature in blue ink, appearing to read "Veronica Vanterpool".

Veronica Vanterpool
Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-6, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to the Operations Control Center

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-6 to require the Massachusetts Bay Transportation Authority (MBTA) to address ongoing safety concerns at MBTA and interim findings from FTA's Safety Management Inspection (SMI) that was initiated in April 2022. This Special Directive mandates that MBTA take seven required actions within its system to address the pattern of safety incidents and interim safety findings related to actions within the Operations Control Center (OCC) at MBTA.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

In response to MBTA's continued safety challenges, FTA decided in April 2022 to conduct a Safety Management Inspection (SMI) of MBTA. This Special Directive is based on the MBTA's ongoing safety issues and on the interim findings of FTA's SMI, which began in April 2022 and is still in progress. FTA is issuing this Special Directive while the SMI remains in progress because the SMI has revealed several serious safety issues that warrant immediate corrective action.

The Operations Control Center (OCC) at the MBTA houses the dispatchers, supervisors, and managers who coordinate all train movements throughout the system. Through review of recent safety events, in-depth interviews, site visits and observations of the Operations Control Center (OCC), and document and data reviews, FTA finds that MBTA's OCC is not meeting its own requirements to ensure that OCC dispatchers and supervisors are adequately trained and certified. Through April 29, 2022, MBTA records showed that 13 of 16 heavy rail dispatchers and six of 11 OCC supervisors had not completed biennial right of way (ROW) safety recertification. In addition, four of 14 dispatchers for the Green Line had not completed annual recertification for their dispatch duties.

FTA also finds that the OCC is not appropriately staffed. Records through April 29, 2022 also show the OCC has four heavy rail dispatcher vacancies (out of 18 positions) and two supervisor vacancies (out of 11) from fiscal year 2022 budgeted positions and is down six total heavy rail dispatchers from OCC personnel requests (out of 20). The OCC does not have a dedicated trainer, and supervisors and OCC's management team fill many roles, including covering dispatcher shifts and providing training.

This lack of staffing creates challenges for OCC management and contributes to unpredictable and extended work schedules for dispatchers, supervisors, and members of OCC's management team. MBTA's hours of service requirements, which allow dispatchers and supervisors to work up to 20 hours on with only four hours off, corroborated by recent safety concerns reported by employees regarding mandated overtime in the OCC, do not ensure that OCC dispatchers and supervisors are properly rested. As noted above, staffing shortages exacerbate challenges in the OCC, particularly for heavy rail dispatchers, who must regularly work 16-hour and occasionally 20-hour shifts to ensure coverage.

Taken together, MBTA has created a management process whereby OCC staff members are required to work without certifications, in a fatigued state, and often fulfilling multiple roles at once. MBTA's failure to ensure that personnel within the Operations Control Center (OCC), including train and power dispatchers, are trained and certified, properly rested, and concentrating on one role at a time is a significant safety risk—one that is compounded by inadequate procedures. These circumstances create an increased safety risk for trains, equipment, personnel and property. While FTA is mindful that these practices are the product of systemic staffing shortages, MBTA must nevertheless fulfill its duty to operate the OCC and the system safely.

This Special Directive identifies seven required actions that MBTA must take to ensure OCC personnel are trained and certified to perform their job function, are provided the opportunity for proper rest between shifts, and are not required to fulfill multiple roles within one shift. FTA and DPU will oversee MBTA's implementation of these safety-critical required actions.

As MBTA works to improve the quality of its MOW programs, the findings and required actions outlined in this Special Directive will assist the agency in focusing its attention on

safety-critical priorities as it addresses these immediate concerns.

Additionally, FTA will work with DPU and MBTA to review and revise all pre-existing corrective action plans as appropriate to ensure that MBTA continues to make timely progress towards building and maintaining a robust safety culture within the agency.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 1: Immediate Actions Ensuring that Operations Control Staff are Recertified and Rested			
Finding		Required Actions	
Finding 1	MBTA does not ensure that OCC staff are recertified as indicated in training materials and required by 49 CFR § 673.29(a).	FTA-OCC-22-001	<p>MBTA must ensure that staff working in the OCC, including dispatchers and supervisors, are certified.</p> <p>Specific Details:</p> <p><u>Submittal #1:</u> MBTA must submit to FTA and DPU each week prior to the next week's day's service a detailed OCC revenue service schedule for each MBTA rail line. This document shall include employee number, line the employee is responsible for or supervising, length of shift in hours, most recent training and certification date, and number of hours between assigned shift and current shift. This form must be signed by the Director of Operations, the Chief of Safety, and the General Manager to verify that each OCC employee assigned to work a shift is certified to MBTA's certification and retraining standards. This action is required beginning 48 hours after the issuance of this Directive and will be required each week for a minimum of six (6) weeks and until the MBTA satisfactorily demonstrates that schedules are made with certified personnel.</p>

	<p><u>Submittal #2:</u> MBTA must submit to FTA and DPU within 24 hours of each day's operations the "as performed" schedule. This action is required for a minimum of six (6) weeks following the initial schedule submission and will be required until MBTA satisfactorily demonstrates that substitutions are made with certified personnel.</p>
<p>Finding 2 MBTA does not ensure its OCC staff are given sufficient opportunity for recovery between shifts.</p>	<p>FTA-OCC-22-002</p> <p>MBTA must ensure OCC staff, including dispatchers, supervisors, and management working within the OCC, have sufficient time off to recover between shifts, consistent with MBTA hours of service policy for rail transit motorpersons.</p> <p>Specific Details:</p> <p><u>Submittal #1:</u> MBTA must submit to FTA and DPU each week prior to the next week's service a detailed staffing plan that validates appropriate duty periods and rest periods for OCC staff. This document shall include for each 24-hour period: employee number, line the employee is responsible dispatching/or supervising, length of shift in hours, most recent training and certification date, and number of hours between assigned shift and current shift. This form must be signed by the Director of Operations, the Chief of Safety, and the General Manager to verify that each employee assigned to work a shift within the OCC works a shift consistent with MBTA's hours of service policy for rail transit motorpersons. This action is required beginning 48 hours after the issuance of this Directive and will be required each week for a minimum of six (6) weeks and until the MBTA satisfactorily demonstrates that schedules are made with rested personnel.</p>

	<p><u>Submittal #2:</u> MBTA must submit to FTA and DPU within 24 hours of each day's operations the "as performed" schedule. This form will validate that any changes to schedule due to employee substitutions were filled with employees that had sufficient opportunity for recovery between shifts. This action is required for a minimum of six (6) weeks following the initial schedule submission and will be required until there is satisfactory demonstration that substitutions are made with appropriately rested personnel.</p>
<p>Finding 3 MBTA requires OCC staff to perform two distinct roles (supervisor and dispatcher) during portions of shifts, preventing proper execution of either role.</p>	<p>FTA-OCC-22-003 MBTA must submit to FTA and DPU each week prior to the next week's service that, for each shift, OCC supervisors and managers are not dual scheduled for both supervisory duties and dispatcher duties at any time during assigned shifts. This action is required beginning 48 hours after the issuance of this Directive and will be required for a minimum of six (6) weeks following the initial schedule submission and will be required until there is satisfactory demonstration that substitutions are made with appropriately rested personnel.</p>

MBTA will begin reporting on Friday, June 17, 2022, for the next work week starting Sunday, June 19 or Monday, June 20 to respond to the required actions set out in Category 1 of this Special Directive, including providing additional information for consideration and proposing any equivalent alternate actions for consideration by FTA's Administrator.

FTA will validate that MBTA is submitting the weekly required submissions associated with Category 1, and FTA will continue to conduct weekly meetings with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

Category 2: Corrective Plans and Procedures to Ensuring that Operations Control Center Staff Are Recertified and Rested			
Finding		Required Actions	
Finding 4	MBTA requires its OCC personnel to work in a fatigued state as a pattern and practice.	FTA-OCC-22-004	MBTA must develop and enforce policies that require OCC personnel to work in a rested state. MBTA must modify its hours-of-service policy to require sufficient hours of rest, consistent with MBTA's hours of service policy for rail transit motorpersons.
Finding 5	MBTA's OCC is significantly understaffed.	FTA-OCC-22-005	MBTA must adequately staff the OCC for current operational needs. MBTA must provide a plan to meet the operational needs of the system, consistent with MBTA's hours of service policy for rail transit motorpersons and meeting scheduled leave requirements.
Finding 6	MBTA faces major challenges in recruiting and training new rail transit dispatchers.	FTA-OCC-22-006	MBTA must identify and address major challenges in recruiting and training new rail transit dispatchers, the quality and performance of their training, and the certification of new candidates.
Finding 7	MBTA allows dispatchers who are not current in their certifications to work in the OCC.	FTA-OCC-22-007	MBTA must verify that all dispatchers working within the OCC are current in their certifications prior to starting their shift.

Twenty (20) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA and DPU that identifies the specific actions that will be

performed to address required action specified in Category 2 of this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to conduct bi-weekly meetings with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: June 15, 2022

A handwritten signature in blue ink, appearing to read "Vanterpool".

Veronica Vanterpool
Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-7, Notice No. 1]

**Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670
Required Actions to Address Findings from Federal Transit Administration Safety
Management Inspection Conducted at the Massachusetts Bay Transportation Authority
Related to Lapsed Certifications**

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-7 to require the Massachusetts Bay Transportation Authority (MBTA) to address ongoing safety concerns at MBTA and interim findings uncovered during FTA's Safety Management Inspection (SMI) that was initiated in April 2022. This Special Directive mandates that MBTA undertake three required actions within its system to address the pattern of safety incidents and interim safety findings concerning lapsed training certifications of safety-sensitive rail personnel.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

In response to MBTA's continued safety challenges, FTA decided in April 2022 to conduct a Safety Management Inspection (SMI) of MBTA. This Special Directive is based on the MBTA's ongoing safety issues and on the interim findings of FTA's SMI, which began in April 2022 and is still in progress. FTA is issuing this Special Directive while the SMI remains in progress because the SMI has revealed several serious safety issues that warrant immediate corrective action.

MBTA documentation reviewed by FTA in late April 2022 on the training and recertification status of rail transit operations personnel indicates that substantial numbers of personnel had not been recertified as specified in MBTA's training program. MBTA's rail transit operations training program specifies annual recertification for all rail transit personnel. Certification status is monitored by the MBTA Training Department. Of the four rail transit lines, the Green Line had the highest levels of non-compliance, with 221 motorpersons (41%), 25 inspectors (26%), 8 supervisors (50%), and 12 yard masters (100%) late for annual recertification. Recent safety events on the Green Line have highlighted challenges with knowledge of and compliance with key safety rules.

Deficiencies also existed for heavy rail transit lines. While non-compliance among motorpersons was less than 5%, 25% of Orange Line, 14% of Red Line, and 33% of Blue Line supervisors were out of compliance with recertification requirements.

MBTA's Agency Safety Plan, dated June 3, 2021, confirms that rail transit operations employees must "receive all mandatory MBTA-wide training courses" to ensure MBTA employees "are trained and competent to perform in their job functions."

Review of recent safety events and results of interviews, on-site observations, and inspections on MBTA's system also identified numerous instances of non-compliance with MBTA's operating rules and procedures, including on speeding and unlocked switches; failure to follow right-of-way safety program requirements specified for train motorpersons and rules governing the movement of trains into and out of carhouses; and numerous challenges associated with safely troubleshooting rail transit vehicles. FTA also identified out-of-date rules, policies, and procedures for operations and the right-of-way safety program.

Given these challenges, FTA is concerned that existing training and related materials may not adequately support motorpersons in understanding MBTA's written rules, procedures, and current requirements. FTA also found that the MBTA's Operations Training Department is significantly understaffed and, while recent improvements have been made, additional resources are required to update rules, procedures, and training and to monitor the performance and recertification of MBTA's operations personnel.

This Special Directive identifies three (3) required actions that MBTA must take to ensure that all employees responsible for the movement of trains are currently trained and certified according to the MBTA's training program and consistent with 49 CFR § 673.29(a). FTA and DPU will monitor MBTA's implementation of these safety-critical required actions.

As MBTA works to improve the quality of its MOW programs, the findings and required actions outlined in this Special Directive will assist the agency in focusing its attention on safety-critical priorities as it addresses these immediate concerns.

Additionally, FTA will work with the DPU and MBTA to review and revise all pre-existing corrective action plans as appropriate to ensure that MBTA continues to make timely progress towards building and maintaining a robust safety culture within the agency.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 1: Immediate Actions Ensuring that Operations Staff Are Recertified			
Finding		Required Actions	
Finding 1	MBTA does not ensure that operations personnel are recertified.	FTA-LC- 22-001	<p>MBTA must ensure that staff operating revenue service trains and supervising train movements and revenue service trains are certified.</p> <p>Specific Details:</p> <p><u>Submittal #1:</u> MBTA must submit to FTA and DPU each week prior to the next week's day's service a detailed revenue service schedule for each MBTA rail line. This document shall include employee number, route employee is assigned, length of shift in hours, last date of training compliance, and number of hours between assigned shift and current shift. This form must be signed by the Director of Operations, the Chief of Safety and the General Manager that verifies that each employee assigned to work a shift is certified to MBTA's certification and retraining standards. This action is required beginning 48 hours after the issuance of this Directive and will be required each week for a minimum of six (6) weeks and until there is satisfactory demonstration that schedules are made with certified personnel.</p> <p><u>Submittal #2:</u> MBTA must submit to FTA and DPU within 24 hours of each week's operation the "as performed" schedule. This form will validate that any changes to schedule due to</p>

	employee substitutions were filled with certified personnel. This action is required for a minimum of six (6) weeks following the initial schedule submission and will be required until there is satisfactory demonstration that substitutions are made with certified personnel.
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MBTA will begin reporting on Friday, June 17, 2022, for the next work week starting Sunday, June 19 or Monday, June 20 to respond to the required actions set out in Category 1 of this Special Directive, including providing additional information for consideration and proposing any equivalent alternate actions for consideration by FTA's Administrator.

FTA will validate that MBTA is submitting the weekly required submissions associated with Category 1, and FTA will continue to conduct weekly meetings with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

Category 2: Corrective Plans and Procedures to Ensuring that Operations Staff Are Recertified			
Finding		Required Actions	
Finding 2	<p>MBTA does not ensure it meets its operational training and recertification requirements for personnel responsible for the movement of railcars.</p> <p>Note: MBTA's rail transit operations training program for its rail transit lines specifies annual recertification for all rail transit personnel. Certification status is monitored by the MBTA Training Department.</p>	FTA-LC- 22-002	<p>MBTA must ensure that personnel with lapsed certifications are not placed on duty to perform or supervise train operations. MBTA must develop and implement procedures to ensure that only trained and certified personnel are scheduled to operate or supervise the movement of railcars.</p>

<p>Finding 3 MBTA does not effectively train and certify personnel responsible for the movement of railcars.</p>	<p>FTA-LC- 22-003 MBTA must create, review, and/or update its training materials to include:</p> <ul style="list-style-type: none"> • Training and certification manuals for each line, to include manuals for operators and supervisors. • Updated rulebooks for all train lines, enforce version control. • A compilation of temporary and permanent orders. <p>MBTA must make training materials available electronically and ensure that employees who have enrolled for training have completed the training.</p>
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Thirty-five (35) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA and DPU that identifies the specific actions that will be performed to address required action specified in Category 2 of this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to conduct bi-weekly meetings with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: June 15, 2022



Veronica Vanterpool
Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-9, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

**Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority
Related to Managing the Impact of Operations, Maintenance, and Capital Project Requirements on the Existing Workforce**

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-9 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies four findings requiring action that the MBTA must take to address FTA's findings. The findings and required actions outlined in this Special Directive will assist the MBTA in focusing its attention on balancing demands from operations and capital projects with workforce capacity and capability to inform resource prioritization.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail, bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted an SMI of the MBTA rail transit system management, operations, and maintenance programs between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system,

which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 1 and is based on FTA's determination that the MBTA is not effectively balancing safety-critical operations and maintenance activities with its efforts to deliver capital projects. This lack of balance is at the center of many of the MBTA's safety challenges.

FTA found that an organizational focus on capital projects has diverted management attention and resources away from the agency's operations and maintenance, allowing the agency to operate a level of service that is not adequately staffed, trained, supervised, or maintained. In addition, existing staffing levels and capabilities do not provide adequate safety oversight for the design, construction, and testing of new capital projects and do not support widespread safety certification of these projects, which is an industry standard practice. MBTA also has experienced a series of construction safety events due to the lack of oversight of worksites.

Resources for Operations and Maintenance

Over the last four years, the MBTA's capital budget has more than doubled, from approximately \$875 million in fiscal year 2018 to over \$2 billion in fiscal year 2022. At the same time, the MBTA is still recovering from the long-standing impact of funding cuts made in 2015-2019 to the MBTA's operations and maintenance budget, which resulted in a reduction in hundreds of millions of dollars and hundreds of positions.

Since 2020, MBTA's transit organization has averaged a 10-percent vacancy rate from budgeted positions with key technical and supervisory positions averaging 20 to 35 percent vacancy rates. For example, MBTA's Transit Workforce Staffing Report by Department (budgeted vs actual) for fiscal year 2022 (beginning July 1, 2021) shows 5,554 active employees for 6,349 budgeted positions - a staffing gap of 795 positions or 12.5 percent. For fiscal year 2021 (beginning July 1, 2020), there were 5,537 active employees for 6,279 budgeted positions - a staffing gap of 742 position or 11.8 percent. So far in fiscal year 2023 (beginning July 1, 2022), there are 5,781 active employees for 6,679 budgeted positions, or a

staffing gap of 898 positions or 13.4 percent.

In addition, specifically for MBTA's rail transit system, over the last two years, some key technical and supervisory positions have averaged 20 to 35 percent vacancy rates, including Operations Control Center dispatchers and supervisors, signal technicians, vehicles repairers, and traction power technicians.

Interviews with MBTA personnel at all levels of the agency indicate that budgeted positions, which have increased under MBTA's current leadership team, do not reflect the true measure of required staff levels because they do not consider the additional responsibilities associated with capital project delivery. In some instances, required staff levels are calculated to rely on overtime to cover staff vacations and training. Interviews with a range of personnel throughout the MBTA's organization indicate that the overall MBTA transit system may be between 1,500 and 2,000 active positions short in managing its current level of activity.

For the last five years, the MBTA's budgeted positions have exceeded its actual active workforce by approximately 7 to 10 percent.¹ The agency also is experiencing significant attrition and retirement of seasoned personnel, with a large cohort of MBTA's technical and supervisory personnel now eligible for retirement. Vacancies in technical positions affect the safety of MBTA's operations, maintenance, and capital project delivery.

FTA notes that MBTA's leadership team has established a strategic hiring plan for fiscal year 2023. This plan sets a goal of hiring over 2,000 workers, including 330 workers funded by the capital budget and 1,759 workers funded by the operating budget in fiscal year 2023. The MBTA's fiscal year 2023 strategic hiring plan may offset some of these challenges, but only if it is successfully executed with a focus on filling positions with safety impact for the agency.

FTA's SMI found that MBTA's leadership is focused on using longer-term capital projects to "build the agency" out of many of the challenges of a legacy system. However, as discussed in FTA's Special Directive 22-4, key elements of this approach are significantly impacting preventive maintenance inspections and repairs for the aging system, exacerbating the deterioration of aging infrastructure and assets that are not the focus of the capital program.

MBTA reported that, due to the challenges and uncertainties of the COVID-19 public health emergency, they have not completed action to address previous findings regarding the need to assess staffing needs for operations and maintenance. Nevertheless, during this same period, MBTA aggressively moved forward with its \$2 billion-per-year capital program, supported largely by existing and overtime resources from the agency's operations and maintenance departments and contractors. In January 2022, MBTA's leadership team and Board of Directors took the unprecedented step of transferring an additional \$500 million from the MBTA's operating budget to its capital budget.

FTA also found that MBTA lacks resources to adequately manage its \$2 billion capital program and complete capital projects on time and without need for retrofits and workarounds. This situation has

¹ Budgeted positions from FY 2019 through FY 2023 totaled 31,099 (across 5 years) with 28,197 active positions during this same time, for an approximately 9 percent vacancy rate over the five-year period.

resulted in deteriorated assets, whether rail transit vehicles, track, switches, stations, facilities, or other elements, remaining in service longer than intended with additional maintenance needs. These assets are vulnerable to failure in new and potentially unexpected ways, such as the September 28, 2021 safety event, when a piece of a restraining rail assembly came loose on the track outside of Broadway station and derailed a train; the April 22, 2022 event when an aging door assembly malfunctioned and a train took power with a passenger trapped between its door panels, resulting in a fatality; or the July 21, 2022 train fire on the transit bridge over the Mystic River, where a rusty sill panel fell off a rail transit train and contacted the third rail.

Emphasizing capital project demands above passenger operations and preventive maintenance can negatively impact the safety culture of the agency. FTA found that unwritten norms have emerged that emphasize a “get it done and go” mentality over following safety rules or ensuring compliance with minimum safety standards, particularly when staff are working 12 to 16-hour days, six days a week.

Resources for Safety Certification

MBTA’s Agency Safety Plan defines safety certification as “a process used to verify safety- related requirements are incorporated into a project, thereby demonstrating that it is operationally ready for revenue service and safe and secure for passengers, employees, public safety agencies, and the general public.” MBTA’s Agency Safety Plan also incorporates by reference MBTA’s Safety Certification Program (SAFE 1.09.00), as the guiding document outlining MBTA’s safety certification process.

The MBTA’s safety certification program requires MBTA’s Safety Department to review all facilities and system designs for safety input. For most capital projects, MBTA’s Engineering and Maintenance (E&M) functions are responsible for safety engineering including project design, compliance with safety and security certification, workplace safety, and supervision of E&M projects.

Documents and records shared by the MBTA reveal a minimal safety certification process for most capital projects. The MBTA was unable to provide safety certification plans as requested for the Green Line Wayside Signal, Green Line B Branch Consolidation, and Green Line D Branch Track and Signal capital projects, among others. In addition, even though the Safety Department is a final signatory on capital project and vehicle certifications, the MBTA was unable to produce any records showing the results of review made by the Safety Department on the certification packages for these vehicles beyond the signature for concurrence.

Interviews also indicated that there is a shortage of Safety Department and other MBTA personnel to support project engineering, start-up, and testing activities. The lack of available personnel can also impact testing and acceptance schedules as well as the activities that can be performed. For example, interviews with MBTA’s Capital Transformation team revealed that Green Line D Branch track and signal contractor had consistently been denied access for several scheduled work outages due to a lack of MBTA personnel necessary to support access. This results in needless delays and can place pressure on the completion of safety critical tests and verification activities.

Resources to Oversee Contractor Safety

The MBTA conducts a range of capital projects to replace, upgrade and expand infrastructure elements on its rail transit system. Many of these projects include active worksites on MBTA property and many

of these contractor managed worksites are accessed by MBTA employees and vehicles as part of normal operations (e.g., the MBTA will continue to use yards that are under construction to house or repair out of service vehicles). Therefore, during the SMI, FTA reviewed several safety events that occurred at contractor worksites on MBTA property, including derailments of work vehicles, electrocutions, fire and smoke events, burns, and falls and found instances of noncompliance with MBTA safety rules. As a result of these reviews, FTA finds that additional supervision at MBTA's contractor work sites is necessary to ensure compliance with MBTA's safety requirements.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 1: Managing the Impact of Operations, Maintenance, and Capital Project Requirements on the Existing Workforce			
Findings		Tracking #	Required Actions
Finding 1	MBTA's staffing levels are not commensurate with the demand for human resources required to carry out current rail transit operations and maintenance in addition to expanding capital program activities.	FTA-22-MBTA-CAT1-1	<p>MBTA must conduct and submit to FTA a workforce analysis and associated workforce planning to include:</p> <ol style="list-style-type: none"> 1. <i>Required activities that must be performed for rail transit operations, maintenance, and capital projects delivery:</i> A description of present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years. 2. <i>Required resources to perform mission-critical activities:</i> A description of the assignment of the necessary human resources to support present and projected day-to-day requirements for rail transit operations, preventive and corrective maintenance, and capital delivery through the next five fiscal years per the description above. 3. <i>Current staffing capabilities for mission-critical activities:</i> The results of an assessment of MBTA's ability to safely operate, maintain, and complete capital project delivery for its rail transit system at current service levels of workforce. 4. <i>Safety case for mission-critical activities that can be performed within current and projected resources over the next five fiscal years:</i> The identification of safety risk associated with current staffing shortages and how they are or will be mitigated and any needed changes or reductions in activities.

Category 1: Managing the Impact of Operations, Maintenance, and Capital Project Requirements on the Existing Workforce			
Findings		Tracking #	Required Actions
Finding 2	MBTA has not demonstrated the organizational capacity to recruit and hire personnel to meet authorized staffing levels.	FTA-22-MBTA-CAT1-2	MBTA must develop and implement a recruitment and hiring plan to address findings from its workforce analysis and associated workforce planning for at least a five-year period, including how it will expand its capabilities for recruiting and hiring personnel to fill operations, maintenance, and capital project delivery positions.
Finding 3	Additional resources are needed to support MBTA's safety engineering and safety certification process for capital projects.	FTA-22-MBTA-CAT1-3	MBTA must modify safety engineering and certification requirements for its capital projects and vehicle procurements and ensure they are addressed through additional E&M and Safety Department staffing, contractor resources, or a combination of approaches. This may be done as part of the workforce analysis in Finding 1, or as part of a separate initiative.
Finding 4	MBTA requires additional oversight of contractor work sites.	FTA-22-MBTA-CAT1-4	FTA recommends that MBTA review the inspection and resident engineering resources needed to ensure compliance with MBTA safety rules related to the Right of Way to ensure the safety of personnel while in active work zones through additional staffing, contractor resources, or a combination of approaches.

Thirty (30) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-10, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to Prioritization of Safety Management Information

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-10 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies six findings requiring action that the MBTA must take to enhance and expedite implementation of the agency's SMS, including the development of procedures, safety management training, safety risk assessment, and safety assurance activities to build the organization's capability to identify safety concerns and to prioritize action to mitigate safety risk.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight (SSO) Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted an SMI of the MBTA rail transit system management, operations, and maintenance programs, between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system, which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four (4) categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 2 and is based on FTA's determination that MBTA has not implemented Safety Management System (SMS) practices in the field that support the identification, analysis, and prioritization of safety information. FTA found that MBTA has not developed the necessary tools and capabilities to support the management of safety risk. As a result, MBTA has been unable to prioritize safety concerns and, subsequently, resources to mitigate safety risk.

SMS Implementation

To assess the status of SMS implementation, FTA reviewed MBTA's SMS implementation plan. FTA found that the SMS implementation plan lacks basic project management principles, including actionable details. FTA found that the lack of detail in the plan makes it unlikely that MBTA executives and managers can determine the extent of the integration of SMS processes and activities within its operations. FTA found that MBTA leadership, from executives through managers to supervisors, did not have a clear understanding of their role in SMS. During field activities, when discussing SMS, MBTA officials' answers were general and lacking in detail and examples.

While recognizing that the implementation of SMS is a complex and multi-year progressive process, the evidence available to FTA indicates ineffective performance of the components of SMS already implemented. FTA found that the imbalance in the allocation of resources between operations and capital project oversight, discussed in Special Directive 22-9, also negatively impacted MBTA's SMS implementation planning and plan execution. For effective SMS implementation and operation, the Accountable Executive (MBTA's General Manager) must set specific expectations for SMS outcomes, as well as provide adequate resources for SMS implementation activities to ensure the integration of the management system into day-to-day operations. FTA did not find evidence that the Accountable Executive set expectations regarding how the SMS generates and prioritizes safety information and did not specify the type of safety information needed to support safety risk resource allocation decisions for MBTA's operations and maintenance.

Prioritized and Actionable Safety Information

FTA found that MBTA's executive leadership has yet to provide explicit direction regarding the type of safety information it requires and has not established the necessary organizational structures to support the movement of safety data from the field to the Board room. FTA determined from interviews and document reviews that, in the absence of direction, MBTA leadership and managers receive raw, unanalyzed safety data as opposed to prioritized information to support strategic decisions related to safety resource allocation.

FTA identified that MBTA primarily relies on corporate memory and management experience, rather than an analysis of safety information, as the means to support decision making related to safety concerns and safety risk. FTA appreciates the role that both corporate memory and experience play during safety risk management and safety assurance activities; however, MBTA was unable to provide evidence of safety analyses to support decisions made to assess and/or mitigate safety risk.

FTA also observed that limited accountability is placed on operating groups and the Safety Department to provide executive management with information that factually substantiates safety risk assessments and the development of safety risk mitigation strategies or provide executive leadership actionable information for safety resource allocation decision making. MBTA's organizational safety currency does not yet include data compiled, analyzed, and prioritized into information.

Collection and Analysis of Safety Information

FTA reviewed over 100 safety event investigation reports completed by MBTA from 2019 through July 2022 and found that MBTA has greatly improved its investigation fact finding process. FTA observed improvement in the level of detail, analysis, and identification of probable cause and contributing factors included in the investigation reports. While there have been improvements, FTA observed gaps that remain in the safety event data collection process and opportunities for additional data and fact finding beyond information provided by MBTA's Safety Department during interviews and document submissions.

FTA also found that operating departments do not routinely collect data to monitor safety concerns. Based on interviews and records reviews, FTA found this to be primarily a symptom of a lack of sufficient resources for operations and maintenance needs and a lack of consistent processes for determining safety priorities. As a result, MBTA relies on information from safety accidents, incidents, and occurrences to identify weaknesses or shortcomings in safety risk mitigations instead of aligning its safety monitoring, auditing, and compliance activities with data-driven safety management priorities.

FTA found that the Safety Department has limited direct access to operations and maintenance data and primarily relies on the receipt of Microsoft Excel workbooks. The lack of integration between data sets results in substantial manual entry of data such as CAP implementation and status, accident investigation activity and document tracking, and analysis and trending. During interviews, MBTA officials indicated that there is a lack of interaction between operations and safety departments to discuss strategies and

tactics for improving data accessibility.

Currently, the Safety Department maintains different logs designed to support hazard identification, employee safety reporting, safety risk assignment, and safety risk mitigation monitoring. FTA found that occasionally the logs contain information related to the same hazardous condition meaning that the Safety Department is manually entering singular data points into multiple sheets. FTA also found instances where the likelihood and severity ratings, as well as the safety risk indexing, did not correspond to MBTA's safety risk assessment Agency Safety Plan requirements. This could be due to the duplicate manual entry of similar data or a lack of sufficient internal training on the safety risk assessment process.

As previously discussed, MBTA currently lacks an integrated plan that defines outcomes for safety management activities and that includes utilization of safety data-related tools. The lack of necessary leadership direction and data integration negatively impacts the Safety Department's ability to analyze, prioritize, and report on safety data in a timely manner. The current suite of tools requires a level of manual entry and data manipulation beyond Safety Department resource capacity.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
Finding 1	MBTA has not ensured that the necessary structures are in place to support effective implementation and operation of its SMS.	FTA-22-MBTA-CAT2-1.A	MBTA must conduct a critical and comprehensive review of its entire SMS planning, implementation, and operational processes and activities to address the gaps discussed in this finding.
		FTA-22-MBTA-CAT2-1.B	MBTA must update its SMS Implementation Plan to reflect the results of this review, including defined actions, timeframes, responsibilities, and expected outcomes.
Finding 2	MBTA executive leadership does not receive prioritized and actionable information related to safety risks or shortcomings in safety risk mitigations.	FTA-22-MBTA-CAT2-2	<p>MBTA leadership must:</p> <ol style="list-style-type: none"> 1. Work with safety and operating department leads (including maintenance and engineering departments) to define explicit criteria for prioritizing safety risks. 2. Include explicit safety risk acceptance criteria in its Agency Safety Plan and/or reference documents. 3. Work with MBTA's Safety Department and operating department leads (including maintenance and engineering departments) to define how safety information must be presented to MBTA leadership in a prioritized and actionable manner. 4. Require, and provide means for, operating department leads (including maintenance and engineering departments) to elevate proposed safety risk mitigations, including their status, that require MBTA leadership approval for resourcing. This must include safety risk mitigations deemed ineffective or inappropriate and that require executive level decision regarding the redirection of, or additional, resourcing.

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
Finding 3	MBTA Executive Management does not consistently ensure its decisions related to safety risks are based on safety data analysis or documented facts.	FTA-22-MBTA-CAT2-3.A	MBTA must map its safety data flows and supporting processes.
		FTA-22-MBTA-CAT2-3.B	MBTA must establish explicit accountabilities and responsibilities for safety data flows as a component of safety information management (collection, analysis, communication, storage, and retrieval of safety data).
		FTA-22-MBTA-CAT2-3.C	MBTA must provide formal training in safety information management to relevant personnel.
		FTA-22-MBTA-CAT2-3.D	MBTA must demonstrate that its executive management uses and promotes the usage of safety data analysis and/or documented facts in decision-making related to safety risk.
Finding 4	MBTA's safety investigations and safety assurance activities do not consistently collect and analyze information on precursor factors.	FTA-22-MBTA-CAT2-4.A	MBTA must update its Safety Assurance process to include monitoring of safety risk mitigations with a) compliance-based activities to provide the baseline for monitoring implementation status and b) performance-based activities to monitor the actual effectiveness of safety risk mitigations.
		FTA-22-MBTA-CAT2-4.B	MBTA must prepare a monthly look-ahead schedule for prioritized safety risk monitoring activities that include safety risk mitigations and corrective actions in place to address MBTA's highest safety priorities.
		FTA-22-MBTA-CAT2-4.C	<p>MBTA must develop and document guidance, and deliver training for safety investigators that ensure the consideration of precursor factors in the analysis of the chain of events leading to a safety event (accident, incident, or occurrence), including but not limited to, for example:</p> <ul style="list-style-type: none"> • Suitability of resources available to frontline

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
			<p>personnel for operational and maintenance activities</p> <ul style="list-style-type: none"> • Deficiencies in policies, procedures, rulebooks • Outdated policies, procedures, and rulebooks • Deficiencies/inadequacies in training Shortcomings in supervision • Deviations from procedures and rules Reasons for lack of adherence to procedure and rules • The limited success of discipline to address safety issues
Finding 5	MBTA's safety risk assessment guidance as part of its Safety Risk Management is ambiguous and has led to confusion among stakeholders regarding their responsibilities and authorities, which has created delays in carrying out safety risk assessments activities.	FTA-22-MBTA-CAT2-5.A	MBTA must develop and document criteria for conducting safety risk assessments consistent with the basic principles of safety management and the tenets of SMS as conveyed in FTA's SMS guidance materials.
		FTA-22-MBTA-CAT2-5.B	MBTA must develop explicit direction for the ownership of safety risk assessments among the Safety Department and the operating departments. Documentation must include providing explicit roles, responsibilities, and thresholds of authority of each department involved.
		FTA-22-MBTA-CAT2-5.C	MBTA must include in the above criteria directives to ensure that operating departments including subject matter expertise, own safety risk assessments, while safety officials provide support for safety risk assessments and reports on results to Executive Leadership for safety resource allocation priorities.

Category 2: Prioritization of Safety Management Information			
Findings		Tracking #	Required Actions
		FTA-22-MBTA-CAT2-5.D	MBTA must expand its policy of establishing a pre-defined schedule of safety risk assessment workshops and develop criteria attuned with the nature of hazard identification (I.e., as they are identified), to expedite safety risk assessments to support prioritization for resource allocation.
Finding 6	MBTA safety information management tools (hazard log, safety risk mitigation log, etc.) do not fully support prioritization of resources to address safety risk and safety performance monitoring.	FTA-22-MBTA-CAT2-6.A	MBTA must evaluate (and correct) the data contained in its hazard log and safety risk mitigation log for accuracy and relevancy to SMS.
		FTA-22-MBTA-CAT2-6.B	MBTA must expedite the build out of its safety risk and safety risk mitigation monitoring information tools.
		FTA-22-MBTA-CAT2-6.C	MBTA must demonstrate use of its safety information management tools to effectively prioritize its resources to address the results of: <ul style="list-style-type: none"> • Safety Risk Monitoring • Safety Performance Monitoring

Forty-five (45) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-11, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to the Effectiveness of Safety Communication

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-11 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies three findings requiring action that the MBTA must take to improve MBTA's management of its safety committee process, employee safety reporting program, and safety promotion activities.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail, bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight (SSO) Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted a SMI of the MBTA rail transit system management, operations, and maintenance programs, between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system, which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's

SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four (4) categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 3 and is based on FTA’s determination that there is a lack of routine, consistent, and meaningful communication regarding safety issues across departments and with frontline workers.

Safety Committee Follow Up

In its Agency Safety Plan and supporting procedures, MBTA documented a structure of safety committees and groups to facilitate information sharing of safety topics. During interviews, FTA was able to confirm that committee and group meetings are convened as scheduled. FTA obtained detailed anecdotal information of the items discussed during the meetings, but learned that safety information from these meetings (that may include presentations, safety data, and analysis) is not formally recorded, either by the Safety Department or by other committee function. MBTA could not provide documentation of safety issues raised and discussed, nor records of safety decisions or actions. MBTA also could not provide documentation to demonstrate a formal process for managing the outcomes of these discussions.

MBTA has established local safety committees, which are smaller workforce groups based on work location, as a primary forum to receive safety information from frontline personnel. These forums provide an avenue for workers to share, and the agency to obtain, information on the safety performance of the agency in the field. During interviews and records review, FTA learned that:

- local safety committee meetings often do not have frontline representation (FTA confirmed this with Safety Department officials and Local 589 union members and union leadership),
- staffing shortages prevent frontline employee participation because they are scheduled for work during meetings,
- there is no demonstrated accountability of the Safety Department representative to document or report out the information discussed during the meetings,
- frontline personnel provide information to supervisors who serve as their proxies, but there is no requirement for employee safety concerns to be documented or acted upon by supervisors.

Given FTA’s findings related to shortcomings in safety data prioritization and presentation (Special Directive 22-10), FTA finds that the absence of outcome documentation from local safety committee

meetings can lead to:

- subsequent actions that are left to interpretation and individual departmental prioritization,
- absence of clearly assigned departmental responsibilities regarding implementation and monitoring of actions, and
- undefined timeframes for actions.

Employee Safety Reporting Program

In 2019, MBTA established its Employee Safety Reporting Program (ESRP). MBTA's Agency Safety Plan states that "MBTA's voluntary, confidential, non-punitive employee reporting program allows for the submission of information related to observed hazards, sole-source safety events, or inadvertent errors without an associated legal or administrative requirement to report. Reported information should be used solely to support the enhancement of safety. and "Voluntary reporting is non-punitive because it affords protection to reporters, thereby ensuring the continued availability of such information to support continuous improvements in safety performance."

FTA observed, and MBTA officials agreed, that the MBTA's ESRP is in actual practice largely limited to the Safety Hotline. FTA analyzed the Safety Hotline log and noted that many of the reports are anonymous which may indicate a weakness in the program as MBTA is unable to follow up with workers on reported concerns. The 20 to 25 Safety Hotline reports per month for an organization of the size of MBTA may indicate a reluctance or skepticism in the safety reporting environment.

Frontline employees have the option to report safety concerns verbally to supervisors who must then elevate the report to the Safety Department. However, there is no established procedure nor controls that ensure that all reports verbally submitted to supervisors are elevated through the system. FTA finds that this creates the probability for loss of potentially valuable safety information and results in under-reporting.

FTA reviewed the Safety Hotline log and found that only a small percentage of reports are about safety concerns and most reports do not rise above the level of individual location "housekeeping" issues or complaints. MBTA indicated that it has conducted ESRP training and consistently promotes the program; however, FTA did not see evidence (neither during discussions with employees nor through a review of the Safety Hotline log) that frontline employees have clarity or instruction on what to report and, most importantly, what not to report through the safety hotline. This potentially generates a situation where the Safety Hotline log contains many reports, but those reports contain scarce actionable safety information. The large number of reports make it difficult to isolate actionable safety information.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 3: Effectiveness of Safety Communication			
Findings		Tracking #	Required Actions
Finding 1	MBTA has not established explicit and formal provisions to ensure safety information from safety committee results in a consistent outcome of documented, prioritized, and actionable safety information.	FTA-22-MBTA-CAT3-1.A	<p>MBTA must develop and describe, in the organization's SMS documentation, instructions regarding the conduct, recording, communication and follow up of the outcome consensus decisions specific for each of the following meetings - taking into consideration the nature (strategic or tactical) of each meeting:</p> <ul style="list-style-type: none"> • Operations and Safety Biweekly call (currently every other Friday) • Operations and Safety weekly meeting (currently on Wednesdays) • Executive Safety Committee (ESC) • Safety Management Review Committee (SMRC) • Safety Management Working Groups (SMWGs) • Data Analysis Group (DAG) • Local Safety Committee Meetings • Joint Labor/Management Safety Committee (required by Bipartisan Infrastructure Law)
		FTA-22-MBTA-CAT3-1.B	In support of the above, MBTA must develop and describe, in the organization's SMS documentation, a formal mechanism and associated guidelines to ensure that the meetings are consistent in the identification and analyses of safety concerns and hazards; prioritization of safety risks; implementation of corrective actions; and safety risk mitigation effectiveness monitoring.
Finding 2	MBTA has not documented explicit and formal provisions to ensure the participation of frontline	FTA-22-MBTA-CAT3-2.A	MBTA must develop explicit and formal guidelines for the expected role and contribution of frontline employees to the local safety committee meetings.

Category 3: Effectiveness of Safety Communication			
Findings		Tracking #	Required Actions
	employees in local safety committees as part of their job responsibilities in relation to the agency's SMS.	FTA-22-MBTA-CAT3-2.B	MBTA must develop instructions for the conduct of the meetings, including explicit departmental accountabilities for meeting outcome information capture, communication and follow up.
Finding 3	MBTA management has not effectively communicated clear direction to frontline employees on what to report and what not to report through the Safety Hotline.	FTA-22- MBTA-CAT3-3.A	MBTA must expedite the development of an effective ESRP as a fundamental source of safety information for hazard identification and safety performance monitoring.
		FTA-22-MBTA-CAT3-3.B	As part of the development of an effective ESRP, MBTA must provide explicit direction to frontline employees on what to report and what not to report through the ESRP (including the safety hotline).
		FTA-22-MBTA-CAT3-3.C	As part of the development of an effective ESRP, MBTA must provide refresher training to stakeholder personnel on the role of employee safety reporting within SMS and the crucial contribution managers and supervisors play in the development of an effective safety reporting context.

Twenty (20) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation

UNITED STATES DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

[Special Directive No. 22-12, Notice No. 1]

Special Directive Under 49 U.S.C. § 5329 and 49 CFR Part 670

Required Actions to Address Findings from the Federal Transit Administration Safety Management Inspection Conducted at the Massachusetts Bay Transportation Authority Related to Operating Conditions and Policies, Procedures, and Training

AGENCY: Federal Transit Administration (FTA), U.S. Department of Transportation (DOT).

SUMMARY: FTA issues Special Directive 22-12 to require the Massachusetts Bay Transportation Authority (MBTA) to address findings documented in FTA's Safety Management Inspection (SMI) report released on August 31, 2022. Conducted between April 14 and June 30, 2022, FTA's SMI reviewed the MBTA rail transit system management, operations, and maintenance programs. This Special Directive identifies seven (7) findings requiring action that the MBTA must take to improve MBTA's management of its operating and maintenance policies, monitoring of rail transit operations, Quality Assurance/Quality Control capabilities, and training and procedures.

FOR FURTHER INFORMATION CONTACT: For program matters, Mr. Joseph DeLorenzo, Associate Administrator for Transit Safety and Oversight and Chief Safety Officer, telephone (202)-366-1783 or joseph.delorenzo@dot.gov; for legal matters, Ms. Emily Jessup, Attorney Advisor, FTA, telephone 202-366-8907 or emily.jessup@dot.gov.

SUPPLEMENTARY INFORMATION:

MBTA is a division of the Massachusetts Department of Transportation (MassDOT), providing heavy rail (subway), light rail, bus, commuter rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island. While MBTA has recently embarked on a significant program of capital improvements, the agency faces systemic challenges in maintaining its aging infrastructure in a state of good repair and managing the ongoing operations of its complex equipment and systems. These challenges require greater focus, assessment, and resource prioritization, at all levels of the organization, to ensure that the system remains safe for both passengers and workers. Under FTA's State Safety Oversight (SSO) Rule, the Massachusetts Department of Public Utilities (DPU) was certified in 2018 as the State Safety Oversight Agency charged with providing Federally required safety oversight of the MBTA rail transit system.

FTA conducted a Safety Management Inspection (SMI) of the MBTA rail transit system management, operations, and maintenance programs, between April 14 and June 30, 2022. MBTA's rail transit system includes the Red, Orange, Blue, and Green Lines and the Mattapan Trolley. FTA's SMI did not include the commuter rail system, which is under the jurisdiction of the Federal Railroad Administration, or MBTA's bus transit system.

FTA performed this SMI to address an escalating pattern of safety incidents and concerns on the MBTA's rail transit system, including rates and numbers of derailments, collisions, and passenger and employee injury events significantly exceeding industry average and peer-based assessments. FTA's SMI also addressed deficiencies FTA identified in the SSO program administered by the DPU, which limit its ability to provide effective safety oversight for the MBTA.

FTA published the SMI report on 08/31/2022. In the report, FTA issued a total of 20 findings to the MBTA across the following four (4) categories:

1. Category 1 – Managing the impact of operations, maintenance, and capital project requirements on the existing workforce
2. Category 2 – Prioritization of safety management information
3. Category 3 – Effectiveness of safety communication
4. Category 4 – Operating conditions and policies, procedures, and training

This Special Directive addresses Category 4 and is based on FTA's determination there are numerous inconsistencies between MBTA operating conditions and practices and the agency's written policies, procedures, practices, and training.

Compliance with Rules and Procedures

FTA observed instances where employees were not complying with required safety, operations, and maintenance rules and procedures. FTA's Special Directives 22-4, 22-5, 22-6, and 22-7 document instances of non-compliance. For example, FTA noted violations in right of way safety rules and vehicle operating rules, preventive maintenance inspections that were not completed as required, inappropriate storage of chemicals in rail yards, an unlocked signal on the right of way, incomplete repairs, and rule violations in readying trains for moves in the rail yard. FTA also observed a rail transit vehicle speeding through a work zone.

FTA also found instances where procedures are well-documented and available but are not followed or enforced, and where workers were required to perform specific activities but were not given the resources or guidance necessary to complete the work. Conversely, FTA found outdated procedures and a lack of operational assessments to ensure revisions accurately capture changes in the system and required work practices.

FTA reviewed over 100 final investigation reports completed for major safety events experienced at the MBTA between January 1, 2019, and April 29, 2022. In over 85 percent of these reports MBTA identified non-compliance with at least one safety, operating, or maintenance rule as a primary or contributing cause of the accident. Review of these reports also reveals the frequent use of unvetted and ad hoc shortcuts in work practices, outdated procedures that have not kept paces with changes in work environments, violations of safety rules to meet deadlines or vehicle counts, and lack of time and resources to review and update rules and procedures to align them with system changes. Finally, FTA found that MBTA does not use many tools, including checklists, to support implementation of key operating and maintenance procedures in the Operations Control Center (OCC) and rail yards.

Monitoring Operations

MBTA's current activities to monitor compliance with operating and maintenance rules include requirements that supervisors monitor daily job duties for operations and maintenance employees, though most departments do not require formal documentation of this monitoring activity. FTA found that supervisors have a range of responsibilities at the MBTA and do not always have time to complete this monitoring or to follow-up with employees regarding their performance. In interviews across operations and maintenance departments, MBTA staff and supervisors indicated that due to a lack of supervisory personnel and officials, it was challenging to provide frontline personnel, particularly new MBTA hires, with additional support and oversight that they may need to understand and comply with all rules, given the complexity of MBTA's operating environment.

MBTA conducts a Safety Rules Compliance Program or SRCP, but FTA finds that more can be done to identify safety-critical rules and procedures, to support MBTA personnel in understanding these requirements and how to comply with them, and to monitor the overall performance of the agency in complying with these procedures. FTA also finds a lack of consistency in how compliance with operating and maintenance rules is monitored across departments.

QA/QC Program

The MBTA uses a QA/QC program to support oversight of vehicle maintenance and engineering activities. These inspections provide findings, but the inspections are limited to one vehicle per month from each of the four lines. FTA noted that the tracking log provided with these monthly inspection reports did not include any re-inspection dates or activities to address the findings. This process for quality control auditing is almost entirely performed by personnel reporting to rail vehicle maintenance management, thus lacking the independence necessary for an effective QA/QC program.

MBTA also delegates the rail car acquisition program QA/QC to the rail car manufacturer and the MBTA's program management consultant. A QA/QC Plan for MBTA's oversight of these processes was not provided to FTA (QA/QC manuals from the rail car manufacturer and contractor were provided). Not unlike the preventive maintenance policy, the rail car acquisition process lacks an MBTA-specific documented QA/QC program with procedures and roles and responsibilities for an independent internal group to report directly to the highest levels of MBTA management.

Technical Training

Technical training for maintenance personnel is embedded within each technical department (vehicle engineering, maintenance of way, signal and train control, communications, facilities, traction power, etc.). MBTA's OCC and Training Department trains all operations personnel and provides right of way (ROW) safety training. MBTA's Human Resources and Labor Relations Department also provide or support other administrative training and orientation for new employees.

FTA generally found that while strong technical courses have been developed in many areas, there are

insufficient resources available to provide enough offerings to adequately train and refresh personnel. Operations personnel face significant challenges in establishing professional service standards, utilizing different adult learning strategies, and taking advantage of technology to bring the field into the classroom. As a result, there is a great reliance on informal, on-the-job training which is not standardized or overseen.

Based on interviews, records reviews, and field observations conducted across several technical disciplines, FTA also found that MBTA has no agency-wide strategy for technical training to ensure the proficiency of MBTA personnel and that many gaps in training exist for operations and maintenance departments. FTA found that training is under-resourced and fractured and that MBTA relies heavily on on-the-job training.

FTA's SMI found outdated emergency procedures and training. Review of over 100 safety event investigation reports dating back to January 1, 2019, indicates inconsistencies in emergency response and the way that the agency is managing emergencies.

MBTA is in the process of hiring hundreds of new motorpersons to replace those who are retiring or leaving through attrition and to support the promotion of veteran motorpersons to other positions within the rail transit system. In interviews, MBTA's rail transit leadership acknowledges that some new operators seem to be struggling in maintaining a balance between learning MBTA heavy rail operations and preserving a focus on safety. In addressing these challenges, numerous MBTA personnel at all levels of the agency noted that MBTA's bus operations has a mentorship program that many new bus operators find beneficial.

Performance of Radio System

Finally, interviews with frontline operations, maintenance, and OCC personnel highlighted several key locations where radio quality does not consistently support effective radio communications. Radio communications are critical to the safety of the MBTA's rail transit service and FTA finds that more must be done to improve radio quality in these locations.

DIRECTIVE AND REQUIRED ACTIONS:

In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs MBTA to take the following actions:

Category 4: Operating Conditions and Policies, Procedures, and Training			
Findings		Tracking #	Required Actions
Finding 1	Documented operating and maintenance rules and procedures are not implemented as required.	FTA-22-MBTA-CAT4-1.A	Each operating and maintenance department must establish a group to review department-wide information on levels of non-compliance with key rules and procedures critical to the safety of activities performed by the department.
		FTA-22-MBTA-CAT4-1.B	Each department must establish and act on a prioritized list of most frequently violated rules and procedures with the most significant potential safety consequences.
		FTA-22-MBTA-CAT4-1.C	Each department must develop and implement approaches, which could include audits, use of checklists and guides, campaigns, and training, to improve compliance.
		FTA-22-MBTA-CAT4-1.D	Each department must report to the Safety Department monthly on its compliance with identified key rules and procedures critical to the safety of activities performed by the department.
		FTA-22-MBTA-CAT4-1.E	The Safety Department must review and audit these reports and compile a monthly compliance report for MBTA's executive leadership team.
		FTA-22-MBTA-CAT4-1.F	Each department must continue to review safety data to assess effectiveness of actions and to improve compliance with safety rules and procedures.
Finding 2	MBTA does not monitor operations, including the conditions of the operating environment, to identify the reasons for deviations between formal, established standards, rules and	FTA-22-MBTA-CAT4-2	MBTA must develop, document, and communicate a mechanism to monitor operations, and provide training to stakeholder safety and operating personnel on this mechanism, to enable the analysis and understanding of situations of non-compliance.

Category 4: Operating Conditions and Policies, Procedures, and Training			
Findings		Tracking #	Required Actions
	procedures, and actual operations and maintenance practices.		
Finding 3	MBTA's QA/QC program is not sufficiently independent from the activities it oversees.	FTA-22-MBTA-CAT4-3.A	MBTA must develop and administer a QA/QC program to independently oversee of ongoing QA/QC activities.
		FTA-22-MBTA-CAT4-3.B	MBTA must ensure that the QA/QC functions are independent of the functions of the Safety department and report directly to the GM.
		FTA-22-MBTA-CAT4-3.C	MBTA must develop a formal QA/QC procedure that details the oversight of and accountability and roles and responsibilities for QA/QC programs provided by railcar manufacturers and MBTA consultants related to quality control of its railcars and subcomponents.
		FTA-22- MBTA-CAT4-3.D	MBTA must ensure that the MBTA QA/QC independent group is staffed with a sufficient SMEs in necessary disciplines to ensure a complete and thorough understanding of the responsibilities under the purview of railcar maintenance and engineering.
Finding 4	Technical training for operations and maintenance departments is under-resourced and decentralized, without sufficient resources and direction, and relies significantly on on-the-job-training (OJT) which is informal and lacks oversight. Emergency response training is poorly integrated into overall training program.	FTA-22-MBTA-CAT4-4.A	MBTA must conduct a training needs assessment for rail transit operations and maintenance departments, to include emergency response training. This assessment should identify training that needs to be updated, developed, and supported with additional resources.
		FTA-22-MBTA-CAT4-4.B	MBTA must implement the results of the training needs assessment.
		FTA-22-MBTA-CAT4-4.C	MBTA must consider opportunities and adopt technology and other resources to support training development and

Category 4: Operating Conditions and Policies, Procedures, and Training			
Findings		Tracking #	Required Actions
			training management and record-keeping.
Finding 5	MBTA lacks formal resource manuals in key maintenance areas and does not currently provide employees with checklists or other tools to support training and implementation of maintenance rules and procedures.	FTA-22-MBTA-CAT4-5.A	In coordination with required actions already underway to address FTA's Special Directive 22-7, the MBTA must review its existing maintenance rules and procedures; identify opportunities for tools and checklists to support employees in carrying out maintenance rules and procedures; and develop, distribute, maintain, and update these materials.
		FTA-22-MBTA-CAT4-5.B	MBTA must include frontline maintenance personnel in the development evaluation of these tools and checklists.
Finding 6	Due to workforce turnover, MBTA's new motorpersons and officials no longer have access to mentoring from experienced motorpersons and officials (inspectors, chief inspectors, and supervisors).	FTA-22-MBTA-CAT4-6	MBTA must evaluate expanding its existing mentoring program from Bus Transit Operations to include new part-time and full-time rail transit operators or consider establishing a mentoring program specific to rail transit operations. In its evaluation, MBTA should consider opportunities and resources to support the professional development of rail transit operations personnel.
Finding 7	Radio quality is deficient in several key locations and does not support adequate communications between OCC and field employees to ensure the safety of MBTA operations and maintenance.	FTA-22-MBTA-CAT4-7.A	MBTA must confirm radio dead spots with frontline motorpersons and maintenance workers.
		FTA-22-MBTA-CAT4-7.B	MBTA must improve the performance of its radio system in these dead spots.

Thirty-five (35) calendar days after the date of this Special Directive, MBTA must submit a corrective action plan(s) to FTA that identifies the specific actions that will be performed to address required action specified in this Special Directive; the milestone schedule for completing corrective action; the responsible parties for action and their contact information; and the verification strategy for ensuring the completion of required work.

FTA, in consultation with DPU, will review and approve (with revisions as necessary) MBTA's corrective action plan(s) and will monitor the agency's progress in resolving each finding and required action.

FTA will continue to meet with MBTA and DPU to review progress until such time as FTA determines that these meetings are no longer needed or may be conducted with less frequency.

PETITIONS FOR RELIEF OR RECONSIDERATION

As set forth in 49 CFR § 670.27(d), the MBTA has thirty (30) calendar days from the date of this Special Directive to petition for reconsideration with the FTA Administrator. The petition must be in writing and signed by the Chair of the MBTA and must include a brief explanation of why the MBTA believes the Special Directive should not apply to it or why compliance with the Special Directive is not possible, is not practicable, is unreasonable, or is not in the public interest. In addition, the petition must include relevant information regarding the factual basis upon which the Special Directive was issued, information in response to any alleged violation or in mitigation thereof, recommend alternative means of compliance for consideration, and any other information deemed appropriate. Unless explicitly stayed or modified by the Administrator, this Special Directive will remain in effect and must be observed pending review of a petition for reconsideration.

Within ninety (90) days of receipt of the petition, the Administrator will provide a written response. In reviewing the petition, the Administrator shall grant relief only where the MBTA has clearly articulated an alternative action that will provide, in the Administrator's judgment, a level of safety equivalent to that provided by compliance with this Special Directive. In reviewing any petition for reconsideration, the Administrator shall grant petitions only where the MBTA has clearly articulated legal or material facts not in evidence at the time of this Special Directive.

ENFORCEMENT

FTA may take enforcement action for any violation of this Special Directive or the terms of any written plan adopted pursuant to this Special Directive in accordance with FTA's authorities under 49 U.S.C. § 5329, including but not limited to (1) directing MBTA to use Federal financial assistance to correct safety deficiencies; (2) withholding up to 25 percent of financial assistance to MBTA under 49 U.S.C. § 5307; and (3) issuing restrictions or prohibitions (*e.g.*, mandatory speed restrictions, shutdown of a rail line, or complete system shutdown) as necessary and appropriate to address unsafe conditions or practices that present a substantial risk of death or personal injury.

Issued on: August 31, 2022



Veronica Vanterpool

Deputy Administrator
Federal Transit Administration
U.S. Department of Transportation



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



To: Peter Butler, Regional Administrator, Region I FTA
From: Steve Poftak, General Manager MBTA
Date: June 27, 2022
Subject: **Use of Federal Formula Funds for Type 10 LRV Base Order**

The Massachusetts Bay Transportation Authority (MBTA) is currently in the process of procuring a fleet of new 100% Light Rail Vehicles (LRV) for operation on the Green Line subway system replacing the aging high-floor Type 7 and partial low-floor Type 8 fleets. The existing Green Line fleets are reaching the end of their useful lives and will continue to age, resulting in reduced reliability, increased maintenance costs and eventually non-availability that leads to loss of scheduled passenger trips. The MBTA would like to clarify that we plan to fund the current base order contract, for 102 vehicles, through FTA Formula Funds.

These vehicles will be needed for operating on the entire Green Line, including the new extension of the Green Line to Union Square in Somerville and College Avenue in Medford. Due to the long lead time associated with the procurement of specialized light rail vehicles, this item represents a critical path for maintaining safe, reliable, and accessible service on the Green Line.

These new vehicles will be significantly more accessible than our current Type 7, 8 and 9 fleets. All components of the vehicle will meet or exceed the Americans with Disabilities Act (ADA) accessibility requirements. For example, the vehicle passenger area floor will be 100% low floor, allowing for accessible boarding at each double door via automated bridge plates. Multiple dedicated priority areas for passengers using wheeled mobility devices and others will be present throughout the vehicles. The vehicles will include a Passenger Announcement / Visual Monitoring System (PA/VMS) to ensure that announcements are provided both audibly and visually. Each of the 102 vehicles will be compatible and accessible with our existing infrastructure at stations that are accessible today (platforms raised to be 8" above top of rail), as well as the additional 19 Green Line stations/stops that are currently under design and will be accessible within 3-4 years. The Department of System-Wide Accessibility will continue to work closely with Green Line Transformation and Vehicle Engineering regarding these considerations.

The design, engineering and bid support costs for the Type 10 fleet procurement are already funded within an FTA grant (MA-2021-047) and the procurement for the 102-vehicles base order is included in the FFY 2022-2026 STIP utilizing Section 5307 formula funds. The plan is to incorporate the base order procurement costs into an FTA grant application in early FFY 2023, once the contract is awarded and the project cost and schedule are more well-defined. It is our understanding that costs associated with the 102-vehicles base order will be eligible for FTA assistance and costs incurred prior to the FTA grant award will be subject to pre-award authority, provided that all federal requirements associated with Section 5307 formula fund grants are complied with.

On May 12, the FTA accepted the MBTA's request to enter the Project Development phase of the CIG Core Capacity Program for the Green Line Transformation Program Project. While the MBTA's initial letter for entrance into the program identified the base order of 102 LRV as part of the program, based on recent discussions with the FTA, we want to clarify that going forward we will not include the scope of work for the base order of 102 vehicles into the Core Capacity program. As part of the Core Capacity program, the MBTA does plan to explore the option to expand the fleet of Type 10 vehicles beyond the 102-base order to support increased capacity. Given the on-going discussions, the MBTA will not exercise an option for additional vehicles to support the Core Capacity program until we have received vehicle pre-award authority from the FTA.

The MBTA is requesting confirmation from the FTA of receipt and concurrence with the approach outlined in this letter. We are happy to set up a meeting with you to discuss any of the details outlined. Please contact Eric Waaramaa at EWaaramaa@MBTA.com if you have any questions.

DocuSigned by:

8BBCDDC4491D4D5...

6/28/2022

Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza, Suite 3830
Boston, MA 02116

Paige Sopher

From: Waaramaa, Eric
Sent: Tuesday, June 28, 2022 5:39 PM
To: 'Butler, Peter (FTA)'
Cc: 'Papetti, Eric (FTA)'
Subject: Green Line Type 10 LRV - FTA Formula Funds (Letter from General Manager)
Attachments: GL Type 10 Light Rail Vehicles - FTA Formula Funds-Preaward Authority 6-28-22 Letter to FTA.pdf

Hi,

I apologize if this is a second email for either of you, but I got a message that the initial email was undeliverable to Peter – so trying once again.

Eric

From: Waaramaa, Eric
Sent: Tuesday, June 28, 2022 6:33 PM
To: Butler, Peter
Cc: 'Papetti, Eric (FTA)'
Subject: Green Line Type 10 LRV - FTA Formula Funds (Letter from General Manager)

Hi Peter,

I hope things are going well. Attached is a letter from the General Manager outlining the MBTA's intention to utilize FTA formula funds for the 102-vehicle base order for the Green Line Type 10 LRV procurement.

The project is included within the FFY 2022-2026 STIP utilizing Section 5307 formula funds and our plan is to incorporate the base order procurement costs into an FTA grant application in early FFY 2023, once the contract is awarded and the project cost and schedule are more well-defined. We want to confirm our understanding that costs associated with this base order will be eligible for FTA assistance and that any base order costs incurred prior to the FTA grant award will be subject to pre-award authority, provided that all requirements associated with Section 5307 formula fund grants are complied with.

If you have any question please let us know. Thanks, and have a great night.

Eric

Paige Sopher

From: Papetti, Eric (FTA) <eric.papetti@dot.gov>
Sent: Monday, July 11, 2022 3:39 PM
To: Poftak, Steve
Cc: Waaramaa, Eric; Butler, Peter (FTA); Pena, Angel; Wolfgang, William; Fuccillo, Matthew; Muhlanger, Michelle (FTA); Adhikari, Shubha (FTA); Griffin, Margaret (FTA); Brelsford, Laura; Dyer, Charles (FTA); Keamy, Matthew (FTA); Paganelli, Tess
Subject: Green Line Type 10 Procurement Response
Attachments: FTA Response - GL Type 10 CIG.pdf

Mr. Poftak,

A letter from our Regional Administrator regarding the MBTA's proposed approach to the Green Line Type 10 vehicle procurement is attached. Please let us know if you have any further questions.

Regards,

Eric

Eric Papetti

Acting Director - Office of Planning and Program Development, Region 1
Federal Transit Administration | U.S. Department of Transportation
55 Broadway, Suite 920, Room 956
Cambridge, MA 02142-1093

Office: 617.494.3494 (currently forwarding to cell)

Cell: 617.599.6991

✉ eric.papetti@dot.gov | 🌐 www.fta.dot.gov | 💬 Chat with me on Teams!

CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.



Headquarters

1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

September 28, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Approval of Standdown Training Action Plan

Dear Mr. Poftak,

Thank you and your team for submitting the requested Standdown Training Action Plan to explain how the Massachusetts Bay Transportation Authority (MBTA) will train employees who have not yet received the training mandated in the Federal Transit Administration's (FTA) Immediate Action Letter of July 28, 2022. FTA appreciates that the MBTA has trained approximately 99 percent of Rail Transportation Operations and Rail Vehicle Maintenance personnel, and that employees not trained are all on long-term out/leave or are currently being processed for discharge.

FTA approves the Standdown Training Action Plan submitted to the FTA and authorizes the MBTA to begin bi-weekly reporting on the status of training the remaining personnel. The first bi-weekly period must cover the period that ends two calendar weeks from the date of issuance of this letter. The initial bi-weekly report must cover any status changes between the termination of daily reporting and the initial start date of bi-weekly reporting.

We appreciate your efforts to enhance MBTA's safety performance. Please contact our SMI Coordinator, Erin Powell, by phone at (202) 771-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Joe P. DeLorenzo'.

Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Ron Ester, Chief Safety Officer, MBTA
Erik Stoothoff, Chief Operating Officer, MBTA
Steve Hicks, Chief Mechanical Officer
Dave Carney, Chief of Transit Services, MBTA
Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of
Public Utilities



U.S. Department
of Transportation

**Federal Transit
Administration**

Headquarters

1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

Date: July 28, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston MA 02116

Subject: Immediate Action Required to Address Safe Movement of Disabled Trains

Dear Mr. Poftak,

As you know, the Federal Transit Administration (FTA) issued Special Directive 22-5 to require the Massachusetts Bay Transportation Authority (MBTA) to address the pattern of safety incidents and interim safety findings concerning unintended and uncontrolled train movements by disabled trains in maintenance facilities and rail yards.

However, there is a continued failure to sufficiently prevent unintended and uncontrolled train movements by disabled trains. There have been three uncontrolled train movement incidents since May 28, 2022, including on July 25 when MBTA experienced an uncontrolled train movement at the Braintree Station. While no injuries have resulted from the recent incidents, uncontrolled train movements, especially on the mainline, are exceptionally dangerous, can result in collision or derailment, and pose a substantial risk of injury or death to employees in the path of the train.

As evidenced through the interim findings uncovered during FTA's Safety Management Inspection (SMI) and the ongoing safety concerns, FTA has determined that a combination of unsafe conditions and practices exist such that there is a substantial risk of death or personal injury. Therefore, in accordance with 49 U.S.C. 5329(h), FTA is requiring the MBTA to conduct **an immediate safety standdown** with all workers who may in the course of their work operate a disabled rail transit vehicle and all workers who may have cause to secure these vehicles. FTA is requiring a safety standdown to **prohibit the MBTA from permitting any such worker who has not attended a safety briefing to move any rail transit vehicles in yards or shops.**

This safety standdown must begin at 12:01 am on Saturday, July 30, 2022. During the safety standdown, all workers who may in the course of their work operate a disabled rail transit vehicle and all workers who may have cause to secure these vehicles must review and discuss the facts and causes of the following incidents:

- the July 25, 2022 Red Line uncontrolled train movement from Caddigan Yard through the Braintree Station and onto the mainline.
- the May 30, 2022 rollaway on the mainline from Braintree Station
- the May 28, 2022 rollaway at Cabot Yard.

The safety briefing must also reinforce the MBTA's policies and procedures that prevent unintended or uncontrolled movements.

The MBTA must provide an update on its progress to conduct these safety briefings at least every 24 hours beginning Monday, August 1, 2022, until all applicable workers have received this briefing. The MBTA also must provide FTA with copies of employee sign-ins indicating attendance at the safety briefings as well as the materials used to conduct the briefings.

In addition, within five (5) calendar days of this letter, the MBTA must prepare checklists that reflect its existing procedures for coupling and uncoupling of rail transit vehicles and must require rail transportation and vehicle maintenance workers to follow and complete these checklists when performing these maneuvers. The MBTA must submit their existing policies and procedures and any necessary new or updated procedures related to these maneuvers, in addition to the checklist requested.

Furthermore, within ten (10) calendar days of this letter, the MBTA must develop and implement a form to document the results of the "circle check" inspection for rail transit vehicles. These completed checklists and forms must be available to FTA and the Massachusetts Department of Public Utilities (DPU) for review.

Safety is our top priority at the U.S. Department of Transportation and FTA. To that end, FTA will continue to work with the MBTA to make progress in setting a foundation for safety. If you have any questions or concerns, please contact the FTA Safety Management Inspection team or me.

Sincerely,


Joe DeLorenzo
 Associate Administrator and
 Chief Safety Officer
 Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region I
 Matthew Nelson, Chair, Massachusetts Department of Public Utilities
 Elizabeth Cellucci, Director of Transportation Oversight, Massachusetts Department of Public Utilities
 Jamey Tesler, Massachusetts DOT Secretary and Chief Executive Officer
 Betsy Taylor, Chair, MBTA Board of Directors
 Ronald Ester, Chief Safety Officer, MBTA



U.S. Department
of Transportation
**Federal Transit
Administration**

REGION 1
Connecticut, Maine,
Massachusetts,
New Hampshire,
Rhode Island, Vermont

Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093
617-494-2055
617-494-2865 (fax)

January 12, 2022

Steve Poftak
General Manager
Massachusetts Bay Transportation Authority (MBTA)
10 Park Plaza
Boston, MA 02116

Re: Financial Management Oversight Review Final Report

Dear Mr. Poftak:

Thank you for your assistance in the Federal Transit Administration's (FTA) Financial Management Oversight Review of the MBTA's financial systems. Attached is a copy of the Final Report conducted of your agency by our contractor, RMW Associates, LLC. The review resulted in findings and recommendations in several areas as summarized in Section V of the report.

Over the next few months, RMW Associates and FTA staff will provide technical assistance to MBTA. The technical assistance is intended to support MBTA's timely closing of material weaknesses and significant deficiencies identified in the FMO Report. MBTA's monthly updates to FTA will be used to monitor the MBTA's progress. In early 2023, a follow-up review is planned to evaluate the effectiveness of the corrective actions.

If you have any questions or comments about the report, please contact Mr. Alex Hammond at 617-494-2304 or alexander.hammond@dot.gov. Thank you.

Sincerely,

Peter S. Butler
Regional Administrator

Attachments:
MBTA – Final Report Full Scope Review

cc:

Samuel Abanyie, Samlin Consulting, Partner
Evans Bannor, Samlin Consulting, Senior Manager
Mary Ann O'Hara, MBTA, CFO



Headquarters

1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

October 26, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Closeout of Immediate Action Letter from July 28, 2022

Dear Mr. Poftak,

Thank you and your team at the Massachusetts Bay Transportation Authority (MBTA) for the actions taken to address the Federal Transit Administration's (FTA) Immediate Action Letter of July 28, 2022. FTA issued this letter in response to a runaway train at Braintree Station on July 25, 2022, MBTA's third such event since May 28, 2022. FTA directed MBTA to take specific actions to enhance MBTA's requirements for both the inspection of rail transit vehicles prior to movement in the rail yard or carhouse and employee understanding of these new requirements and lessons learned from previous events.

In response to FTA's Immediate Action Letter MBTA has taken the following actions:

- conducted Safety Standdown Training with Rail Transportation and Vehicle Maintenance employees in July and August;
- developed and implemented checklists for pre-trip inspections, circle check inspections and special inspections in timeframes specified by FTA in August;
- developed a Training Action Plan in September to manage the fewer than one (1) percent of affected employees who were unable to complete the Safety Standdown Training; and
- incorporated the new pre-trip, circle check and special inspection checklists into resubmitted corrective action plans in August and September in response to FTA's Special Directive 22-5, Vehicle Securement.

Because MBTA has completed the actions noted in the Immediate Action Letter, FTA closes out this letter. MBTA may complete its Training Action Plan without further reporting to FTA.

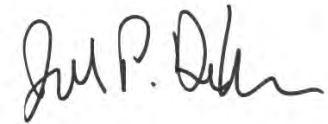
Please be advised that FTA will continue to monitor MBTA's activities regarding the safe movement of rail transit vehicles into and out of carhouses and in rail yards through on-going evaluation of MBTA's implementation of corrective actions established for Special Directive 22-5, Vehicle Securement.

We look forward to observing your continued progress both in conducting these inspections and enhancing the visual inspection of MBTA's rail transit vehicle fleet.

Conclusion

We appreciate your efforts to enhance MBTA's safety performance. Please contact our SMI Coordinator, Erin Powell, by phone at (771) 200-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe P. DeLorenzo".

Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Erik Stoothoff, Acting Chief Operating Officer, MBTA
Steve Hicks, Chief Mechanical Officer
Ron Ester, Chief Safety Officer, MBTA
Katie Choe, Chief of Quality, Compliance and Oversight, MBTA
Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of Public Utilities



TO: Joseph DeLorenzo
Associate Administrator for Transit Safety and Oversight & Chief Safety Officer,
Federal Transit Administration (FTA)

FROM: Steve Poftak
General Manager, Massachusetts Bay Transportation Authority (MBTA)

DATE: August 22, 2022

SUBJECT: MBTA Response to Draft FTA SMI Report

Thank you for allowing MBTA the opportunity to review and provide comments on the FTA Safety Management Inspection (SMI) Draft Final Report, delivered on August 12, 2022.

A complete list of MBTA comments is enclosed, including clarifications, corrections, outstanding questions, recommendations, and updates on specific initiatives since the on-site activities for the SMI were performed.

MBTA has also identified supplemental documentation for submittal to FTA associated with specific comments. These supplemental documents will be provided to FTA for review via the Secure Large File Transfer Solution portal.

MBTA acknowledges the critical nature of the activities discussed in the SMI report and looks forward to continuing a constructive dialogue on these topics with FTA, including how findings may best be addressed via corrective actions to ensure the continued safety and reliability of the transit system.

Please feel free to contact me if you have any questions. Thank you.

cc: E. Shepherd, FTA
E. Powell, FTA
C. McLemore, FTA
E. Cellucci, DPU
J. Gonneville, MBTA
J. Lenicheck, MBTA
R. Ester, MBTA

Paige Sopher

From: Powell, Erin (FTA) <erin.powell@dot.gov>
Sent: Thursday, November 10, 2022 8:12 AM
To: Poftak, Steve; Brelsford, Laura
Cc: Butler, Peter (FTA); DeLorenzo, Joseph (FTA); Gonneville, Jeffrey D.
Subject: RE: Accessibility Request for Final SMI Report and Special Directives
Attachments: FTA-SD-22-09-MBTA-Category 1_FINAL-20221024 (1).pdf; FTA-SD-22-10-MBTA-Category 2_FINAL-20221026.pdf; FTA-SD-22-11-MBTA-Category 3_FINAL-20221026.pdf; FTA-SD-22-12-MBTA-Category 4_FINAL-20221026.pdf; FTA-SD-22-13_MDPU-Category 5_FINAL-20221026.pdf

Mr. Poftak/Ms. Brelsford,

Attached, please find Special Directives 22-9 through 22-13, formatted for Accessibility for those who are visually impaired as discussed previously.

Let me now if you have further issues or requests.

Thanks!

Erin Powell
SMI Coordinator

From: Powell, Erin (FTA)
Sent: Wednesday, October 19, 2022 6:52 AM
To: Poftak, Steve ; Brelsford, Laura
Cc: Butler, Peter (FTA) ; DeLorenzo, Joseph (FTA) ; jgonneville@mbta.com
Subject: RE: Accessibility Request for Final SMI Report and Special Directives

Mr. Poftak/Ms. Brelsford,

Attached, please find the SMI Final Report, formatted for Accessibility for those who are visually impaired as discussed previously.

We are in the process of converting SD 22-9 to SD 22-13 and will send those over to your team as they become available.

Let me know if you have further issues or requests.

Thanks!

Erin Powell

From: Poftak, Steve <spoftak@MBTA.com>
Sent: Wednesday, September 14, 2022 7:41 AM
To: Powell, Erin (FTA) <erin.powell@dot.gov>
Cc: Butler, Peter (FTA) <Peter.Butler@dot.gov>; Brelsford, Laura <LBrelsford@MBTA.com>
Subject: RE: Accessibility Request for Final SMI Report and Special Directives

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Erin,

Thanks for your diligence on this – it had gotten subsumed by my inbox. I'm adding our amazing AGM for Systemwide Accessibility Laura Brelsford to the email chain in hopes that she can answer your questions with greater precision. Thanks again,

Steve

From: Powell, Erin (FTA) <erin.powell@dot.gov>
Sent: Wednesday, September 14, 2022 7:38 AM
To: Poftak, Steve <spoftak@MBTA.com>
Cc: Butler, Peter (FTA) <Peter.Butler@dot.gov>
Subject: RE: Accessibility Request for Final SMI Report and Special Directives

Mr. Poftak,

I am following up on your request for a remediated copy of the SMI Final Report and Special Directives.

Could you please respond on the following questions so that we can meet the needs of your members?

- Explain the issues the specific staff members are having with the current PDFs.
- Identify the issue we need to remediate for (i.e. – if there a visual disability, please identify the issues currently being faced when reading the PDFs)
- Is assistive technology (such as screen reader that helps to provide the similar information to disabled user as provided to non-disabled user) being used by him or his team?

Thanks!

Erin Powell
SMI Coordinator

From: Powell, Erin (FTA)
Sent: Friday, September 2, 2022 2:26 PM
To: Poftak, Steve <spoftak@MBTA.com>
Cc: Butler, Peter (FTA) <Peter.Butler@dot.gov>
Subject: Accessibility Request for Final SMI Report and Special Directives

Mr. Poftak,

The FTA has already performed a “first-pass” remediation on the SMI Final Report and Special Directives. During the “first-pass” we embed text in the document’s structure that is picked up by screen readers. This process then allows people to reach out via email if they have a specific disability and need a fully remediated document. A fully remediated document set will take 1-2 weeks to create. As a result, our policy is to not fully remediate documents unless we get a specific request from someone with a disability who has a specific need. To ensure that we understand the actual need of your members, can you please:

- Explain the issues the specific staff members are having with the current PDFs.

- Identify the issue we need to remediate for (i.e. – if there a visual disability, please identify the issues currently being faced when reading the PDFs)
- Is assistive technology (such as screen reader that helps to provide the similar information to disabled user as provided to non-disabled user) being used by him or his team?

Thanks so much and we look forward to understanding the needs of your members.

Very respectfully,

Erin Powell
SMI Team Coordinator

From: Poftak, Steve <spoftak@MBTA.com>
Sent: Friday, September 2, 2022 8:41 AM
To: Powell, Erin (FTA) <erin.powell@dot.gov>
Cc: Butler, Peter (FTA) <Peter.Butler@dot.gov>
Subject: request

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Ms. Powell,

I've received several requests from members of my staff for copies of the final FTA SMI and related Special Directives that meet accessibility standards. Would it be possible to provide those when they are available? Many thanks.

Respectfully,

Steve

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Paige Sopher

From: DeDonato, Matthew
Sent: Thursday, June 9, 2022 5:17 PM
To: 'elliott.shepherd@dot.gov'
Cc: DeGloria, Paula; Ester, Ronald; 'Boyd, Annabelle'; 'Powell, Erin (FTA)'
Subject: RE: MBTA document request
Attachments: MBTA Document Request_220524.docx; MBTA Document Request_220525.docx

Mr. Shepherd,
Documents related to the attached document requests for Teams 1, 2, and 6 have been added to the FTA file transfer site.
The teams are working to assemble the remaining outstanding documentation.
Please let me know if there are any questions or concerns.
Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Ester, Ronald
Sent: Friday, June 3, 2022 11:11 AM
To: DeDonato, Matthew
Cc: DeGloria, Paula
Subject: FW: MBTA document request

Have you all received this request?

From: Shepherd, Elliott (FTA) <elliott.shepherd@dot.gov>
Sent: Friday, June 3, 2022 11:07 AM
To: Ester, Ronald <rester@MBTA.com>
Cc: Boyd, Annabelle <aboyle@boydcatongroup.com>; Powell, Erin (FTA) <erin.powell@dot.gov>
Subject: MBTA document request

Good morning Ronald,

I found this in my email and I didn't sent this early, please see our teams request from 2/25/22.

Thank you,
Elliott

CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.

Paige Sopher

From: Poftak, Steve
Sent: Tuesday, April 19, 2022 11:03 AM
To: DeLorenzo, Joe (FTA)
Cc: Cellucci, Elizabeth (DPU; Butler, Peter (FTA; Muhlanger, Michelle (FTA; Pfister, Jamie (FTA; Jamey.Tesler@state.ma.us; Betsy.Taylor@state.ma.us; Ester, Ronald; Kincaid, Paul (FTA; Janine.hynds@dot.state.ma.us; Webb, Kate (FTA
Subject: Response Letter from MBTA
Attachments: FTA - J. DeLorenzo - 4-19-2022.pdf

Joe,

In response to your letter, please see the attached.

Regards,

Steve

Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza, Suite 3830
Boston, MA 02116



Headquarters

1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

March 3, 2023

Mr. Jeff Gonneville
Interim General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Response to Closeout Request for FTA-TRA-22-009 (Green Line Work Train)

Dear Mr. Gonneville:

On December 30, 2022, the Massachusetts Bay Transportation Authority (MBTA) submitted a Corrective Action Plan (CAP) closeout request for required action FTA-TRA-22-009 (Green Line Work Train). The MBTA developed this CAP as part of its response to interim findings issued in Special Directive (SD) 22-4: Track Maintenance from the Safety Management Inspection (SMI) initiated by the Federal Transit Administration (FTA) in April 2022.

Closeout Approval for FTA-TRA-22-009 (Green Line Work Train)

MBTA's CAP for FTA-TRA-22-009 includes four (4) action items, approved by FTA on August 10, 2022, to address the following SD 22-4 finding and required action:

- **Finding 9:** MBTA's Green Line work train has been inoperable for at least 8 months.
- **Required Action (FTA-TRA-22-009):** MBTA must restore Green Line work train capabilities.

To implement this CAP, between August 3, 2022 and December 30, 2022, MBTA submitted the following documentation demonstrating completion of the CAP action items:

- memoranda and work orders for preventive and corrective maintenance for: Green Line Crane Car #4360, Green Line Generator-Pump-Lift (GPL) Car #4361, and Green Line Flat Car #4362,
- procedures for converting from generator power to Overhead Catenary System (OCS) power for GPL Car #4361,
- GPL Car #4361 lift and generator operating procedures,
- operating manual for GPL Car #4361 and Flat Car #4362,
- brake test configurations and brake test results for Crane Car #4360, GPL Car #4361, and Flat Car #4362,

- power test configurations and results for Crane Car #4360, GPL Car #4361,
- signals and communications equipment list and current processes for use of Crane Car #4360, GPL Car #4361, and Flat Car #4362, and
- in-use schedule for Green Line Work Train.

FTA carefully evaluated this documentation and reviewed specific submissions with MBTA during bi-weekly meetings on SD 22-5 in November and December 2022. FTA conducted on-site verification regarding the performance of the Green Line work train on December 6 and 7, 2022 and on January 25, 2023. These verifications confirmed that Crane Car #4360, GPL Car #4361, and Flat Car #4362 have been repaired to a serviceable condition as documented in submissions to FTA and are satisfactorily supporting Green Line maintenance work.

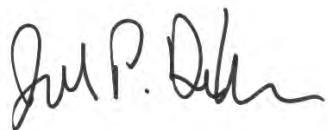
On January 26, 2023, MBTA supplied follow-up documentation, requested by the FTA team, verifying resolution of all open safety-related work order items for Crane Car #4360, GPL Car #4361, and Flat Car #4362, and providing a narrative description clarifying the engineering justification for acceptance of the service brake test results for Crane Car #4360, GPL Car #4361, and Flat Car #4362.

Based on review of these submissions and the results of verification activity, FTA finds that these completed action items adequately satisfy the requirements of CAP FTA-TRA-22-009 and this CAP may now be closed. Given the critical importance of this CAP for ensuring the MBTA's ability to complete maintenance on the Green Line, please be advised that FTA will continue to monitor use of the Green Line work train. Should the Green Line work train become unavailable for an extended period, and its work train capabilities remain unaddressed by other means, FTA may re-open this CAP. Also, prior to closing SD 22-4, FTA will conduct a final verification to ensure that the Green Line work train's capabilities continue to be operational.

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our SMI Coordinator, Erin Powell, by phone at (771) 200-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Erik Stoothoff, Acting Chief Operating Officer, MBTA

Ron Ester, Chief Safety Officer, MBTA

Katie Choe, Chief of Quality, Compliance and Oversight, MBTA

Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts

Department of Public Utilities (DPU)

Robert Hanson, Rail Safety Director, DPU



Headquarters

1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

January 13, 2023

Mr. Jeff Gonneville
Interim General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Approval of Corrective Action Plans for Special Directives 22-9, 22-10, and 22-12

Dear Mr. Gonneville,

Thank you and your team for providing updated Corrective Action Plans (CAPs) and project management information to address comments from the Federal Transit Administration (FTA) regarding the proposed CAPs previously submitted by the Massachusetts Bay Transportation Authority (MBTA) to address [Special Directive \(SD\) 22-9, Workforce Capacity](#); [SD 22-10, Prioritized Safety Management Information](#); and [SD 22-12, Operating Conditions and Policies, Procedures and Training](#). FTA received the MBTA's submissions, as requested, on January 3, 2023.

Approval of Proposed CAPs for SD 22-9, SD 22-10, and SD 22-12

Based on the MBTA's clarifications and additional information provided in response to FTA's correspondence of December 6, 2022, FTA approves the resubmitted CAPs for SD 22-9, SD 22-10, and SD 22-12. With this action, all MBTA CAPs related to the Safety Management Inspection (SMI) are now approved.

For SD 22-9 and SD 22-10, MBTA's resubmitted CAPs were updated with the current names for all advisory committees, executive steering committees and working groups. For SD 22-12, in addition to correcting committee and working group names, MBTA addressed FTA's request that additional information be incorporated into specific action items for Finding 3, related to the MBTA's Quality Management Plan and supporting procedures.

Finally, for the CAPs in all three SDs, MBTA provided an initial Project Management Plan (PMP) and Integrated Master Schedule (IMS) as the basis for the Quality, Compliance, and Oversight Office's (QCOO) management and oversight of the MBTA's implementation of the actions. The PMP and IMS also address the other SDs issued by FTA through the SMI.

PMP and Integrated Work Schedule

To support monitoring and implementation of MBTA's project management approach for SD 22-9, SD 22-10 and SD 22-12, FTA is adding the PMP and IMS as an action item for each CAP:

- For SD 22-9, the PMP and IMS are added to FTA-22-9-MBTA-CAT1-2, as Action Item 11
- For SD 22-10, the PMP and IMS are added to FTA-22-10-MBTA-CAT2-1, as Action Item 20
- For SD 22-12, the PMP and IMS are added to FTA-22-12-MBTA-CAT-4-1, as Action Item 18

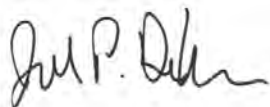
As a result of the added Action Items, FTA directs MBTA to revise and submit to FTA its Correction Action Plans (CAP) to reflect the addition of PMP and IMS to the Action Items for SD 22-9, SD 22-10, and SD 22-12 by 31 January 2023.

In addition, FTA directs MBTA to submit quarterly updates to the PMP and IMS, due April 5, 2023 (for the period January 1 through March 31, 2023); July 5, 2023 (for the period April 1 through June 30, 2023); October 5, 2023 (for the period July 1 through September 30, 2023); and January 5, 2024 (for the period October 1 through December 31, 2023); and so on, until FTA either revises the submission frequency or the SDs are closed. To support the first update, due April 5, 2023, FTA will submit written comments on the PMP and IMS by the end of January 2023, and schedule a meeting to discuss the PMP and IMS quarterly update by mid-February.

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our SMI Coordinator, Erin Powell, by phone at (771) 200-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Erik Stoothoff, Acting Chief Operating Officer, MBTA
Ron Ester, Chief Safety Officer, MBTA
Katie Choe, Chief of Quality, Compliance and Oversight, MBTA

Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of Public Utilities (DPU)

Robert Hanson, Rail Safety Director, DPU



Headquarters

1200 New Jersey Avenue, SE
Washington, DC 20590

SENT VIA EMAIL

December 6, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Subject: Additional Information Required Prior to Approval of Resubmitted Corrective Action Plans for Special Directives 22-9, 22-10, 22-12

Dear Mr. Poftak,

Thank you and your team for submitting updated Corrective Action Plans (CAPs) to address comments from the Federal Transit Administration (FTA) regarding the initial CAP submittals from the Massachusetts Bay Transportation Authority (MBTA) to address Special Directive (SD) 22-9, Workforce Capacity; SD 22-10, Prioritized Safety Management Information; and SD 22-12, Operating Conditions and Policies, Procedures and Training.

This letter highlights additional information requested by FTA in order to approve updated CAPs for each Special Directive. FTA requests that MBTA resubmit CAPs for SD 22-9 and SD 22-10 using the current names for all relevant workgroups and committees. Related to SD 22-12, FTA requests further clarification of four (4) action items and resubmission using current names for all relevant workgroup and committees.

In addition, FTA is requesting that MBTA provide project management information that explains how MBTA will coordinate tasks, resources, stakeholders, and other project elements as it works close to all of the CAPs for SD 22-9, 10, 11, and 12. This request is further detailed below.

SD 22-9, Workforce Capacity

On October 1, 2022, MBTA submitted four (4) CAPs on time as required in SD 22-9, addressing [FTA's four \(4\) findings and four \(4\) required actions](#). FTA approved MBTA's initial CAP proposal for Finding 4 but required resubmittal for CAPs developed in response to Findings 1, 2, and 3 (correspondence dated Friday, October 14, 2022). Collectively, these three Findings require a workforce analysis and associated workforce planning, recruitment, and hiring to ensure MBTA's

capability to perform mission-critical operations, maintenance, capital project delivery, and safety certification in a manner which ensures the safety of passengers, employees, contractors, and infrastructure.

FTA identified several areas where further information and clarification was needed including:

- the make-up, structure; roles and responsibilities, and resourcing of the working groups charged with overseeing and managing these CAPs;
- MBTA's approach for collecting information from MBTA's frontline personnel and technical and executive leadership to support and inform the contractor's work for these CAPs;
- MBTA's approach for briefing MBTA's executive leadership team and the MBTA board and ensuring their ownership of the results of the contractor work managed by the designated working groups; and
- interim actions that MBTA may be taking to address non-compliance with existing safety procedures and plans discussed in FTA's findings.

MBTA provided information to address these concerns in its submittal, dated November 4, 2022. These updates and clarifications provide the further detail and additional actions and milestones requested by FTA regarding how the MBTA will manage and oversee these CAPs. However, the submissions used outdated names for committees and workgroups.

By Tuesday, January 3, 2023, given the changes in naming conventions and as discussed previously with MBTA, FTA requests that MBTA resubmit the SD 22-9 CAPs to include the current names for all advisory committees, executive steering committees and working groups.

SD 22-10, Prioritized Safety Management Information

On October 15, 2022, MBTA submitted six (6) CAPs on time as required in SD 22-10, addressing [FTA's six \(6\) findings and 17 required actions](#). In correspondence dated October 28, 2022, FTA required resubmittal of MBTA's CAPs for Findings 1 through 6.

Collectively, these findings require MBTA to revise both its strategic and tactical approaches to implementation of its Safety Management System (SMS). At the strategic level, FTA required MBTA Executive Leadership to provide direct and explicit guidance to operations and maintenance management, as well as the Safety Department, for the identification and elevation of safety information necessary to prioritize resources to address safety risks in MBTA operations. At the tactical level, FTA required MBTA Executive Leadership to work with operations and maintenance management and the Safety Department to establish and integrate the necessary structures, processes, and tools to support leadership safety priorities and implementation of the MBTA's SMS.

As previously discussed with representatives of MBTA's Safety Department and Quality, Compliance and Oversight Office (QCOO), FTA's evaluation of MBTA's approach to these proposed CAPs found that they are logically structured and sequenced. FTA required resubmittal, however, because FTA found that MBTA had not provided sufficient details on how the organization will:

- direct and manage safety risk in the interim while work on these CAPs is being completed,
- ensure safety risk information is presented to Executive Leadership for resource

- prioritization,
- coordinate updates to SMS processes, tools, and activities with updates to the MBTA's Agency Safety Plan, and
- identify and monitor safety risk through safety assurance activities and event investigations.

In follow-up correspondence, dated November 18, 2022, MBTA updated its CAPs to address FTA's concerns and to incorporate specific comments made by FTA in its evaluation of these CAPs.

MBTA also included additional actions and milestones in its CAPs, as requested by FTA.

Collectively, these updates and additions address FTA's comments and concerns. However, the submissions used outdated names for committees and workgroups.

By Tuesday, January 3, 2023, given the changes in naming conventions and as discussed previously with MBTA, FTA requests that MBTA resubmit the SD 22-10 CAPs to include current names for all advisory committees, executive steering committees and working groups.

SD 22-12, Operating Conditions and Policies, Procedures and Training

On October 5, 2022, MBTA submitted seven (7) CAPs on time as required in SD 22-12, addressing [FTA's seven \(7\) findings and 19 required actions](#). In correspondence dated October 21, 2022, FTA approved four (4) CAPs and required resubmittal of MBTA's CAPs for Findings 1, 2 and 3. Collectively, these three findings require MBTA:

- to ensure each MBTA department identifies, reviews, and addresses noncompliance with key rules and procedures critical to the safety of activities performed by the department, and also reports results to the Safety Department and Executive Leadership;
- to develop and implement an approach to monitoring operations and maintenance activities to enable the analysis and understanding of situations of non-compliance; and
- to develop and implement an independent quality assurance and quality control function.

Based on FTA's analysis of MBTA's proposed CAPs for Findings 1, 2, and 3, FTA requested additional milestones for implementation of action items extending through Calendar Year 2025 and the first quarter of Calendar Year 2026. FTA also requested additional action items to manage the safety issues associated with these findings in the interim, while contract and other work was being performed. Finally, FTA requested plans on engagement with frontline personnel, integration of contractor work into MBTA's operations and maintenance, and additional information on resources for overseeing critical work proposed in these CAPs.

On November 14, 2022, MBTA updated its CAPs to address FTA's concerns and to incorporate specific comments made by FTA in its evaluation into the CAPs. MBTA also included additional actions and milestones in its CAPs, as requested by FTA.

While these updates and additions address FTA's comments and concerns for Findings 1 and 2, FTA requires additional information to be provided to address four (4) action items in the CAP for Finding 3, including:

- Action Item 3 – This action item states that MBTA will “Develop Quality Assurance (QA) procedures with specific requirements, such that they are auditable.” FTA requests that

MBTA revise this action item because as currently written, MBTA indicates it will only develop a Quality Management Plan (QMP) and does not specify QA procedures.

- Action Item 7 – MBTA must evaluate whether “Establish[ing] [a] program for oversight of Vehicle Engineering...” is necessary or even redundant given the development of both the QMP and attendant procedures. FTA requests additional clarification as to whether MBTA’s internal audit program provides the necessary oversight.
- Action Item 28 – MBTA must clarify how the Quality Management Program will ensure quality oversight of all maintenance activities, not just those that are deemed safety critical. FTA requests that MBTA also clarify the role of the Safety Department in auditing the Quality Department.
- Action Item 29 – This action items states that MBTA will "Procure Document Management System" and includes expectations for accessibility to documents in the system. FTA requests that MBTA clarify its process for procedural development and its configuration management process that includes both change management and document control. MBTA must also ensure controls are in place such that revisions to procedures and related documents are accessible and both controlled (to prevent confusion) and communicated to those with a need to know.

By Tuesday, January 3, 2023, FTA requests that the CAP for Finding 3 be resubmitted to address FTA’s comments on these four (4) action items. In addition, as previously discussed with MBTA’s team, given changes in naming conventions, FTA requests that MBTA resubmit the SD 22-12 CAPs to include current names for all advisory committees, executive steering committees and working groups.

Project Management Information Required for SD 22-9, SD 22-10, and SD 22-12 CAP Approval

On November 16, 2022, MBTA’s QCOO leadership provided an update on its project management approach for completing and monitoring work associated with SD 22-9, SD 22-10, SD 22-11, and SD 22-12. QCOO explained its integrated strategy, for each to CAP, to:

- form *ad hoc* advisory and executive steering committees to guide work and address CAP requirements,
- establish permanent working groups to monitor progress and ensure ongoing CAP implementation and resolution of related safety issues – after CAP closure,
- conduct strategic planning sessions to identify adaptive challenges and technical challenges associated with CAPs,
- engage technical expertise through contracting,
- support, monitor and oversee contractor work, including best practices review, gap analysis, and solution design,
- implement solutions to address CAP requirements and assess effectiveness,
- engage internal stakeholders and frontline workers throughout CAP process, and
- practice transparency and strong communication.

QCOO also indicated it planned to include CAPs from SD 22-4 through SD 22-7 as part of its integrated approach as staffing levels increase.

Before FTA can approve the submitted CAPs for SD 22-9, SD 22-10 and SD 22-12, MBTA must

demonstrate it has the capacity to manage these efforts.

By Tuesday, January 3, 2023, FTA requests that MBTA submit a Project Management Plan (PMP) detailing the agency's approach for managing the CAPs submitted for SD 22-9, SD 22-10, SD 22-11, and SD 22-12.

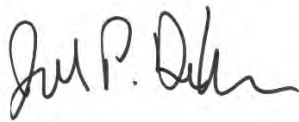
MBTA also must provide read-only access to the Integrated Master Schedule by January 3, 2023. FTA recommends MBTA follow established guidance for PMP contents and in creating the Integrated Master Schedule. FTA also may request a formal meeting with QCOO and other MBTA representatives to review the PMP and Integrated Master Schedule.

When FTA accepts the PMP and Integrated Master Schedule, as well as the additional information requested to address Finding 3 in SD 22-12, FTA will issue approval letters for the SD 22-9, SD 22-10, and SD 22-12 resubmitted CAPs.

Conclusion

We appreciate your efforts to enhance MBTA's safety performance, and we look forward to working with you and your team as the MBTA addresses these findings and required actions. Please contact our SMI Coordinator, Erin Powell, by phone at (771) 200-8016 or by email at Erin.Powell@dot.gov with any questions.

Sincerely,



Joe DeLorenzo
Associate Administrator and
Chief Safety Officer
Office of Transit Safety and Oversight

cc: Peter Butler, Regional Administrator, FTA Region 1
Jeffrey Gonneville, Deputy General Manager, MBTA
Erik Stoothoff, Acting Chief Operating Officer, MBTA
Ron Ester, Chief Safety Officer, MBTA
Katie Choe, Chief of Quality, Compliance and Oversight, MBTA
Elizabeth Cellucci, Director, Transportation Oversight Division, Massachusetts Department of Public Utilities

DPU



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
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MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

January 24, 2022

VIA ELECTRONIC COPY AND FIRST-CLASS MAIL

Mr. Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan Closeout MBTA CAP 7380-7384 / C21-016-5

Dear Mr. DeDonato:

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #7380-7384 which contains the following corrective action items as below:

- Item 1- E&M Training and Safety will establish and document a formal review process, taking place at least once annually, to ensure that all major safety-related policy changes in the Safety Plan and related safety content are integrated into E&M training materials or that we provide our employees with separate, related safety training.

Privileged, confidential, protected communication, for the intended recipient only

FAX: (617) 345-9101
www.mass.gov/dpu

- Item 2 - The process for investigating events involving E&M personnel will include Safety investigators notifying the Director of E&M Training to determine if re-training is needed. This process should be documented and require regular discussion of recent events and open investigations between Safety and E&M Training via the monthly E&M Safety Committee Meeting. An important goal is to ensure that investigations can fully identify, document, and address trends and patterns that may require the changes to the current training material, involvement of E&M instructors and remedial training for some E&M employees.
- Item 3 - Since E&M Training does not have course development resources or Safety Subject Matter Experts (SMEs), E&M instructors address safe operation of equipment. The introduction of new equipment happens infrequently. However, when it does occur, the instructor adds additional content to cover safe operation for that item. E&M Training will document those updates and share that information with Safety annually. When MBTA Safety produces safety content that requires E&M employee training, MBTA Safety will provide training materials to help address gaps in safety training requirements.
- Item 4 - E&M Training has asked the Office of the Chief Engineer (OCE) to provide ongoing updates and adequate notice in the planning of training. This includes determining whether 3rd-party vendors will provide the training or if the vendor will use a Train-the-Trainer approach. E&M Training and the Office of the Chief Engineer will document a process for review of upcoming configuration changes and modifications via a new or existing standing meeting.
- Item 5 - Significant changes to training materials required by the adoption of new equipment, work practices, or assets happens infrequently. However, when it does occur, the E&M instructor typically adds additional content to cover safe operation for that item or practice. E&M Training will document any relevant updates that materially affect our employee training, share that information with Safety as a standing agenda item in an existing recurring meeting, and ensure those changes are documented in the meeting minutes.

The Department has reviewed the CAP and supporting documents in its entirety and verified corrective actions. Therefore, the DPU has closed CAP # 7380-7384 (DPU # C21-016). The Department continues to monitor risks associated with the hazards identified in this CAP through its continuing risk monitoring activities.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc:

L. Dawley – DPU
A. Modh – DPU
M. DeDonato – MBTA
E. Golding– MBTA

Smith, Christopher MF. (DOT)

From: DeDonato, Matthew
Sent: Friday, April 29, 2022 6:46 PM
To: 'Limlengco, Ivana (DPU)'
Cc: Raine, Kendrick (DPU); Dawley, Leah (DPU); Gomes, Alicia; Connolly, Kevin; Fong, Margaret; Culp, Steven; Murphy, Kathleen A.; Catsos, Michael; Davis, Andre John
Subject: CAP 8021 (C22-006)- Green Line Yard Switches - Request for Closure
Attachments: SO_22_031_LR70.pdf; SO_22_031_LR70 Signoffs.pdf; SO_22_031 Tracking Sheet.pdf; DPU CAP Form_8021 Request for Closure 4.29.22.docx

Assistant Director Limlengco,

In accordance with the provisions of 220 CMR 151.07, MBTA Safety submits the attached request to close Item #1 of CAP 8021 (DPU #C22-006) focused on mitigating the hazard of Green Line yard switches not being set for the trolley's intended route.

Light Rail Transportation issued Special Order #22-031 to all Green Line Streetcar Motorpersons as a rule reminder of Rule #LR70. The Special Order stressed the importance of properly setting and "walking the route" to confirm that there are no obstructions to the intended route. Streetcar Motorpersons were required to review and sign an acknowledgment of receipt for the special order.

In addition to the updated request for closure form, the following enclosures are attached:

- Special Order 22-031
- Special Order 22-031 Signoffs
- Special Order 22-031 Tracking Sheet

With the completion of this Corrective Action, all items associated with CAP 8021 have been completed.

Please feel free to contact me directly if you have any further questions or concerns.

Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Tuesday, March 8, 2022 11:33 AM
To: DeDonato, Matthew <mdedonato@MBTA.com>
Cc: Raine, Kendrick (DPU) <kendrick.raine@state.ma.us>; Dawley, Leah (DPU) <leah.dawley@state.ma.us>
Subject: RE: DPU Report FY21-02540 - Derailment Riverside Yard at Track #10 -Switch #69 - 080721

Hi Matt,

Please see the attached letter regarding the acceptance of MBTA CAP #8021.

Sincerely,
Ivana

IVANA LIMLENGCO

Dvvlwdq#G lufw#r i#Jdl#Wdqv#Wdihw#
Ghsdwp hqwr# #Sxedf#Wdihw#
Wdqv#rwdwq#R yhuwjkw#G ly#lwrq#
R qh#r#wk#Wdwrq#B*#orru#Erwrq#P D##85443#
P relh#k##4:1689;89#

From: Culp, Steven <SCulp@MBTA.com>

Sent: Monday, February 7, 2022 3:41 PM

To: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>

Cc: Roman, Paul (DPU) <paul.roman@mass.gov>; 'Lavin, Michael (DPU)' <michael.lavin@state.ma.us>; Raine, Kendrick (DPU) <Kendrick.Raine2@mass.gov>; Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>; Modh, Arun (DPU) <Arun.Modh@mass.gov>; Morris, John T (DPU) <John.T.Morris@mass.gov>; Murphy, Kathleen (MBTA) <kamurphy@MBTA.com>; Ester, Ronald (MBTA) <rester@MBTA.com>; Carvalho, David (DPU) <David.Carvalho@mass.gov>; DeDonato, Matthew (MBTA) <mdedonato@MBTA.com>; Dawley, Leah (DPU) <Leah.Dawley@mass.gov>; Rosario, Stephanie (MBTA) <srosario@MBTA.com>

Subject: DPU Report FY21-02540 - Derailment Riverside Yard at Track #10 -Switch #69 - 080721

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Dear Ms. Limlengco,

Attached for your review is MBTA Safety's Final Incident Report #21-02540, involving an Light Rail Vehicle Derailment at Riverside Yard, Track #10, Switch #69 on the August 7, 2021. This report was completed for the Transportation Oversight Division of the Massachusetts Department of Public Utilities Per Requirement 220 C.M.R§151.09(1), for your review and acceptance.

Additionally, MBTA Safety has included CAP Form #8021 for your review and acceptance.

Please feel free to contact me, should you have any questions.

Thank you,
Steven

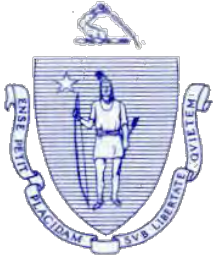
Steven V. Culp, WSO-CSSD
Chief Investigation and Safety Assurance Officer
MBTA Safety
Phone: 617-222-3471
Cell: 617-908-3143



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DEPARTMENT OF PUBLIC UTILITIES

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KARYN E. POLITO
LIEUTENANT GOVERNOR

BETHANY A. CARD
SECRETARY OF ENERGY
AND ENVIRONMENTAL AFFAIRS

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BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
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ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

June 24, 2022

VIA ELECTRONIC COPY

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA # 8062/C22-04

Dear Mr. DeDonato,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8062 which contains one corrective action. This corrective action is intended to mitigate the hazard identified in the 2020 Triennial Audit as Finding #4 regarding the lack of safety critical procedures within the Power System Maintenance Department.

The Department has reviewed the CAP and associated procedures in their entirety and verified corrective action #1 has been completed. The DPU accepts the completion of corrective action #1 for the creation of the safety critical procedures with the Power System Maintenance Department. However, the DPU wants to ensure that power maintenance staff and vendors are properly trained on these new procedures prior to their implementation. The DPU directs the MBTA to create a new corrective action within this CAP to track the training and implementation of these safety critical procedures.

Please contact me should you have any questions or concerns.

Sincerely,

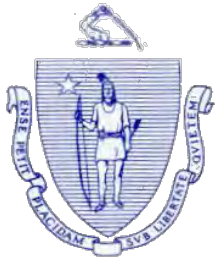
/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc:

D. Carvalho –DPU
W. Charrette – MBTA



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
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(617) 305-3500

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CECILE M. FRASER
COMMISSIONER

August 26, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan modification MBTA #8062 Item #2

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan modification identified as MBTA #8062 Item 2. This corrective action is intended to mitigate the hazard of 2020 Triennial Audit Finding #4.

Based on a review of the corrective action plan Item 2 for Power Systems Maintenance to identify and train any MBTA Power Equipment Technicians or MBTA Power Engineers that are responsible for performing or managing the work associated with the approved SOPs for Emergency Generator Inspection Test and Maintenance, Gas Turbine Inspection and Maintenance, Compressed Natural Gas Detection Inspection and Test, Monthly/Quarterly/Semi-Annual Fire Alarm Inspection, Fire Suppression Inspection and Test, and Emergency Ventilation Fan Inspection), the Department approves the CAP modification. The Department intends to perform risk monitoring activities to ensure the corrective actions have been completed in a timely manner.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.
cc:

D. Carvalho - DPU
W. Charrette - MBTA
S. Culp - MBTA

Smith, Christopher MF. (DOT)

From: Catsos, Michael
Sent: Tuesday, December 13, 2022 9:41 PM
To: Cellucci, Elizabeth (DPU); Dawley, Leah (DPU)
Cc: Limlengco, Ivana (DPU)
Subject: CAP 8201 - Closure Request
Attachments: DPU CAP Form_8201 - Request to Close Item 1 - 12-13-22.docx; Training Progress Summary Pie Chart - EM E&M Safety Event Investigation Manual Rev 3.1.pdf; Training Progress Summary Pie Chart - EM E&M Tool Box Talk (MBTA Safety Event Investigation Manual) July 26th, 2022 (3).pdf

Ms. Cellucci / Ms. Dawley,

Please find attached a closure request and supporting documents for CAP 8201, related to incident reporting and scene preservation.

Thank you,
Mike

Michael Catsos
Director of SMS and Safety Oversight
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com



Smith, Christopher MF. (DOT)

From: DeDonato, Matthew
Sent: Friday, July 8, 2022 4:45 PM
To: 'Limlengco, Ivana (DPU)'; Dawley, Leah (DPU)
Cc: Cheever, Joseph; Martin, Jr., Ray E.
Subject: CAP 8201, 8221, 8261 - Extension Request
Attachments: DPU CAP Form_8201 - Extension Request 7.8.22.docx; DPU CAP 8221 - Extension Request 7.8.22.docx; DPU CAP Form_8261 - Extension Request 7.8.22.docx

Assistant Director Limlengco,

Please see the attached extension requests for CAPs 8201, 8221, & 8261.
E&M has developed the related trainings and to ensure consistent tracking is uploading completion data through the LearningHub. Due to competing resource issues related to this change, as well the FTA SMI, an extension to 7/29/2022 is requested to allow for compiling the complete tracking reports for these items.
Feel free to reach out to me directly if you have any questions.

Thank you,
Matt

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Dawley, Leah (DPU)
Sent: Friday, March 18, 2022 12:38 PM
To: Culp, Steven
Cc: DeDonato, Matthew ; Limlengco, Ivana (DPU) ; Roman, Paul (DPU) ; Walsh, Michael F.
Subject: RE: DPU FY21-03449_Derailment-Hi-Rail Vehicle_Bowdoin Station_102021

Dear Mr. Culp,

On behalf Assistant Director Ivana Limlengco, please see the attached approval letters regarding CAPs 8201 and 8261.

Regards,

Leah Dawley
Auditor
Department of Public Utilities
Transportation Oversight Division
One South Station, Boston, MA 02110

From: Culp, Steven V (MBTA) <sculp@mbta.com>

Sent: Monday, February 28, 2022 6:00 PM

To: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>

Cc: Roman, Paul (DPU) <paul.roman@mass.gov>; Raine, Kendrick (DPU) <Kendrick.Raine2@mass.gov>; Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>; Modh, Arun (DPU) <Arun.Modh@mass.gov>; Morris, John T (DPU) <John.T.Morris@mass.gov>; Murphy, Kathleen (MBTA) <kamurphy@MBTA.com>; Ester, Ronald (MBTA) <rester@MBTA.com>; Carvalho, David (DPU) <David.Carvalho@mass.gov>; DeDonato, Matthew (MBTA) <mdedonato@MBTA.com>; Dawley, Leah (DPU) <Leah.Dawley@mass.gov>; Cassetta, Paul (MBTA) <PCassetta@MBTA.com>; Cheever, Joseph (MBTA) <jcheever@MBTA.com>; Martin, Jr., Ray (MBTA) <RMartin@MBTA.com>; Golding, Elizabeth (MBTA) <egolding@MBTA.com>

Subject: DPU FY21-03449_Derailment-Hi-Rail Vehicle_Bowdoin Station_102021

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Dear Ms. Limlengco,

Attached for your review is MBTA Safety's Final Incident Report #21-03449, involving a derailment of a Hi-Rail Grad-All at Bowdoin Station on the October 20, 2021. This report was completed for the Transportation Oversight Division of the Massachusetts Department of Public Utilities Per Requirement 220 C.M.R. §151.09(1), for your review and acceptance.

Additionally, MBTA Safety has included CAP Form #8261 for your review and acceptance. A copy of CAP Form #8201 is attached for reference, but this was also submitted for report #FY21-02669.

Please feel free to contact me, should you have any questions.

Thank you,
Steven

Steven V. Culp, WSO-CSSD
Chief Investigation and Safety Assurance Officer
MBTA Safety
Phone: 617-222-3471
Cell: 617-908-3143



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Smith, Christopher MF. (DOT)

From: Catsos, Michael
Sent: Tuesday, December 13, 2022 9:11 PM
To: Cellucci, Elizabeth (DPU); Dawley, Leah (DPU)
Cc: Limlengco, Ivana (DPU)
Subject: CAP 8281 - Closure Request
Attachments: DPU CAP Form_8281 - Item #1 - Closure Request.docx; Light Rail Pin Hitch Procedure.pdf; Light Rail Tow Bar Procedure.pdf

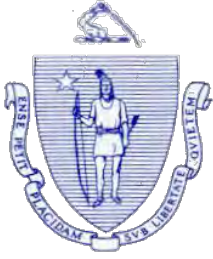
Ms. Cellucci / Ms. Dawley,

Please find attached a closure request and supporting documents for CAP 8281, regarding train uncoupling during vehicle movement.

Thank you,
Mike

Michael Catsos
Director of SMS and Safety Oversight
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com





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AND ENVIRONMENTAL AFFAIRS

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(617) 305-3500

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CECILE M. FRASER
COMMISSIONER

April 4, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: Proposed CAPs - SRCP Deficiencies

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8141-8146 which contains six (6) corrective actions. These corrective actions are intended to mitigate the deficiencies of the Safety Rules Compliance Program (SRCP) identified by the Department.

Based on a review of the corrective action plan, the Department approves the CAP and has issued the following DPU Control Number - C22-007. The Department intends to perform risk monitoring activities to ensure the corrective actions have been completed in a timely manner. The Department also intends to conduct a document review of the SRCP manual to identify potential areas that need improvement or updating.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc: L. Dawley – DPU
T. Rao – DPU
P. Roman – DPU
M. Fong – MBTA
R. Ester – MBTA



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BOSTON, MA 02110
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MATTHEW H. NELSON
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ROBERT E. HAYDEN
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CECILE M. FRASER
COMMISSIONER

April 29, 2021

VIA ELECTRONIC COPY

Mr. Michael Catsos
Deputy Director of Safety Assurance
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA #8321

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8321 which contains five corrective actions. The corrective actions is intended to provide internal written procedures for OHS assigned tasks (excluding the Drug and Alcohol Program) and for all safety related activities.

Based on a review of the corrective action plan, the Department approves the CAP and has issued the following DPU Control Number – C22-016. The Department intends to perform risk monitoring activities to ensure the corrective actions have been completed in a timely manner.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc: L. Dawley – DPU
R. Kendrick – DPU
A. Modh – DPU
M. DeDonato – MBTA
K. LeGrow – MBTA



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

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BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
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ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

November 29, 2022

VIA ELECTRONIC MAIL

Michael Catsos, Director
Safety Assurance and Promotion
MBTA
185 Kneeland Street
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA 8901

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR §151.07, has completed a review of the submitted corrective action plan MBTA 8901 which contains one corrective action. This corrective action is intended to mitigate the hazard of not lowering the trains' pantographs before transitioning from the Overhead Catenary System (OCS) catenary to third rail power.

The Department approves the CAP and has issued the following DPU Control Number: C22-030. The Department will perform risk monitoring activities to ensure the corrective action is completed in a timely manner.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

cc:

D. Carvalho – DPU
L. Dawley - DPU
F. Hunter - MBTA
J. Adams -MBTA



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

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BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
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COMMISSIONER

September 16, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety Department
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: Proposed CAPs - Internal Safety Audit of MBTA Safety

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8622-8623, 8641-8648, 8661-8663 which contains thirteen (13) corrective actions. These corrective actions are intended to address the findings and recommendations of the internal audit of the MBTA Safety Department.

Based on a review of the corrective action plan, the Department approves the CAP in full and has issued the following DPU Control Number - C22-022. The Department will monitor the implementation of the corrective measures described in the CAP at intervals it deems necessary and appropriate.

Please contact me should you have any questions or concerns.

Sincerely,

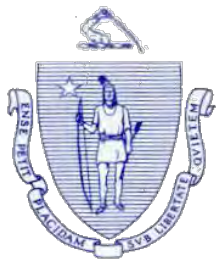
/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

T. Rao – DPU
M. Fong – MBTA
R. Ester – MBTA



CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

BETHANY A. CARD
SECRETARY OF ENERGY
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CHAIR

ROBERT E. HAYDEN
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CECILE M. FRASER
COMMISSIONER

October 3, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety Department
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: Review of proposed CAP

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8681, 8682 which contains two (2) corrective actions. These corrective actions are intended to address the third rail insulator damage near JFK/UMASS Truck Pad which resulted in a Code 1.

Based on a review of the corrective action plan, the Department approves the CAP in full and has issued the following DPU Control Number – C22-023. The Department will monitor the implementation of the corrective measures described in the CAP at intervals it deems necessary and appropriate.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

P. Roman – DPU
J. Cheever – MBTA
A. Williams – MBTA

Smith, Christopher MF. (DOT)

From: Minevitz, Albert
Sent: Tuesday, November 8, 2022 12:18 PM
To: Cellucci, Elizabeth (DPU); Dawley, Leah (DPU); Roman, Paul (DPU)
Cc: Catsos, Michael; Walsh, Michael F.; Hicks, Steve
Subject: CAP Closure Request - 8281 - Pin Hitching Procedures - Heavy Rail Only
Attachments: appendix A - pin radius calculations.pdf; appendix B - clearance versus pin radii.pdf; appendix C - clearance versus pin radii.pdf; chain analysis report - red & orange.doc; Chain Analysis Report Blue Line.doc; chaining procedure.pdf; Coupler Pin Hitch Training Red Line 9-30-2022.pptx; DPU CAP Form_8281_RequestClose_Item1_HeavyRail.docx; EEQA 52270 Blue Line Chaining Procedure_.pdf; Orange Line #12 Pin Hitch Procedure EEQA #52261.pdf; Orange Line #12 Pin Test Report.pdf; Orange Line #14 coupler and pin hitch training.pdf; pin engineering analysis report.pdf; pin test report.pdf; Red Line pin hitch procedure 9-15-2022.pdf; Training for Orange Line Coupler Pin Hitching.pdf; DPU CAP Form_8281_RequestClose_Item1_HeavyRail.pdf

Ms. Cellucci,

Please see attached request to close CAP 8281 – Item 1 (Heavy Rail Only). The procedures for Light Rail are currently under development. Thank you and please contact myself or Michael Catsos with any questions.

Regards,

Albert “Jake” Minevitz
MBTA Safety – System Safety Specialist
Cell: (857) 202-0136



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
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KARYN E. POLITO
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MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

August 29, 2022

VIA ELECTRONIC MAIL

Michael Catsos
Deputy Director of Safety Assurance and Promotion
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: CAP MBTA 8201 closure request of item #1 and #2.

Dear Mr. Catsos,

Pursuant to 220 CMR 151.07, the Department of Public Utilities ("DPU") has completed a review of the MBTA's request to close MBTA Corrective Action Plan (CAP) #8201 Item #1 and Item #2.

MBTA CAP #8201 is related to Engineering & Maintenance (E&M) staff failing to immediately report and preserve the scene of an incident or accident. Item #1 states, "Senior Director of Engineering and Maintenance with MBTA Safety will conduct remedial training to all E&M leadership Supervisor and above on the MBTA PADT Policy and Safety Event Investigation Manual, emphasizing the importance of following the processes in place, including the immediate notification to the OCC and supervisor when an event occurs." The MBTA has requested the closure of this item and offered the following, "E&M developed the enclosed Safety Tool Box talk that covers PADT Policy and Safety Event Investigation, including investigation thresholds and training. E&M leadership was required to review and acknowledge the training in the Learning Hub, as well as review and acknowledge the Event Investigation Manual. Enclosed is the Safety Tool Box talk material, and the training completion reports. Completion is at over 85% and E&M continues to follow-up for the few individuals still outstanding." On August 2nd 2022, MBTA E&M High Rail truck #2495 derailed outside of

Quincy Center Station. The DPU Investigator on call responded to investigate this incident and found that the MBTA Operator of High Rail truck #2495 failed to preserve the scene of the incident, and when questioned they stated that they were unaware of the requirement of incident scene preservation. The DPU rejects the MBTA request to close Item #1 and requests that MBTA resubmit the closure request when training to all E&M leadership, Supervisors and above achieves 100% completion.

CAP 8201 Item #2 states “MBTA MOW to train all new hires and reinstruct current employees about the proper process for a derailment, such as scene preservation, protocol for notification and reporting.”, In support of this closure request MBTA reports that “E&M developed the enclosed Safety Alert material that covers safety event procedures including scene preservation, notification, and reporting. MOW personnel received the toolbox talk and completion was recorded in the LearningHub. Enclosed is the E&M Safety Alert and the training completion report.”. The DPU has reviewed these supporting materials and grants closure of CAP item #2.

Please contact me should you have any questions or concerns.

Sincerely,

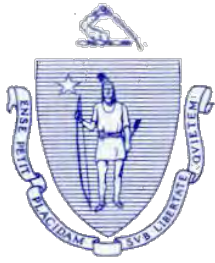
/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

P. Roman - DPU
J. Cheever - MBTA
R. Martin - MBTA



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

BETHANY A. CARD
SECRETARY OF ENERGY
AND ENVIRONMENTAL AFFAIRS

ONE SOUTH STATION
BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

September 8, 2022

VIA ELECTRONIC MAIL

Michael Catsos
Deputy Director of Safety Assurance and Promotion
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: CAP MBTA 8401 closure request of Item #1.

Dear Mr. Catsos,

Pursuant to 220 CMR 151.07, the Department of Public Utilities ("DPU") has completed a review of the MBTA's request to close MBTA Corrective Action Plan (CAP) #8401 Item #1.

MBTA CAP #8401 is related to worker protection and electrical hazards associated with work on or near electrical conductors (i.e third rail). Item #1 states, "MOW will take immediate action to retrain and distribute this directive among all MOW staff, as well as collect signatures from all active MOW employees." The DPU has reviewed signature submittals provided by the MBTA, including the supporting documentation and the CAP form for Item #1 closure request which was found incomplete. As a result, the DPU rejects the request for closure of item #1. The DPU directs the MBTA to provide accompanying narrative of initial actions taken, corrective actions taken and any additional details of the corrective action item which may be pertinent. Upon review, each of these sections of the CAP form were blank and should be completed as supporting narrative of a closure request. A highlighted date of "June 10, 2022" was populated in the box labeled Date Closed. As a reminder the date of a corrective action items' closure is the date in which the DPU concurs with a requested closure request. The date of a CAP item's closure is transmitted through correspondence from the DPU to the MBTA.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

P. Roman - DPU
J. Marcello - MBTA
R. Martin - MBTA



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

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BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

October 27th, 2022

VIA ELECTRONIC COPY

Steven V. Culp
Chief of Safety Engineering and Construction
MBTA Safety Department
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: MBTA CAP 8701 Action Item #1

Dear Mr. Culp,

Pursuant to 220 CMR 151.07, the Department of Public Utilities ("DPU") has completed a review of the MBTA's request to close MBTA Corrective Action Plan (CAP) #8701 Item #1.

MBTA CAP 8701 Item #1 was created to mitigate the hazard "Improper actions taken when personnel respond to emergencies on the ROW". In response to this hazard, MBTA stated the following corrective action, "Special Order to be developed to ensure that Officials do not put customers or authority property in a position of danger when responding to emergencies by use of train.". MBTA has stated that the "Special order was published and distributed on October 21, 2022" and provided supplemental documentation demonstrating this fact. The DPU has reviewed the MBTA's requests for closure and grants closure of CAP 8701.

Please contact me should you have any questions.

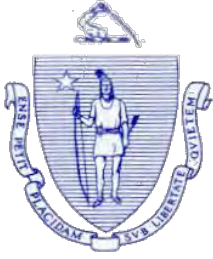
Sincerely,

/s/

Elizabeth Cellucci
Director, Transportation Oversight Division
Department of Public Utilities

Enc.

cc: T. Rao – DPU
M. Catsos – MBTA
A. Williams – MBTA



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

MATTHEW A. BEATON
SECRETARY OF ENERGY
AND ENVIRONMENTAL AFFAIRS

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BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

April 22, 2022

VIA ELECTRONIC COPY

Mr. Michael Catsos
Deputy Director of Safety Assurance
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA #7367

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #7367 which was part of a group of corrective actions. The corrective action is intended to mitigate the hazard that was identified as a result of MBTA's 2020 Internal Safety Review of the OCC Department.

The Department has reviewed the CAP in its entirety and verified that C21-015-03 corrective actions have been completed. Therefore, the DPU grants closure of CAP #7367 (DPU #C21-015-03). The Department continues to monitor risks associated with the hazard identified in this CAP through its continuing risk monitoring activities.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc: L. Dawley – DPU
A. Modh – DPU
M. DeDonato – MBTA
M. Catsos – MBTA



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



February 25, 2022

Ms. Elizabeth Cellucci
Director, Transportation Oversight Division
Massachusetts Department of Public Utilities (DPU)
Transportation Oversight Division
One South Station
Boston, MA 02110

Re: General Manager's Certification of Compliance

Dear Ms. Cellucci:

The Massachusetts Bay Transportation Authority ("MBTA"), as required by 220 CMR 151.05 "Internal Safety and Security Audits" and 49 CFR 673, submits MBTA's 2021 Annual Internal Safety Audit Report.

Based on the results of the internal audits conducted, I, Steve Poftak, General Manager, do hereby certify that the MBTA is in compliance with its MBTA Transit Safety Plan.

MBTA values its relationship with you, and joint efforts to work cooperatively in providing a safe and reliable rail service. Should you have any questions, comments, or concerns, please feel free to contact Ronald Ester, Chief Safety Officer, at (617) 352-4881.

Sincerely,

Steve Poftak
General Manager

February 24, 2022
Dated: _____

Enc: 2021 Annual Internal Safety Audit

Report cc: R. Ester, Chief Safety Officer

Paige Sopher

From: Catsos, Michael
Sent: Friday, February 25, 2022 11:39 AM
To: Cellucci, Elizabeth (DPU)
Cc: Limlengco, Ivana (DPU); Ester, Ronald; McDonnell, Meghan
Subject: 2021 Annual Internal Safety Audit Report and Certification of Compliance
Attachments: 2021 Annual Internal Safety Audit Report FINAL.pdf; 2021 Annual Certification of Compliance.pdf

Dear Ms. Cellucci,

On behalf of General Manager Steve Poftak and Chief Safety Officer Ronald Ester, the MBTA hereby submits the 2021 Annual Internal Safety Audit Report and GM's Certification of Compliance in accordance with 220 CMR 151.05 and 49 CFR 673.

Hard copies of these documents can be provided to DPU upon request.

Should you have any questions, please feel free to contact me.

Thank you,
Mike

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com



Paige Sopher

From: Catsos, Michael
Sent: Friday, February 25, 2022 11:39 AM
To: Cellucci, Elizabeth (DPU)
Cc: Limlengco, Ivana (DPU); Ester, Ronald; McDonnell, Meghan
Subject: 2021 Annual Internal Safety Audit Report and Certification of Compliance
Attachments: 2021 Annual Internal Safety Audit Report FINAL.pdf; 2021 Annual Certification of Compliance.pdf

Dear Ms. Cellucci,

On behalf of General Manager Steve Poftak and Chief Safety Officer Ronald Ester, the MBTA hereby submits the 2021 Annual Internal Safety Audit Report and GM's Certification of Compliance in accordance with 220 CMR 151.05 and 49 CFR 673.

Hard copies of these documents can be provided to DPU upon request.

Should you have any questions, please feel free to contact me.

Thank you,
Mike

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com





**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

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(617) 305-3500

MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

December 28, 2022

VIA Electronic Mail

Mr. Ronald Ester
MBTA Chief Safety Officer
185 Kneeland Street, Floor 3
Boston, MA 02110

RE: 2022 MBTA Transit Safety Plan

Dear Mr. Ester:

The Department of Public Utilities ("Department") has completed its review of the 2022 MBTA Transit Safety Plan ("Plan"), submitted by the MBTA to the Department on December 16, 2022.

The Department conducted the review in accordance with 220 CMR 151.03(3), 49 CFR Part 674.29, and 49 CFR Part 673.13. The Department utilized Version 3 of the Public Transportation Agency Safety Plan ("PTASP") checklist for Rail Transit Agencies and State Safety Oversight Agencies, which includes the current Bipartisan Infrastructure Law PTASP requirements at 49 U.S.C. § 5329(d), to verify the Plan's compliance with current federal and Department regulations. The checklist completed by the Department is attached.

The Department hereby approves the 2022 MBTA Transit Safety Plan.

Sincerely,

/s/
Elizabeth Cellucci
Director
Transportation Oversight Division

/s/
Dave Carvalho
Assistant Director
Transportation Oversight Division

Enc.

cc:

Steve Poftak, General Manager

Jeffrey Gonneville, Deputy General Manager

David Panagore, Chief Administrative Officer

Kenneth Green, Acting Police Chief

David Carney, AGM Bus Operations

James Neider, Chief of Capital Programs

Steven Culp, Chief Investigation and Safety Assurance Officer

Michael Catsos, Deputy Director

Revisions Drafted Fall/Winter 2022 for Approval by EOY

- **Signature Page, Section 1.4**
 - Updated approval process reflects the creation of joint management/labor Transportation Safety Management Working Group for compliance with Bipartisan Infrastructure Law.
- **Preface 3, Safety Policy Statement**
 - Reviewed and refreshed core commitments in response to FTA-identified safety priorities.
- **Preface 4, MBTA SMS Implementation**
 - Updated to include new SMS implementation exit expectations/milestones, including standup of joint management/labor safety committee.
 - Clarified connections between SMS implementation and FTA SMI findings/recommendations.
 - Refreshed descriptions of key tasks and milestones related to safety data management, safety risk management, and safety assurance.
- **Section 3.1, MBTA Safety Performance Targets**
 - Updated safety performance targets for fatalities, injuries (target of 2% reduction), safety events (target of 2% reduction), and system reliability.
 - Expanded description of how performance targets are currently monitored by safety leadership and used to inform safety decision-making.
 - Expanded description of current practices related to reporting on safety performance targets.
- **Section 4.2, Safety Management Committee Structure**
 - Updated to reflect current meeting names and terminology (e.g. Bus DAG v. BARC, ESC v. Executive Safety Performance Management Meeting).
 - Updated to reflect short- and medium-term action steps related to Local Safety Committees: recordkeeping and documentation requirements, Authority-wide meeting schedule, promotion and marketing requirements, training requirements.
- **Section 5.1, Application of Safety Risk Management**
 - Updated and clarified roles, responsibilities, and action steps for risk analysis.
 - Clarified short- and medium-term changes to process for risk review and acceptance by management and executive leadership.
 - Clarified short-term expectations for initiating safety risk management / mitigation when safety assurance activities identify a deviation from acceptable safety outcomes.
- **Section 6, Safety Assurance**
 - Added MBTA-specific details to better explain safety assurance phases and action steps, and clarify how these different steps fit together.
 - Clarified FTA SMI requirement to carry out compliance- or performance-based assurance activities in response to applicable areas of safety risk.
 - Clarified schedules, timelines, and management review process for different types of safety assurance activities.
- **Section 6.2.5, Hazardous Conditions Investigations**
 - Updated to better reflect current state of hazard investigation activities and DPU review / approval process.

- **Section 6.3, Data Analysis**
 - Clarified goals, expectations, and requirements for data analysis, highlighting FTA differentiation between “data” and “information”.
 - Documented current state of implementation for MBTA’s SMS database.
- **Section 6.4.2, Corrective Action Plan**
 - Revised sections on CAP development and verification for alignment with DPU Standard Operating Guidelines.
- **Section 7.2, Safety Communication**
 - Updated description of process for distribution of safety policy statement to frontline employees.
- **Appendices**
 - Clarified current state of department-specific safety committees / meetings.
 - Clarified expectations around safety performance monitoring and measurement, including communication with MBTA Safety about these activities.
- **Appendix H, Safety Assessment Decision Tool**
 - New appendix added to reflect Safety Department guidance on eight triggers for Safety Risk Management, SRM tools, and SRM outputs / monitoring process.

Smith, Christopher MF. (DOT)

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Monday, April 4, 2022 3:46 PM
To: DeDonato, Matthew
Cc: Dawley, Leah (DPU)
Subject: Accepted CAPs
Attachments: MBTA CAP 8221 CAP Approval.pdf; MBTA CAP 8241 CAP Approval.pdf; MBTA CAP 8281 CAP Approval.pdf

Hi Matt,

I recently reconciled DPU's CAPs and letters, and I wanted to inform you that the below CAPs were reviewed and approved with the following approval dates, for your records. I've also attached the corresponding letters.

MBTA CAP Number	DPU Approval Date
8221	3/18/22
8241	3/17/22
8281	3/17/22

Please let me know if you have any questions.

Sincerely,
Ivana

IVANA LIMLENGCO

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CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.

Smith, Christopher MF. (DOT)

From: Catsos, Michael
Sent: Friday, April 1, 2022 11:51 AM
To: Cellucci, Elizabeth (DPU); Limlengco, Ivana (DPU)
Cc: Dwarika, Kimberly; DeDonato, Matthew; Minevitz, Albert; McDonnell, Meghan
Subject: Closure Request - CAP 7367
Attachments: DPU CAP Form OCC 4-1-22 - Request For Closure.docx; SOPTABLEOFCONTENTS w. revision dates.doc; SOP-29 Dispatching Emergency Re-Railing Trucks 3.30.2022.doc; SOP-18.0 ROW Access WSP 3.29.2022 SECOND REVISION.doc; SOP-16.0 Slippery Rail 3.10.22.doc

Dear Ms. Cellucci,

In accordance with the provisions of 220 CMR 151.07, MBTA Safety formally submits the attached request to close CAP MBTA ID# 7367.

Attached supporting documents include the following:

- SOP Table of Contents / Update Tracking Mechanism
- Sample of revised OCC SOPs

If you have any questions, please do not hesitate to contact me.

Thank you,
Mike

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com



Smith, Christopher MF. (DOT)

From: Minevitz, Albert
Sent: Tuesday, November 30, 2021 2:52 PM
To: 'Elizabeth.Cellucci@mass.gov'; Limlengco, Ivana; 'Michael.Lavin@mass.gov'; 'Arun.Modh@mass.gov'; 'Kendrick.Raine2@mass.gov'
Cc: Hall, Andrew; Finnegan, John; Gauthier, John; Thomas, Latarsha; Graham, Joseph; Chann, Megan; Catsos, Michael; DeDonato, Matthew
Subject: Closure Request - CAPs 7360-7364
Attachments: TFM ISA CAPs - Request to Close.docx

Dear Ms. Cellucci,

In accordance with the provisions of 220 CMR 151.07, MBTA Safety formally submits the attached request to close CAPs MBTA ID# 7360-7364 (Items 1 – 5).

In addition to the updated CAP form, below is a SharePoint link to the following supporting documents:

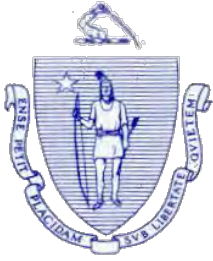
- Item 1: MCC User Guide, Bus maintenance weekly report, Creating and Managing Work Orders V2, HNTB Transfers, Tableau Dashboard, Transferring Work Order, and Various Transferred Work Orders.
- Item 2: Safety Hotline Call tracker(s), Tableau Dashboard, Work Priority Guideline Assessment, Asset Criticality Framework, and various Operational Importance Documents.
- Item 3: Design Directives (Color Standards, Doors Frames and Hardware, and Flooring Surfaces), E&M and VE Outreach workshop invitation.
- Item 4: Asset PMI Frequency sheet, PMI Completion Dashboard, and QM PMI Dashboard.
- Item 5: CPR/AED Training, MBTA Training Dashboard, Crane Safety Training, Confined Space Training, Wheel Truing Machine Training, and Scissor Lift Training.

<https://mbta.sharepoint.com/sites/DPUSubmittal/Shared%20Documents/Forms/AllItems.aspx?viewid=00880a15%2D983e%2D4075%2D818e%2D84d2af296806>

Please feel free to contact me directly if you have any further questions or concerns.

Thank you,

Albert “Jake” Minevitz, on behalf of Michael Catsos



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

BETHANY A. CARD
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MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

October 21, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

Dear Mr. Catsos,

The Department of Public Utilities (DPU) is writing with concern regarding a significant number of overdue Corrective Action Plan (CAP) matters. As of today, October 21st 2022, the MBTA Safety Department is late submitting relevant documentation for fifteen different Corrective Actions within twelve different Corrective Action Plans, all of which have been communicated to Safety by the DPU in the Monthly Hazard Tracking Log & CAP Review Meeting.

Per 220 CMR 151.07:

“(4) If the Transportation Authority does not complete a CAP within 60 days of the discovery of the Hazard and/or Risk, it shall submit a written request for an extension outlining the reason(s) for the extension, including the tasks to be completed and a timeline for completion.

(5) The Transportation Authority must provide the Department with written:

- (a) Verification that each corrective action described in the CAP has been implemented, or that a proposed alternate action(s) has been implemented subject to Department review and approval;
- (b) Status reports as requested by the Department, describing the status of each corrective action not completely implemented pursuant to a CAP's implementation schedule; and

(c) Reports to the Department, using the Department's CAP identification number, when the requirements of an approved CAP have been satisfied.”

Given the number of overdue Corrective Action Plan matters, as well as the critical safety nature of some, the Department directs MBTA Safety to submit formal extension requests for all relative matters by the close of business on October 25th, 2022.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc: R. Ester – MBTA
S. Culp – MBTA
A. Williams – MBTA
E. Cellucci – DPU



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

MATTHEW A. BEATON
SECRETARY OF ENERGY
AND ENVIRONMENTAL AFFAIRS

ONE SOUTH STATION
BOSTON, MA 02110
(617) 305-3500

MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

January 24, 2022

VIA ELECTRONIC COPY AND FIRST-CLASS MAIL

Mr. Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan Closeout MBTA CAP 7380-7384 / C21-016-5

Dear Mr. DeDonato:

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #7380-7384 which contains the following corrective action items as below:

- Item 1- E&M Training and Safety will establish and document a formal review process, taking place at least once annually, to ensure that all major safety-related policy changes in the Safety Plan and related safety content are integrated into E&M training materials or that we provide our employees with separate, related safety training.

Privileged, confidential, protected communication, for the intended recipient only

FAX: (617) 345-9101
www.mass.gov/dpu

- Item 2 - The process for investigating events involving E&M personnel will include Safety investigators notifying the Director of E&M Training to determine if re-training is needed. This process should be documented and require regular discussion of recent events and open investigations between Safety and E&M Training via the monthly E&M Safety Committee Meeting. An important goal is to ensure that investigations can fully identify, document, and address trends and patterns that may require the changes to the current training material, involvement of E&M instructors and remedial training for some E&M employees.
- Item 3 - Since E&M Training does not have course development resources or Safety Subject Matter Experts (SMEs), E&M instructors address safe operation of equipment. The introduction of new equipment happens infrequently. However, when it does occur, the instructor adds additional content to cover safe operation for that item. E&M Training will document those updates and share that information with Safety annually. When MBTA Safety produces safety content that requires E&M employee training, MBTA Safety will provide training materials to help address gaps in safety training requirements.
- Item 4 - E&M Training has asked the Office of the Chief Engineer (OCE) to provide ongoing updates and adequate notice in the planning of training. This includes determining whether 3rd-party vendors will provide the training or if the vendor will use a Train-the-Trainer approach. E&M Training and the Office of the Chief Engineer will document a process for review of upcoming configuration changes and modifications via a new or existing standing meeting.
- Item 5 - Significant changes to training materials required by the adoption of new equipment, work practices, or assets happens infrequently. However, when it does occur, the E&M instructor typically adds additional content to cover safe operation for that item or practice. E&M Training will document any relevant updates that materially affect our employee training, share that information with Safety as a standing agenda item in an existing recurring meeting, and ensure those changes are documented in the meeting minutes.

The Department has reviewed the CAP and supporting documents in its entirety and verified corrective actions. Therefore, the DPU has closed CAP # 7380-7384 (DPU # C21-016). The Department continues to monitor risks associated with the hazards identified in this CAP through its continuing risk monitoring activities.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc:

L. Dawley – DPU
A. Modh – DPU
M. DeDonato – MBTA
E. Golding– MBTA

Smith, Christopher MF. (DOT)

From: DeDonato, Matthew
Sent: Friday, April 29, 2022 6:46 PM
To: 'Limlengco, Ivana (DPU)'
Cc: Raine, Kendrick (DPU); Dawley, Leah (DPU); Gomes, Alicia; Connolly, Kevin; Fong, Margaret; Culp, Steven; Murphy, Kathleen A.; Catsos, Michael; Davis, Andre John
Subject: CAP 8021 (C22-006)- Green Line Yard Switches - Request for Closure
Attachments: SO_22_031_LR70.pdf; SO_22_031_LR70 Signoffs.pdf; SO_22_031 Tracking Sheet.pdf; DPU CAP Form_8021 Request for Closure 4.29.22.docx

Assistant Director Limlengco,

In accordance with the provisions of 220 CMR 151.07, MBTA Safety submits the attached request to close Item #1 of CAP 8021 (DPU #C22-006) focused on mitigating the hazard of Green Line yard switches not being set for the trolley's intended route.

Light Rail Transportation issued Special Order #22-031 to all Green Line Streetcar Motorpersons as a rule reminder of Rule #LR70. The Special Order stressed the importance of properly setting and "walking the route" to confirm that there are no obstructions to the intended route. Streetcar Motorpersons were required to review and sign an acknowledgment of receipt for the special order.

In addition to the updated request for closure form, the following enclosures are attached:

- Special Order 22-031
- Special Order 22-031 Signoffs
- Special Order 22-031 Tracking Sheet

With the completion of this Corrective Action, all items associated with CAP 8021 have been completed.

Please feel free to contact me directly if you have any further questions or concerns.

Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Tuesday, March 8, 2022 11:33 AM
To: DeDonato, Matthew <mdedonato@MBTA.com>
Cc: Raine, Kendrick (DPU) <kendrick.raine@state.ma.us>; Dawley, Leah (DPU) <leah.dawley@state.ma.us>
Subject: RE: DPU Report FY21-02540 - Derailment Riverside Yard at Track #10 -Switch #69 - 080721

Hi Matt,

Please see the attached letter regarding the acceptance of MBTA CAP #8021.

Sincerely,
Ivana

IVANA LIMLENGCO

Dvvlwdq#G lufw#r i#Jdl#Wdqv#Wdihw#
Ghsdwp hgw# #Sxedf#Wdihw#
Wdqv#rwdwq#R yhu#jkw#G ly#lwrq#
R qh#r#wk#Wdwrq#B*#orru#Erwrq#P D##85443#
P relh#k##4:1689;89#

From: Culp, Steven <SCulp@MBTA.com>

Sent: Monday, February 7, 2022 3:41 PM

To: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>

Cc: Roman, Paul (DPU) <paul.roman@mass.gov>; 'Lavin, Michael (DPU)' <michael.lavin@state.ma.us>; Raine, Kendrick (DPU) <Kendrick.Raine2@mass.gov>; Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>; Modh, Arun (DPU) <Arun.Modh@mass.gov>; Morris, John T (DPU) <John.T.Morris@mass.gov>; Murphy, Kathleen (MBTA) <kamurphy@MBTA.com>; Ester, Ronald (MBTA) <rester@MBTA.com>; Carvalho, David (DPU) <David.Carvalho@mass.gov>; DeDonato, Matthew (MBTA) <mdedonato@MBTA.com>; Dawley, Leah (DPU) <Leah.Dawley@mass.gov>; Rosario, Stephanie (MBTA) <srosario@MBTA.com>

Subject: DPU Report FY21-02540 - Derailment Riverside Yard at Track #10 -Switch #69 - 080721

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Dear Ms. Limlengco,

Attached for your review is MBTA Safety's Final Incident Report #21-02540, involving an Light Rail Vehicle Derailment at Riverside Yard, Track #10, Switch #69 on the August 7, 2021. This report was completed for the Transportation Oversight Division of the Massachusetts Department of Public Utilities Per Requirement 220 C.M.R§151.09(1), for your review and acceptance.

Additionally, MBTA Safety has included CAP Form #8021 for your review and acceptance.

Please feel free to contact me, should you have any questions.

Thank you,
Steven

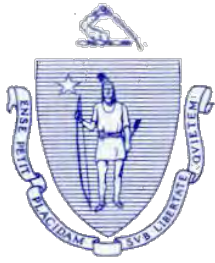
Steven V. Culp, WSO-CSSD
Chief Investigation and Safety Assurance Officer
MBTA Safety
Phone: 617-222-3471
Cell: 617-908-3143



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June 24, 2022

VIA ELECTRONIC COPY

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA # 8062/C22-04

Dear Mr. DeDonato,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8062 which contains one corrective action. This corrective action is intended to mitigate the hazard identified in the 2020 Triennial Audit as Finding #4 regarding the lack of safety critical procedures within the Power System Maintenance Department.

The Department has reviewed the CAP and associated procedures in their entirety and verified corrective action #1 has been completed. The DPU accepts the completion of corrective action #1 for the creation of the safety critical procedures with the Power System Maintenance Department. However, the DPU wants to ensure that power maintenance staff and vendors are properly trained on these new procedures prior to their implementation. The DPU directs the MBTA to create a new corrective action within this CAP to track the training and implementation of these safety critical procedures.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc:

D. Carvalho –DPU
W. Charrette – MBTA



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
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CECILE M. FRASER
COMMISSIONER

August 26, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan modification MBTA #8062 Item #2

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan modification identified as MBTA #8062 Item 2. This corrective action is intended to mitigate the hazard of 2020 Triennial Audit Finding #4.

Based on a review of the corrective action plan Item 2 for Power Systems Maintenance to identify and train any MBTA Power Equipment Technicians or MBTA Power Engineers that are responsible for performing or managing the work associated with the approved SOPs for Emergency Generator Inspection Test and Maintenance, Gas Turbine Inspection and Maintenance, Compressed Natural Gas Detection Inspection and Test, Monthly/Quarterly/Semi-Annual Fire Alarm Inspection, Fire Suppression Inspection and Test, and Emergency Ventilation Fan Inspection), the Department approves the CAP modification. The Department intends to perform risk monitoring activities to ensure the corrective actions have been completed in a timely manner.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.
cc:

D. Carvalho - DPU
W. Charrette - MBTA
S. Culp - MBTA

Smith, Christopher MF. (DOT)

From: Catsos, Michael
Sent: Tuesday, December 13, 2022 9:41 PM
To: Cellucci, Elizabeth (DPU); Dawley, Leah (DPU)
Cc: Limlengco, Ivana (DPU)
Subject: CAP 8201 - Closure Request
Attachments: DPU CAP Form_8201 - Request to Close Item 1 - 12-13-22.docx; Training Progress Summary Pie Chart - EM E&M Safety Event Investigation Manual Rev 3.1.pdf; Training Progress Summary Pie Chart - EM E&M Tool Box Talk (MBTA Safety Event Investigation Manual) July 26th, 2022 (3).pdf

Ms. Cellucci / Ms. Dawley,

Please find attached a closure request and supporting documents for CAP 8201, related to incident reporting and scene preservation.

Thank you,
Mike

Michael Catsos
Director of SMS and Safety Oversight
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com



Smith, Christopher MF. (DOT)

From: DeDonato, Matthew
Sent: Friday, July 8, 2022 4:45 PM
To: 'Limlengco, Ivana (DPU)'; Dawley, Leah (DPU)
Cc: Cheever, Joseph; Martin, Jr., Ray E.
Subject: CAP 8201, 8221, 8261 - Extension Request
Attachments: DPU CAP Form_8201 - Extension Request 7.8.22.docx; DPU CAP 8221 - Extension Request 7.8.22.docx; DPU CAP Form_8261 - Extension Request 7.8.22.docx

Assistant Director Limlengco,

Please see the attached extension requests for CAPs 8201, 8221, & 8261.
E&M has developed the related trainings and to ensure consistent tracking is uploading completion data through the LearningHub. Due to competing resource issues related to this change, as well the FTA SMI, an extension to 7/29/2022 is requested to allow for compiling the complete tracking reports for these items.
Feel free to reach out to me directly if you have any questions.

Thank you,
Matt

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Dawley, Leah (DPU)
Sent: Friday, March 18, 2022 12:38 PM
To: Culp, Steven
Cc: DeDonato, Matthew ; Limlengco, Ivana (DPU) ; Roman, Paul (DPU) ; Walsh, Michael F.
Subject: RE: DPU FY21-03449_Derailment-Hi-Rail Vehicle_Bowdoin Station_102021

Dear Mr. Culp,

On behalf Assistant Director Ivana Limlengco, please see the attached approval letters regarding CAPs 8201 and 8261.

Regards,

Leah Dawley
Auditor
Department of Public Utilities
Transportation Oversight Division
One South Station, Boston, MA 02110

From: Culp, Steven V (MBTA) <sculp@mbta.com>

Sent: Monday, February 28, 2022 6:00 PM

To: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>

Cc: Roman, Paul (DPU) <paul.roman@mass.gov>; Raine, Kendrick (DPU) <Kendrick.Raine2@mass.gov>; Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>; Modh, Arun (DPU) <Arun.Modh@mass.gov>; Morris, John T (DPU) <John.T.Morris@mass.gov>; Murphy, Kathleen (MBTA) <kamurphy@MBTA.com>; Ester, Ronald (MBTA) <rester@MBTA.com>; Carvalho, David (DPU) <David.Carvalho@mass.gov>; DeDonato, Matthew (MBTA) <mdedonato@MBTA.com>; Dawley, Leah (DPU) <Leah.Dawley@mass.gov>; Cassetta, Paul (MBTA) <PCassetta@MBTA.com>; Cheever, Joseph (MBTA) <jcheever@MBTA.com>; Martin, Jr., Ray (MBTA) <RMartin@MBTA.com>; Golding, Elizabeth (MBTA) <egolding@MBTA.com>

Subject: DPU FY21-03449_Derailment-Hi-Rail Vehicle_Bowdoin Station_102021

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Dear Ms. Limlengco,

Attached for your review is MBTA Safety's Final Incident Report #21-03449, involving a derailment of a Hi-Rail Grad-All at Bowdoin Station on the October 20, 2021. This report was completed for the Transportation Oversight Division of the Massachusetts Department of Public Utilities Per Requirement 220 C.M.R. §151.09(1), for your review and acceptance.

Additionally, MBTA Safety has included CAP Form #8261 for your review and acceptance. A copy of CAP Form #8201 is attached for reference, but this was also submitted for report #FY21-02669.

Please feel free to contact me, should you have any questions.

Thank you,
Steven

Steven V. Culp, WSO-CSSD
Chief Investigation and Safety Assurance Officer
MBTA Safety
Phone: 617-222-3471
Cell: 617-908-3143



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Smith, Christopher MF. (DOT)

From: Catsos, Michael
Sent: Tuesday, December 13, 2022 9:11 PM
To: Cellucci, Elizabeth (DPU); Dawley, Leah (DPU)
Cc: Limlengco, Ivana (DPU)
Subject: CAP 8281 - Closure Request
Attachments: DPU CAP Form_8281 - Item #1 - Closure Request.docx; Light Rail Pin Hitch Procedure.pdf; Light Rail Tow Bar Procedure.pdf

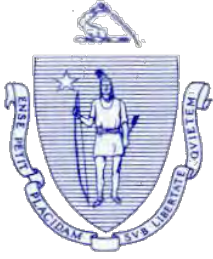
Ms. Cellucci / Ms. Dawley,

Please find attached a closure request and supporting documents for CAP 8281, regarding train uncoupling during vehicle movement.

Thank you,
Mike

Michael Catsos
Director of SMS and Safety Oversight
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com





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(617) 305-3500

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CECILE M. FRASER
COMMISSIONER

April 4, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: Proposed CAPs - SRCP Deficiencies

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8141-8146 which contains six (6) corrective actions. These corrective actions are intended to mitigate the deficiencies of the Safety Rules Compliance Program (SRCP) identified by the Department.

Based on a review of the corrective action plan, the Department approves the CAP and has issued the following DPU Control Number - C22-007. The Department intends to perform risk monitoring activities to ensure the corrective actions have been completed in a timely manner. The Department also intends to conduct a document review of the SRCP manual to identify potential areas that need improvement or updating.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc: L. Dawley – DPU
T. Rao – DPU
P. Roman – DPU
M. Fong – MBTA
R. Ester – MBTA



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(617) 305-3500

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COMMISSIONER

April 29, 2021

VIA ELECTRONIC COPY

Mr. Michael Catsos
Deputy Director of Safety Assurance
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA #8321

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8321 which contains five corrective actions. The corrective actions is intended to provide internal written procedures for OHS assigned tasks (excluding the Drug and Alcohol Program) and for all safety related activities.

Based on a review of the corrective action plan, the Department approves the CAP and has issued the following DPU Control Number – C22-016. The Department intends to perform risk monitoring activities to ensure the corrective actions have been completed in a timely manner.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc: L. Dawley – DPU
R. Kendrick – DPU
A. Modh – DPU
M. DeDonato – MBTA
K. LeGrow – MBTA



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(617) 305-3500

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CECILE M. FRASER
COMMISSIONER

November 29, 2022

VIA ELECTRONIC MAIL

Michael Catsos, Director
Safety Assurance and Promotion
MBTA
185 Kneeland Street
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA 8901

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR §151.07, has completed a review of the submitted corrective action plan MBTA 8901 which contains one corrective action. This corrective action is intended to mitigate the hazard of not lowering the trains' pantographs before transitioning from the Overhead Catenary System (OCS) catenary to third rail power.

The Department approves the CAP and has issued the following DPU Control Number: C22-030. The Department will perform risk monitoring activities to ensure the corrective action is completed in a timely manner.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

cc:

D. Carvalho – DPU
L. Dawley - DPU
F. Hunter - MBTA
J. Adams -MBTA



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September 16, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety Department
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: Proposed CAPs - Internal Safety Audit of MBTA Safety

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8622-8623, 8641-8648, 8661-8663 which contains thirteen (13) corrective actions. These corrective actions are intended to address the findings and recommendations of the internal audit of the MBTA Safety Department.

Based on a review of the corrective action plan, the Department approves the CAP in full and has issued the following DPU Control Number - C22-022. The Department will monitor the implementation of the corrective measures described in the CAP at intervals it deems necessary and appropriate.

Please contact me should you have any questions or concerns.

Sincerely,

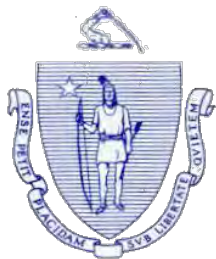
/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

T. Rao – DPU
M. Fong – MBTA
R. Ester – MBTA



CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

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October 3, 2022

VIA ELECTRONIC COPY

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety Department
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: Review of proposed CAP

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #8681, 8682 which contains two (2) corrective actions. These corrective actions are intended to address the third rail insulator damage near JFK/UMASS Truck Pad which resulted in a Code 1.

Based on a review of the corrective action plan, the Department approves the CAP in full and has issued the following DPU Control Number – C22-023. The Department will monitor the implementation of the corrective measures described in the CAP at intervals it deems necessary and appropriate.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

P. Roman – DPU
J. Cheever – MBTA
A. Williams – MBTA

Smith, Christopher MF. (DOT)

From: Minevitz, Albert
Sent: Tuesday, November 8, 2022 12:18 PM
To: Cellucci, Elizabeth (DPU); Dawley, Leah (DPU); Roman, Paul (DPU)
Cc: Catsos, Michael; Walsh, Michael F.; Hicks, Steve
Subject: CAP Closure Request - 8281 - Pin Hitching Procedures - Heavy Rail Only
Attachments: appendix A - pin radius calculations.pdf; appendix B - clearance versus pin radii.pdf; appendix C - clearance versus pin radii.pdf; chain analysis report - red & orange.doc; Chain Analysis Report Blue Line.doc; chaining procedure.pdf; Coupler Pin Hitch Training Red Line 9-30-2022.pptx; DPU CAP Form_8281_RequestClose_Item1_HeavyRail.docx; EEQA 52270 Blue Line Chaining Procedure_.pdf; Orange Line #12 Pin Hitch Procedure EEQA #52261.pdf; Orange Line #12 Pin Test Report.pdf; Orange Line #14 coupler and pin hitch training.pdf; pin engineering analysis report.pdf; pin test report.pdf; Red Line pin hitch procedure 9-15-2022.pdf; Training for Orange Line Coupler Pin Hitching.pdf; DPU CAP Form_8281_RequestClose_Item1_HeavyRail.pdf

Ms. Cellucci,

Please see attached request to close CAP 8281 – Item 1 (Heavy Rail Only). The procedures for Light Rail are currently under development. Thank you and please contact myself or Michael Catsos with any questions.

Regards,

Albert “Jake” Minevitz
MBTA Safety – System Safety Specialist
Cell: (857) 202-0136



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

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ROBERT E. HAYDEN
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CECILE M. FRASER
COMMISSIONER

August 29, 2022

VIA ELECTRONIC MAIL

Michael Catsos
Deputy Director of Safety Assurance and Promotion
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: CAP MBTA 8201 closure request of item #1 and #2.

Dear Mr. Catsos,

Pursuant to 220 CMR 151.07, the Department of Public Utilities ("DPU") has completed a review of the MBTA's request to close MBTA Corrective Action Plan (CAP) #8201 Item #1 and Item #2.

MBTA CAP #8201 is related to Engineering & Maintenance (E&M) staff failing to immediately report and preserve the scene of an incident or accident. Item #1 states, "Senior Director of Engineering and Maintenance with MBTA Safety will conduct remedial training to all E&M leadership Supervisor and above on the MBTA PADT Policy and Safety Event Investigation Manual, emphasizing the importance of following the processes in place, including the immediate notification to the OCC and supervisor when an event occurs." The MBTA has requested the closure of this item and offered the following, "E&M developed the enclosed Safety Tool Box talk that covers PADT Policy and Safety Event Investigation, including investigation thresholds and training. E&M leadership was required to review and acknowledge the training in the Learning Hub, as well as review and acknowledge the Event Investigation Manual. Enclosed is the Safety Tool Box talk material, and the training completion reports. Completion is at over 85% and E&M continues to follow-up for the few individuals still outstanding." On August 2nd 2022, MBTA E&M High Rail truck #2495 derailed outside of

Quincy Center Station. The DPU Investigator on call responded to investigate this incident and found that the MBTA Operator of High Rail truck #2495 failed to preserve the scene of the incident, and when questioned they stated that they were unaware of the requirement of incident scene preservation. The DPU rejects the MBTA request to close Item #1 and requests that MBTA resubmit the closure request when training to all E&M leadership, Supervisors and above achieves 100% completion.

CAP 8201 Item #2 states “MBTA MOW to train all new hires and reinstruct current employees about the proper process for a derailment, such as scene preservation, protocol for notification and reporting.”, In support of this closure request MBTA reports that “E&M developed the enclosed Safety Alert material that covers safety event procedures including scene preservation, notification, and reporting. MOW personnel received the toolbox talk and completion was recorded in the LearningHub. Enclosed is the E&M Safety Alert and the training completion report.”. The DPU has reviewed these supporting materials and grants closure of CAP item #2.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

P. Roman - DPU
J. Cheever - MBTA
R. Martin - MBTA



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

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CECILE M. FRASER
COMMISSIONER

September 8, 2022

VIA ELECTRONIC MAIL

Michael Catsos
Deputy Director of Safety Assurance and Promotion
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: CAP MBTA 8401 closure request of Item #1.

Dear Mr. Catsos,

Pursuant to 220 CMR 151.07, the Department of Public Utilities ("DPU") has completed a review of the MBTA's request to close MBTA Corrective Action Plan (CAP) #8401 Item #1.

MBTA CAP #8401 is related to worker protection and electrical hazards associated with work on or near electrical conductors (i.e third rail). Item #1 states, "MOW will take immediate action to retrain and distribute this directive among all MOW staff, as well as collect signatures from all active MOW employees." The DPU has reviewed signature submittals provided by the MBTA, including the supporting documentation and the CAP form for Item #1 closure request which was found incomplete. As a result, the DPU rejects the request for closure of item #1. The DPU directs the MBTA to provide accompanying narrative of initial actions taken, corrective actions taken and any additional details of the corrective action item which may be pertinent. Upon review, each of these sections of the CAP form were blank and should be completed as supporting narrative of a closure request. A highlighted date of "June 10, 2022" was populated in the box labeled Date Closed. As a reminder the date of a corrective action items' closure is the date in which the DPU concurs with a requested closure request. The date of a CAP item's closure is transmitted through correspondence from the DPU to the MBTA.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director of Rail Transit Safety
Transportation Oversight Division

Enc.

cc:

P. Roman - DPU
J. Marcello - MBTA
R. Martin - MBTA



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
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CECILE M. FRASER
COMMISSIONER

October 27th, 2022

VIA ELECTRONIC COPY

Steven V. Culp
Chief of Safety Engineering and Construction
MBTA Safety Department
185 Kneeland Street, 3rd Floor
Boston, MA 02111

RE: MBTA CAP 8701 Action Item #1

Dear Mr. Culp,

Pursuant to 220 CMR 151.07, the Department of Public Utilities ("DPU") has completed a review of the MBTA's request to close MBTA Corrective Action Plan (CAP) #8701 Item #1.

MBTA CAP 8701 Item #1 was created to mitigate the hazard "Improper actions taken when personnel respond to emergencies on the ROW". In response to this hazard, MBTA stated the following corrective action, "Special Order to be developed to ensure that Officials do not put customers or authority property in a position of danger when responding to emergencies by use of train.". MBTA has stated that the "Special order was published and distributed on October 21, 2022" and provided supplemental documentation demonstrating this fact. The DPU has reviewed the MBTA's requests for closure and grants closure of CAP 8701.

Please contact me should you have any questions.

Sincerely,

/s/

Elizabeth Cellucci
Director, Transportation Oversight Division
Department of Public Utilities

Enc.

cc: T. Rao – DPU
M. Catsos – MBTA
A. Williams – MBTA



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

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COMMISSIONER

April 22, 2022

VIA ELECTRONIC COPY

Mr. Michael Catsos
Deputy Director of Safety Assurance
MBTA Safety Department
185 Kneeland St
Boston, MA 02111

RE: Corrective Action Plan submittal MBTA #7367

Dear Mr. Catsos,

The Department of Public Utilities ("Department" or "DPU") in accordance with the provisions of 220 CMR 151.07, has completed a review of the submitted corrective action plan identified as MBTA #7367 which was part of a group of corrective actions. The corrective action is intended to mitigate the hazard that was identified as a result of MBTA's 2020 Internal Safety Review of the OCC Department.

The Department has reviewed the CAP in its entirety and verified that C21-015-03 corrective actions have been completed. Therefore, the DPU grants closure of CAP #7367 (DPU #C21-015-03). The Department continues to monitor risks associated with the hazard identified in this CAP through its continuing risk monitoring activities.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Ivana Limlengco
Assistant Director for Rail Transit Safety,
Transportation Oversight Division

Enc.

cc: L. Dawley – DPU
A. Modh – DPU
M. DeDonato – MBTA
M. Catsos – MBTA

Paige Sopher

From: Catsos, Michael
Sent: Friday, February 25, 2022 11:39 AM
To: Cellucci, Elizabeth (DPU)
Cc: Limlengco, Ivana (DPU); Ester, Ronald; McDonnell, Meghan
Subject: 2021 Annual Internal Safety Audit Report and Certification of Compliance
Attachments: 2021 Annual Internal Safety Audit Report FINAL.pdf; 2021 Annual Certification of Compliance.pdf

Dear Ms. Cellucci,

On behalf of General Manager Steve Poftak and Chief Safety Officer Ronald Ester, the MBTA hereby submits the 2021 Annual Internal Safety Audit Report and GM's Certification of Compliance in accordance with 220 CMR 151.05 and 49 CFR 673.

Hard copies of these documents can be provided to DPU upon request.

Should you have any questions, please feel free to contact me.

Thank you,
Mike

Michael Catsos

Deputy Director of Safety Assurance and SMS Implementation

MBTA Safety

185 Kneeland Street, 3rd Floor

Boston, MA 02111

Cell: (617)352-6044

mcatsos@mbta.com



Massachusetts Bay
Transportation Authority

2021 ANNUAL INTERNAL SAFETY AUDIT REPORT

Ronald Ester
Chief Safety Officer





Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poflak, General Manager



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Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



ACKNOWLEDGEMENTS

MBTA's General Manager, Steve Poftak, authorizes and fully supports MBTA's Annual Internal Safety Audit.

The MBTA's 2021 internal safety audits were conducted and facilitated by management and staff of MBTA Safety, under the direction of MBTA's Chief Safety Officer.

MBTA Safety would like to thank the management and employees who participated in the 2021 internal safety audit process, which included the MBTA Clinic / Occupational Health Services, Light Rail Operations, Light Rail Training, Maintenance of Way, Paratransit Services, and Rail Vehicle Maintenance.



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poflak, General Manager



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Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



February 24, 2022

Date

I, Steve Poftak, MBTA General Manager, do authorize and endorse the 2021 MBTA Annual Internal Safety Audit Report.



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poflak, General Manager



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DEFINITIONS & ACRONYMS

- **Annual Safety Audit Report** – The report prepared by MBTA Safety that describes internal safety audit activities performed during the preceding twelve months.
- **APTA** – American Public Transportation Association
- **BAT** – Breath Alcohol Technician
- **BFD** – Boston Fire Department
- **CAP** – Corrective Action Plan
- **CFR** – Code of Federal Regulations
- **CM** – Corrective Maintenance
- **CMR** – Code of Massachusetts Regulations
- **COM** - Compliant
- **Corrective Action Plan (CAP)** – A plan developed by the MBTA to minimize, control, correct, or eliminates hazards and the schedule for implementing those actions.
- **CSO** – Chief Safety Officer
- **CWR** – Compliant with Recommendation
- **D & A** – Drug and Alcohol
- **DLS** – Department of Labor Standards
- **Department of Public Utilities (DPU or Department)** – Massachusetts’ State Safety Oversight Agency (SSOA)
- **EAP** – Employee Assistance Program
- **E&M** – Engineering & Maintenance
- **FRA** – Federal Railroad Administration
- **FTA** – Federal Transit Administration
- **GM** – General Manager, or Chief Executive Officer of the MBTA
- **Hazard** – Any real or potential condition that can cause injury, illness, or death; damage to or loss of a system, equipment, or property; or damage to the environment.
- **ICS** – Incident Command System
- **LMS** – Learning Management System
- **LR** – Light Rail
- **MBTA** – Massachusetts Bay Transportation Authority
- **MCC** – Maintenance Control Center
- **MRO** – Medical Review Officer
- **NC** – Noncompliant
- **NEXT** – National Express Transit
- **NTI** – National Transit Institute
- **NTSB** – National Transportation Safety Board
- **OCC** – Operations Control Center
- **OHS** – Occupational Health Services
- **OSHA** – Occupational Safety and Health Administration
- **OTJ** – On The Job



- **PMI** – Preventative Maintenance Inspection
- **PPE** – Personal Protective Equipment
- **QA/QC** – Quality Assurance / Quality Control
- **Rail Fixed Guideway System (RFGS or MBTA)** – As determined by the FTA, any light, heavy, or rapid rail system, monorail, inclined plane, funicular, trolley, or automated guideway that: 1) Is not regulated by the Federal Railroad Administration (FRA); 2) Is included in FTA’s calculation of fixed guideway route miles or receives funding under FTA’s formula program for urbanized areas (49 USC 5336); 3) Has submitted documentation to the FTA indicating its intent to be included in FTA’s calculation of fixed guideway route miles to receive funding under FTA’s formula program for urbanized areas (49 USC 5336).
- **RFP** – Request for Proposals
- **ROW** – Right of Way
- **SAP** – Substance Abuse Professional
- **Safety Assurance** – One of the four (4) main components of SMS; ensures and verifies effectiveness of MBTA’s SMS safety performance, corrective action mitigations, and overall program.
- **Safety Management Policy** – One of the four (4) main components of SMS; a transit agency’s documented commitment to safety, which defines the transit agency’s safety objectives and the accountabilities and responsibilities of its employees in regard to safety.
- **Safety Promotion** – One of the four (4) main components of SMS; provides visibility of executive management’s commitment to safety and fosters improved safety performance by increasing safety awareness through safety communication and training.
- **Safety Risk Management** – One of the four (4) main components of SMS; the processes, activities, and tools MBTA utilizes to identify and analyze hazards and evaluate safety risks in operations and supporting activities. These include recognizing, identifying, and evaluate hazards; resolving or reducing those hazards to an acceptable risk level; and tracking the effectiveness of hazard controls.
- **SCMP** – Street Car Motorperson
- **SMRC** – Safety Management Executive Review Committee
- **SMS** – Safety Management System
- **SOP** – Standard Operating Procedure
- **SRCP** – Safety Rules Compliance Program
- **State Safety Oversight Agency (SSOA)** – The entity, other than the transit agency, designated by the state or several states to implement 49 CFR Part 659.
- **SSPP** – System Safety Program Plan
- **TFM** – Transit Facilities Maintenance
- **TSI** – Transportation Safety Institute
- **USC** – United States Code
- **VTS** – Veterans Transportation Service



1.0 INTRODUCTION

Federal Transit Administration (FTA) regulation 49 Code of Federal Regulations (CFR) Part 673, as well as 220 Code of Massachusetts Regulations (CMR) 151.05, require the Massachusetts Bay Transportation Authority (MBTA) to develop and document an ongoing internal safety audit process to assess compliance with, and measure the effectiveness of, the MBTA Safety Plan. On behalf of the General Manager and the MBTA, MBTA Safety conducts these internal audits through a comprehensive evaluation of all components of the Safety Plan, rotating through safety-sensitive MBTA departments and functions each year.

Several important factors impacted the implementation of the MBTA Internal Safety Audit Program in 2021. Most notably, in July 2020, the Authority adopted a new Transit Safety Plan in accordance with 49 CFR Part 673. The Transit Safety Plan, which is organized around the principles of Safety Management Systems (SMS) and designed to support MBTA's eventual full implementation of SMS, supersedes the 21-element System Safety Program Plan (SSPP) and sets out a comprehensive reorganization and rethinking of the Authority's safety activities. As described in previous Annual Internal Safety Review Reports, SMS focuses on integrating management of safety risk throughout the organization and ensuring the implementation of effective risk mitigation processes. It provides a number of benefits, including formalized accountabilities, improved safety collaboration across departments, and empowerment of employees through a non-punitive safety-reporting program.

In continuity with this transition, MBTA Safety employed the new checklist format established in 2020 for the 2021 audits, designed to capture key activities under both the previous 21-element SSPP and the current Transit Safety Plan. As in 2020, each checklist is organized in four primary categories to reflect the four core components of SMS (Safety Management Policy, Safety Risk Management, Safety Assurance, and Safety Promotion); the checklists also identify the most applicable SSPP element associated with each question or topic. Targeted interviews performed by MBTA Safety's audit teams enabled the department to assess compliance with safety program requirements over the previous three-year period while discussing the ongoing implementation of SMS.

A second notable occurrence in 2021 was MBTA's ongoing response to the COVID-19 pandemic. While the overall impacts of the pandemic and response on the Internal Audit Program were minimal, COVID-19 safety requirements did require certain audit meetings and document reviews to be conducted in an online format. In addition, extra caution was taken during field-based activities through the use of masking, physical distance, and reduced group numbers performing observations.

MBTA Safety has implemented one additional change to the format of the Annual Report in 2021. Previously, 'compliant with recommendation' (CWR) findings necessitated only follow-up from the department. In consultation with the Massachusetts Department of Public Utilities (DPU) State Safety Oversight (SSO) staff, a change was made to require a formal 'corrective action plan' (CAP) in response to a CWR finding. This change was made in



conjunction with the move towards expanded formal risk mitigation and monitoring as required by SMS. This change will provide a more formalized, documented, and structured response to audit findings.

The audit process allows MBTA to conduct a “deep dive” investigation into specific areas of MBTA’s transit system. These methods were utilized to review the safety activities of five MBTA departments and functions:

1. MBTA Clinic / Occupational Health Services
2. Light Rail Transportation and Training
3. Maintenance of Way
4. Paratransit Operations
5. Rail Vehicle Maintenance

Following the audits, checklists were completed to reflect results. MBTA’s checklists and initial findings were submitted to the relevant departments, who responded with their comments and concurrence.

Although opportunities for safety improvements were identified, all five audited departments were found to be compliant with the 2021 MBTA Transit Safety Plan. Internal safety audits are a safety assurance activity that determines the adequacy and effectiveness of the MBTA Transit Safety Plan. Based on the results of the internal audits conducted, the MBTA believes the Transit Safety Plan is adequate and effective. As a result of this audit, MBTA Safety issued fifteen (15) Findings of Compliance with Recommendation, which are contained within this report.

2.0 MBTA INTERNAL SAFETY AUDIT PROCESS

As the Accountable Executive, the MBTA’s General Manager has ultimate authority for the safe and secure operation of the MBTA transportation system. The General Manager assigns responsibility and authority to the Chief Safety Officer (CSO), who is designated to interface with MBTA divisions, departments, and directorates, as well as the DPU and other regulators, to implement and oversee the MBTA Safety Plan. The CSO, through MBTA Safety, is also responsible for performing annual internal safety audits.

MBTA Safety conducts and/or oversees ongoing, scheduled internal safety audits, assessments, and inspections of the MBTA’s rail operations, maintenance, and support departments and functions to evaluate compliance with the MBTA Safety Plan. The purpose of the internal audit program is to assist management in assessing the efficacy of the MBTA’s systems, including but not limited to internal rules, processes, and procedures that have been created, implemented, and set forth within the Safety Plan to help ensure and improve the safety of employees, passengers, contractors, emergency responders and the general public.

A significant function of MBTA Safety during the internal safety audit process is to provide technical assistance and guidance to the participating department, area, or committee in order



to improve SMS processes and to ensure compliance with the Safety Plan. During the course of the internal audit, MBTA Safety provides comments and suggestions to improve system safety process activities as guided by FTA circulars/guidance, rules, and regulations; safety initiatives; American Public Transit Association (APTA) standards; National Transportation Safety Board (NTSB) recommendations; as well as transit industry circulars, and/or best practices.

MBTA Safety determines compliance when a department or function is substantially adhering to applicable federal and state regulations as well as MBTA safety program requirements. In some instances, findings of compliance incorporate observations, which may include but are not limited to notable efforts, clarifications, and/or suggestions to improve Safety Plan process activities.

For instances where a department or function is technically in compliance with applicable federal and state regulations and MBTA safety program requirements, but opportunities for improvement (e.g. efficiency, efficacy) are identified, MBTA Safety may issue a finding of compliance with recommendation. These instances include when no written plan, policy, or procedure is in place for a particular activity, practices are not fully consistent with relevant industry best practices and standards, or organizational and resource issues have inhibited the performance of safety-related activities. Audited departments are required to respond to findings of compliance with recommendation with a CAP identifying action steps to resolve the finding, a responsible individual, and a projected completion date.

MBTA Safety may issue a finding of non-compliance in an explicit instance of non-adherence to applicable federal and state regulations or MBTA safety program requirements. In these instances, audited departments and functions are also required to respond to MBTA safety with a proposed CAP.

Internal Safety Audit Assessment Scale		
Assessment Scale Level	Description	Response Requirement
Noncompliant (NC)	The department is not in compliance with applicable federal and state regulations or MBTA safety program requirements.	Corrective Action Plan (CAP) Required
Compliant with Recommendation (CWR)	The department is technically in compliance with applicable federal and state regulations and MBTA safety program requirements, but no written plan, policy, or procedure is in place, practices are not fully consistent with relevant industry best practices and standards, or organizational and resource issues have	Corrective Action Plan (CAP) Required



	inhibited the performance of safety-related activities.	
Compliant (COM)	Resources are in place to accomplish all performance objectives. Employees are trained and knowledgeable on the policies and procedures which facilitate compliance with applicable internal and external requirements. Findings of Compliance may be accompanied by Observations.	No Response Required

Figure 1: Internal Safety Audit Assessment Scale

MBTA Safety and management from the audited departments formally track Internal Safety Audit mitigations and CAPs to resolution in coordination with the DPU.

MBTA Safety's future schedule for departments to audit as part of the ongoing Internal Safety Audit process can be found below.

Year	Departments
2021	- Rail Vehicle Maintenance (Heavy and Light), Maintenance of Way, Light Rail Transportation, Light Rail Training, Occupational Health Services, Paratransit Services
2022	- Heavy Rail Training, Heavy Rail Transportation, Capital Delivery, Power, Signals, Safety
2023	- Operations Control Center (OCC), Transit Facilities Maintenance, Procurement & Logistics, Bus Maintenance, E&M Training

Figure 2: Internal Safety Audit Program Three Year Scope (2021-2023)



3.0 ANNUAL SAFETY AUDIT REPORT CRITERIA

Consistent with 220 CMR 151.05(3), MBTA is required to submit an annual report on its yearly audit activities, due on or before February 15 of each year. Further, per DPU requirements, the report must include the following components:

- A checklist for each audit conducted, which must include the method of verification, results of the audit activity, and recommended actions, if applicable.
- An Internal Safety Audit Report summarizing findings for each audit regarding adequacy and effectiveness of the Safety Plan.
- A table included within the report that identifies the scope of the completed internal review program conducted on a 3-year basis that lists:
 - SMS elements relevant to internal reviews as described in APTA guidance; and
 - The relevant departments within the MBTA covered by the internal audit program.
- A statement by the MBTA's GM, certifying compliance with the Safety Plan and/or identifying areas of non-compliance.



4.0 INTERNAL SAFETY AUDIT 2021 RESULTS

The following presents MBTA's internal safety audit activities and findings for the 2021 Internal Safety Audit. Each audit summary includes a discussion of the audit methodology, key findings, observations, and MBTA Safety recommendations.

4.1 Occupational Health Services

Department Overview

Occupational Health Services (OHS) comprises the Massachusetts Bay Transportation Authority (MBTA) Clinic, Workers' Compensation division, Drug and Alcohol (D&A) program, and Employee Assistance Program (EAP). Since 2019, OHS has been housed within the MBTA Safety Department. OHS participates in the Occupational Health and Safety Working Group and consistently coordinates with other MBTA Safety Department staff.

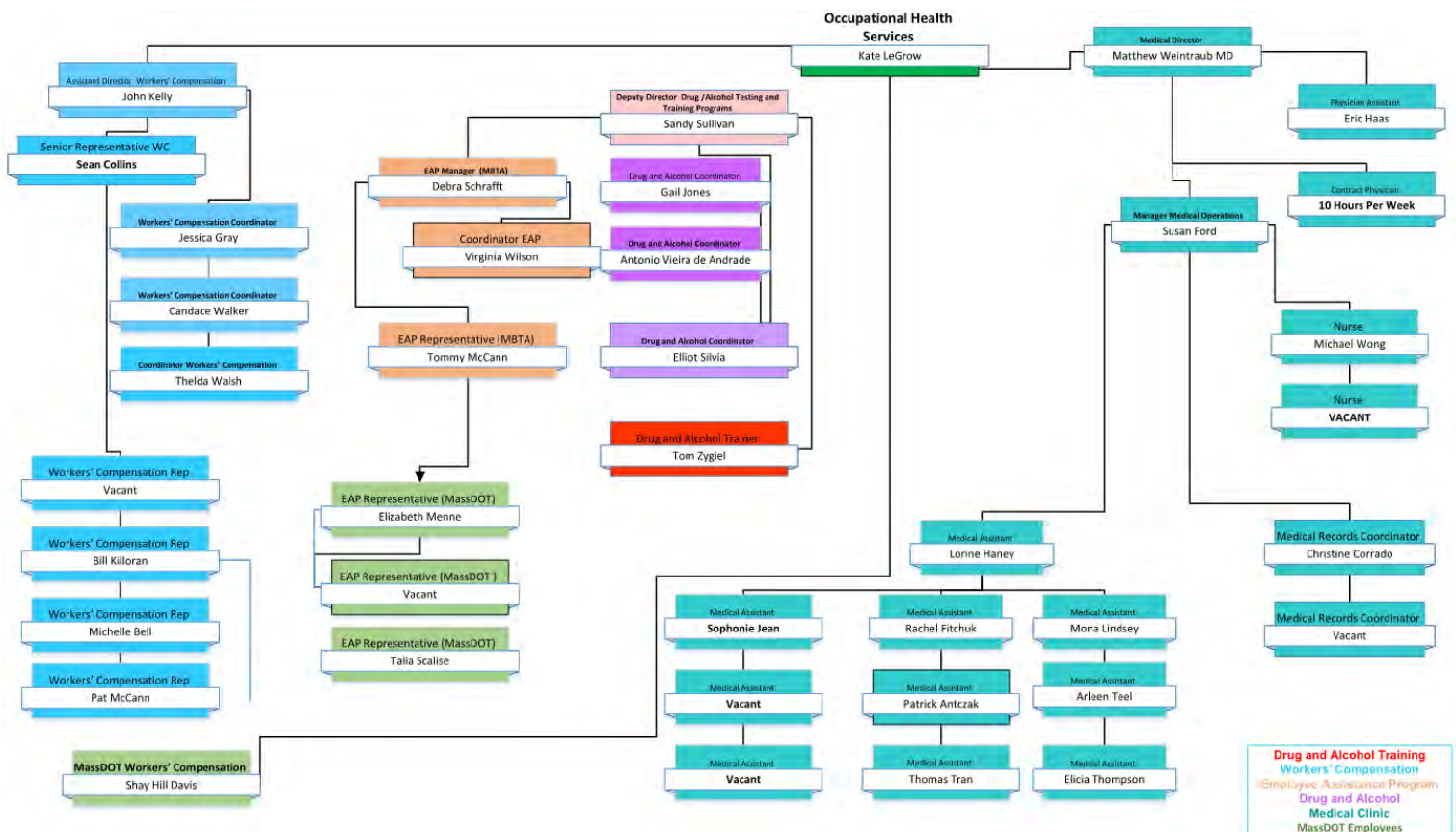


Figure 4: Occupational Health and Safety Organization Structure

The Clinic, overseen by the Medical Director, provides medical services to MBTA employees including D&A testing and physicals. It is staffed by trained and certified medical professionals, including two medical review officers (MROs), allowing OHS to review



D&A test laboratory results in-house. The Clinic manages a thorough fatigue management program, which includes the use of employee sleep questionnaires and referrals to sleep specialists for sleep apnea and fatigue-related issues. OHS administers fatigue awareness training to all MBTA employees. The Clinic conducts all employee physicals including routine mandatory physicals, fitness-for-duty physicals, post-accident physicals, and return-to-work physicals. OHS has processes in place for the review and monitoring of employee medications that can impact their ability to complete their jobs safely.

OHS's EAP and D&A program are overseen by the deputy director of drug/alcohol testing and training programs. OHS's D&A program, governed by MBTA's Drug and Alcohol Policy, ensures MBTA's compliance with all federal and authority standards for employee drug and alcohol testing and related training. MBTA conducts extensive D&A testing under its own authority in addition to required Federal Transit Administration (FTA) tests. OHS conducts all D&A testing in-house and employs breath alcohol technicians (BATs). OHS provides D&A training to MBTA employees, including federally-required D&A training for safety-sensitive employees and reasonable suspicion training.

OHS runs MBTA's extensive EAP. The EAP, through its substance abuse professional (SAP) program, provides services including education and follow-up testing plans to employees who have violated federal D&A regulations. EAP staff are trained in trauma-informed counseling and have numerous resources available to provide to employees experiencing trauma, following accidents, combatting substance abuse disorders, receiving discipline referrals, or experiencing other issues that may affect safety performance.

Workers' Compensation works with employees to manage workers' compensation claims from their inception to closure and analyzes employee injury data with the aim of reducing future injury risk. Workers' Compensation investigates claims and ensures employees receive appropriate medical treatment. Worker's Compensation also completes required injury and illness reporting to the Occupational Safety and Health Administration (OSHA).

Audit Activities

On September 30 and October 1, 2021, MBTA's audit team conducted interviews with senior OHS management regarding safety activities conducted by the department, including representatives from the Clinic, Workers' Compensation, and the D&A program and EAP. Audit criteria included Department of Public Utilities Regulation 220 Code of Massachusetts Regulations Part 151.03 and FTA Regulation 49 Code of Federal Regulations Part 673, as well as the 2021 MBTA Safety Plan. Discussion topics included safety management responsibilities and accountabilities, hazard identification and reporting, corrective actions and safety mitigations, change management, coordination between OHS and outside departments, safety training, and safety communication. Prior to conducting interviews, the audit team reviewed documentation requested from OHS related to its safety activities.

Audit Observations

OHS is well resourced to complete all assigned tasks safely and its staff are well-qualified and meet all training and certification requirements. OHS tracks its MROs', BATs', and SAPs' compliance with all education and recertification requirements. In addition to having



well-qualified staff, programming at OHS is robust. OHS's in-house D&A testing facilitates MBTA's adherence to federal and authority testing requirements. Similarly, the EAP is very robust and support's MBTA's safety culture. EAP staff are trained to perform trauma-informed counseling to employees and have plentiful resources available to provide employees in the program.

OHS senior management recognize that safety is its core function, serving MBTA departments authority wide. OHS is knowledgeable of MBTA safety management system (SMS) processes and the MBTA Safety Plan; participates in monthly Occupational Health and Safety Working Group meetings; has developed department-specific safety goals; and completes data collection and analysis related to employee injuries. OHS compiles MBTA's OSHA 300 log, a monthly workers' compensation report, and an internal monthly D&A program report.

OHS communicates safety information, including standards and policies, to employees via the MBTA intranet, email, posting of information in communal areas, and staff meetings. OHS provides regular feedback to employees on their performance, including for safety-related tasks, commending their work as appropriate or developing performance improvement plans for those employees who require them.

OHS works to ensure the safety of its own staff and all MBTA staff who visit the Clinic. The Clinic's medical staff are certified in cardiopulmonary resuscitation and the Clinic is equipped with a defibrillator and other emergency medical equipment. OHS conducts routine cleaning of the Clinic and ensures its equipment and materials are properly calibrated and are not used once expired. OHS works with building management to resolve building-related hazards. OHS personnel participate in emergency exercises as well as fire and evacuation drills. OHS relies on the medical training of its employees to ensure biohazards are appropriately mitigated.

OHS communicates regularly with other departments as well as other members of the Safety Department. In addition to coordinating with MBTA supervisors to schedule D&A tests, OHS coordinates with procurement personnel to review contractor D&A plans and test equipment undergoing procurement. Workers' Compensation regularly coordinates with other departments to address identified trends in employee injuries and reduce the risk of future injuries. OHS supports accident investigations via the provision of post-accident D&A tests and physicals.

Strengths

- **EAP:** The EAP, managed by OHS, is very robust and offers many resources to employees in addition to required SAP resources. The EAP provides support services to employees involved in accidents, receiving discipline referrals, or who have violated federal D&A regulations. By making such resources available to its employees, MBTA can proactively address issues such as trauma and substance abuse that may affect employee safety performance.
- **Employee Injury Analysis and Mitigation:** OHS's Workers' Compensation division analyzes MBTA's employee injury data and utilizes identified trends



to determine the root cause of injuries. MBTA then works to mitigate the root cause and lower the risk of future injuries.

- **Fatigue Management Program:** OHS runs a thorough fatigue management program for MBTA employees, which includes the provision of fatigue awareness training to all personnel, the use of sleep questionnaires, and coordination with sleep specialists as required. Ensuring employees have adequate sleep is vital to the safety of MBTA operations.

Findings of Noncompliance (NC)

Safety issued zero (0) Findings of Noncompliance to OHS.

Findings of Compliance with Recommendation (CWR)

Safety issued the following one (1) Finding of Compliance with Recommendation to OHS:

1. While the parameters of OHS programs are well-defined in Federal and State regulatory requirements and guidance, OHS does not have formal, internal written procedures for assigned tasks other than those for the D&A program.
 - a. OHS should document procedures for all of its safety-related activities. The Drug and Alcohol Policy adequately describes D&A-related processes completed by OHS, but procedures for other OHS activities, such as physicals, workers' compensation tasks, and EAP activities should also be documented.

Observations

Safety issued two (2) Observations to OHS.

1. OHS has set a number of 2021 safety goals documented in a spreadsheet maintained by department managers. MBTA Safety encourages the OHS team to continue implementing goals in alignment with this spreadsheet while expanding documentation on how goal progress is measured, where goal-related indicators are compiled and tracked in other department documentation, which individuals are responsible for goal fulfillment, and what time intervals are present for revisiting each goal. As described in Section 4.2.4 of the MBTA Safety Plan, a data analysis group may be able to help facilitate the implementation of required data collection, analysis, and reporting.
2. MBTA Safety encourages the OHS management team to maintain and expand coordination with the MBTA's safety risk management program to properly document and assess all hazards. Where necessary, OHS should continue to identify hazards through proactive and reactive means as described in Section 5.2.2 of the MBTA Safety Plan; document hazards via the MBTA Hazard Tracking System; conduct or support safety risk assessment of hazards; and develop, implement, document, and monitor the effectiveness of mitigations in response to the identified hazards. The audit team also encourages OHS management to continue to promote the use of the employee safety hotline in communications with department staff.



4.2 Light Rail Transportation and Training

Department Overview

MBTA's Light Rail (LR) Transportation function is responsible for day-to-day operation of all Green Line revenue service, as well as interfacing with other MBTA departments and teams including the Operations Control Center (OCC), Engineering and Maintenance (E&M), and MBTA Safety to ensure that service is delivered safely and without interruption. LR Transportation is headed by a Division Chief, with a management structure that includes two Superintendents, eight Supervisors, and several hundred full- or part-time motorpersons.

In support of this primary responsibility, LR Transportation staff and management perform a variety of additional functions, including accident response and investigation, hazard identification and reporting, safety rules compliance / efficiency testing, emergency drills and exercises, and corrective action plan management. While frontline staff have baseline responsibilities in all of these areas, each activity is primarily overseen by field and executive management.

LR Transportation managers coordinate both internally and externally to manage emerging safety hazards and issues. There is a monthly LR Transportation safety committee meeting which includes frontline personnel as well as Safety representation. LR Transportation managers are also active in the monthly Safety Rules Compliance Program (SRCP) Committee Meeting, weekly Right of Way (ROW) Access Committee meetings, monthly ROW Safety Committee meetings, and the bi-weekly Safety and Ops Coordination Meeting, among others.

LR Transportation is supported by a robust training program, headed by the Assistant General Manager of Operations and Operations Training and administered by instructors in the Training School. All motorpersons complete initial training and certification before becoming eligible for revenue service operations. The training program also includes periodic recertification for motorpersons, ad-hoc refresher trainings in response to accidents and hazards, and less-formal communications such as safety briefings and flashes.

Light Rail Organizational Chart



Figure 4: Light Rail Transportation and Training Organizational Structure



Audit Activities

MBTA Safety performed a series of formal virtual interviews with Light Rail Transportation between June 22 and July 13, 2021. Using a checklist derived from the MBTA Transit Safety Plan, the interviews included detailed discussion of the following: Safety Management Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. Following the completion of the interviews, MBTA Safety's audit team performed an on-site inspection of Reservoir Yard accompanied by company managers, supervisors, and maintenance personnel on August 11, 2021. The facility houses both administrative, operational, and maintenance functions of the Light Rail. The on-site activity included a review of general housekeeping, fire life safety, personal protective equipment, and other facility safety activities, as well as informal discussions with LR Transportation Motorpersons and field management regarding their understanding of the safety program and access to safety-related materials. Once all activities were completed, the MBTA Safety audit team reviewed all applicable information to form determinations on compliance, non-compliance, or any other recommendations.

Audit Observations

LR Transportation's management team is well-integrated into the day-to-day activities of the business unit. Field managers maintain a constant presence on the system and communicate regularly with senior leadership to discuss developing service issues, safety trends and patterns, and staff needs. A more formal structure of internal safety meetings allows leadership to collect safety feedback from staff. While the ratio of staff to supervisors is high, both frontline employees and managers appear well informed of their baseline safety duties and accountabilities. Information on safety policies and programs is readily accessible in LR Transportation facilities, breakrooms, and management offices.

LR Transportation management coordinate with outside departments and functions frequently to manage safety issues. LR Transportation's management team is represented in weekly Safety Data Review meetings, bi-weekly Safety and Ops Coordination meetings, monthly SRCP Committee meetings, Right of Way Access Committee meetings, and many other recurring weekly and monthly meetings. These meetings include discussion of recent accidents and incidents, safety data patterns, upcoming system and equipment changes, special event planning, and other topics.

At a high level, the LR Transportation function is closely integrated into MBTA's hazard management process, and staff at all levels are familiar with expectations for hazard identification and reporting established under the Safety Management System. Hazards are regularly reported and documented through OCC, management, local safety committees, and other activities, and LR Transportation leadership coordinate closely with Safety to ensure that all hazards are promptly mitigated to appropriate levels. Leadership have also played an active role in initial Safety Risk Management workshops performed by Safety.

LR Transportation maintains a series of emergency action protocols documented in coordination with the Operations Control Center and other functions through Standard Operating Procedures and the Rulebook. While staff are familiar with emergency



management expectations and have access to both classroom and on-the-job training opportunities, the audit team observed that LR Transportation's integration with ongoing drill and exercise planning and training could be enhanced to ensure that additional training opportunities are made available and that lessons learned from drills are incorporated fully into operating rules and requirements.

Managers carry out an extensive program of oversight and quality management activities to ensure that rail vehicles are operated in accordance with MBTA requirements. LR Transportation field supervisors and instructors are responsible for carrying out SRCP observations and documenting any discrepancies with the Rulebook. Senior managers maintain other spreadsheets and tracking tools to monitor open work orders impacting operations, to inventory speed signage and signals equipment, and to track safety data.

LR Transportation's training program is robust, consisting of a 40-day new hire onboarding program as well as an 8-hour recertification component. All training programs include hands on components and information on the latest available safety rules and procedures, with targeted refreshers delivered to Motorpersons outside of the recertification program on a periodic basis. LR Transportation training instructors are drawn from a pool of the most experienced employees, with at least five years of experience required to be eligible for a position.

Strengths

- **Hazard Management:** LR Transportation displays a strong understanding of the hazard identification and tracking process as outlined by the Transit Safety Plan. LR transportation is consistently identifying hazards through reports from front line staff and following up at the management level. LR management has excelled at tracking work orders to closure in conjunction with many other departments including Safety.
- **Field Presence:** Both LR transportation management as well as LR Training instructors maintain a constant field presence. This is completed through SRCP audits, QA of SRCP audits, trainings, response to incidents and more. This presence allows front line staff ease of access to management and instruction when it comes to questions, issues, or identified safety hazards.
- **Training:** LR Transportation's training program is comprehensive and vigorous. Training for new hires includes a 40-day program including hands on and classroom work. In addition, there is an 8-hour recertification program for all SCMP's with targeted refreshers delivered outside of the recertification course.

Findings – Noncompliance (NC):

Safety issued zero (0) Findings of Noncompliance to Light Rail Transportation and Training.

Findings - Compliance with Recommendation (CWR):

Safety issued the following five (5) Findings of Compliance with Recommendation to LR Transportation and Training:



1. LR Transportation does not maintain specific goals and objectives related to performance and safety within the department.
 - a. LR Transportation management should review applicable MBTA-wide and Safety goals and develop/document specific business unit goals and objectives related to safety and performance.
2. LR Transportation management are not consistently included in drills and exercises, and lessons learned from recent drills and exercises may not be adequately incorporated into department procedures and work practices as a result.
 - a. LR Transportation management should coordinate with MBTA's emergency management function to ensure that the department is represented in all major drills and exercises, and that after-action report findings with potential applicability to Light Rail are reviewed at the management level.
3. LR Transportation has not established clear and uniform requirements for completion of pre-trip inspections. Rules, procedures, and management expectation regarding pre-trip inspections are unclear, leading to variations in pre-trip inspection practices across seasons and work locations.
 - a. LR Transportation management should clearly identify and document expectations for pre-trip inspections, including the nature of the inspection, the required frequency, and which personnel are responsible. Management should ensure that pre-trip inspections are administered consistently across all locations at all times of year that they are required (or year-round, if necessary).
4. There is no existing requirement for LR Transportation field managers to complete Incident Command System (ICS) training, despite their primary role in event response.
 - a. LR Transportation management should review the existing training program and consider expanding training on the accident investigation process to include ICS modules, documenting a determination as to whether or not expanding the training program is appropriate.
5. There is no existing requirement for LR Transportation employees to complete blood-borne pathogen training, despite their relatively high likelihood of exposure.
 - a. LR Transportation management should review the existing training program and consider including blood-borne pathogen training, documenting a determination as to whether expanding the training program is appropriate.

Observations:

Safety issued one (1) Observation to LR Transportation and Training:

1. LR Transportation management should consider an enhanced level of engagement with OCC management during the ongoing review and update process for OCC standard operating procedures (SOPs) to ensure that all operational and emergency requirements are accounted for in OCC documentation.



4.3 Maintenance of Way

Department Overview

MBTA's Maintenance of Way (MOW) department, contained within Engineering and Maintenance (E&M), is responsible for continuous inspection and maintenance of rail and special track work across Light and Heavy Rail mainline and yards. MOW's area of responsibility also extends to the maintenance of specialized non-revenue equipment and the storage and inventory of key track components.

MOW coordinates with outside business units including Safety, Transportation, the Operations Control Center (OCC), Maintenance Control Center (MCC), and other E&M teams. Along with these departments, MOW works to identify and manage emergency maintenance issues related to track and switches, as well as to conduct planned outages of track and yard areas for maintenance. These activities are coordinated through weekly and monthly meetings held by various groups, which include the Code 1 Task Force, Derailment Committee, E&M Safety Committee Meeting, and other formal and informal discussions.

Maintenance activities performed by MOW are coordinated and monitored through technologies including Trapeze and MaxTrax, a phone- and tablet-based app for field inspections. Preventative Maintenance Inspections (PMIs) include riding and walking track inspections performed by teams in the field, as well as less frequent but more intensive inspections using track geometry vehicles. Data collected from inspections is logged using Trapeze and then used to create dashboards used for management tracking of work activity.

All job classifications within MOW are subject to an initial onboarding training program, which consists of both classroom and hands-on, on-the-job training. Expanded training is provided to individuals based on their position and job duties. Both Heavy Rail and Light Rail are overseen by an individual superintendent and share information directly with supervisors that specifically oversee individual lines and yards. System repairpersons and section foremen are required to recertify every two years. Training instructors are drawn from a pool of senior employees with at least 10 years of experience in the department.

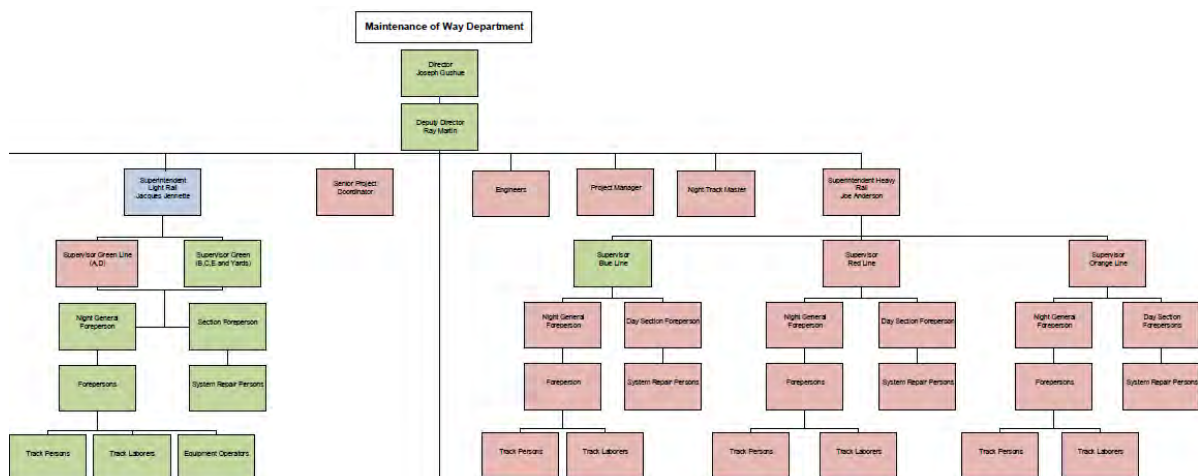


Figure 5: Maintenance of Way Organizational Structure for Light and Heavy Rail Maintenance

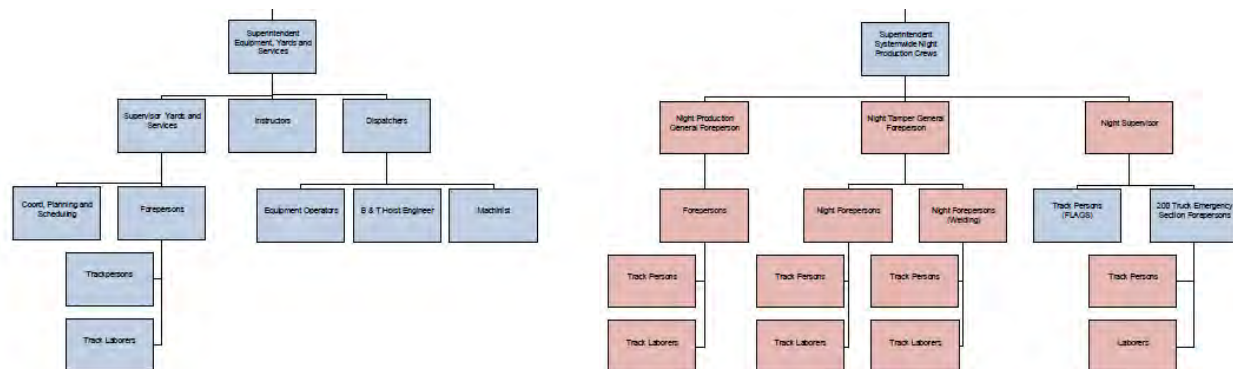


Figure 6: Maintenance of Way Organizational Structure for Equipment and Night Production

Audit Activities

MBTA Safety performed a series of formal virtual interviews with MOW management between April 26 and April 27, 2021. Using a checklist derived from the MBTA Transit Safety Plan, the interviews included detailed discussion of the following: Safety Management Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. Following the completion of the interviews, MBTA Safety's audit team performed an on-site field observation on May 25, 2021. This observation included maintenance being performed and track walkers performing their nightly duties on the Green Line, and was accompanied by the Department of Public Utilities (DPU), MOW Training, supervisors, and maintenance personnel. The observations included a review of the work being conducted, relevant documentation (MaxTrax) and interviews with employees of various job titles. Once all activities were completed, the MBTA Safety audit team reviewed all applicable information to form determinations on compliance, non-compliance, or any other recommendations.

Audit Observations

MOW managers and staff demonstrated a strong understanding of baseline employee safety accountabilities and responsibilities. Safety expectations are established beginning with pre-hiring through job descriptions and the onboarding process, and are communicated to employees on an ongoing basis through meetings, emails, toolbox talks, and posted safety flashes. Employees demonstrated awareness of how to access the Transit Safety Plan if needed, and managers were able to describe their involvement in monitoring annual updates or revisions to the Plan. Managers also showed that an adequate framework for discussion of safety goals and objectives is in place, with meetings to discuss these objectives held on an ongoing basis and with managers ensuring department goals align with higher level goals in the Transit Safety Plan. MOW's management chain of command includes clear lines of accountability over different geographic areas of the system and categories of maintenance activity.

MOW maintains a fairly robust program for management oversight of employee activities in the field, although the audit team observed that new technology being used by the department presents opportunities for further improvement. Local area managers are



accountable for inspecting all segments of track under their control at least once each year, which complements the ongoing program of weekly track inspections performed by frontline track inspectors. MaxTrax, a mobile-based program, is used to document inspections, record defects, and communicate information on required corrective maintenance to managers for further action. Preventative maintenance activities are scheduled via Trapeze, which is also being built out to include a comprehensive listing of MOW assets. Field employees noted that expanded management oversight may benefit the overall quality of the maintenance program, capturing defects that have escaped notice during regular ongoing track inspections and ensuring that track inspectors can be reeducated on specific techniques and procedures if needed.

MOW's interviewees demonstrated that a process is in place for identification and management of safety-related hazards requiring discussion with outside departments and/or formal mitigation via the hazard management process. Managers coordinate effectively with MCC and with field personnel to manage defects that are identified in accordance with applicable track standards; trends and systemic issues are elevated as needed for further review and are often managed via maintenance campaigns or other documented corrective actions. Hazard discussions are documented in emails, meeting minutes, and Operations Control Center (OCC) notifications related to specific issues.

Interviewees also shared information regarding MOW's coordination with outside departments. The department is represented in the safety certification process for major capital projects, including the Green Line Extension and procurement of new fleet vehicles. The department also monitors smaller, localized projects on an ongoing basis through meetings and email communications. These discussions frequently include Safety, Operations, Procurement, and other teams; changes with impacts on the system configuration are addressed via updates to rules, procedures, and maintenance guidance. Regarding emergency response and management, MOW's interviewees did note that the existing response process is largely rooted in institutional knowledge, and MOW does not have a significant level of involvement in emergency drills, exercises, or after-action activities.

Training activities for MOW personnel are wide-reaching in their scope. All employees complete an initial training program while being onboarded into the department. Additional on-the-job training is provided for specific tasks, job positions, personal protective equipment requirements, and pieces of equipment. Training requirements are documented in a training matrix maintained by MOW management, and trainings completed by individual employees in accordance with this matrix are documented in the MBTA Learning Hub.

Strengths

- **Communication:** MOW effectively takes advantage of existing channels of communication (for example, Everbridge Notifications via Operations Control Center) to alert stake holders to hazards or incidents related to track conditions. Additionally, MOW keeps an open line of communication with MBTA Safety via meetings, email, and hazard log documentation.



- **Training:** All job classifications within MOW have an initial training program provided by the MOW training instructors. Additionally, there is expanded training depending on the job positions and job tasks. The Learning Hub is used as a tracking / recording keeping system.
- **Change Management:** MOW plays an active role in major changes being proposed for the system. Managers collaborate with capital delivery to identify components in need of purchase and repair. Additionally, they are involved with the safety certification process when applicable.

Findings of Noncompliance

Safety issued zero (0) Findings of Noncompliance to Maintenance of Way (MOW).

Findings - Compliance with Recommendation (CWR):

Safety issued the following two (2) Finding of Compliance with Recommendation to MOW:

1. MOW's procedures for response to emergency events are not fully documented and largely consist of institutional knowledge.
 - a. MOW management should perform an assessment of existing emergency procedures, identify gaps, and develop or formalize new procedures to ensure that documented processes are in place for all applicable emergency event types. These procedures should be utilized as a baseline, with acknowledgement that emergency situations contain many variables where institutional knowledge can play a role.
2. The shift from analog to digital MOW business processes presents an opportunity to improve upon supervisor field verification of PMIs and targeted observations of staff.
 - a. As the implementation of MaxTrax continues, MOW management should examine workflows and technological capacity to develop an enhanced process for verifying that supervisors adhere to schedules and requirements for field activity oversight. MOW management should confirm the effectiveness of this process through regular records reviews and status check-ins.

Observations:

Safety issued four (4) Observations to MOW:

1. MOW management and field staff have minimal exposure to emergency drill and exercise planning and implementation. MOW management could coordinate with MBTA's Emergency Management function to ensure that the department is included in drill and exercise planning, implementation, after-action report development, and implementation of recommendations whenever necessary.
2. While MOW employees can access safety communications via multiple channels, MOW management should ensure that safety flashes and bulletins are distributed to / posted in all MOW satellite facilities.
3. MOW management should continue to provide high-level familiarization on hazard



identification and reporting requirements for MOW staff, and monitor the process for hazard management outside of the preventative maintenance process.

4. MOW management should continue efforts to document institutional knowledge related to critical points of failure within the system, and complete a full assessment of switches and track segments in coordination with other MBTA business units to aid in scheduled maintenance and overhaul/replacement of components where necessary.

4.4 Paratransit Services

Department Overview

MBTA Paratransit (The RIDE), provides door-to-door, shared-ride transportation to eligible people who cannot use the subway, bus, or trolley all or some of the time due to temporary or permanent disability. This audit includes internal MBTA Paratransit staff and service contractors National Express Transit (NEXT), and Veterans Transportation Services (VTS).

The internal MBTA Paratransit team is responsible for developing paratransit policies and procedures, sharing them with contractors, communicating MBTA updates to contractors, meeting with contractors on a periodic basis, and monitoring issues as they arise. Internal staff management includes, a Chief and Deputy Chief of Paratransit Services and four deputy directors that are responsible for operations, administration, technology, and innovation and analysis. Each deputy director manages a team of one to six employees to fulfill their above duties.

Both NEXT and VTS provide transportation services to MBTA and The RIDE customers. NEXT and VTS hire and train their own operators and conduct vehicle maintenance and safety investigations on MBTA owned vehicles operated by NEXT and VTS employees. Both have their own organizational hierarchy. NEXT currently has 28 managerial and supervisory staff (including 20 safety employees), 14 window dispatchers, various support staff, and approximately 250 drivers to fulfill the MBTA contract. The 20 safety staff respond to incidents, conduct facility walkthroughs, and collect and analysis safety data. NEXT Corporate has a strong influence on local policies and procedures and work closely with Boston staff to fulfill contract obligations. VTS has been a provider of THE RIDE service for over 30 years. Its fleet of 380 vehicles and drivers provide well over 750,000 rides each year. Managerial, safety, and support staff oversee three sites across the Boston Metro area, coordinate with The Ride Access Center (TRAC), and fulfill safety responsibilities. Safety staff are split across all three sites and can respond anywhere in the system.

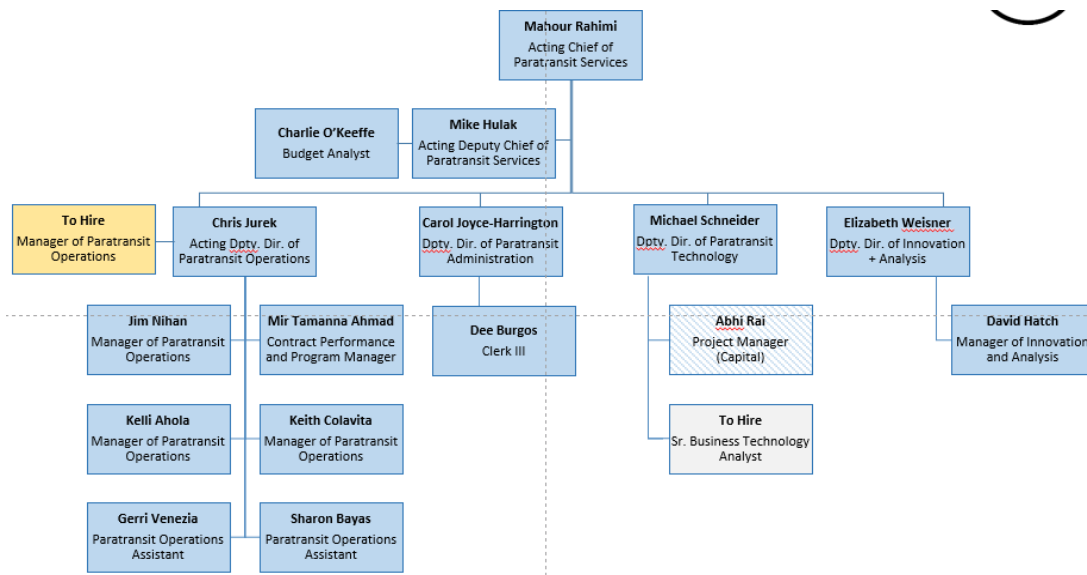


Figure 7: Paratransit Services Organizational Structure

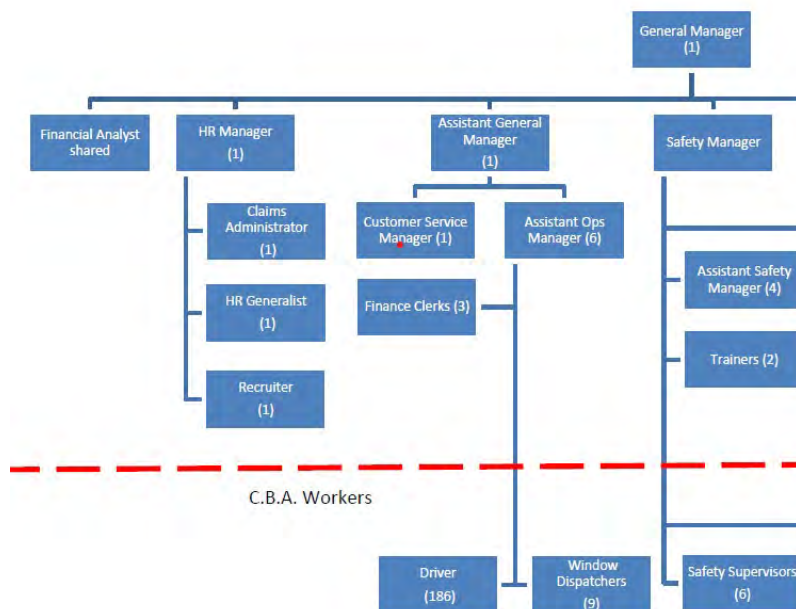


Figure 8: NEXT Paratransit Services Organizational Structure

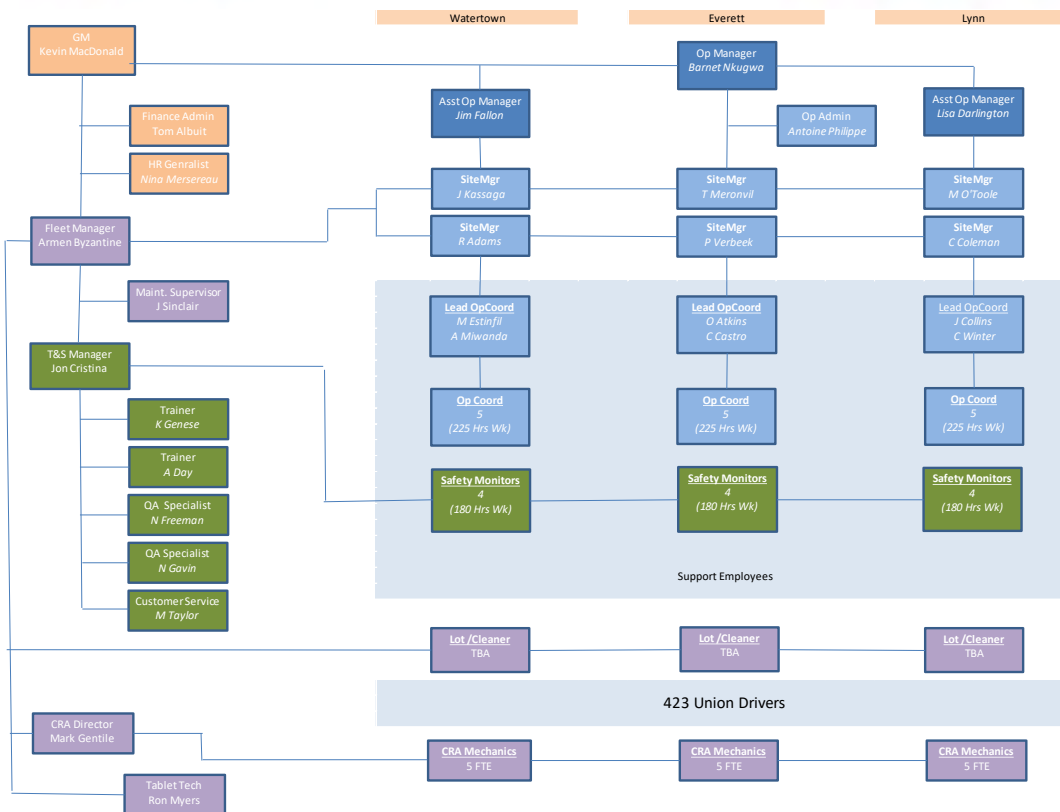


Figure 9: VTS Paratransit Services Organizational Structure

Audit Activities

MBTA Safety performed a series of formal virtual interviews with Veteran's Transportation Service (VTS) and National Express Transit (NEXT) management between September 20 and September 22, 2021. These two entities provide the MBTA with Paratransit services (The Ride). Using a checklist derived from the MBTA Transit Safety Plan, the interviews included detailed discussion of the following: Safety Management Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. Following the completion of the interviews, MBTA Safety's audit team performed an on-site inspection of VTS and NEXT facilities in Quincy, Hyde Park, Everett, Charlestown, Watertown, and Lynn accompanied by company managers, supervisors, and maintenance personnel. These facilities house both administrative, operational, and maintenance functions of the RIDE. The facility inspection included a review of general housekeeping, fire life safety, equipment, hazardous materials storage, personal protective equipment, spill prevention, and other facility safety activities. Once all activities were completed the MBTA Safety audit team reviewed all applicable information to form determinations on compliance, non-compliance, or any other recommendations.

Audit Observations

Management from the MBTA Paratransit Contract Team, VTS and NEXT demonstrated a strong commitment to safety during interviews with the audit team. The MBTA Safety Audit Team visited all five (5) facilities between VTS and NEXT and found that safety-related activities are well coordinated on the shop floor.



Safety related issues are tracked via quarterly reports between the contractors and the MBTA Paratransit Contract Team. Additionally, each contractor conducts periodic safety meetings to address safety concerns, topics, and new information with front line employees.

Each contractor also tracks key metrics related to preventative maintenance completion, corrective maintenance, fleet reliability, in-service failures, accidents, injuries, and overtime utilization. This data is compiled into reports on various software's/platforms and distributed to various area management for tracking, Quality Assurance (QA) and review.

The Training function for both vendors is very well integrated within the companies. Training curriculum is based in the requirements outlined in the contract established between the vendor and the MBTA Contract Team. Each contractor provides new hire training that consists of many topics including but not limited to vehicle familiarization, defensive driving, general operations training and basic first aid.

The VTS training curriculum is particularly strong. The description and documentation highlighted a combination of classroom and field training including 'On The Job' (OTJ) training with a senior driver. The VTS program has an evaluation built into the program in order to follow up with new drivers after their first 40 days in service.

The NEXT Training program contains a well-documented and consistent program aided by centralized training materials from their corporate office. Additionally, NEXT utilizes a learning management program called Taleo to provide standardized online trainings to employees as well as to track and monitor training and recertification status.

Both contractors utilize the Drivecam system in order to monitor operations performance. The software is utilized not only for monitoring and disciplinary action but for coaching as well. The focus on coaching operators in appropriate situations displays a commitment to the growth of a positive safety culture as well as retaining skilled employees.

Both contractors display a lack of formalized hazard identification processes and trainings. The addition of a formalized hazard identification process would bring the vendors into compliance with that portion of Safety Management Systems (SMS) as well as continue to promote a safe working environment.

Strengths

- **Technology and Data Driven:** Both Paratransit contractors rely on a wide range of technology to help provide a safe and reliable service. Each organization uses this technology effectively to provide its basic service. It also uses technology to provide enhanced oversight, monitoring, and improvements to their operation. These varied technologies are used to provide a safer environment for drivers and riders. Most notable is the "Drive-Cam" system which can provide real time monitoring of a driver's activities as well as generate actionable reports to pinpoint unsafe activities and coach drivers appropriately. A suite of other software is utilized to provide long term operational and safety specific information to contractor management and the MBTA.

- **Facilities:** All paratransit contractor facilities are very well suited to provide the required services to the MBTA and those who utilize the RIDE. Each facility is clean, well-staffed,



safe, and organized. These facilities lend themselves to the overall professionalism of the operation. At these sites they conduct the operational support, fit-for-duty checks, uniform checks, and vehicle maintenance. The facilities are strategically placed throughout Eastern Massachusetts to allow for a high level of service. Overall, these facilities are a testament to the professionalism, safety, and success of the RIDE program.

• **Incident Response:** Both organizations have documented SOPs and training in place for the immediate response to RIDE vehicles being involved in a motor vehicle accident or incident. Paratransit Safety personnel are given specific training as part of their onboarding which includes hands on training for the aftermath of an accident including responding to the scene, documenting, interviewing witnesses/drivers, and uploading the information into a tablet-based program. In the time after the accident has occurred, depending on the severity, the accident will be reviewed further by management and determinations will be made on the level of coaching and/or discipline for a driver that may be required. These steps combined aid to minimize the impact of the incident itself and prevent other accidents in the future.

Findings – Noncompliance (NC):

Safety issued zero (0) Findings of Noncompliance to Paratransit Services.

Findings - Compliance with Recommendation (CWR):

Safety issued the following six (6) Findings of Compliance with Recommendation to Paratransit Services:

1. There is no consistent process for MBTA Paratransit Contract Management to obtain updated versions of the MBTS Safety Plan.
 - a. The MBTA Safety audit team recommends that the MBTA Paratransit team work with MBTA Safety to create and document a formalized process for receiving the yearly update of the Safety Plan.
2. The competitive nature of awarded contracts limits information sharing between the MBTA, NEXT and VTS, causing some inconsistencies in areas such as training, policies, and safety procedures.
 - a. The MBTA Safety audit team recommends all parties (MBTA Safety, Paratransit, and Contractors) should work together to best of their abilities to develop standardized training, policy, and safety procedures when possible. This could also take the form of a yearly or quarterly review to ensure all contractors have the most up-to-date information and their organization is compliant with MBTA Safety standards.
3. Vendors do not have a formalized timeline to complete changes to their own documentation upon updates to the MBTA Transit Safety Plan.
 - a. While both major vendors have documented a requirement to revise their plans and procedures based on updates to the MBTA Safety Plan, the audit team recommends that vendors establish and formalize a 30-day timeline for review



- of each revised MBTA Transit Safety Plan and corresponding updates to reflect changes.
4. NEXT and VTS do not consistently manage hazards in accordance with the safety risk management processes outlined in the MBTA Transit Safety Plan.
 - a. All hazards identified, including low-risk hazards and/or hazards that can be mitigated without the support of other departments, should be documented and assessed for associated safety risk. Both contractors have a sufficient process in place for reporting hazards that are associated with the operation of vehicles. However, hazard identification and reporting should be expanded beyond hazards associated with vehicles. Vendors should demonstrate that hazards are being managed in accordance with program requirements and employee training by providing documentation of both vehicle-based and other hazards that have been reported, formally documented, and managed or eliminated.
 5. NEXT does not have a formalized process for documenting and tracking Corrective Action Plans (CAPs) issued by MBTA management or Safety.
 - a. While NEXT does maintain a process for lower level disciplinary actions and corrective retraining, Safety recommends that NEXT work with the appropriate internal parties, as well as MBTA liaisons and MBTA Safety, to establish a formalized process for documenting, tracking, and closing the more-complex corrective action plans (CAPs) which may emerge from audits, investigations, and inspections.
 6. NEXT and VTS do not have a defined threshold on when to report hazards identified to MBTA Management or MBTA Safety.
 - a. The MBTA Safety audit team recommends defining a threshold or category of hazards to report. In addition, the MBTA Safety audit team recommends adding a bullet in the safety section of the quarterly reports for hazards identified under the new threshold.

Observations

Safety issued one (1) Observation to Paratransit Services:

1. NEXT did not provide a documented example of the training management system currently being utilized. MBTA Audit team recommends that NEXT provide some documentation from the Taleo learning system brought up during interviews.

4.5 Rail Vehicle Maintenance

Department Overview

MBTA's Rail Vehicle Maintenance function performs preventative maintenance (PM/PMI) and corrective maintenance (CM) for all vehicles in MBTA's rail fleet. The rail maintenance senior management team includes a Director of Rail Maintenance and a Deputy Chief Mechanical Officer- Rail, who report to MBTA's Chief Mechanical Officer. Beneath the Director are two Deputy Director Positions overseeing MBTA's heavy and light rail



maintenance facilities. Answering to the heavy and light rail Deputy Directors, several Superintendents oversee individual facility Forepersons. Light Rail Maintenance includes facilities at Riverside, Reservoir, Lake Street (also known as Boston College) and Mattapan; Heavy Rail Maintenance includes facilities at Cabot, Wellington, and Orient Heights.

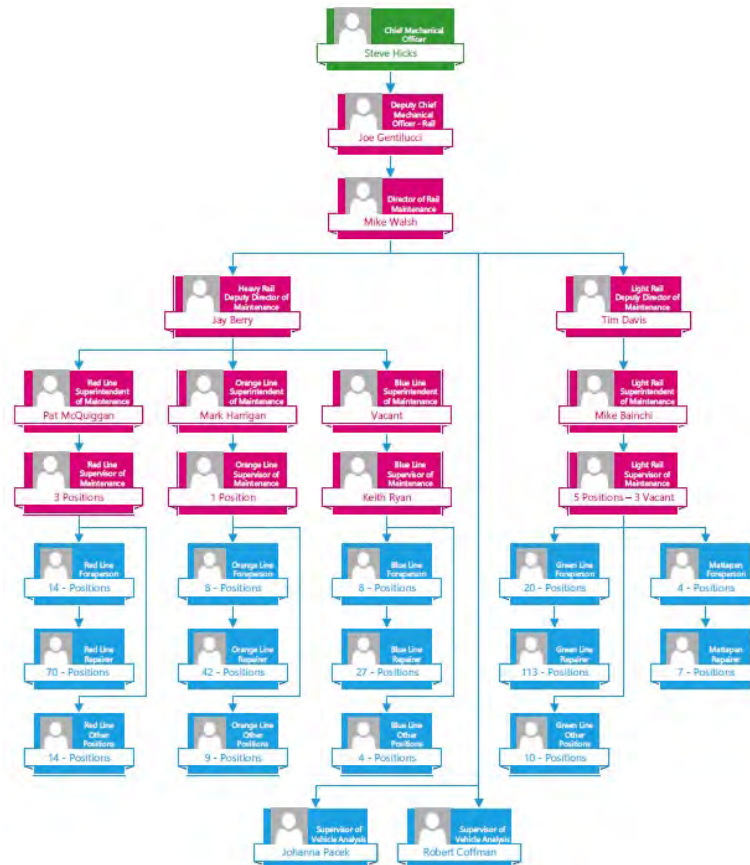


Figure 10: Rail Vehicle Maintenance Organizational Structure

Superintendents in support roles are broken out by line and report to the Deputy Director of either Light Rail or Heavy Rail Maintenance. The staff in Rail Maintenance Training carry out key safety-related activities to supplement ongoing preventative and corrective maintenance, including course development and delivery, development of technical memoranda, and configuration management and control.

Rail Maintenance management interface with MBTA Safety and other departments regarding safety issues through several ongoing meetings, including the Monthly Safety Committee Meetings and Code 1 Task Force. Management also continuously coordinates with MBTA Safety on recent or developing safety events and issues via accident investigations, engineering reviews of proposed equipment changes, safety data reporting, rule and procedure development, and ongoing Quality Assurance/Quality Control (QA/QC) activities.

Audit Activities



MBTA Safety performed a pre-audit documentation assessment, a pre-audit meeting and a series of formal interviews with senior Rail Vehicle Maintenance management between March 22 and March 24, 2021, using a checklist derived from the MBTA Transit Safety Plan (TSP). The activities included a review of each of the following TSP components and technical areas as they pertain to Rail Maintenance, including associated plans, policies, procedures, meetings, reporting processes, training, recordkeeping, management oversight, and coordination with outside departments and stakeholders.

- Safety Management Policy Statement
- MBTA Safety Management System (SMS) Implementation
- SMS Policies and Documentation
- Safety Performance
- Organizational Structure & Responsibilities
- Safety Risk Management
- Safety Assurance
- Safety Promotion
- Safety Training

Following the completion of the interviews, MBTA Safety's audit team performed an on-site inspection of the Riverside Carhouse, accompanied by Rail Vehicle Maintenance management representatives. The facility inspection included a review of general housekeeping, fire life safety, hazardous materials storage and use, personal protective equipment, hot work areas, spill prevention and control, and other facility safety activities such as a records review and employee interviews.

Audit Observations

Management from the Rail Vehicle Maintenance function demonstrated a strong commitment to safety during interviews and the facility inspection with the MBTA Safety audit team. Safety-related activities are well-coordinated at the facility and department level, tracked via bi-weekly management meetings with the Chief Maintenance Officer and separate meetings with staff from the Office of the Chief Engineer.

Strengths

- **Configuration Management:** Rail Vehicle Maintenance has a robust maintenance program for new vehicles, which includes carhouse training, reviewing different systems, write-ups on failures, and looking at possible alterations on maintenance. Proposed changes are discussed with personnel in the carhouse, with forepersons and supervisors, and are then vetted through the engineering process including MBTA Safety. The department works closely with Vehicle Engineering to ensure new procurement vehicles and parts meet original manufactured specifications while inspecting and communicating any safety-sensitive items.
- **Training and Certification:** Rail Vehicle Maintenance effectively uses tracking tools such as the Learning Management System (LMS) to ensure that staff complete



required job-specific and safety trainings. The system provides automated notifications to employees when they are due for training. Instructional staff within the department are skilled with a minimum of 10 years of experience and provide continuous support to maintenance personnel in all stages of professional development. The training function is well-integrated with the rest of Rail Vehicle Maintenance, meaning that new safety policies and lessons learned are quickly incorporated into instructional materials and shared with the wider staff. Rail Vehicle Maintenance Training develops new trainings and courses with innovative tools such as virtual formats. The department treats policy/procedure updates as an ‘all hands on deck’ situation and strives to include most different levels.

Findings of Noncompliance (NC)

Safety issued zero (0) Findings of Noncompliance to Rail Vehicle Maintenance.

Findings of Compliance with Recommendation (CWR)

Safety issued the following one (1) Findings of Compliance with Recommendation to Rail Maintenance:

1. Rail Vehicle Maintenance management have not formally approved safety goals and objectives since 2018. While documented, goals and objectives for 2021 were in draft form; approved goals for 2020 and 2019 were not available for review.
 - a. MBTA Safety recommends that Rail Vehicle Maintenance management establish a formal process or utilize an existing monthly/annual meeting to develop and formally adopt safety goals and objectives in alignment with the Authority-wide goals and objectives established in the Transit Safety Plan.

Observations

Safety issued one (1) Observation to Rail Maintenance:

1. A Foreperson was interviewed regarding how to access Safety Data Sheets. They were able to navigate to the MBTA Intranet but required additional direction on how to open Sitehawk and view a specific SDS.

APPENDIX A

2021 Internal Safety Audit Program Components

Safety Management Systems (SMS) Component	Associated System Safety Program Plan (SSPP) Elements	Audited Departments
General Requirements / Safety Management Policy	<ul style="list-style-type: none"> • Element 1: Introduction • Element 2: Purpose, Scope, and Performance Objectives • Element 3: Overview of Management Structure • Element 4: MBTA Safety Plan Control and Update • Element 5: Implementation, Tasks, Activities, and Responsibilities • Element 11: Emergency Management 	<ul style="list-style-type: none"> • The Clinic • Light Rail Operations and Training • Maintenance of Way • Paratransit Operations • Rail Vehicle Maintenance
Safety Risk Management	<ul style="list-style-type: none"> • Element 6: Safety Risk Management • Element 7: Management of Change 	<ul style="list-style-type: none"> • The Clinic • Light Rail Operations and Training • Maintenance of Way • Paratransit Operations • Rail Vehicle Maintenance
Safety Assurance	<ul style="list-style-type: none"> • Element 8: Safety and Security Certification • Element 9: Data Collection and Analysis • Element 10: Accident Investigation • Element 12: Internal Safety Audit • Element 13: Rules Compliance • Element 14: Facilities and Equipment Safety Inspections • Element 15: Maintenance Audits and Inspections • Element 17: Configuration Management • Element 21: Procurement 	<ul style="list-style-type: none"> • The Clinic • Light Rail Operations and Training • Maintenance of Way • Paratransit Operations • Rail Vehicle Maintenance
Safety Promotion	<ul style="list-style-type: none"> • Element 16: Training and Certifications • Element 18: Workplace Safety • Element 19: Hazardous Materials Program • Element 20: Human Factors 	<ul style="list-style-type: none"> • The Clinic • Light Rail Operations and Training • Maintenance of Way • Paratransit Operations • Rail Vehicle Maintenance

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APPENDIX B



MBTA SAFETY

2021 Internal Safety Interview Report

Date: January 10, 2022

TO: Kate LeGrow
*Director - Occupational Health
Services*

FROM: Michael Catsos
*Deputy Director of Safety
Assurance and Promotion*

CC: S. Sullivan
J. Kelly
M. Weintraub
W. Ahmed
M. Catsos
M. McDonnell
N. Stern
A. Modh, DPU
K. Raine, DPU

Area Audited: Occupational Health Services (OHS)

Audit Approach:

Assessment of the department's adequacy in meeting safety program requirements as outlined in the MBTA Safety Plan derived from the referenced documents listed below.

Reference Documents:

- 2021 MBTA Safety Plan
- Department of Public Utilities Regulation 220 CMR 151.03
- Federal Transit Administration (FTA) Regulation 49 CFR 673
- August 2019 MBTA Drug and Alcohol Policy

Audit Date: September 30, 2021 – October 1, 2021

Summary:

OHS comprises the Massachusetts Bay Transportation Authority (MBTA) Clinic, Workers' Compensation division, Drug and Alcohol (D&A) program, and Employee Assistance Program (EAP). Since 2019, OHS has been housed within the MBTA Safety Department. OHS's D&A Program, governed by MBTA's Drug and Alcohol Policy, ensures MBTA's compliance with all federal and authority standards for employee drug and alcohol testing and related training. The Clinic provides medical services to MBTA employees including D&A testing and employee physicals. Workers' Compensation works with employees to manage workers' compensation claims from their inception to closure and analyzes employee injury data with the aim of reducing future injury risk. The EAP provides support services for employees, including following accidents, discipline, or violation of federal D&A regulations. The EAP includes MBTA's substance abuse professional (SAP) program. OHS reported having adequate resources to complete all assigned tasks safely. Staff are well-qualified and meet all training and certification requirements.

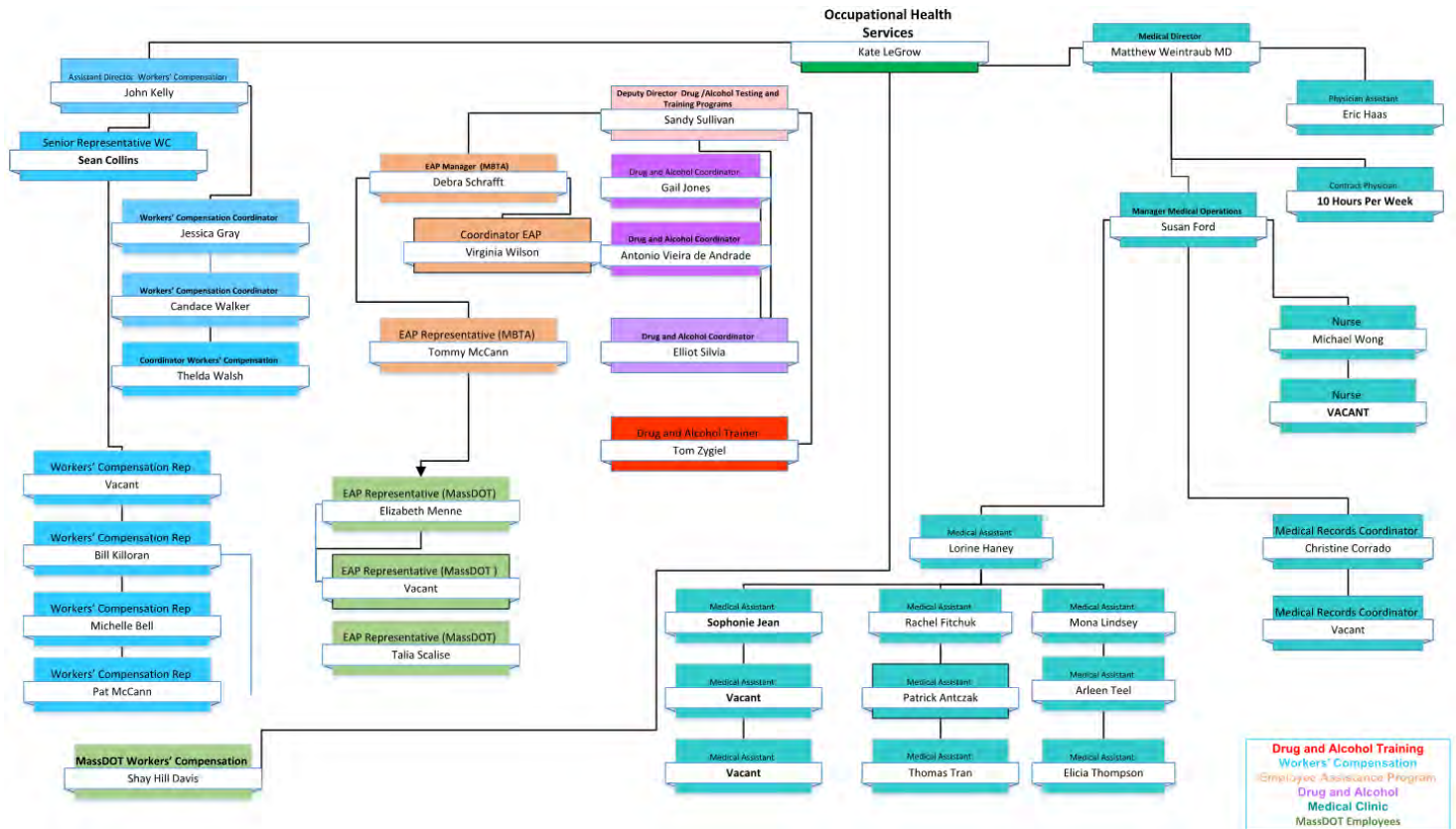


Figure 1: MBTA OHS Organizational Chart

OHS manages MBTA's D&A program for all employees, for all types of required testing. The Clinic directly administers all MBTA employee D&A tests and employs in-house medical review officers; tests are sent to an external lab for analysis. OHS provides D&A training to MBTA employees, including federally-required D&A training for safety-sensitive employees and reasonable suspicion training. OHS runs MBTA's extensive EAP. In addition to providing required SAP support, EAP staff provide numerous other resources such as trauma-informed counseling to employees involved in accidents, stress management support, and guidance to employees receiving discipline referrals.

The Clinic manages a thorough fatigue management program, which includes the use of employee sleep questionnaires and referral to sleep specialists for sleep apnea and fatigue-related issues. OHS administers fatigue awareness training to MBTA employees. The Clinic conducts all employee physicals including routine mandatory physicals, fitness-for-duty physicals, post-accident physicals, and return-to-work physicals. OHS has processes in place for the review and monitoring of employee medications that can impact their ability to complete their jobs safely.

OHS is knowledgeable of MBTA safety management system (SMS) processes and the MBTA Safety



Plan; participates in monthly Occupational Health and Safety Working Group meetings; has developed department-specific safety goals; and completes data collection and analysis related to employee injuries. However, OHS would benefit from further development and implementation of SMS processes, including data-driven performance analysis and systematic safety risk management.

OHS thoroughly communicates safety information to its employees as well as other MBTA employees via the MBTA intranet, email, posting of information in communal areas, and staff meetings. OHS provides feedback to employees on their safety performance via a performance review program and creates performance improvement plans for employees as needed. OHS coordinates with procurement personnel as needed to test and acquire equipment and materials. OHS has processes in place for the regular inspection and calibration of its equipment.

Findings – Noncompliance (NC): None

Findings – Compliance with Recommendation (CWR):

1. While the parameters of OHS programs are well-defined in Federal and State regulatory requirements and guidance, OHS does not have formal, internal written procedures for assigned tasks other than those for the D&A program.
 - a. OHS should document procedures for all of its safety-related activities. The Drug and Alcohol Policy adequately describes D&A-related processes completed by OHS, but procedures for other OHS activities, such as physicals, workers' compensation tasks, and EAP activities should also be documented.

Observations:

1. OHS has set a number of 2021 safety goals documented in a spreadsheet maintained by department managers. MBTA Safety encourages the OHS team to continue implementing goals in alignment with this spreadsheet while expanding documentation on how goal progress is measured, where goal-related indicators are compiled and tracked in other department documentation, which individuals are responsible for goal fulfillment, and what time intervals are present for revisiting each goal. As described in Section 4.2.4 of the MBTA Safety Plan, a data analysis group may be able to help facilitate the implementation of required data collection, analysis, and reporting.
2. MBTA Safety encourages the OHS management team to maintain and expand coordination with the MBTA's safety risk management program to properly document and assess all hazards. Where necessary, OHS should continue to identify hazards through proactive and reactive means as described in Section 5.2.2 of the MBTA Safety Plan; document hazards via the MBTA Hazard Tracking System; conduct or support safety risk assessment of hazards; and develop, implement, document, and monitor the effectiveness of mitigations in response to the identified hazards. The audit team also encourages OHS management to continue to promote the use of the employee safety hotline in communications with department staff.



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	1 Introduction	<u>Interview:</u> OHS was involved in the development of the MBTA Safety Plan, which is available to all employees online and in hard copy. OHS communicates safety-related messaging to employees in a number of ways. Evaluation of OHS employee safety-related responsibilities starts in the interview process and continues through regular evaluation.		
Safety Management Policy	2 Purpose, Scope, Performance Objectives	<u>Interview:</u> OHS has set safety numerous safety goals tracked in a management-level spreadsheet.		
Safety Management Policy	3 Overview of Management Structure	<u>Interview:</u> OHS comprises MBTA's D&A Program, EAP, Clinic, and Worker's Compensation. It is managed by a director and is housed within MBTA's Safety Department. The current organization allows for the effective implementation of		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		assigned safety-related tasks. OHS's director participates in monthly Occupational Health and Safety Working Group meetings. OHS regularly coordinates with other Safety Department personnel.		
Safety Management Policy	4 MBTA Safety Plan Control and Update	<u>Interview:</u> OHS's director provided information that was incorporated in the development of the Safety Plan. OHS communicates updates to the plan and other procedures via multiple methods.	<u>Compliant with Recommendation:</u> While the parameters of OHS programs are well-defined in Federal and State regulatory requirements and guidance, OHS does not have formal, internal written procedures for assigned tasks other than those for the D&A program. OHS should document procedures for all of its safety-related activities. The Drug and Alcohol Policy adequately describes D&A-related processes completed by OHS, but procedures for other OHS activities, such as physicals, workers' compensation tasks, and EAP activities should also be documented.	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	5 Implementation, Tasks, Activities and Responsibilities	<u>Interview:</u> OHS reported that it generally does not face challenges in carrying out its tasks outlined in the Safety Plan and that it is provided adequate resources to perform these tasks. OHS reported the need to adjust its completion of certain tasks in response to COVID-19.		
Safety Management Policy	11 Emergency Management	<u>Interview:</u> The Clinic's medical staff are certified in CPR and the Clinic is equipped with a defibrillator and other emergency medical equipment. OHS provides support to employees involved in emergencies through the EAP. OHS personnel participate in emergency exercises and drills.		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Risk Management	6 Safety Risk Management	<u>Interview:</u> OHS reported that hazards that are less serious in nature are reported to department management. OHS coordinates with building management when necessary to mitigate hazards. The safety hotline is posted in the Clinic for employees to use and Clinic personnel address workplace hazards in accordance with their medical training.		
Safety Risk Management	7 Management of Change	<u>Interview:</u> OHS works with MBTA's Procurement Department in the testing and acquisition of new equipment. OHS is notified of rule and procedure changes by email, T-STOP, and Everbridge. If possible, new rules are posted at the Clinic. OHS does not sit on any rules or procedure update committees, but is involved in conversations about updates as needed.		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Risk Management	14 Facilities and Equipment Safety Inspections	<u>Interview:</u> OHS routinely inspects the clinic for cleanliness and monitors the expiration dates and calibration of its equipment and materials.		
Safety Assurance	9 Data Collection and Analysis	<u>Interview:</u> OHS develops workers' compensation data reports that are submitted to the CSO and are used to guide hazard mitigation activities. OHS develops internal D&A testing reports.		
Safety Assurance	10 Accident Investigation	<u>Interview:</u> OHS personnel often participate in event investigation activities. OHS conducts post-accident D&A, hearing, and vision testing. OHS conducts post-accident physicals and reviews possible health-related contributing factors to the accident. OHS reported that it is not involved in post-accident CAP processes.		
Safety Assurance	12 Internal Safety Reviews	<u>Interview:</u> OHS tracks its action in response to audit findings via an Excel spreadsheet. OHS reported that the findings it is issued are		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		typically resolved via documentation edits and do not require long-term tracking. OHS reported that it does not utilize CAPs.		
Safety Assurance	13 Rules Compliance	<u>Interview:</u> OHS does not sit on any committees assigned tasks for rule and procedure updates, but Safety and other relevant departments involve OHS as changes are proposed that may affect OHS activities.		
Safety Assurance	15 Maintenance Audits and Inspections	<u>Interview:</u> OHS is responsible for the inspection and calibration of all of its equipment, including breathalyzers. OHS coordinates with equipment manufacturers to address defects as required. OHS also conducts inventory activities to ensure materials and equipment are not utilized following their expiration dates.		
Safety Assurance	17 Configuration Management	<u>Interview:</u> OHS is directly involved in the procurement of its own equipment. OHS personnel who will use the equipment test and provide input on possible purchases. OHS		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		assesses how the equipment will interface with its existing systems.		
Safety Promotion	16 Training and Certifications	<u>Interview:</u> OHS administers D&A- and fatigue-related training to all MBTA employees. OHS ensures its staff retain up-to-date certifications in accordance with their job responsibilities. OHS maintains records of its employees' training and enters training completion information in the LMS for other MBTA employees. MBTA administers refresher training when acquiring new equipment or when changes to policies occur.		
Safety Promotion	18 Workplace Safety	<u>Interview:</u> OHS personnel are provided appropriate PPE and are responsible for completing OSHA injury and illness reporting. OHS performs regular internal performance management through daily observation of employee work and periodic evaluations. OHS communicates safety		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		information with employees electronically and in person.		
Safety Promotion	19 Hazardous Materials Programs	<u>Interview:</u> Handling of hazardous materials and spills is performed by certified medical staff in adherence with medical standards. If there is a hazardous material/biohazard spill that OHS cannot rectify, building maintenance is notified.		
Safety Promotion	20 Human Factors	<u>Interview:</u> MBTA's Drug and Alcohol Policy details all of OHS's processes for FTA and authority D&A testing and fitness-for-duty requirements. MBTA supervisors are trained in reasonable suspicion and conduct fitness-for-duty checks. OHS conducts employee physicals and has a thorough fatigue management program in place. MBTA safety-sensitive employees are required to report medication use to OHS for review. OHS oversees its contractors' compliance with D&A		





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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		requirements.		
Accepted By:			Date:	
Completed By: Michael Catsos			Date: 1/10/22	

APPENDIX C

2021 MBTA Safety Internal Audit Checklist: Occupational Health Services		 
Department: Occupational Health Services (OHS) Department Representative(s): Kate LeGrow (OHS Director), Sandy Sullivan (Deputy Director of Drug/Alcohol Testing and Training Programs), Matthew Weintraub, MD (Medical Director), John Kelly (Assistant Director, Workers' Compensation) Review Date(s) 9/30/2021 – 10/1/2021		Reviewer(s): Michael Catsos, Meghan McDonnell, Wahas Ahmed, Nicholas Stern, Stephanie Malin (TRA), Stephen Frazier (TRA), Claire Adler (TRA) Observer(s): Arun Modh (DPU), Kendrick Raine (DPU) Field Auditor(s):
Reference Criteria: 2021 MBTA Safety Plan		

#	SSPP Element	General Requirements/Safety Management Policy (Includes activities and associated plans/procedures identified in TSP Sections 1. Introduction, 2. SMS Policies, 3. Safety Performance and Documentation, 4. Organizational Structure and Responsibilities)	Department Response/Review Team Observations	Key
1.1	Element 1: Introduction	Are you familiar with the MBTA Safety Plan? How is it made available to all employees?	The Director of OHS has reviewed the latest version of the MBTA Safety Plan and was involved in supplying information for its development. There is a hard copy available both at the Clinic and in the Worker's Compensation office. Additionally, the plan is available to all employees through MBTA's intranet. Staff are made aware of the physical and electronic locations of the plan.	COM

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Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

1.2	Element 1: Introduction	How are safety standards and policies, including the safety policy statement, communicated to employees?	OHS communicates safety information, including standards and policies, to employees via the MBTA intranet, email, posting of information in communal areas, and staff meetings.	COM
1.3	Element 1: Introduction	How are safety-related responsibilities incorporated into job descriptions and employee evaluations?	All OHS job applicants are evaluated on their ability to understand the safety-related tasks assigned to the position to which they are applying via the interview process. OHS job descriptions set minimum standards for the positions, including for medical personnel. OHS has a robust employee evaluation process, including for safety performance. Employees are assigned performance improvement plans for performance requiring improvement and are commended for positive performance.	COM
1.4	Element 2: Purpose, Scope, and Performance Objectives	Are safety goals regularly discussed at manager meetings? How does your department set and monitor a safety goal? Please provide an example.	OHS has set numerous safety goals for 2021. Safety goals are discussed as part of overall discussions focusing on safety as an inherent aspect of OHS's work. Workers' Compensation maintains MBTA's OSHA 300 log and develops a monthly report of employee injuries, the reduction of which is one of OHS's goals. The D&A program compiles MBTA's annual MIS report and runs monthly reports on post-accident testing, abnormal tests, and positive tests. Observation:	COM

2021 MBTA Safety Internal Audit Checklist: Occupational Health Services



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Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

			OHS has set a number of 2021 safety goals documented in a spreadsheet maintained by department managers. MBTA Safety encourages the OHS team to continue implementing goals in alignment with this spreadsheet while expanding documentation on how goal progress is measured, where goal-related indicators are compiled and tracked in other department documentation, which individuals are responsible for goal fulfillment, and what time intervals are present for revisiting each goal. As described in Section 4.2.4 of the MBTA Safety Plan, a data analysis group may be able to help facilitate the implementation of required data collection, analysis, and reporting.	
1.5	Element 3: Overview of Management Structure	Describe how the department is organized. Does the current organization allow for the effective implementation of assigned safety-related tasks?	OHS is managed by a director and has been part of the Safety Department since August 2019. It comprises the D&A program, the EAP, the Clinic, and Worker's Compensation. The Clinic is overseen by the medical director, who is a certified medical review officer. The EAP and D&A program are overseen by the deputy director of drug/alcohol testing and training programs. The assistant director of workers' compensation oversees the Worker's Compensation division. Despite a small number of position vacancies, attributable mostly to COVID-19, OHS's organization structure allows it to effectively implement its safety-related tasks.	COM
1.6	Element 3: Overview of Management Structure	Describe participation in any committees devoted to safety issues, their roles and responsibilities, and a	The OHS director is a member of the Occupational Health and Safety Working Group, which meets monthly. Agendas are available for these meetings. Both frontline employees and management personnel participate in this working group.	COM

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Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

		schedule for when meetings are conducted.		
1.7	Element 3: Overview of Management Structure	Describe interface with the Safety Department outside of safety committee meetings.	OHS is part of the Safety Department as of August 2019. OHS regularly interacts with Safety Department personnel including to following accidents and to report on employee injuries.	COM
1.8	Element 4: MBTA Safety Plan Control and Update	Describe involvement in periodic reviews and updates to the Safety Plan.	<p>The OHS director provided input into and answered questions related to the MBTA Safety Plan.</p> <p>Compliant With Recommendation (CWR): While the parameters of OHS programs are well-defined in Federal and State regulatory requirements and guidance, OHS does not have formal, internal written procedures for assigned tasks other than those for the D&A program. OHS should document procedures for all of its safety-related activities. The Drug and Alcohol Policy adequately describes D&A-related processes completed by OHS, but procedures for other OHS activities, such as physicals, workers' compensation tasks, and EAP activities should also be documented.</p>	CWR
1.9	Element 4: MBTA Safety	Discuss management's process for distributing the latest approved Safety Plan	OHS communicates safety information, including standards and policies, to employees via the MBTA intranet, email, posting of information in	COM

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Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

	Plan Control and Update	and other new/updated safety procedures to impacted employees.	communal areas, and staff meetings. All procedures are reviewed with employees via training.	
1.10	Element 4: MBTA Safety Plan Control and Update	To your knowledge, are any department activities not adequately described in the Safety Plan?	OHS reported sufficient documentation of department activities in the Safety Plan.	COM
1.11	Element 5: Implementation, Tasks, Activities, and Responsibilities	Describe any challenges in carrying out the safety-related tasks as specified in the MBTA Safety Plan. Are departmental resources appropriate for the accomplishment of assigned safety-related tasks?	OHS reported that it generally does not face challenges in carrying out its tasks outlined in the Safety Plan and that it is provided adequate resources to perform these tasks. OHS did report the need to adjust its completion of tasks in response to COVID-19 including related to conducting required physicals, including to renew CDL medical cards, and in-person counseling as part of the EAP. Eventually, CDL medical cards licenses were extended due the pandemic and OHS equipped itself to provide virtual counseling and training.	COM
1.12	Element 11: Emergency Management	Describe OHS roles and responsibilities related to response to emergencies, the conduct of emergency	The Clinic's medical staff are certified in CPR and the Clinic is equipped with a defibrillator and other emergency medical equipment. OHS personnel are not first responders and do not respond to accident scenes but participate in investigation activities. OHS provides support to	COM

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		exercises, first responder training, or other emergency management functions.	employees involved in emergencies through the EAP. OHS participates in fire and emergency evacuation drills, and staff are trained to alert building security and central control in an emergency. Fire marshals are assigned in the facilities in which OHS works. OHS personnel may volunteer to participate in emergency exercises if they desire.	
1.13	Element 5: Implementation, Tasks, Activities, and Responsibilities	[FIELD] Interview at least one employee and one supervisory personnel to determine what they understand regarding their safety roles and responsibilities.	Management and staff have a baseline understanding of safety programs and individual safety responsibilities.	COM
1.14	Element 11: Emergency Management	[FIELD] Verify that employees possess easily-accessible versions of emergency SOPs, plans, call lists, etc.	Emergency information is available to all clinic employees in the clinic itself and via TSTOP and other digital resources.	COM

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Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response/Review Team Observations	Key
2.1	Element 6: Safety Risk Management	How are reported or identified hazards addressed? What is the process for communicating these hazards to MBTA Safety and/or other relevant departments? Provide an example.	<p>OHS reported that hazards that are less serious in nature are reported to department management. OHS coordinates with other departments when necessary to mitigate a hazard. For example, OHS coordinates with building management to address facility hazards and access to areas containing hazards is restricted until the hazard can be addressed. Medical staff are trained in dealing with the cleanup and disposal of hazardous waste and sharps. The contact information for MBTA's safety hotline is posted in the Clinic and employees can use it to report if needed. OHS does not believe any of its employees have used the hotline. OHS detailed how it coordinated with its employees to address hazards related to COVID-19.</p> <p>Observation:</p>	COM

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Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response/Review Team Observations	Key
			MBTA Safety encourages the OHS management team to maintain and expand coordination with the MBTA's safety risk management program to properly document and assess all hazards. Where necessary, OHS should continue to identify hazards through proactive and reactive means as described in Section 5.2.2 of the MBTA Safety Plan; document hazards via the MBTA Hazard Tracking System; conduct or support safety risk assessment of hazards; and develop, implement, document, and monitor the effectiveness of mitigations in response to the identified hazards. The audit team also encourages OHS management to continue to promote the use of the employee safety hotline in communications with department staff.	
2.2	Element 6: Safety Risk Management	What role does OHS play in the development and implementation of mitigations for identified	OHS reported that it mitigates hazards locally and coordinates with other departments as necessary. OHS reported that MBTA has a	COM

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Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response/Review Team Observations	Key
		hazards? How are mitigations tracked?	risk management group, to which it provides information on hazards as needed.	
2.3	Element 6: Safety Risk Management	Describe roles and responsibilities related to the assessment of safety risk. Does OHS play a role in safety risk assessment, analysis, or investigation?	OHS's primary role in safety risk assessment is analyzing lagging indicators, such as employee injuries. OHS works with departments to track and follow up on work orders to address the root cause of employee injuries.	COM
2.4	Element 6: Safety Risk Management	What safety risks require the development of a corrective action plan (CAP)? How is OHS involved with the implementation of CAPs? Provide an example.	OHS reported that it has not been assigned or developed any CAPs.	COM
2.5	Element 6: Safety Risk Management	How does OHS assess the effectiveness of past implemented safety risk mitigations?	OHS reported that its medical staff follow their medical training in dealing with hazards such as sharps. OHS does not typically track safety risk mitigations, although during the COVID-19 pandemic, staff documented the implementation of increased cleaning.	COM

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#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response/Review Team Observations	Key
2.6	Element 6: Safety Risk Management	Describe the hazard reporting procedure and how it is communicated with employees to ensure safety hazards in the workplace are reported effectively. Describe what constitutes a hazard that would require reporting.	OHS reported that it does not typically face hazards outside of building-related safety concerns. OHS did not demonstrate understanding of what constitutes a hazard under safety risk management.	COM
2.7	Element 6: Safety Risk Management	Discuss sources of hazard information regularly reviewed by management and staff to identify hazards.	OHS reviews D&A test results, workers' compensation claims, employee information collected via the EAP, and physical results and regularly identifies problematic trends that it then works with other departments to mitigate. While OHS does not currently designate these as hazards, they should be addressed in accordance with MBTA's safety risk management processes.	COM

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2.8	Element 7: Management of Change	Describe department involvement in equipment or system changes and/or the introduction of new equipment, including related to the review/testing/approval of the equipment before implementation.	OHS works with MBTA's Procurement Department in the testing and acquisition of new equipment. For example, OHS is currently procuring new breathalyzers and will train its personnel on using the new equipment. In procuring new equipment, OHS assesses how the equipment will interface with its existing systems.	COM
2.9	Element 7: Management of Change	How is each OHS employee notified of rule/procedure changes and how is this documented? What role does OHS play in the update of rules and procedures?	OHS is notified of rule and procedure changes via email, T-STOP, or Everbridge. If possible, updated rules will be posted at the Clinic. OHS does not sit on committees to update rules or procedures, but OHS employees can report the need to update items as they deem necessary. OHS provides input on procedural or rule changes as requested.	COM
2.10	Element 14: Facilities and Equipment	Explain department involvement in current facility/Clinic inspection	OHS routinely inspects the Clinic for cleanliness and monitors the expiration dates for breathalyzers, gloves, conductive EKG lotion,	COM

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	Safety Inspections	processes/procedures. Are facility/Clinic inspections routinely conducted by employees? How are identified defects reported and tracked?	and other materials. OHS has procedures to ensure equipment clocks are updated during biannual time changes and maintains calibration logs for all of its equipment. OHS coordinators are responsible for equipment inspections and materials inventory. OHS reported that the FTA is the only external entity that conducts inspections of its programs.	
2.11	Element 6: Safety Risk Management	[FIELD] Verify via records review that hazards identified by personnel are documented and communicated to safety as needed. Verify that hazard mitigations and/or CAPs are being documented.	Employees have a baseline understanding of safety hazards. As identified in the finding above, employees do not consistently utilize the Employee Safety Reporting Program or formal hazard management process for mitigating or eliminating hazards.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response/Review Team Observations	Key
3.1	Element 9: Data Collection and Analysis	What types of safety-related data is OHS tasked with compiling and analyzing? Explain how safety data are collected by employees and how data from information systems are shared with MBTA Safety and other departments. How is this data utilized to guide departmental decision making?	OHS develops monthly reports on workers' compensation data that are submitted to the CSO. Area-specific workers' compensation reports may also be developed as needed. OHS also creates internal D&A testing reports. Clinic personnel review lists of employees requiring physicals to ensure they are completed on time.	COM
3.2	Element 10: Accident Investigation	Explain roles and responsibilities in the accident/incident investigation process, including definition of reportable events, notification and immediate response. Describe the department's process for coordination with safety during the investigation process.	OHS conducts post-accident D&A, hearing, and vision testing. OHS conducts post-accident physicals and reviews possible health-related contributing factors for the accident such as fatigue, medication use, or known medical conditions/history. If an employee is sent for medical attention following an accident, the	COM

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			employee is instructed to call central control upon release from the hospital in order to complete D&A testing.	
3.3	Element 10: Accident Investigation	Describe the department's coordination with safety to develop immediate mitigations and CAPs following safety events.	OHS reported that it is not involved in post-accident CAP processes.	COM
3.4	Element 12: Internal Safety Audit	How does OHS review, implement, and track MBTA Safety Internal Audit, SSOA triennial audits, or other external audit recommendations and corrective actions?	OHS tracks its action in response to audit findings via an Excel spreadsheet. OHS reported that the findings it is issued are typically resolved via documentation edits and do not require long-term tracking. OHS reported that it does not utilize CAPs.	COM
3.5	Element 13: Rules Compliance	Discuss department involvement in updates to safety rules and procedures, including schedules, management responsibilities, and coordination with Safety.	OHS does not sit on any committees assigned tasks for rule and procedure updates, but Safety and other	COM

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			relevant departments involve OHS in discussions, emails, and meetings as changes are proposed that may affect OHS activities.	
3.6	Element 15: Maintenance Audits and Inspections	What role does OHS play in equipment inspections? For what safety-related equipment is OHS responsible for inspections and upkeep? How does the OHS Department ensure each piece of equipment is defect free? How are defects reported and tracked?	OHS is responsible for the inspection and calibration of all of its equipment, including breathalyzers. OHS coordinates with equipment manufacturers to address defects as required. OHS also conducts inventory activities to ensure materials and equipment is not utilized following their expiration dates.	COM
3.7	Element 17: Configuration Management	Is the department involved in the MBTA's Configuration Management and Control process, such as for new procurements of new equipment? Do employees have the ability to provide feedback?	OHS is directly involved in the procurement of its own equipment. OHS personnel who will use the	COM

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			equipment test and provide input on possible purchases.	

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response/Review Team Observations	Key
4.1	Element 16: Training and Certifications	Does OHS directly administer any training? What types of training are offered to and required of employees and supervisors? What types of occupational health and safety training are administered to employees (i.e., right to know, hazard communications, bloodborne pathogens, fall protection)?	OHS administers D&A awareness training, reasonable suspicion training, and fatigue awareness training. OHS administers D&A and fatigue awareness training during new employee orientation and administers reasonable suspicion training multiple times throughout the year to individuals in supervisory positions. OHS also provides supervisors of non-safety sensitive employees probable cause training.	COM

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			While refresher training is not required by federal regulation or MBTA policy, most supervisors have completed reasonable suspicion/probable cause training multiple times. OHS also administers required training to its BATs as well as C1 training, which certifies employees to provide training to BATs, including on testing equipment. OHS's MROs are certified and are recertified every five years by external academies. OHS SAPs comply with continuing education requirements. Optional CPR training is provided to OHS personnel by a contractor; all OHS staff are currently	

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			certified. OHS also provides training to its employees on new equipment either via the equipment manufacturer or via a train-the-trainer process. OHS also administers error training to its employees as needed. OHS also provides informal hazardous waste training to employees that work at its vaccination clinics. OHS has also provided post-accident testing decision training to department personnel in the past.	
4.2	Element 16: Training and Certifications	Is there a responsible party who oversees all training? Please describe the qualification process to become an instructor.	OHS's D&A compliance coordinators are responsible for the coordination and tracking of BAT and C1 training. OHS's MROs and SAPs are	COM

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			responsible for ensuring they complete required training. The deputy director of drug/alcohol testing and training programs is responsible for ensuring new hires receive D&A training. OHS's C1 training program certifies employees as BAT trainers.	
4.3	Element 16: Training and Certifications	How are changes to training programs communicated to MBTA Safety and any relevant departments prior to their implementation?	If changes are made to information provided via OHS training, such as changes to D&A requirements, OHS can administer retraining to pertinent staff.	COM
4.4	Element 16: Training and Certifications	How are training records maintained and monitored? How does an employee, and their supervisor, know when they are due for training?	D&A training records are maintained in MBTA's LMS. OHS maintains records of certification dates for BATs, C1 trainers, MPOs, and SAPs.	COM

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4.5	Element 16: Training and Certifications	How does the department ensure that updated procedures, bulletins, and rules are addressed in initial, remedial, and refresher training courses provided for employees?	OHS primarily communicates changes with employees face-to-face and frequently hands out printed bulletins. As needed, OHS meets with staff to review changes. If notice of updates is sent via email, a read receipt is required.	COM
4.6	Element 18: Workplace Safety	How are PPE requirements determined for each job task? How are these requirements communicated to employees?	Clinic staff are trained on PPE use via their external medical education and all PPE utilized by OHS personnel is medical grade. Individuals tasked with D&A testing and sample collection are provided training on appropriate PPE. MBTA provided OHS personnel additional PPE as required in response to the COVID-19 pandemic.	COM
4.7	Element 18: Workplace Safety	Describe the OSHA-specific worker safety activities that OHS completes (i.e., inspections, injury and illness reporting).	OHS reports all MBTA reportable injuries and illnesses on the OSHA Form 300.	COM

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4.8	Element 18: Workplace Safety	What processes are in place to ensure employees know and follow workplace safety rules and procedures? How often are compliance reviews conducted and how are they documented? How are identified issues mitigated?	OHS performs regular internal performance management through daily observation of employee work and periodic evaluations, which are sent to MBTA Human Resources. These evaluations allow for employees to be commended for good work or for the development of performance improvement plans as needed.	COM
4.9	Element 18: Workplace Safety	Describe how safety information is communicated to employees. How is action taken in response to employee safety reports communicated to employees? Are the methods used to communicate safety information to employees appropriate and effective?	OHS employees and MBTA employees in general receive safety information via Safety Flashes, T-STOP, emails, the MBTA intranet, and safety posters/bulletins. OHS reported that it believes all of its	COM

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			employees are aware of MBTA's safety hotline.	
4.10	Element 19: Hazardous Materials Program	What processes are in place for the proper handling, storage, use, and disposal of hazardous materials? How are employees trained on these procedures?	OHS personnel follow medical standards for the handling and disposal of urine. The small portion of staff who administer vaccines are trained in the handling of sharps. OHS does not have processes outside of medical training, procedures, and standards for the management of hazardous materials.	COM
4.11	Element 19: Hazardous Materials Program	What procedures are in place for employees when an incident occurs involving hazardous materials (ex. chemicals, bodily fluids)? Are supplies and equipment accessible for the cleanup and control of hazardous materials spills and incidents (i.e., chemical showers, eyewashes, spill kits)?	OHS staff who are medically-trained follow industry standards for spills of specimens, such as urine. If there is a hazardous material/biohazard spill that OHS cannot clean up internally, the area is sectioned off and building	COM

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			maintenance is notified. OHS has eyewash in its first aid kits.	
4.12	Element 20: Human Factors	Describe the types of testing conducted under MBTA authority and how MBTA differentiates between these tests and those conducted under FTA authority.	MBTA conducts extensive D&A testing under its own authority in addition to required FTA tests, including pre-employment, post-even, and probable cause testing. Only safety-sensitive employees are subject to random testing. MBTA-authority tests are marked as such on testing documentation and the Drug and Alcohol Policy differentiates between FTA and authority testing requirements.	COM
4.13	Element 20: Human Factors	Explain how the MBTA's Fitness for Duty and Drug & Alcohol policies for employees and managers are implemented.	Supervisors receive fitness-for-duty training as part of reasonable suspicion training. While only safety-	COM

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			sensitive employees are required to get fitness-for-duty checks, OHS instructs all supervisors to perform them. All departments document their own fitness-for-duty checks. Supervisors may submit requests to OHS to give employees fitness-for-duty physicals. Such requests must be documented.	
4.14	Element 20: Human Factors	How often is the Drug & Alcohol Policy reviewed and revised? Who is responsible for the revisions and dissemination of the updated plan to all MBTA employees? How are changes to federal testing requirements incorporated into the policy and communicated to employees?	OHS updates the Drug and Alcohol Policy when changes to the program are made. Employees are required to sign for updated copies of the policy.	COM
4.15	Element 20: Human Factors	How are MBTA employees trained on the Drug & Alcohol Policy? What is the duration of the training? How are records of	OHS administers D&A training to new employees during orientation. Training records are maintained in	COM

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		the training kept? Is a refresher training provided when updates are made?	MBTA's LMS. Training is two and half hours long. Reasonable suspicion training is three and a half hours long. Routine refresher training is not required but can be administered for employees as needed.	
4.16	Element 20: Human Factors	Describe the processes in place for pre-employment testing for safety-sensitive positions. What is the process for reviewing a new employee's historical DOT Drug and Alcohol testing history?	OHS administers pre-employment testing to all employees. OHS follows 49 CFR Part 40.25 and requests to review two years of testing records for safety-sensitive position applicants if the employee was previously subject to DOT testing requirements. OHS makes at least two attempts to receive these records. OHS D&A testing protocols includes a list of safety-sensitive	COM

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			positions and HR will inform OHS if new safety-sensitive positions are created.	
4.17	Element 20: Human Factors	When an employee returns to work after off duty greater than 30 days, how does Occupational Health Services ensure the employee is fit for duty?	OHS is required to administer return-to-work physicals for employees that have been off duty for at least 32 days.	COM
4.18	Element 20: Human Factors	Describe the process when notified that an employee of the clinic has been selected for a random drug & alcohol test.	No Clinic employees are subject to random testing.	COM
4.19	Element 20: Human Factors	Describe the processes in place related to reasonable suspicion testing. Who is permitted to make reasonable suspicion testing determinations? How are those individuals trained? Are any routine checks in place to ensure employee fitness for duty?	Only MBTA supervisors who have completed reasonable suspicion training can request reasonable suspicion tests be completed. OHS administers reasonable suspicion training, which is three and a half hours long. Supervisors of safety-sensitive employees are required to	COM

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			conduct regular fitness-for-duty checks of all employees.	
4.20	Element 20: Human Factors	Describe the process within the clinic when notified that an employee or contracted employee has been selected to attend a drug & alcohol test in the following scenarios: (a) Random Testing (b) Reasonable Suspicion (c) Scheduled	OHS utilizes a computer-based random selection software that is configured to select the correct number of employees for testing to meet federal testing percentage requirements. D&A coordinators schedule testing appointments with the supervisors of the selected employees no more than one day before the appointment. The supervisor then informs the employee in advance of their reporting time with only enough time to allow for travel to the testing site. Random tests can be rescheduled for	COM

2021 MBTA Safety Internal Audit Checklist: Occupational Health Services



Department: Occupational Health Services (OHS)
Department Representative(s): Kate LeGrow (OHS Director), Sandy Sullivan (Deputy Director of Drug/Alcohol Testing and Training Programs), Matthew Weintraub, MD (Medical Director), John Kelly (Assistant Director, Workers' Compensation)
Review Date(s) 9/30/2021 – 10/1/2021

Reviewer(s): Michael Catsos, Meghan McDonnell, Wahas Ahmed, Nicholas Stern, Stephanie Malin (TRA), Stephen Frazier (TRA), Claire Adler (TRA)
Observer(s): Arun Modh (DPU), Kendrick Raine (DPU)
Field Auditor(s):

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response/Review Team Observations	Key
			employees who are out on their scheduled testing day but return to work prior to the end of the testing period. If testing cannot be completed during the testing period, OHS personnel document the reason testing was not completed. OHS is notified of new employees requiring testing by Human Resources. OHS is notified by supervisors of employees requiring reasonable suspicion testing. Return-to-work and follow-up testing are administered as prescribed by SAPs.	
4.21	Element 20: Human Factors	Describe what processes managers use to monitor employee fatigue and hours of service.	OHS provides all MBTA employees fatigue awareness training. Employees are required to fill out	COM

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			sleep questionnaires whenever they visit the Clinic, except when reporting for random D&A testing. OHS can refer employees to a sleep specialist and if sleep-related conditions are identified, OHS ensures compliance with mitigations prior to completion of safety-sensitive tasks. OHS tracks mitigation compliance continually for employees diagnosed with sleep disorders.	
4.22	Element 20: Human Factors	Describe the processes in place for employee reporting of prescription and over-the-counter medicine use that may inhibit their ability to safely perform their assigned tasks.	MBTA's Drug and Alcohol Policy requires employees to report medication use to OHS. OHS reviews this information and determines whether the medication will affect	COM

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Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response/Review Team Observations	Key
			the employee's ability to perform their assigned tasks safely with or without restrictions.	
4.23	Element 20: Human Factors	Describe how the OHS department ensures that the drug and alcohol policy is appropriately implemented in procurements/ requests for proposal (RFP) of new contracts for various work.	OHS participates in procurement activities as needed. MBTA's procurement processes detail the policies to which contractors are subject. OHS reviews contractor D&A policies to ensure they comply with federal requirements and review testing records as required. MBTA's contractors are audited with MBTA during FTA D&A audits.	COM
4.24	Element 16: Training and Certifications	[FIELD] Review training program for OHS employees to verify: a) How training records are maintained. b) That training consists of both classroom and hands-on training.	Training records are maintained via spreadsheets controlled by management, as well as the MassDOT Learning Hub system.	COM

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#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response/Review Team Observations	Key
		c) Consistency with written training programs and/or syllabi.	Trainings consist of largely classroom-based activities, but some training is issued informally on an in person basis. Many employees have completed job qualifications prior to hiring.	
4.25	Element 16: Training and Certifications	<p>[FIELD] Review the training and certification records for a sample of employees for the past three (3) years to determine if:</p> <p>a) The employee has completed the initial training program and refresher and remedial training as necessary.</p> <p>b) The course content was appropriate and adequate to meet training and recertification requirements.</p>	Employees in a sample of records reviewed had completed all required initial and refresher training on topics such as Fitness for Duty, fatigue, and the Drug & Alcohol Program.	COM
4.26	Element 16: Training and Certifications	<p>[FIELD] Through a records review:</p> <p>a) Verify that a process for maintaining and accessing employee training records is in place.</p>	A process is in place for clinic managers to review and access employee training records. Managers track required safety trainings, which	COM

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Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response/Review Team Observations	Key
		b) Verify that categories of safety-related work requiring training and certification have been identified. c) Verify that the MBTA has processes in place to assess compliance with its training and certification requirements.	are clearly identified, and periodically monitor compliance with training and certification requirements.	

APPENDIX D



MBTA SAFETY

2021 Internal Safety Audit Report

Date: December 15, 2021

TO: Aisheea Isidor <i>Assistant General Manager of Operations and Operations Training</i> Alicia Gomes <i>Division Chief, Light Rail</i>	CC: I. Payne F. Hunter F. Olson R. Ester A. Limacher T. Maher M. McDonnell E. Cellucci, DPU A. Modh, DPU K. Raine, DPU
FROM: Michael Catsos <i>Deputy Director of Safety Assurance and Promotion</i>	

Area Audited: Light Rail Transportation and Training

Audit Approach:

Assessment of the department's adequacy in meeting safety program requirements as outlined in the MBTA Safety Plan derived from the referenced documents listed below.

Reference Documents:

- 2021 MBTA Transit Safety Plan
- Department of Public Utilities (DPU) Regulation 220 CMR 151.03
- Federal Transit Administration (FTA) Regulation 49 CFR 673

Audit Date: July 13, 2021 and August 11, 2021

Summary:

MBTA's Light Rail (LR) Transportation function is responsible for day-to-day operation of all Green Line revenue service, as well as interfacing with other MBTA departments and teams including the Operations Control Center (OCC), Engineering and Maintenance (E&M), and MBTA Safety to ensure that service is delivered safely and without interruption. LR Transportation is headed by a Division Chief, with a management structure that includes two Superintendents, eight Supervisors, and several hundred full- or part-time motorpersons.



In support of this primary responsibility, LR Transportation staff and management perform a variety of supporting functions, including accident response and investigation, hazard identification and reporting, safety rules compliance / efficiency testing, emergency drills and exercises, and corrective action plan management. While frontline staff have baseline responsibilities in all of these areas, each activity is primarily overseen by field and executive management.

LR Transportation managers coordinate both internally and externally to manage emerging safety hazards and issues. There is a monthly LR Transportation safety committee meeting which includes frontline personnel as well as Safety representation. LR Transportation managers are also active in the monthly Safety Rules Compliance Program (SRCP) Committee Meeting, weekly Right of Way (ROW) Access Committee meetings, monthly ROW Safety Committee meetings, and the bi-weekly Safety and Ops Coordination Meeting, among others.

LR Transportation is supported by a robust training program, headed by the Assistant General Manager of Operations and Operations Training and administered by instructors in the Training School. All motorpersons complete initial training and certification before becoming eligible for revenue service operations. The training program also includes periodic recertification for motorpersons, ad-hoc refresher trainings in response to accidents and hazards, and less-formal communications such as safety briefings and flashes.

Findings – Noncompliance (NC): None

Findings - Compliance with Recommendation (CWR):

1. LR Transportation does not maintain specific goals and objectives related to performance and safety within the department.
 - a. LR Transportation management should review applicable MBTA-wide and Safety goals and develop/document specific business unit goals and objectives related to safety and performance.
2. LR Transportation management are not consistently included in drills and exercises, and lessons learned from recent drills and exercises may not be adequately incorporated into department procedures and work practices as a result.
 - a. LR Transportation management should coordinate with MBTA's emergency management function to ensure that the department is represented in all major drills and exercises, and that after-action report findings with potential applicability to Light Rail are reviewed at the management level.
3. LR Transportation has not established clear and uniform requirements for completion of pre-



trip inspections. Rules, procedures, and management expectation regarding pre-trip inspections are unclear, leading to variations in pre-trip inspection practices across seasons and work locations.

- a. LR Transportation management should clearly identify and document expectations for pre-trip inspections, including the nature of the inspection, the required frequency, and which personnel are responsible. Management should ensure that pre-trip inspections are administered consistently across all locations at all times of year that they are required (or year-round, if necessary).
4. There is no existing requirement for LR Transportation field managers to complete Incident Command System (ICS) training, despite their primary role in event response.
 - a. LR Transportation management should review the existing training program and consider expanding training on the accident investigation process to include ICS modules, documenting a determination as to whether or not expanding the training program is appropriate.
5. There is no existing requirement for LR Transportation employees to complete blood-borne pathogen training, despite their relatively high likelihood of exposure.
 - a. LR Transportation management should review the existing training program and consider including blood-borne pathogen training, documenting a determination as to whether expanding the training program is appropriate.

Observations:

1. LR Transportation management should consider an enhanced level of engagement with OCC management during the ongoing review and update process for OCC standard operating procedures (SOPs) to ensure that all operational and emergency requirements are accounted for in OCC documentation.



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	1 Introduction	<u>Interview:</u> The Transit Safety Plan is provided to Light Rail (LR) Transportation management by Safety annually. Employees are aware the plan can be accessed on TSTOP.	<u>Compliant With Recommendation:</u> LR Transportation does not maintain specific goals and objectives related to performance and safety within the department. LR Transportation management should review applicable MBTA-wide and Safety goals and develop/document specific business unit goals and objectives related to safety and performance.	
		<u>Field:</u> Key documents are distributed to employees and posted publicly in operations facilities. Reminders are also circulated through memos and safety flashes.		
Safety Management Policy	2 Purpose, Scope, Performance Objectives	<u>Interview:</u> Safety goals depend on specific actions and objectives discussed in safety meetings. Those specific goals are monitored through management meetings, targeted observations, and verification.		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	3 Overview of Management Structure	<u>Interview:</u> There are two superintendents and eight supervisors supervising several hundred operators. There are both part and full time operators, but no significant differences in their roles and responsibilities. There is a monthly LR safety committee meeting that includes MBTA Safety, motorpersons, officials, yardmaster, training, vehicle maintenance, etc.		
Safety Management Policy	4 Safety Plan Control and Update Procedure	<u>Interview:</u> Management are generally aware of the annual plan update process. There are no specific known gaps between safety plan content and LR Transportation and Training programs.		
Safety Management Policy	5 Safety Plan Implementation, Tasks, Activities and Responsibilities	<u>Interview:</u> Supervisors monitor day to day actions in the field to build trust and maintain perspective on developing issues.		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		<u>Field:</u> Employees interviewed in the field were able to explain their basic safety roles and responsibilities, including hazard identification and reporting.		
Safety Management Policy	11 Emergency Management	<u>Interview:</u> Operators contact the Operations Control Center (OCC) in the event of an emergency. Officials in the field will then be contacted by OCC. OCC has access to emergency procedures.	<u>Compliant with Recommendation:</u> LR Transportation management are not consistently included in drills and exercises, and lessons learned from recent drills and exercises may not be adequately incorporated into department procedures and work practices as a result. LR Transportation management should coordinate with MBTA's emergency management function to ensure that the department is represented in all major drills and exercises, and that after-action report findings with potential applicability to Light Rail are reviewed at the management level.	



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Risk Management	6 Safety Risk Management	<u>Interview</u> : Hazards are regularly reported to department officials or management. Immediate hazards are reported to OCC / Maintenance Control Center (MCC) if they can't be addressed on the spot. Other hazards may require a mobile official to be dispatched to the location.		
		<u>Field</u> : Hazard information reportedly moves freely through the chain of command. The "see something, say something" expectation is deeply ingrained thanks to trainings, constant management reminders, MBTA Safety postings and info blasts.		
Safety Risk Management	7 Management of Change	<u>Interview</u> : LR Transportation managers meet with departments involved, engineers, equipment manufacturers, procurement, and other teams. The training school facilitates equipment		



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Steve Poftak, General Manager



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		familiarization.		
Safety Assurance	14 Facilities and Equipment Inspections	<u>Interview:</u> LR Transportation management perform informal safety related checks of operations-side facilities. Yardmasters, vehicle maintenance, and facilities control most facility inspections. Station officials do perform limited station walkthroughs.		
Safety Assurance	8 Safety and Security Certification	<u>Interview:</u> LR Transportation management participate in regular meetings on system extensions and new vehicle procurements. LR Transportation supports testing of vehicles for braking, signals, crossover functionality, etc., in coordination with E&M, Capital Delivery, and others.		
Safety Assurance	9 Data Collection and Analysis	<u>Interview:</u> The Safety Rules Compliance Program is the primary method for collecting operational and rules		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		compliance data. A shared excel document is used to track key open work orders impacting operations, including date opened and status. LR Transportation also inventories speed signage and other key safety equipment on a continuous basis.		
Safety Assurance	10 Accident Investigations	<p><u>Interview:</u> Supervisors respond when notified by OCC or when otherwise made aware of an event from monitoring the radio and other communications. The response varies depending on the severity of each event after initial assessment.</p> <p><u>Field:</u> Safety's audit team reviewed a sample of investigation reports prepared by LR Transportation.</p>	<p><u>Compliant with Recommendation:</u> There is no existing requirement for LR Transportation field managers to complete Incident Command System (ICS) training, despite their primary role in event response. LR Transportation management should review the existing training program and consider expanding training on the accident investigation process to include ICS modules, documenting a determination as to whether expanding the training program is appropriate.</p>	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Assurance	12 Internal Safety Reviews	<u>Interview:</u> Internal Safety Audit recommendations are tracked until implementation using a spreadsheet maintained by LR Transportation management.		
Safety Assurance	13 Rules Compliance	<u>Interview:</u> LR Transportation coordinates with Safety and other departments to perform safety rules compliance activities via the SRCP committee. Rules compliance audits are created and updated in response to new programs and procedures.		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Assurance	15 Maintenance Audits and Inspections	<u>Interview:</u> LR Transportation managers in the field noted some inconsistencies in expectations around completion and documentation of pre-trip inspections.	<u>Compliant with Recommendation:</u> LR Transportation has not established clear and uniform requirements for completion of pre-trip inspections. Rules, procedures, and management expectation regarding pre-trip inspections are unclear, leading to variations in pre-trip inspection practices across seasons and work locations. LR Transportation management should clearly identify and document expectations for pre-trip inspections, including the nature of the inspection, the required frequency, and which personnel are responsible. Management should ensure that pre-trip inspections are administered consistently across all locations at all times of year that they are required (or year-round, if necessary).	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Assurance	17 Configuration Management	<i>Interview:</i> Meetings related to configuration management are project- or procurement-specific. Safety is integrated into the LR operations configuration change process both formally and informally.		
Safety Assurance	21 Procurement	<i>Interview:</i> LR Transportation management are engaged to participate in procurement reviews and ensure that equipment doesn't present any new hazards.		
Safety Promotion	16 Training and Certification Program	<i>Interview:</i> The Assistant General Manager (AGM) of OCC and Training oversees all training within LR Transportation. There are two Superintendents of training, 13 LR instructors, and six new instructors being onboarded. Instructors are drawn from the pool of Inspectors, with a minimum of five years' experience required. New hire training is 40 days in length. All Motorpersons start as part-time Motorpersons.		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		Recertification consists of a truncated, 8 hour program including a hands-on component and updates on any recent rule and procedure changes.		
		<u>Field:</u> MBTA Safety's audit team reviewed a training matrix for LR Transportation staff as well as a sample of individual training records. Training consists of both classroom and hands-on, on-the-job training.		
Safety Promotion	18 Workplace Safety	<u>Interview:</u> PPE requirements for LR Transportation personnel are established in the ROW Rulebook. Compliance is checked daily by supervisors when staff report for duty, and via other compliance activities such as the SRCP.		
Safety Promotion	19 Hazardous Materials Programs	<u>Interview:</u> LR Transportation employees have minimal exposure to	<u>Compliant with Recommendation:</u> There is no existing requirement for	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		hazardous materials as a part of their day to day work, with the exception of bodily fluids	LR Transportation employees to complete blood-borne pathogen training, despite their relatively high likelihood of exposure. LR Transportation management should review the existing training program and consider including blood-borne pathogen training, documenting a determination as to whether expanding the training program is appropriate.	
Safety Promotion	20 Human Factors	<u>Interview:</u> All operators check in daily with a pull out official to confirm they are able to safely perform their duties. There is a FFD checklist with justifications for ruling a person unfit for duty. Officials undergo a four-hour training discussing the D&A test process, signs and symptoms, drug test types and panels.		
Accepted By:				Date:
Completed By: DD Mike Catsos				Date: 12/15/21

APPENDIX E

**2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training**



Department: Light Rail Transportation, LR Training

Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly

Review Date(s): 7/13, 8/11/2021

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	General Requirements / Safety Management Policy (Includes activities and associated plans/procedures identified in Transportation Safety Plan (TSP Sections 1. Introduction, 2. Safety Management System (SMS) Policies, 3. Safety Performance and Documentation, 4. Organizational Structure and Responsibilities)	Department Response / Review Team Observations	Key
1.1	Element 1: Introduction	Are you familiar with the MBTA Safety Plan? How is it made available to all Light Rail Transportation employees?	The Transit Safety Plan is provided to Light Rail (LR) Transportation management by Safety annually. According to interviewees, a summary of the role / function of the Plan is posted publicly in key facilities. Employees are aware the plan can be accessed on TSTOP.	COM
1.2	Element 1: Introduction	How are safety standards and policies / changes communicated to Light Rail Transportation employees?	Key documents themselves are distributed to employees and posted publicly in operations facilities. Reminders are also circulated through memos and safety flashes. Most employees have email addresses, but not all. LR Transportation management work with the Everbridge team to do Everbridge notification blasts with links and key info.	COM
1.3	Element 1: Introduction	How are safety goals within Light Rail Transportation aligned with the MBTA's	According to interviewees, while Safety is at the heart of Green Line (GL) operations and factors into all procedures,	CWR

2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training



Department: Light Rail Transportation, LR Training

Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly

Review Date(s): 7/13, 8/11/2021

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

Reference Criteria: 2021 MBTA Safety Plan

		mission to promote safety as a core value?	<p>processes, and activities, there are not specific, documented goals specific to the department. It is difficult to determine whether department goals align with MBTA-wide goals, although they naturally align toward creating and sustaining a safe work environment.</p> <p>Compliant with Recommendation: LR Transportation does not maintain specific goals and objectives related to performance and safety within the department. LR Transportation management should review applicable MBTA-wide and Safety goals and develop/document specific business unit goals and objectives related to safety and performance.</p>	
1.4	Element 2: Purpose, Scope, and Performance Objectives	Are safety goals regularly discussed at manager meetings? How does your department set and monitor a safety goal? Please provide an example.	<p>Safety goals depend on specific actions / objectives discussed in safety meetings. Those specific goals are monitored through management meetings, targeted observations, and verification. Example: changes related to the safety of carhouse and yard moves.</p> <p>LR Transportation managers noted that there is strong integration with the training function to put out flashes, conduct targeted observations and reinstruction /</p>	COM

2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training



Department: Light Rail Transportation, LR Training

Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly

Review Date(s): 7/13, 8/11/2021

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

Reference Criteria: 2021 MBTA Safety Plan

			familiarization on developing safety issues. Memos are distributed to employees as reminders on how things should be done.	
1.5	Element 3: Overview of Management Structure	Describe how the Light Rail Transportation department is organized.	LR Transportation interviewees provided a high level overview of the department org chart. There are two superintendents and eight supervisors supervising several hundred operators. Trainstarters oversee manpower distribution. There are both part and full time operators, but no significant differences in their roles and responsibilities.	COM
1.6	Element 3: Overview of Management Structure	Summarize the responsibilities of the Light Rail Transportation Department. Include any role(s) LR Transportation employees perform as it relates to safety and/or safety-related committees.	There is a monthly LR safety committee meeting that includes MBTA Safety, motorpersons, officials, yardmaster, training, vehicle maintenance, etc. They try to switch these people in and out with each new rating. The meeting is focused on identifying and resolving specific issues coming from staff. There are a couple of historic examples of hazards that were escalated from the meeting to senior management or Safety. Management-level meetings include the weekly safety data review meeting, bi-weekly safety / ops coordination meeting, Safety Rules Compliance Program (SRCP), Right of Way (ROW) access, ROW safety committee.	COM

2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training



Department: Light Rail Transportation, LR Training
Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly
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Reference Criteria: 2021 MBTA Safety Plan

1.7	Element 3: Overview of Management Structure	Describe Light Rail Transportations interface with the Safety Department outside of safety committee meetings.	LR Transportation communicates regularly with MBTA Safety on safety issues. Examples: glare on windows of type 9s. These discussions are coordinated on an ad hoc basis but documented via emails, site visit reports, etc.	COM
1.8	Element 4: MBTA Safety Plan Control and Update	Describe the role of Light Rail Transportation management in annual or unscheduled reviews / updates to the Transit Safety Plan	Interviewees cited no specific examples of LR Transportation issues leading to a required change to the Safety Plan. Management are generally aware of the annual plan update process.	COM
1.9	Element 4: MBTA Safety Plan Control and Update	Confirm that all department safety- related activities are adequately described in the Safety Plan or associated documents.	No specific known gaps between LR Transportation programs and the Transit Safety Plan.	COM
1.10	Element 5: Implementation, Tasks, Activities, and Responsibilities	How does senior management in Light Rail Transportation promote a positive safety culture throughout the department? Describe any safety promotions or challenges that Light Rail Transportation experiences in carrying out the safety-related tasks specified in the MBTA Transit Safety Plan.	Supervisors in the field monitor day to day actions. Management stay embedded in the day to day operations of the system, which helps build trust. Safety changes are grounded in this on-the-ground perspective. Challenges include complacency and practical drift from training. Example – slapping switches. Management have previously added rules and performed campaigns to address	COM

2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training



Department: Light Rail Transportation, LR Training

Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly

Review Date(s): 7/13, 8/11/2021

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

Reference Criteria: 2021 MBTA Safety Plan

			issues. Everbridge notifications are also used for targeted campaigns.	
1.11	Element 11: Emergency Management	Describe Light Rail Transportation's role and responsibilities in the development of emergency management procedures.	<p>Operators contact the Operations Control Center (OCC) in the event of an emergency. Officials in the field will then be contacted by OCC. OCC has access to emergency procedures. Certain emergency situations are described in the rulebook, but not all. LR Transportation interviewees noted that each situation is different and that responses vary for each event.</p> <p>Observation: LR Transportation management should consider an enhanced level of engagement with OCC management during the ongoing review and update process for OCC standard operating procedures (SOPs) to ensure that all operational and emergency requirements are accounted for in OCC documentation.</p>	COM
1.12	Element 11: Emergency Management	Describe Light Rail Transportation involvement in emergency drills and exercises, including planning, implementation, and after-action report development.	LR Transportation has emergency action plans related to facility evacuation and emergencies. Interviewees noted that senior LR management have not been included in drills and exercises held during the past several years. They were aware of earlier examples of LR participation in drills and exercises, and cited the upcoming GL drill on the new Green	CWR

2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training



Department: Light Rail Transportation, LR Training

Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly

Review Date(s): 7/13, 8/11/2021

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

Reference Criteria: 2021 MBTA Safety Plan

			<p>Line Extension (GLX) alignment as an example of engagement with emergency responders.</p> <p>Compliant with Recommendation: LR Transportation management are not consistently included in drills and exercises, and lessons learned from recent drills and exercises may not be adequately incorporated into department procedures and work practices as a result. LR Transportation management should coordinate with MBTA's emergency management function to ensure that the department is represented in all major drills and exercises, and that after-action report findings with potential applicability to Light Rail are reviewed at the management level.</p>	
1.13	Element 5: Implementation, Tasks, Activities, and Responsibilities	[FIELD] Interview at least one employee and one supervisor to determine what they understand regarding their safety roles and responsibilities.	Safety's audit team performed interviews with multiple frontline employees and LR Transportation supervisors to gauge their understanding of their safety responsibilities. All were familiar with safety related expectations of their positions through written job descriptions, the training program, and regular communication from their supervisors.	COM

2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training



Department: Light Rail Transportation, LR Training

Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly

Review Date(s): 7/13, 8/11/2021

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

Reference Criteria: 2021 MBTA Safety Plan

1.14	Element 11: Emergency Management	[FIELD] Verify that Light Rail Transportation employees possess easily-accessible versions of emergency SOPs, plans, call lists, etc.	Employees interviewed by the audit team were comfortable with navigating to TSTOP to find safety documents, or with contacting a supervisor to obtain copies.	COM
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#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.1	Element 6: Safety Risk Management	How does Light Rail Transportation address reported or identified hazards? What is the process for communicating these hazards to MBTA Safety and/or other relevant departments? Provide an example.	According to interviewees, hazards are regularly reported to department officials or management. Immediate hazards are reported to OCC / Maintenance Control Center (MCC) if they can't be addressed on the spot. Other hazards may require a mobile official to be dispatched to the location. Information on hazard reports is shared with LR Transportation management – station reports, job numbers, etc. LR management frequently follow up directly with Engineering and Maintenance (E&M) management to discuss reported issues.	COM

**2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training**



Department: Light Rail Transportation, LR Training
Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly
Review Date(s): 7/13, 8/11/2021

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.2	Element 6: Safety Risk Management	How is Light Rail Transportation involved with the implementation of Corrective Action Plans (CAPs)? Provide an example.	Interviewees discussed examples of recent corrective action plans (CAPs) related to accidents and incidents involving LR Transportation personnel. LR Transportation management holds fact finding meetings following major events, and potential CAPs are discussed with all impacted teams. Fact findings are documented and notes are retained.	COM
2.3	Element 6: Safety Risk Management	Describe the hazard reporting procedure and how it is communicated with employees to ensure safety hazards in the workplace are reported effectively.	Hazard information reportedly moves freely through the chain of command. The “see something, say something” expectation is deeply ingrained thanks to trainings, constant management reminders, MBTA Safety postings and info blasts.	COM
2.4	Element 6: Safety Risk Management	Discuss sources of hazard information regularly reviewed by Light Rail Transportation management and staff to identify hazards.	Managers consult information from MBTA Safety and the rail training school to identify potential sources of hazard information. Training records, accident investigation reports and supporting materials, and OCC data are among the resources that management review to identify new or emerging hazards.	COM

2021 MBTA Safety Internal Audit Checklist Light Rail Transportation and Training



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#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.5	Element 7: Management of Change	What is Light Rail Transportation's involvement in infrastructure and equipment changes and/or the review/testing of the equipment before implementation?	LR Transportation managers meet with departments involved, engineers, equipment manufacturers, procurement, and other teams. The training school facilitates equipment familiarization. LR Ops is involved in plans for static and integrated testing, system familiarization, and pre-revenue operations on new line segments like the Green Line Extension. LR Transportation contributes to schedules for major milestones.	COM
2.6	Element 7: Management of Change	How is each Light Rail Transportation employee notified of rule/procedure changes and how is this documented?	Memos are either handed out informally or distributed with a required signoff. Rule changes are completed via special orders and they are distributed using a more formalized process. Memos / special orders are retained and incorporated into the rulebook by the Rulebook Committee.	COM
2.7	Element 14: Facilities and Equipment	Explain Light Rail Transportation's current facility inspection process/procedures. Are facility inspections routinely conducted by Light Rail Transportation employees?	LR Transportation management perform informal safety related checks of operations-side facilities. Yardmasters, vehicle maintenance, and facilities control most facility	COM

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	Safety Inspections		inspections. Station officials do perform limited station walkthroughs.	
2.8	Element 14: Facilities and Equipment Safety Inspections	Describe how results from the inspections are stored and analyzed.	Officials' station checks are documented in station reports. Results are called in to MCC and job numbers are recorded on a form. The paper forms are retained. LR Transportation follow up to ensure that results are corrected.	COM
2.9	Element 15: Maintenance Audits and Inspections	How does a Light Rail Transportation employee know when to communicate maintenance defects during revenue service and non-revenue service? Does Light Rail Transportation have a list of maintenance defects that would/would not allow a trip to continue in revenue service?	Operators call in defects when they occur. Any defect serious enough to hinder the trip – doors, brakes, propulsion, etc. – would be called in immediately. When the defect is reported, an official is dispatched – this individual makes a decision on whether or not the vehicle can continue in service.	COM
2.10	Element 6: Safety Risk Management	[FIELD] Verify via a records review that hazards identified by Light Rail Transportation personnel are documented and communicated to safety as needed.	Documents provided by LR Transportation management, as well as Safety's own hazard log, demonstrate that hazards are regularly documented and communicated to Safety.	COM

2021 MBTA Safety Internal Audit Checklist Light Rail Transportation and Training



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2.11	Element 15: Maintenance Audits and Inspections	<p>[FIELD] Randomly select a sample light rail vehicles and review the pre-trip records in the yardmaster's office for those vehicles for the past ninety days. Check to verify that:</p> <ol style="list-style-type: none"> 1. The pre-trip form was completed and was consistent with the MBTA's transportation program. 2. The forms were filed with appropriate supervisor. 3. Any defects were reported to Light Rail Vehicle Maintenance/Engineering. 	<p>Safety's audit team reviewed a sample of pre-trip inspection documents provided during the 2020 Department of Public Utilities (DPU) Triennial Audit of MBTA, as well as additional supporting documentation. While the sample included pre-trip inspections performed at all times of year, LR Transportation managers in the field noted some inconsistencies in expectations around completion and documentation of pre-trip inspections.</p> <p>Compliant with Recommendation: LR Transportation has not established clear and uniform requirements for completion of pre-trip inspections. Rules, procedures, and management expectation regarding pre-trip inspections are unclear, leading to variations in pre-trip inspection practices across seasons and work locations. LR Transportation management should clearly identify and document expectations for pre-trip inspections, including the nature of the inspection, the required frequency, and</p>	CWR

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			which personnel are responsible. Management should ensure that pre-trip inspections are administered consistently across all locations at all times of year that they are required (or year-round, if necessary).	

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.1	Element 8: Safety and Security Certification	Describe LR Transportation's role in a recent safety certification. What processes/procedures are used to inform LR Transportation employees of their role in a safety certification? Provide an example (e.g., Type 9 LRV) of a current project requiring Safety Certification.	LR Transportation management participate in regular meetings on system extensions and new vehicle procurements. New trainings must be developed to get operators certified to operate in specific locations. Prior to training, LR Transportation supports testing of vehicles for braking, signals, crossover functionality, etc., in coordination with E&M, Capital Delivery, and others.	COM
3.2	Element 8: Safety and Security Certification	Are project design changes and non-conformance reports (NCRs) provided to LR Transportation management to review/analyze for safety impacts? If so, does LR Transportation document their conclusions/analyses in accordance with MBTA's Safety Certification Program?	Key project changes are presented to LR Transportation and other MBTA management in meetings on a weekly basis for discussion and further action. These meetings include other functions including planning and schedules, vehicle maintenance, fare collection, and bus operations. Discussions are documented in meeting minutes.	COM
3.3	Element 9: Data Collection and Analysis	Explain how Light Rail Transportation collects and analyzes data to identify hazards and control their potential consequences.	LR Transportation management use several methods to develop and track safety data. The Safety Rules Compliance Program is the primary method for collecting operational and rules compliance data. A shared excel document is used to track key open work orders impacting operations,	COM

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			including date opened and status. LR Transportation also inventories speed signage and other key safety equipment on a continuous basis.	
3.4	Element 9: Data Collection and Analysis	Explain how safety data is collected by Light Rail Transportation employees and how data from information systems is shared with MBTA Safety and other departments. Provide examples of this process, including any trends observed from rules compliance audits that may indicate quality or training issues.	Operating rules violations, including speed sign violations and other violations, are captured in spreadsheets or via the SRCP database. Results from SRCP activities are shared with the SRCP Committee, which includes MBTA Safety. Mitigations are put in place in response to trends or patterns in the data.	COM
3.5	Element 10: Accident Investigation	Explain Light Rail Transportation roles and responsibilities in the accident/incident investigation process, including notification and immediate response. Describe the department's process for coordination with safety during the investigation process, including for root cause identification, collection of	Supervisors respond when notified by OCC or when otherwise made aware of an event from monitoring the radio and other communications. Upon arrival at the scene, managers interview operators if possible to get a sense of what occurred. The response varies depending on the severity of each event after initial assessment. Following the on-scene response, Safety is included on exchange of documents and collection of supporting resources. LR	COM

2021 MBTA Safety Internal Audit Checklist Light Rail Transportation and Training



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		training/maintenance/operational records, review of applicable rules and procedures.	Training sometimes interviews employees and makes determination of preventability / non-preventability of accidents. The post-event review between Ops and Training includes a review of applicable rules and procedures that may have been violated.	
3.6	Element 10: Accident Investigation	Are there standardized incident response procedures for specific incident types? (For example, a Code 3) How are Light Rail Transportation employees trained on the initial information to collect and necessary steps to follow?	<p>According to LR Transportation management, virtually all employees are aware of the need for immediate response and scene preservation. Supervisors take custody of employees involved in each event, coordinate with dispatch, meet with additional responders, and coordinate post-accident testing if required. There is an initial post-accident huddle to discuss initial findings and responsibilities.</p> <p>Compliant with Recommendation: There is no existing requirement for LR Transportation field managers to complete Incident Command System (ICS) training, despite their primary role in event response. LR Transportation management should review the existing training program</p>	CWR

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			and consider expanding training on the accident investigation process to include ICS modules, documenting a determination as to whether expanding the training program is appropriate.	
3.7	Element 10: Accident Investigation	Describe the department's coordination with safety to develop immediate mitigations and CAPs following safety events.	CAP development ties into the fact finding process, which includes Safety, Training, and Transportation management. CAPs may include employee outreach, safety flashes, or updates to training and recertification programs. During this process, managers set timelines in order to meet milestones and accomplish deliverables. All after-action findings are added to a matrix and tracked, though interviewees noted that formal CAPs are rarely developed from accident investigations.	COM
3.8	Element 12: Internal Safety Audit	How does Light Rail Transportation review, implement, and track MBTA Safety Internal Audit recommendations and corrective actions?	Internal Safety Audit recommendations are tracked until implementation using a spreadsheet maintained by LR Transportation management. Managers meet monthly to review the sheet and move action items forward.	COM

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3.9	Element 12: Internal Safety Audit	Describe internal reviews, observations, and audits conducted by Light Rail Transportation that are not part of the Safety Rules Compliance Program (SRCP).	LR Transportation management periodically arrange targeted reviews and observations outside of the SRCP program. In one example, horn audits were performed in reaction to complaints from residents near the system to verify that operators made use of the gong except in emergency situations. Other targeted or random compliance audits have also been performed.	COM
3.10	Element 13: Rules Compliance	How are policy/procedure changes (including bulletins) provided to employees?	Policy and procedure changes are circulated via email and Everbridge, and posted in major operations facilities.	COM
3.11	Element 13: Rules Compliance	Verify that the department documents how supervisors are evaluated to assess their effectiveness in overseeing implementation/compliance with operating rules.	SRCP-15, Supervisory Oversight, is designed to check supervisor performance. All SRCPs are mailed to districts on a daily basis and manually entered into SRCP database. There are mechanisms in place to verify the integrity of results by checking paper forms against train schedules, etc.	COM
3.12	Element 13: Rules Compliance	Discuss how the results of departmental safety rules compliance activities are	The monthly SRCP Committee meeting includes Safety and all other impacted departments.	COM

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		communicated to the safety department and other management.		
3.13	Element 13: Rules Compliance	How does Light Rail Transportation ensure that updated procedures, bulletins, and rules are addressed in initial, remedial, and refresher training courses provided for employees?	The operations training function makes regular updates when requested by LR Transportation. In one recent example, Transportation requested training incorporated into the recertification program for Officials to make sure first report of injury paperwork was submitted correctly. There is no formal meeting to discuss training updates, but this may not be urgently required due to regular contact between the groups.	COM
3.14	Element 17: Configuration Management	How is Light Rail Transportation involved in the MBTA's Configuration Management and Control process, such as for new procurements or modifications to rail vehicles? Do employees have the ability to provide feedback on these projects?	Meetings related to configuration management are project- or procurement-specific. Engineering has asked operators for input on features for the Type 9 vehicles, as one example. When Type 9s were first delivered, there were weekly meetings to discuss faults, issues, etc.	COM
3.15	Element 17: Configuration Management	Discuss department coordination with the safety function in development, review, and documentation of proposed changes.	Safety is integrated into the LR operations configuration change process both formally and informally.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.16	Element 21: Procurement	Are procurements of new equipment/vehicles reviewed by Light Rail Transportation to verify the new equipment or materials will not present a hazard to the existing system?	LR Transportation management are engaged to participate in procurement reviews and ensure that equipment doesn't present any new hazards.	COM
3.17	Element 10: Accident Investigation	[FIELD] Randomly select a Light Rail Transportation Instructor who investigated a major incident and review the incident report created, including the process and questions used to record incidents.	Safety reviews LR Transportation investigation report materials on an ongoing basis as a component of the accident investigation process. Any deficiencies are identified and corrected before the final report is issued.	COM
3.18	Element 13: Rules Compliance	[FIELD] Records review: Confirm that supervisors document rule violations observed. Confirm any actions taken by department management in response to violations observed.	Safety performs ongoing oversight of LR Transportation's Safety Rules Compliance Program, documenting any significant discrepancies and reporting them to the SRCP Committee. Field managers consistently document and report rule violations via the appropriate channels.	COM
3.19	Element 15: Light Rail Transportation	[FIELD] Observe a Light Rail Transportation audit.	See above.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
	Audits and Inspections			

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.1	Element 16: Training and Certifications	What types of training are offered to Motorpersons in the Light Rail Transportation department? Describe both certification/recertification components.	LR Transportation's new hire training program includes guidance on reading rail, reading signals, rulebook and procedure review, and a full day of Americans with Disabilities Act (ADA) training in addition to training on operating a vehicle. New hire training is 40 days in length. All Motorpersons start as part-time Motorpersons. Recertification consists of a truncated, 8 hour program including a hands-on component and updates on any recent rule and procedure changes.	COM

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#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.2	Element 16: Training and Certifications	Is there a responsible party within LR Transportation who oversees all training? What are the requirements (e.g. years of experience, education, etc.) to become an Instructor? Please describe the qualification process.	The Assistant General Manager (AGM) of OCC and Training oversees all training within LR Transportation. There are two Superintendents of training, 13 LR instructors, and six new instructors being onboarded. Instructors are drawn from the pool of Inspectors, with a minimum of five years' experience required. Generally there are enough candidates with the experience and qualifications that management are seeking. The latest staffing increase for LR training is linked with the opening of the Green Line Extension, return of service after COVID-19, and the fact that earlier staff numbers were considered short.	COM
4.3	Element 16: Training and Certifications	How are changes to training programs communicated to MBTA Safety and any relevant departments prior to their implementation?	Certain training packages are updated in tandem with Safety where needed, such as those associated with open CAPs. Others are shared for situational awareness and/or approval. Trainings with ROW impacts can be shared with the ROW Safety Committee or in other forums.	COM

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4.4	Element 16: Training and Certifications	How are training employees notified of updated policies and procedures from Light Rail Transportation and other applicable departments? What training or communication is required when these updates necessitate changes to LR Transportation procedures?	Recertification for Motorpersons is largely reserved for sharing updates on general practices. There are also processes for more urgent updates and communications to employees. For example, training flashes and workshops facilitated by the training school were recently used in response to hazards presented by operation of a new type of switch. In that instance, all inspectors passed through hands on practice and sign off within ~2 weeks of hazard identification. The training function may also use memos to employees and train the trainer activities to familiarize instructors with changes to policies and procedures.	COM
4.5	Element 16: Training and Certifications	How are training records maintained and monitored? How does an employee, and their supervisor, know when they are due for training?	LR Transportation training recordkeeping takes place using the Learning Hub, Peoplesoft, and manual tracking with spreadsheets. ROW training is tracked in the Learning Hub; Motorperson recertification is tracked via spreadsheets, and management interviewees stated that efforts to migrate records out of this format are ongoing. Previous	COM

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			recertification reports generated using Microsoft 360 were not providing consistently accurate information.	
4.6	Element 18: Workplace Safety	Describe how Light Rail Transportation determines appropriate Personal Protective Equipment (PPE) requirements for each job task an employee may be performing. How does Light Rail Transportation ensure adherence to proper PPE usage?	PPE requirements for LR Transportation personnel are established in the ROW Rulebook. Compliance is checked daily by supervisors when staff report for duty, and via other compliance activities such as the SRCP.	COM
4.7	Element 18: Workplace Safety	Does Light Rail Transportation know where to find/access the MBTA Occupational Health & Safety (OHS) Plan and associated programs? How does/will Light Rail Transportation communicate the contents of the OHS Plan to its employees?	LR Transportation management are familiar with OHS program requirements. Workplace injuries are documented by supervisors and statements are collected for all injuries. These reports are shared with Safety, Workman's Compensation, and other groups. LR Transportation and Safety both participate in a weekly Wednesday safety data review meeting where recent injuries are discussed.	COM

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4.8	Element 19: Hazardous Materials Program	Describe the Light Rail Transportation hazardous materials (HazMat) program, hazardous materials plan or procedure.	<p>LR Transportation employees have minimal exposure to hazardous materials as a part of their day to day work, with the exception of bodily fluids. LR Transportation management noted that there is no specific requirement for Motorpersons to complete blood-borne pathogens training.</p> <p>Compliant with Recommendation: There is no existing requirement for LR Transportation employees to complete blood-borne pathogen training, despite their relatively high likelihood of exposure. LR Transportation management should review the existing training program and consider including blood-borne pathogen training, documenting a determination as to whether expanding the training program is appropriate.</p>	CWR
4.9	Element 20: Human Factors	Explain how Light Rail Transportation implements the MBTA's Fitness for Duty	All operators check in daily with a pull out official to confirm they are able to safely perform their duties. There is a FFD checklist with justifications for ruling a person unfit	COM

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		and Drug & Alcohol policies for employees and managers.	for duty; pull out officials can call on a second person to verify the status of a reporting employee. LR Transportation administers training for all frontline managers on how to administer these checks. Reasonable suspicion checks are somewhat rare, but they are used.	
4.10	Element 20: Human Factors	Discuss applicable justifications for testing (reasonable suspicion, post-accident, random, etc.) and verify that tests are administered in accordance with applicable standards.	Officials undergo a four-hour training discussing the D&A test process, signs and symptoms, drug test types and panels. Approximately 50% of employees are selected for a random screening every 2 years. On a daily basis, the MBTA Clinic contacts LR management with selected employees; LR management pull employees at some point during their scheduled shift.	COM
4.11	Element 20: Human Factors	Describe Light Rail Transportation's process when notified that an employee has been selected for a random drug & alcohol test.	See above.	COM

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4.12	Element 20: Human Factors	Describe what processes managers use to monitor employee fatigue and hours of service.	LR management rely on the HASTUS system to provide warning when a Motorperson's scheduled work violates the 10 hour rest rule or when overtime exceeds limits in a given week. According to LR Transportation's interviewees, the 10 hour rule is always adhered to – employees without 10 hours of rest get paid leave until hitting the 10 hour threshold. Management become aware of these situations at least a day in advance. The Assistant General Manager must approve anyone exceeding the overtime (OT) threshold, and those employees must get special fitness for duty (FFD) checks.	COM
4.13	Element 20: Human Factors	How is overtime awarded to Light Rail Transportation employees? Describe processes LR Transportation management uses to voluntarily or involuntarily assign overtime work to employees.	LR Transportation overtime is governed by the Overtime Policy and distributed based on seniority. Approvals for Transportation overtime are routed through individual Division Chiefs. Involuntary OT is rarely assigned.	COM

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Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.14	Element 16: Training and Certifications	<p>[FIELD] Review training program for Motorpersons and Instructors to verify:</p> <ul style="list-style-type: none"> a) How training records are maintained. b) That training consists of both classroom and hands-on training. c) Consistency with written training programs and/or syllabi. 	Training records are maintained in both hard copy and via the MassDOT Learning Hub. Safety's audit team confirmed via a records review that training consists of both classroom and hands on training time. Trainings administered to LR Transportation personnel are consistent with written training syllabi.	COM
4.15	Element 16: Training and Certifications	<p>[FIELD] Review the training and certification records for a sample of employees for the past three (3) years to determine if:</p> <ul style="list-style-type: none"> a) The employee has completed the initial training program and refresher and remedial training as necessary. b) The course content was appropriate and adequate to meet training and recertification requirements. 	A sample of individual training records indicates that employees completed all required initial training, refresher and remedial training, and recertification activities according to required timelines.	COM

**2021 MBTA Safety Internal Audit Checklist
Light Rail Transportation and Training**



Department: Light Rail Transportation, LR Training

Department Representative(s): Ivy Payne, Alicia Gomes, Aisheea Isidor, Frenia Hunter, Steve Daly

Review Date(s): 7/13, 8/11/2021

Reference Criteria: 2021 MBTA Safety Plan

Reviewer(s): Michael Catsos, Anya Limacher, Thomas Maher

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.16	Element 16: Training and Certifications	<p>[FIELD] Through a records review:</p> <ul style="list-style-type: none"> a) Verify that a process for maintaining and accessing employee training records is in place. b) Verify that categories of safety-related work requiring training and certification have been identified. c) Verify that the MBTA has processes in place to assess compliance with its training and certification requirements. 	LR Transportation managers have established a process to collect and retrieve training records as needed. Safety-related trainings and safety-sensitive work activities have been identified. Compliance with training and certification requirements is monitored by LR Transportation training management and assessed as a part of other processes including accident investigations.	COM

APPENDIX F



MBTA SAFETY

2021 Internal Safety Audit Report

Date: October 18, 2021

TO: Joseph Gushue <i>Director, Maintenance of Way</i>	CC: J. Cheever R. Ester A. Fletemeyer A. Giugni M. McDonnell A. Modh, DPU K. Raine, DPU
FROM: Michael Catsos <i>Deputy Director of Safety Assurance and Promotion</i>	

Area Audited: Maintenance of Way

Audit Approach:

Assessment of the department's adequacy in meeting safety program requirements as outlined in the MBTA Safety Plan derived from the referenced documents listed below.

Reference Documents:

- 2021 MBTA Transit Safety Plan
- Department of Public Utilities (DPU) Regulation 220 CMR 151.03
- Federal Transit Administration (FTA) Regulation 49 CFR 673

Audit Date: April 26-27 and May 25, 2021

Summary:

MBTA's Maintenance of Way (MOW) department, contained within Engineering and Maintenance (E&M), is responsible for continuous inspection and maintenance of rail and special track work across Light and Heavy Rail mainline and yards. MOW's area of responsibility also extends to maintenance of specialized non-revenue equipment and storage/inventory of key track components.

MOW coordinates with outside business units including Safety, Transportation, the Operations Control Center (OCC), and other E&M teams to identify and manage emergency maintenance issues related to track and switches, as well as to conduct planned outages of track and yard areas for maintenance. These activities are coordinated through weekly and monthly meetings including the Code 1 Task Force, Derailment Committee, E&M Safety Committee Meeting, and other formal and informal discussions.

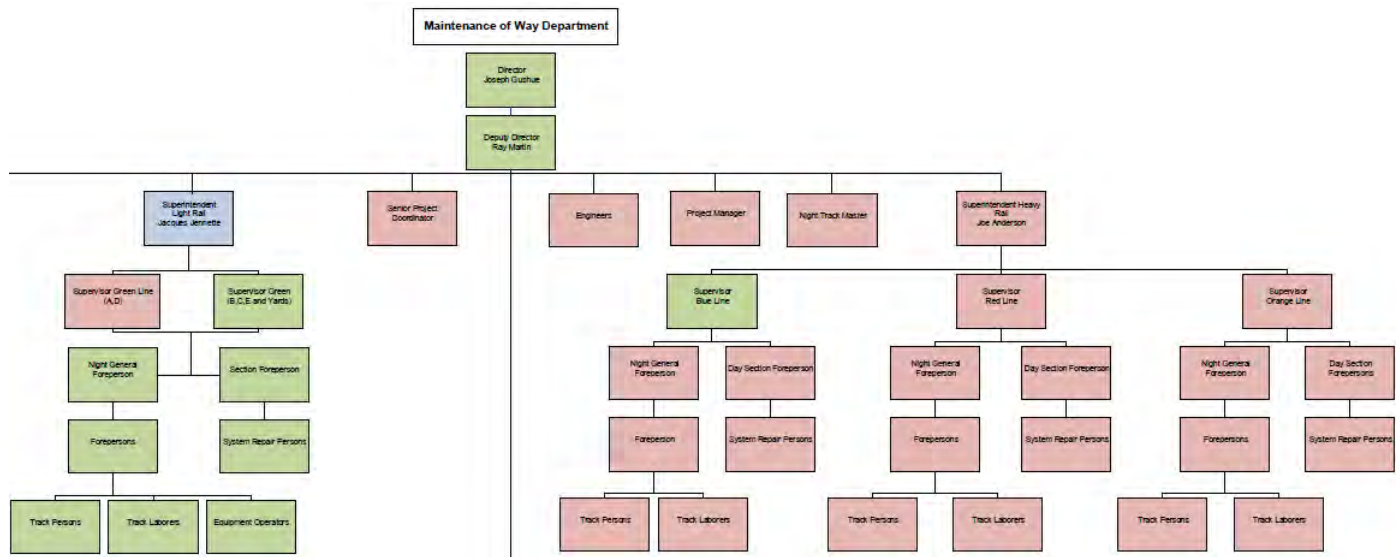


Figure 1: Maintenance of Way Organizational Chart for Light and Heavy Rail Maintenance

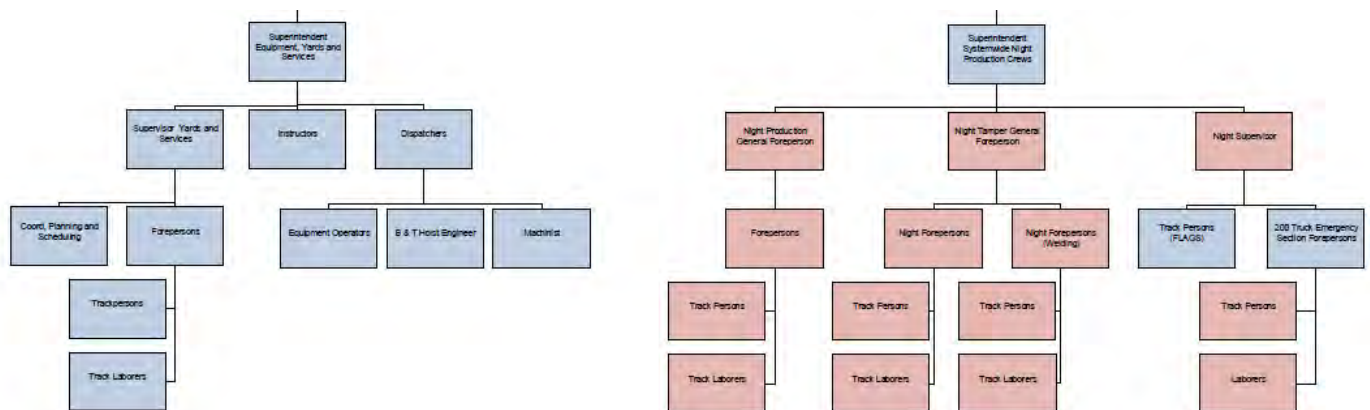


Figure 2: Maintenance of Way Organizational Chart for Equipment and Night Production

Maintenance activities performed by MOW are coordinated through technologies including Trapeze and MaxTrax, a phone- and tablet-based app for field inspections. Preventative Maintenance Inspections (PMIs) include riding and walking track inspections performed by teams in the field, as well as less-frequent but more-intensive inspections using track geometry vehicles. Data from inspections in Trapeze is used to create dashboards for management tracking of work activity.

All job classifications within MOW are subject to an initial onboarding training program. Expanded training is provided to each individual based on their position and job duties. System repairpersons and



section foremen are required to recertify every two years. Instructors are drawn from a pool of senior employees with at least 10 years of experience in the department.

Findings – Noncompliance (NC): None

Findings - Compliance with Recommendation (CWR):

1. MOW's procedures for response to emergency events are not fully documented and largely consist of institutional knowledge.
 - a. MOW management should perform an assessment of existing emergency procedures, identify gaps, and develop or formalize new procedures to ensure that documented processes are in place for all applicable emergency event types. These procedures should be utilized as a baseline, with acknowledgement that emergency situations contain many variables where institutional knowledge can play a role.
2. The shift from analog to digital MOW business processes presents an opportunity to improve upon supervisor field verification of PMIs and targeted observations of staff.
 - a. As the implementation of MaxTrax continues, MOW management should examine workflows and technological capacity to develop an enhanced process for verifying that supervisors adhere to schedules and requirements for field activity oversight. MOW management should confirm the effectiveness of this process through regular records reviews and status check-ins.

Observations:

1. MOW management and field staff have minimal exposure to emergency drill and exercise planning and implementation. MOW management could coordinate with MBTA's Emergency Management function to ensure that the department is included in drill and exercise planning, implementation, after-action report development, and implementation of recommendations whenever necessary.
2. While MOW employees can access safety communications via multiple channels, MOW management should ensure that safety flashes and bulletins are distributed to / posted in all MOW satellite facilities.
3. MOW management should continue to provide high-level familiarization on hazard identification and reporting requirements for MOW staff, and monitor the process for hazard management outside of the preventative maintenance process.
4. MOW management should continue efforts to document institutional knowledge related to critical points of failure within the system, and complete a full assessment of switches and track



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segments in coordination with other MBTA business units to aid in scheduled maintenance and overhaul/replacement of components where necessary.



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	1 Introduction	<u>Interview:</u> The MBTA Transit Safety Plan is available online, where it is posted on TSTOP. Safety-related responsibilities and expectations are listed clearly in job descriptions and via verbal communication throughout the onboarding process. Additionally, There is a sign-off process for supervisors regarding all key safety-related items.		
		<u>Field:</u> MOW employees stated they receive information on safety topics and procedures from Tool Box Talks, and from publicly-posted documents in MOW facilities.		
Safety Management Policy	2 Purpose, Scope, Performance Objectives	<u>Interview:</u> Safety goals and objectives align with higher-level MBTA safety priorities. Specific safety concerns are discussed on a regular basis.		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	3 Overview of Management Structure	<u>Interview:</u> A Director leads the MOW department, followed by a Deputy Director who supervises four Superintendents. The Superintendents supervise the various areas within the department. There are also a section foreman and seven engineers as well as dispatchers.		
Safety Management Policy	4 Safety Plan Control and Update Procedure	<u>Interview:</u> MOW management monitor discussions regarding updates to the Plan during regular safety committee meetings and provide input as needed. Planning for this would include increased staff, overtime, retraining, and recertification.		
Safety Management Policy	5 Safety Plan Implementation, Tasks, Activities and Responsibilities	<u>Interview:</u> Management cited implementation of new OSHA requirements as a significant challenge. Another specific challenge is the increasing emphasis on safety training.		
		<u>Field:</u> MOW employees interviewed in the field		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		were able to explain their basic safety roles and responsibilities, including hazard identification and reporting.		
Safety Management Policy	11 Emergency Management	<u>Interview:</u> Emergency management procedures are posted within each building and/or trailer. MOW places emphasis on snow and ice management to ensure that customers and employees are safe in respect to those conditions, as well as high wind events.	<u>Compliant With Recommendation:</u> MOW's procedures for response to emergency events are not fully documented and largely consist of institutional knowledge. MOW management should perform an assessment of existing emergency procedures, identify gaps, and develop or formalize new procedures to ensure that documented processes are in place for all applicable emergency event types. These procedures should be utilized as a baseline, with acknowledgement that emergency situations contain many variables where institutional knowledge can play a role.	
		<u>Field:</u> MOW employees in the field were able to describe where they can obtain safety information including policies, plans, and procedures. Employees noted that Safety Flashes and other communications are sometimes not available at certain facilities, explaining that this may be due to the large number of		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		smaller MOW facilities and trailers across the system.		
Safety Risk Management	6 Safety Risk Management	<u>Interview:</u> Various hazards, including track related defects, are addressed utilizing systems and processes in place. For example a track defect will be remedied with a speed restriction reported to both Operations Control Center (OCC) and Maintenance Control Center (MCC).		
		<u>Field:</u> Significant track defects and other hazards are largely documented and communicated to MBTA Safety in a timely manner. Documentation includes Everbridge notifications, emails, hazard logs, and meeting		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		minutes.		
Safety Risk Management	7 Management of Change	<u>Interview:</u> MOW typically has a significant impact on identifying track improvements. In the past, MOW has periodically provided Capital Delivery with a list of components needing replacement or repair.		
Safety Assurance	14 Facilities and Equipment Inspections	<u>Interview:</u> Trapeze is currently the system of record and can generate work orders for identified defects, reporting on overall preventative maintenance (PM) and corrective maintenance (CM) completion rates. <u>Field:</u> MBTA Safety's audit team observed a walking track inspection of a portion of the Green Line tunnel between Kenmore and Blandford Street. MOW's inspectors documented all concerns in their phone-based inspection program and had access to MOW's track standards for		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		reference during the track walk.		
Safety Assurance	8 Safety and Security Certification	<u>Interview:</u> The initiation of Safety and Security Certification processes is currently spearheaded by Capital Delivery/New Vehicle delivery when required. MOW plays an active role in the safety and security certification process when needed, for example oversight of the Green Line Extension (GLX).		
Safety Assurance	9 Data Collection and Analysis	<u>Interview:</u> Safety-related information is obtained and documented through daily and monthly reports where MOW provides reoccurring information about speed restrictions and derailment information as events occur.		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Assurance	10 Accident Investigations	<u>Interview:</u> MOW employees receive training from DOT, FTA, OSHA, as well as internal training. These training prepare them for incident response for different kinds of accidents that may occur. Responses can vary depending on the severity of the situation but generally involve an on-scene investigation, participation in after action meetings, providing DPU requested information and reviewing reports.		
		<u>Field:</u> Safety's audit team reviewed a sample of investigation reports involving MOW field response. Checklists and related questions capturing track and switch conditions were properly completed; no notable deficiencies were identified.		
Safety Assurance	12 Internal Safety Reviews	<u>Interview:</u> All recommendations are tracked by Safety and regularly reviewed with		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		MOW management.		
Safety Assurance	13 Rules Compliance	<p><u>Interview:</u> MOW ensures that supervisors are meeting their obligations by requiring that supervisors sign a weekly certification to verify that inspections have occurred. Updated rules, procedures, and bulletins are directed to MOW's trainer and incorporated into training course materials and discussion.</p> <p><u>Field:</u> Safety violations observed by supervisors in the field are corrected immediately and escalated to management if warranted. Trends and patterns in safety violations are discussed in management meetings.</p>	<p><u>Compliant With Recommendation:</u> The shift from analog to digital MOW business processes presents an opportunity to improve upon supervisor field verification of PMIs and targeted observations of staff. As the implementation of MaxTrax continues, MOW management should examine workflows and technological capacity to develop an enhanced process for verifying that supervisors adhere to schedules and requirements for field activity oversight. MOW management should confirm the effectiveness of this process through regular records reviews and status check-ins.</p>	
Safety Assurance	15 Maintenance Audits and Inspections	<p><u>Interview:</u> The primary functions that take place overnight are track inspections made by system</p>		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		repairpersons and system foremen. Defects are verified by different levels of leadership, and corrective maintenance work is generated and tracked in Trapeze.		
		<u>Field:</u> Safety's audit team reviewed samples of QA/QC documentation and inspection reports. The team observed track inspection activities performed by an inspection crew and discussed the process for supervisory verification of the inspection results.		
Safety Assurance	17 Configuration Management	<u>Interview:</u> MOW management are involved in major system changes through committees and management meetings. Major changes with impacts on system configuration are taken into account through updates to rules, procedures, and maintenance guidance.		
Safety Assurance	21 Procurement	<u>Interview:</u> MOW management are routinely involved in procurements for new maintenance		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		equipment and track components to verify that no new hazards will be introduced.		
Safety Promotion	16 Training and Certification Program	<u>Interview:</u> All job classifications within MOW have an initial training program. Additionally, there is expanded training depending on the job positions and job tasks. The learning hub is used as a tracking / recording keeping system.		
		<u>Field:</u> MBTA Safety's audit team reviewed a training matrix for MOW personnel as well as a sample of individual training records. Training consists of both classroom and hands-on, on-the-job training.		
Safety Promotion	18 Workplace Safety	<u>Interview:</u> Most of the basic PPE covers the majority of MOW tasks. There is specialized PPE for welding to account for lighting impact and respiratory issues with welding.		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		Adherence is maintained by the chain of command.		
Safety Promotion	19 Hazardous Materials Programs	<u>Interview:</u> A Job Hazard Assessment (JHA) identifies potential hazards present during specific jobs. MOW works with fewer hazardous chemicals than other E&M departments, but employees are trained on hazard communication and response.		
Safety Promotion	20 Human Factors	<u>Interview:</u> Fitness of duty monitoring takes place as employees begin their shifts. The general foremen have been trained on this process online through the Learning Management System (LMS). Fatigue monitoring is done through the overtime dashboard.		
Accepted By:			Date:	
Completed By: DD Mike Catsos			Date: 9/28/2021	

APPENDIX G

**2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way**



Department: Maintenance Of Way

Department Representative(s): Joe Gushue, Ray Martin

Review Date(s): 4/26/21-4/27/21, 5/25/21

Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	General Requirements / Safety Management Policy (Includes activities and associated plans/procedures identified in Transportation Safety Plan (TSP Sections 1. Introduction, 2. Safety Management System (SMS) Policies, 3. Safety Performance and Documentation, 4. Organizational Structure and Responsibilities)	Department Response / Review Team Observations	Key
1.1	Element 1: Introduction	Are you familiar with the MBTA Safety Plan? How is it made available to all employees?	The MBTA Transit Safety Plan is available online, where it is posted on TSTOP. It has been regularly circulated via email to Maintenance of Way (MOW) supervisors and superintendents, who then post the Safety plan on bulletin boards in respective areas. Notification of these postings is also verbally communicated to all employees.	COM
1.2	Element 1: Introduction	How are safety standards and policies communicated to Maintenance Of Way employees?	There is a sign-off process for supervisors regarding all key safety-related items. Toolbox Talks take place to communicate safety standards and policies for larger, more widespread issues. These take place across all shifts and work locations	COM
1.3	Element 1: Introduction	How are safety-related responsibilities incorporated into Maintenance Of Way job descriptions and employee evaluations?	Safety-related responsibilities and expectations are listed clearly in job descriptions and via verbal communication throughout the onboarding process.	COM

2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way



Department: Maintenance Of Way Department Representative(s): Joe Gushue, Ray Martin Review Date(s): 4/26/21-4/27/21, 5/25/21	Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni
Reference Criteria: 2021 MBTA Safety Plan	

1.4	Element 2: Purpose, Scope, and Performance Objectives	Are safety goals regularly discussed at manager meetings? How does your department set and monitor a safety goal? Please provide an example.	Speed restrictions are discussed and implemented, and inspections occur frequently, including geometry runs and visual inspections. PPE and COVID-19 concerns are also communicated regularly. Safety goals and objectives align with higher-level MBTA safety priorities.	COM
1.5	Element 3: Overview of Management Structure	Describe how the Maintenance Of Way department is organized.	A Director leads the MOW department, followed by a Deputy Director who supervises 4 Superintendents (overnight, heavy rail for Red, Orange, and Blue Lines, and light rail for Green Line). The Superintendent of Yards and Services position is currently open. The Superintendents supervise the rail shop, swing masters, tampers, tie handlers, and others that work with material storage, rail fabrication, and inventory kept on site. There is also a section foreman and 7 engineers (with one position currently open), as well as dispatchers.	COM
1.6	Element 3: Overview of Management Structure	Describe Maintenance Of Way's participation in any committees devoted to safety issues, their roles and responsibilities, and a schedule for when meetings are conducted.	The MOW department participates in the Derailment Committee and the Code 1 Task Force, as well as monthly staff meetings with operations, and a monthly Occupational Health and Safety (OHS) meeting. MOW is primarily a participant within these meetings. Interviewees shared concerns about the	COM

2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way



Department: Maintenance Of Way Department Representative(s): Joe Gushue, Ray Martin Review Date(s): 4/26/21-4/27/21, 5/25/21	Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni
Reference Criteria: 2021 MBTA Safety Plan	

			MBTA's plan for effectively implementing new OSHA requirements and what that might mean for incorporating more weekly/monthly meetings.	
1.7	Element 3: Overview of Management Structure	Describe Maintenance Of Way's interface with the Safety Department outside of safety committee meetings.	MOW staff interface with Safety leadership and Safety Lead Investigator for Track on a continuous, informal basis.	COM
1.8	Element 4: MBTA Safety Plan Control and Update	Describe Maintenance Of Way's involvement in periodic reviews and updates to the Safety Plan.	MOW management monitor discussions regarding updates to the Plan during regular safety committee meetings and provide input as needed.	COM
1.9	Element 4: MBTA Safety Plan Control and Update	Discuss management's process for distributing the latest approved Safety Plan and other new/updated safety procedures to impacted employees.	MOW leadership typically emails superintendents and supervisors any updated Safety Plan information and asks to discuss any new information with employees. The Safety Plan is posted in areas where it can be made available and employees can communicate with leadership to ask for additional conversations if any questions arise.	COM
1.10	Element 4: MBTA Safety Plan Control and Update	Confirm that all department safety-related activities are adequately described in the Safety Plan or associated documents.	The MOW Department has had the opportunity to review the updated Transit Safety Plan. The department feels adequately represented by the updated Plan.	COM
1.11	Element 5: Implementation,	Describe any challenges that Maintenance Of Way experiences in carrying out the safety-	Management cited implementation of new OSHA requirements as a significant challenge. Another	COM

2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way



Department: Maintenance Of Way

Department Representative(s): Joe Gushue, Ray Martin

Review Date(s): 4/26/21-4/27/21, 5/25/21

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Reference Criteria: 2021 MBTA Safety Plan

	Tasks, Activities, and Responsibilities	related tasks as specified in the MBTA Safety Plan.	specific challenge is the increasing emphasis on safety training. MOW management expressed concerns about their ability to provide the proper training while sustaining daily required work at current staffing levels; MOW faces challenges with the amount of people available to provide training and continue work while a percentage of employees undergo training. Currently, staffing issues are a central challenge and the MOW department feels that they currently have the minimum staff in order to keep to the MBTA's core mission in terms of safety and service. The planned increase in training will impact the way in which employees are available, if, for example, an additional 10% of employees are removed from their daily tasks for training purposes. Planning for this would include increased staff, overtime, retraining, and recertification.	
1.12	Element 11: Emergency Management	Describe Maintenance Of Way's role and responsibilities in the development of emergency management procedures.	Each MOW facility has an evacuation plan. Emergency management procedures are posted within each building and/or trailer. MOW places emphasis on snow and ice management to ensure that customers and employees are safe in respect to those conditions, as well as high wind events. There	CWR

2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way



Department: Maintenance Of Way
Department Representative(s): Joe Gushue, Ray Martin
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Reference Criteria: 2021 MBTA Safety Plan

are additional crews on standby for broken rail and heat events. The department is currently developing a Hot and Cold Weather Procedure. However, many of the emergency management procedures are part of institutional knowledge. Some of this information has been included within a few SOPs, but many employees within MOW know these procedures from their personal work experience.

Compliant with Recommendation: MOW's procedures for response to emergency events are not fully documented and largely consist of institutional knowledge. MOW management should perform an assessment of existing emergency procedures, identify gaps, and develop or formalize new procedures to ensure that documented processes are in place for all applicable emergency event types. These procedures should be utilized as a baseline, with acknowledgement that emergency situations contain many variables where institutional knowledge can play a role.

2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way



Department: Maintenance Of Way

Department Representative(s): Joe Gushue, Ray Martin

Review Date(s): 4/26/21-4/27/21, 5/25/21

Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni

Reference Criteria: 2021 MBTA Safety Plan

1.13	Element 11: Emergency Management	Describe Maintenance Of Way's involvement in emergency drills and exercises, including planning, implementation, and after-action report development.	<p>The MOW department's involvement in emergency response exercises is very limited. Takeaways relevant to maintenance are typically shared with the MOW department, and if the emergency drill was a derailment, MOW would respond.</p> <p>Department management noted that many events are not set up to directly test their skills, they are geared towards the emergency responders.</p> <p>Observation: MOW management and field staff have minimal exposure to emergency drill and exercise planning and implementation. MOW management could coordinate with MBTA's Emergency Management function to ensure that the department is included in drill and exercise planning, implementation, after-action report development, and implementation of recommendations whenever necessary.</p>	COM
1.14	Element 5: Implementation, Tasks, Activities, and Responsibilities	[FIELD] Interview at least one employee and one supervisory personnel to determine what they understand regarding their safety roles and responsibilities.	MOW employees interviewed in the field were able to explain their basic safety roles and responsibilities, including hazard identification and reporting.	COM

**2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way**



Department: Maintenance Of Way Department Representative(s): Joe Gushue, Ray Martin Review Date(s): 4/26/21-4/27/21, 5/25/21	Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni
Reference Criteria: 2021 MBTA Safety Plan	

1.15	Element 11: Emergency Management	[FIELD] Verify that Maintenance Of Way employees possess easily-accessible versions of emergency SOPs, plans, call lists, etc.	<p>MOW employees in the field were able to describe where they can obtain safety information including policies, plans, and procedures. Employees noted that Safety Flashes and other communications are sometimes not available at certain facilities, explaining that this may be due to the large number of smaller MOW facilities and trailers across the system.</p> <p>Observation: While MOW employees can access safety communications via multiple channels, MOW management should ensure that safety flashes and bulletins are distributed to / posted in all MOW satellite facilities.</p>	COM
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#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.1	Element 6: Safety Risk Management	How does Maintenance Of Way address reported or identified hazards? What is the process for communicating these hazards to MBTA Safety	Speed restrictions are implemented where a certain level of track condition indicates a safety hazard. The speed limit is lowered in accordance with the judgements of MOW personnel on site and MBTA	COM

**2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way**



Department: Maintenance Of Way Department Representative(s): Joe Gushue, Ray Martin Review Date(s): 4/26/21-4/27/21, 5/25/21	Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni
Reference Criteria: 2021 MBTA Safety Plan	

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
		and/or other relevant departments? Provide an example.	track standards, and then communicated to the Operations Control Center (OCC), Maintenance Control Center (MCC), and Safety. A common example of a smaller hazard identified would be a track defect. In this case, the employee documents the hazard in inspection paperwork, then reports the hazard to their supervisor. These types of hazards are usually dealt with immediately, and are not usually escalated to the level of a speed restriction.	
2.2	Element 6: Safety Risk Management	How is Maintenance Of Way involved with the implementation of Corrective Action Plans (CAPs)? Provide an example.	Typically, before a Corrective Action Plan (CAP) is formalized, the MOW department reviews a draft copy to identify potential concerns and review if the suggested mitigation is attainable. However, there have not been a significant amount of CAPs assigned recently to MOW. The Safety Review Panel Report and recent accident investigations have not generated any CAPs specific to MOW.	COM
2.3	Element 6: Safety Risk Management	Describe the hazard reporting procedure and how it is communicated with employees to	As described above, many hazards are mitigated immediately by personnel in the field. However, a recent challenge has been documenting hazards	COM

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Maintenance Of Way**



Department: Maintenance Of Way Department Representative(s): Joe Gushue, Ray Martin Review Date(s): 4/26/21-4/27/21, 5/25/21	Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni
Reference Criteria: 2021 MBTA Safety Plan	

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
		ensure safety hazards in the workplace are reported effectively.	<p>reported by employees. For example, recently, there was a tamper with braking discrepancies. A machinist adjusted it to address the braking discrepancies, and both the issue and remedy were reported to Safety. However, management interviewees did not feel that the urgency of the issue was properly conveyed to the parties involved.</p> <p>Observation: MOW management should continue to provide high-level familiarization on hazard identification and reporting requirements for MOW staff, and monitor the process for hazard management outside of the preventative maintenance process.</p>	
2.4	Element 6: Safety Risk Management	Discuss sources of hazard information regularly reviewed by Maintenance Of Way management and staff to identify hazards.	Track inspectors use a dedicated app to record track conditions and hazards. Once entered, if needed, these inspections are logged in Trapeze to generate work orders. Trapeze creates a master report that management review on a regular basis.	COM

2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way



Department: Maintenance Of Way Department Representative(s): Joe Gushue, Ray Martin Review Date(s): 4/26/21-4/27/21, 5/25/21	Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni
Reference Criteria: 2021 MBTA Safety Plan	

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.5	Element 7: Management of Change	What is Maintenance Of Way's involvement in infrastructure and equipment changes and/or the review/testing of the equipment before implementation?	MOW typically has a significant impact on identifying track improvements. In the past, MOW has periodically provided Capital Delivery with a list of components needing replacement or repair. Recent Green Line (GL) maintenance work has been a direct result of that conversation, as well as work for the Orange Line (OL) and Blue Line (BL) restrictions for 85 lb rail. Most rail maintenance machines used by MOW are consistent with standard industry equipment used elsewhere, although new purchases are reviewed by management for any safety issues.	COM
2.6	Element 7: Management of Change	How is each Maintenance Of Way employee notified of rule/procedure changes and how is this documented?	This is very similar to the process that takes place for Safety Notifications. An email is sent out with an attached rule or procedure change, and is then forwarded to superintendents and supervisors in order to distribute to all employees.	COM
2.7	Element 14: Facilities and Equipment Safety Inspections	Explain Maintenance of Way's current inspection process/procedures. What types of inspections are routinely conducted by Maintenance of Way employees?	ROW inspections take place in line with Massachusetts general laws and MBTA track standards. Operators are required to complete a circle check before entering all vehicles. There are	COM

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Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni

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			Job Hazard Analyses (JHAs) performed by work crew supervisors at the beginning of each night. MOW teams are asked to verify the functionality of tools that will be in use. MOW is in the process of moving to a digital format for inspectors. Currently, the inspection schedule is a spreadsheet posted in each physical work location, with walking Light Rail (LR) inspections performed three times a week, and Heavy Rail (HR) inspections performed two times a week. Ultrasonic testing and other specialized defect assessments are performed at less-frequent intervals.	
2.8	Element 14: Facilities and Equipment Safety Inspections	Describe how results/findings from the inspections are corrected. How are findings and subsequent corrective actions stored and analyzed?	Track inspection results are generated through walking or riding inspection runs. Once defects are determined, a work order (WO) is generated in Trapeze and the work required to remove the defect is scheduled. Trapeze is currently the system of record and is capable of reporting on overall preventative maintenance (PM) and corrective maintenance (CM) completion rates. The MOW	COM

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#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
			department is still transitioning to digital recordkeeping.	
2.9	Element 14: Facilities and Equipment Safety Inspections	How does Maintenance of Way ensure test equipment and measurement devices are properly calibrated? Is there a preventative maintenance program Maintenance of Way uses?	Frontline staff are able to calibrate most equipment themselves with the instructions provided by the original equipment manufacturer (OEM). Most electronic devices are capable of self-calibration. All tools and measuring devices are inspected at least annually to verify their functionality.	COM
2.10	Element 14: Facilities and Equipment Safety Inspections	If track walkers are unable to inspect sections of track for any reason, how does MOW management ensure those sections are inspected according to the MOW Track Maintenance Standards?	If track walkers cannot inspect sections of track, typically MOW hires an overtime team or another inspector to complete the work. This is part of a fluid work process that happens on a daily basis. It is rare for segments of track to go uninspected for any period exceeding the maintenance standards.	COM
2.11	Element 14: Facilities and Equipment Safety Inspections	Does Maintenance of Way trend high risk areas that frequently require track repair? If so, how often does Maintenance of Way perform inspections of these high risk areas?	MOW is aware of all the critical operational points, which are points that affect service in the event of major failures. High-risk areas in yards, which are those that require frequent moves, are just as important as turnback moves. MOW works continuously to identify new priority switches and	COM

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			<p>other crucial areas, although managers reported that this information is retained as institutional knowledge rather than through formal documentation. Managers are currently working to formally document all high-risk switches and track locations.</p> <p>Observation:. MOW management should continue efforts to document institutional knowledge related to critical points of failure within the system, and complete a full assessment of switches and track segments in coordination with other MBTA business units to aid in scheduled maintenance and overhaul/replacement of components where necessary.</p>	
2.12	Element 6: Safety Risk Management	[FIELD] Verify via a records review that hazards identified by Maintenance Of Way personnel are documented and communicated to safety as needed.	Significant track defects and other hazards are largely documented and communicated to MBTA Safety in a timely manner. Documentation includes Everbridge notifications, emails, hazard logs, and meeting minutes.	COM

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#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.13	Element 14: Facilities and Equipment Safety Inspections	[FIELD] Observe a Maintenance of Way track inspection for documented procedural verification.	MBTA Safety's audit team observed a walking track inspection of a portion of the Green Line tunnel between Kenmore and Blandford Street. MOW's inspectors documented all concerns in their phone-based inspection program and had access to MOW's track standards for reference during the track walk.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.1	Element 8: Safety and Security Certification	Describe the role that Maintenance Of Way plays in the Safety and Security Certification process. Give an example.	MOW plays an active role in oversight for the Green Line Extension (GLX). MOW is involved with the different working groups and certification process, design criteria, and design review. This is primarily a Capital Delivery/New Vehicle Procurement responsibility, however MOW offers a support role.	COM
3.2	Element 8: Safety and Security Certification	Identify any thresholds used by the department to determine whether to initiate the Safety and Security Certification process.	The initiation of Safety and Security Certification processes is currently spearheaded by Capital Delivery/New Vehicle delivery when required. Recently with Type 8, a change in standards might signal future MOW involvement.	COM
3.3	Element 9: Data Collection and Analysis	Explain how safety-related information is obtained, documented, analyzed, and shared with senior management. Provide an example.	Safety-related information is obtained and documented through daily and monthly reports where MOW provides reoccurring information about speed restrictions and derailment information as events occur. There are fluid conversations between senior management and the MOW department. For example, the most recent Orange Line derailment has spurred meetings three times a week for updated information on this subject.	COM

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3.4	Element 9: Data Collection and Analysis	Explain how safety data is collected by Maintenance Of Way employees and how data from information systems is shared with MBTA Safety and other departments. Provide examples of this process, including any trends observed from rules compliance audits that may indicate quality or training issues.	Inspections provide a good portion of MOW performance and quality data. Inspection reports are verified by a section foreman and then archived in Trapeze. Additional examples include the implementation of dashboards for safety data with overtime dashboards, PMI completion dashboards, and open work orders dashboards. OCE's QA/QC team has begun overseeing PMI compliance and reports back to MOW management.	COM
3.5	Element 10: Accident Investigation	Explain Maintenance Of Way's roles and responsibilities in the accident/incident investigation process, including notification and immediate response. Describe the department's process for coordination with safety during the investigation process, including for root cause identification, collection of training/maintenance/operational records, review of applicable rules and procedures.	Notifications can come in through operations, through OCC, through All Pages, or through a direct call from anyone in the T. As an example of MOW's response activities, in the case of a derailment, MOW will dispatch an engineer and a section foreman to investigate and provide immediate response. This is then followed by supervisor personnel and management. The level of response depends on the severity of the event and how it affects the public and service quality. The root cause is discussed during the derailment meeting, along with a copy of the DPU report. An internal report is circulated within the department, along with additional information requested by the DPU	COM

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			(inspections, switch certifications) to be provided. It is a collaboration between Signals, Power, MOW, and additional departments on a case by case basis.	
3.6	Element 10: Accident Investigation	Are there standardized incident response procedures for specific incident types? How are Maintenance Of Way employees trained on the initial information to collect and necessary steps to follow?	The derailment investigation policy has been described above. MOW employees receive training from DOT, FTA, OSHA, as well as internal training. Internal training is on-the-job shadowing with a senior engineer to model work for new employees. Institutional knowledge is passed along through this modeling. Training mostly takes place on a case by case basis with limited documentation. Employees occasionally have the opportunity to shadow a derailment response, based on the severity of the incident.	COM
3.7	Element 10: Accident Investigation	Describe how MOW employees are trained to complete the non-revenue vehicle derailment checklist. Are copies of the checklist easily accessible in non-revenue vehicles and MOW supervisor offices?	The Non-Revenue Vehicle Derailment Checklist is a fairly new process but not all employees fill this out (only supervisors, engineers, and general foremen). This is not in each Non-Revenue Vehicle, but key employees have copies of the checklist available on their phone for reference at any time.	COM

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3.8	Element 10: Accident Investigation	Describe the department's coordination with safety to develop immediate mitigations and CAPs following safety events.	MOW has not been directly subject to a formal CAP within several years according to department management. Immediate mitigations are documented in investigation reports and carried out by MOW in coordination with Safety team representatives.	COM
3.9	Element 12: Internal Safety Audit	How does Maintenance Of Way review, implement, and track MBTA Safety Internal Audit recommendations and corrective actions?	All recommendations are tracked by Safety and regularly reviewed with MOW management. One of the recommendations that came out of the last MBTA Safety audit in 2018 centered on fatigue awareness and training. In response to this recommendation, the MOW overtime (OT) dashboard was created as a way to track overtime from different sources. There is currently an inherent 2-day lag with visibility in terms of the hours that employees work. Supervisors do not see this dashboard right now. However, it is easily accessible online.	COM
3.10	Element 12: Internal Safety Audit	Describe internal reviews, observations, and audits conducted by Maintenance Of Way that are not part of the Safety Rules Compliance Program (SRCP).	Most of the safety issues that do come up are communicated in real time or through biweekly management meetings or through emails and/or phone. Observations (on-site inspections) are done by several different positions and then issues are addressed. Outside	COM

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			observations are ongoing as a part of the daily job tasks. Separately, as described above, MOW is subject to OCE's QA/QC program.	
3.11	Element 13: Rules Compliance	Discuss department involvement in updates to safety rules and procedures, including schedules, management responsibilities, and coordination with Safety.	In one example, internal management meetings have been used to track the development and implementation of the OT dashboard. The MOW department works with the LEAN team for support with this, as a part of recommendations from the Safety Panel Review and internal audits. The department reports facing difficulty with shifting from a paper system to a digitized format, as well as ensuring buy-in and compliance with new program requirements. Employees respond and adapt to capital improvement changes, OSHA changes, Safety oversight, updated inspection techniques, FTA oversight with DPU, and the transition to digital recordkeeping.	COM
3.12	Element 13: Rules Compliance	Verify that the department documents how supervisors are evaluated to assess their effectiveness in overseeing implementation/compliance with operating and maintenance rules.	MOW ensures that supervisors are meeting their obligations by requiring that supervisors sign a weekly certification to verify that inspections have occurred. Supervisors are required to walk their line at least once a year and forepersons walk their line at least once a week.	CWR

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			<p>The MOW Department has hired consultants to help train supervisors to ensure that they are focusing on the most critical areas. MOW management and interviewees indicated that Supervisors have less of a presence in the field than desired, and may not be fulfilling applicable requirements for field verification and oversight.</p> <p>Compliant with Recommendation: The shift from analog to digital MOW business processes presents an opportunity to improve upon supervisor field verification of PMIs and targeted observations of staff. As the implementation of MaxTrax continues, MOW management should examine workflows and technological capacity to develop an enhanced process for verifying that supervisors adhere to schedules and requirements for field activity oversight. MOW management should confirm the effectiveness of this process through regular records reviews and status check-ins.</p>	

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.13	Element 13: Rules Compliance	How does Maintenance Of Way ensure that updated procedures, bulletins, and rules are addressed in initial, remedial, and refresher training courses provided for employees?	Updated rules, procedures, and bulletins are directed to MOW's trainer and incorporated into training course materials and discussion.	COM
3.14	Element 15: Maintenance Audits and Inspections	Describe the Maintenance Of Way/Engineering Quality Assurance program for maintenance and oversight.	The primary functions that take place overnight are track inspections made by system repairpersons and system foremen. Defects are verified by different levels of leadership, and corrective maintenance work is generated as defects are identified. In addition to being performed by MOW management, QA/QC is performed under OCE's QA/QC program.	COM
3.15	Element 15: Maintenance Audits and Inspections	How does Maintenance Of Way schedule QA/QC to ensure that various infrastructure components are reviewed according to defined schedules?	Before Trapeze, there was a set schedule for inspections (PMIs) and now, they are scheduled in Trapeze. Additional inspections are covered with overtime to keep up with the schedule. MOW coordinates with OCE to discuss sampling techniques and inspection activity schedules.	COM
3.16	Element 15: Maintenance	Describe the roles and responsibilities of a Maintenance Of Way QA/QC employee,	The section foreman is the primary individual responsible for the QA/QC process and works to validate and verify inspection reports and track that has been worked on.	COM

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	Audits and Inspections	including the number of employees dedicated to performing QA/QC.	Supervisors are also required to validate those inspections. There are current 13 section foremen.	
3.17	Element 15: Maintenance Audits and Inspections	Describe a recent Maintenance Of Way QA/QC audit finding and how the department complied with the audit finding's corrective action.	The formalized QA/QC audit process is still very new and the MOW department hasn't had many audit findings thus far. Service requests have been generated in response to individual defects identified during QA/QC activities.	COM
3.18	Element 15: Maintenance Audits and Inspections	Explain how data from sources such as track inspections is used to prioritize maintenance and/or create speed restrictions.	Track inspections help MOW create speed restrictions based on the severity of the defects that are found. Speed restrictions may be implemented the moment a defect is discovered by an inspector, and are removed only after management review and verification or through resolution of a defect.	COM
3.19	Element 17: Configuration Management	How is Maintenance Of Way involved in the MBTA's Configuration Management and Control process, such as for new procurements or modifications to Maintenance Of Way? Do employees have the ability to provide feedback on these projects?	MOW management are involved in major system changes through committees and management meetings. Major changes with impacts on system configuration are taken into account through updates to rules, procedures, and maintenance guidance.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.20	Element 17: Configuration Management	Discuss department coordination with the safety function in development, review, and documentation of proposed changes.	There are currently incoming OSHA and OHS proposed changes. MOW management coordinate with Safety via the E&M Safety Committee meeting and other ongoing meetings / trainings to ensure that all changes are reviewed and properly documented.	COM
3.21	Element 21: Procurement	Are procurements of new infrastructure components reviewed by Maintenance Of Way to verify the new equipment or materials will not present a hazard to the existing system?	MOW management are routinely involved in procurements for new maintenance equipment and track components to verify that no new hazards will be introduced.	COM
3.22	Element 10: Accident Investigation	[FIELD] Randomly select a Maintenance Of Way staff person who investigated a major incident and review the incident report created, including the process and questions used to record incidents.	Safety's audit team reviewed a sample of investigation reports involving MOW field response. Checklists and related questions capturing track and switch conditions were properly completed; no notable deficiencies were identified.	COM
3.23	Element 13: Rules Compliance	[FIELD] Records review: Confirm that supervisors document rule violations observed. Confirm any actions taken by department management in response to violations observed.	Safety violations observed by supervisors in the field are corrected immediately and escalated to management if warranted. Trends and patterns in safety violations are discussed in management meetings.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.24	Element 15: Maintenance Audits and Inspections	[FIELD] Observe a Maintenance Of Way QA/QC audit.	Safety's audit team reviewed samples of QA/QC documentation and field inspection reports. The team observed track inspection activities performed by an inspection crew and discussed the process for supervisory verification of the inspection results.	COM

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.1	Element 16: Training and Certifications	What types of training are offered to and required of Maintenance Of Way employees of all different job titles? Describe both certification/recertification components.	All job classifications within MOW have an initial training program. Additionally, there is expanded training depending on the job positions and job tasks (i.e. laborer, trackman, foreman, section foreman, system repairperson). All the training builds on itself to provide a cumulative training effort. There is no recertification program for trackmen, but system repairpersons and section foremen are recertified every 2 years to ensure that their skill set is up to standard.	COM

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#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.2	Element 16: Training and Certifications	Is there a responsible party within Maintenance Of Way who oversees all training? What are the requirements (e.g. years of experience, education, etc.) to become an Instructor? Please describe the qualification process.	The instructor for track has historically been promoted from a position such as Foreman or General Foreman, with at least 10 years of experience in MOW and demonstrated competency. The equipment instructor must have a CDL license class A and B, be able to drive a tractor trailer, sustain in-house training efforts, and is usually a senior operator that has exposure and experience with equipment.	COM
4.3	Element 16: Training and Certifications	How are changes to training programs communicated to MBTA Safety and any relevant departments prior to their implementation?	Any changes to training that have taken place mostly relate to training delivery, as the MOW department has moved towards the Learning Management System (LMS) and an increasingly digital format. Training usually occurs through video and PowerPoint presentation formats. These changes are discussed with Safety in the E&M Safety Committee meeting or other meetings as needed.	COM
4.4	Element 16: Training and Certifications	How are training employees notified of updated policies and procedures from Maintenance Of Way and other applicable departments? What training	Policy changes, including recent COVID-related changes, are pushed out through email memoranda to superintendents and supervisors, who inform their employees about any impacts.	COM

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		or communication is required when these updates necessitate changes to Maintenance Of Way procedures?		
4.5	Element 16: Training and Certifications	How are training records maintained and monitored? How does an employee, and their supervisor, know when they are due for training?	The Learning Hub LMS is the system of record for training requirements, where notifications will be shared with Supervisors and then down to the employees. There are a limited number of workstations where employees without computers can access trainings while on site.	COM
4.6	Element 18: Workplace Safety	Describe how Maintenance of Way determines appropriate Personal Protective Equipment (PPE) requirements for each job task an employee may be performing. How does Maintenance of Way ensure adherence to proper PPE usage?	Most of the basic PPE covers the majority of MOW tasks. There is specialized PPE for welding to account for lighting impact and respiratory issues with welding. MBTA OSHA updates are still in development. Adherence is maintained by the chain of command.	COM
4.7	Element 18: Workplace Safety	Describe Maintenance of Way's hot work (welding, cutting, brazing, etc.) practices and the safety considerations made when performing hot work. Describe any	The Hot Work Policy is in development right now. Fire-resistant clothing, fire watch coverage (someone standing by with water) will be required under the policy. Work outside is typically less of an issue with hot work on the	COM

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		differences in practice when hot work is performed in different environmental conditions (e.g. tunnels, streets, bridges, residential, etc.).	ROW (concern comes with potential leaves and vegetation, though in those cases there is someone on standby to put out small fires). For hot work in tunnels, emergency fans might be requested, though that is not a standardized process. On bridges, there are concerns with older ties catching fire, which are managed by the crew on site.	
4.8	Element 19: Hazardous Materials Program	What procedures are in place for employees when an incident occurs involving hazardous materials?	A Job Hazard Assessment (JHA) identifies potential hazards present during specific jobs. MOW works with fewer hazardous chemicals than other E&M departments, but employees are trained on hazard communication and response.	COM
4.9	Element 20: Human Factors	Explain how Maintenance Of Way implements the MBTA's Fitness for Duty and Drug & Alcohol policies for employees and managers.	Fitness of duty monitoring takes place as employees begin their shifts. The general foremen have been trained on this process online through the Learning Management System (LMS). Checks are performed at the beginning of each shift and throughout the day.	COM
4.10	Element 20: Human Factors	Discuss applicable justifications for testing (reasonable suspicion, post-accident, random, etc.) and verify that	For randomized drug tests, employees are notified at the beginning of their shifts. Tests are also administered based on the severity of any potential incidents on the job.	COM

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		tests are administered in accordance with applicable standards.		
4.11	Element 20: Human Factors	Describe Maintenance Of Way's process when notified that an employee has been selected for a random drug & alcohol test.	See above.	COM
4.12	Element 20: Human Factors	Describe what processes managers use to monitor employee fatigue and hours of service.	To monitor employee fatigue, the MOW department uses the OT dashboard. When there are significant storms in the winter that extends over several shifts, there is a process (not documented) to allow employees to rest before continuing work.	COM
4.13	Element 16: Training and Certifications	[FIELD] Review training program for various job titles to verify: a) How training records are maintained. b) That training consists of both classroom and hands-on training. c) Consistency with written training programs and/or syllabi.	MBTA Safety's audit team reviewed a training matrix for MOW personnel as well as a sample of individual training records. Training consists of both classroom and hands-on, on-the-job training.	COM

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Reference Criteria: 2021 MBTA Safety Plan	

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.14	Element 16: Training and Certifications	[FIELD] Review the training and certification records for a sample of employees for the past three (3) years to determine if: <ul style="list-style-type: none"> a) The employee has completed the initial training program and refresher and remedial training as necessary. b) The course content was appropriate and adequate to meet training and recertification requirements. 	A sample of employee training records indicates that employees have complete required initial and refresher training as required under the MOW training program.	COM
4.15	Element 16: Training and Certifications	[FIELD] Through a records review: <ul style="list-style-type: none"> a) Verify that a process for maintaining and accessing employee training records is in place. b) Verify that categories of safety-related work requiring training and certification have been identified. c) Verify that the MBTA has processes in place to assess compliance with its 	A process is in place for MOW managers and supervisors to review training records using the MassDOT LMS. Oversight processes are in place to review compliance with training requirements.	COM

**2021 MBTA Safety Internal Audit Checklist
Maintenance Of Way**



Department: Maintenance Of Way

Department Representative(s): Joe Gushue, Ray Martin

Review Date(s): 4/26/21-4/27/21, 5/25/21

Reviewer(s): Michael Catsos, Meghan McDonnell, Amanda Fletemeyer, Andrea Giugni

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
		training and certification requirements.		

APPENDIX H



MBTA SAFETY

2021 Internal Safety Interview Report

Date: January 7, 2022

TO: Mahour Rahimi <i>Acting Chief of Paratransit Services</i>	CC: R. Ester M. McDonnell A. Minevitz C. Dominick N. Stern M. Hulak G. Venizia C. Jurek K. Ahola
FROM: Michael Catsos <i>Deputy Director of Safety Assurance and Promotion</i>	

Area Audited: MBTA Paratransit Services and Contracted Vendors

Audit Approach:

Assessment of the department's adequacy in meeting safety program requirements as outlined in the MBTA Transit Safety Plan derived from the referenced documents listed below.

Reference Documents:

- 2021 MBTA Transit Safety Plan
- Federal Transit Administration (FTA) Regulation 49 CFR 673
- Additional documents as requested (see document request list)

Audit Date: September 30th, 2021 – October 13th, 2021

Summary:

MBTA Paratransit (The RIDE), provides door-to-door, shared-ride transportation to eligible people who cannot use the subway, bus, or trolley all or some of the time due to temporary or permanent disability. This audit includes internal MBTA Paratransit staff and service contractors National Express Transit (NEXT), and Veterans Transportation Services (VTS). The internal MBTA Paratransit team are responsible for creating and communicating paratransit policies and procedures to contractors, communicating MBTA updates to contractors, meeting with contractors on a periodic basis and monitoring issues as they arise. Both NEXT and VTS provide transportation services to MBTA and The RIDE customers. NEXT and VTS hire and train their own operators and conduct vehicle maintenance and safety investigations on MBTA owned vehicles operated by NEXT and VTS employees.



NEXT provides on-demand, curb-to-curb or door-to-door paratransit service in cities and communities across the United States. NEXT currently has 28 managerial and supervisory staff (including 20 safety employees), 14 window dispatchers, various support staff, and approximately 250 drivers to fulfill the MBTA contract. The 20 safety staff respond to incidents, conduct facility walkthroughs, and collect and analysis safety data. NEXT Corporate has a strong influence on local policies and procedures and work closely with Boston staff to fulfill contract obligations.

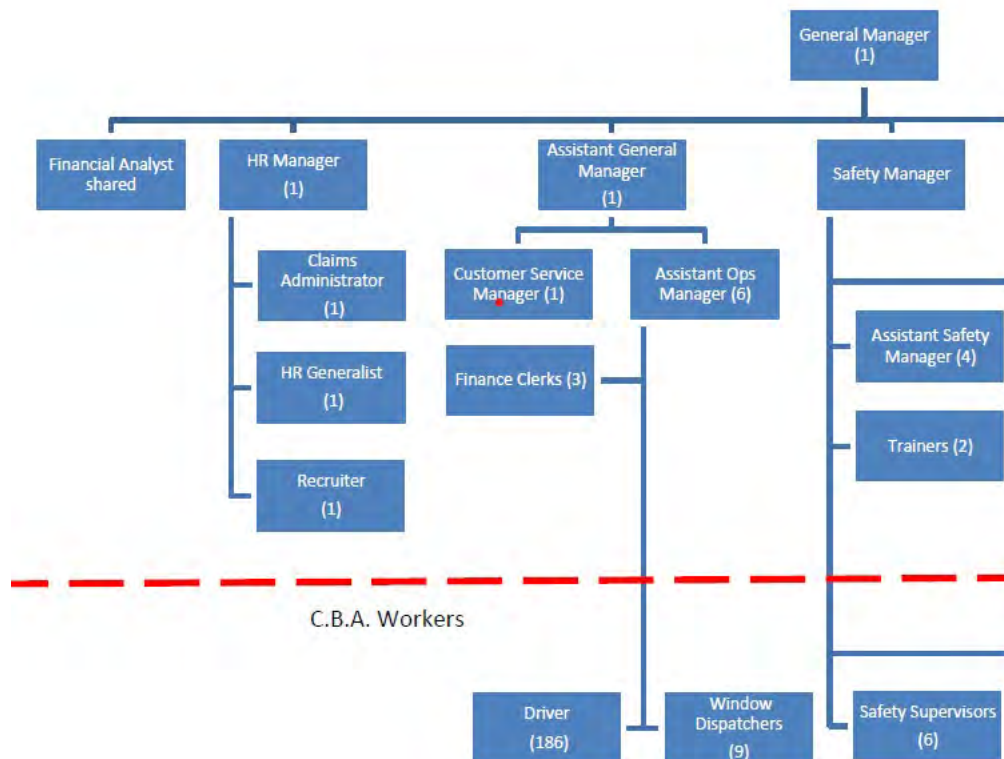


Figure 1: NEXT Organizational Chart for MBTA Operations

VTS provides door-to-door public transportation to people who cannot use public transit (subways, buses, and trains), all or some of the time, because of a physical, cognitive, or mental disability. VTS has been a provider of THE RIDE service for over 30 years. Its fleet of 380 vehicles and drivers provides well over 750,000 rides each year. Managerial and support staff oversee three sites across the Boston Metro area, coordinate with The Ride Access Center, and fulfill safety responsibilities. Safety staff are split across all three sites and can respond anywhere in the system.



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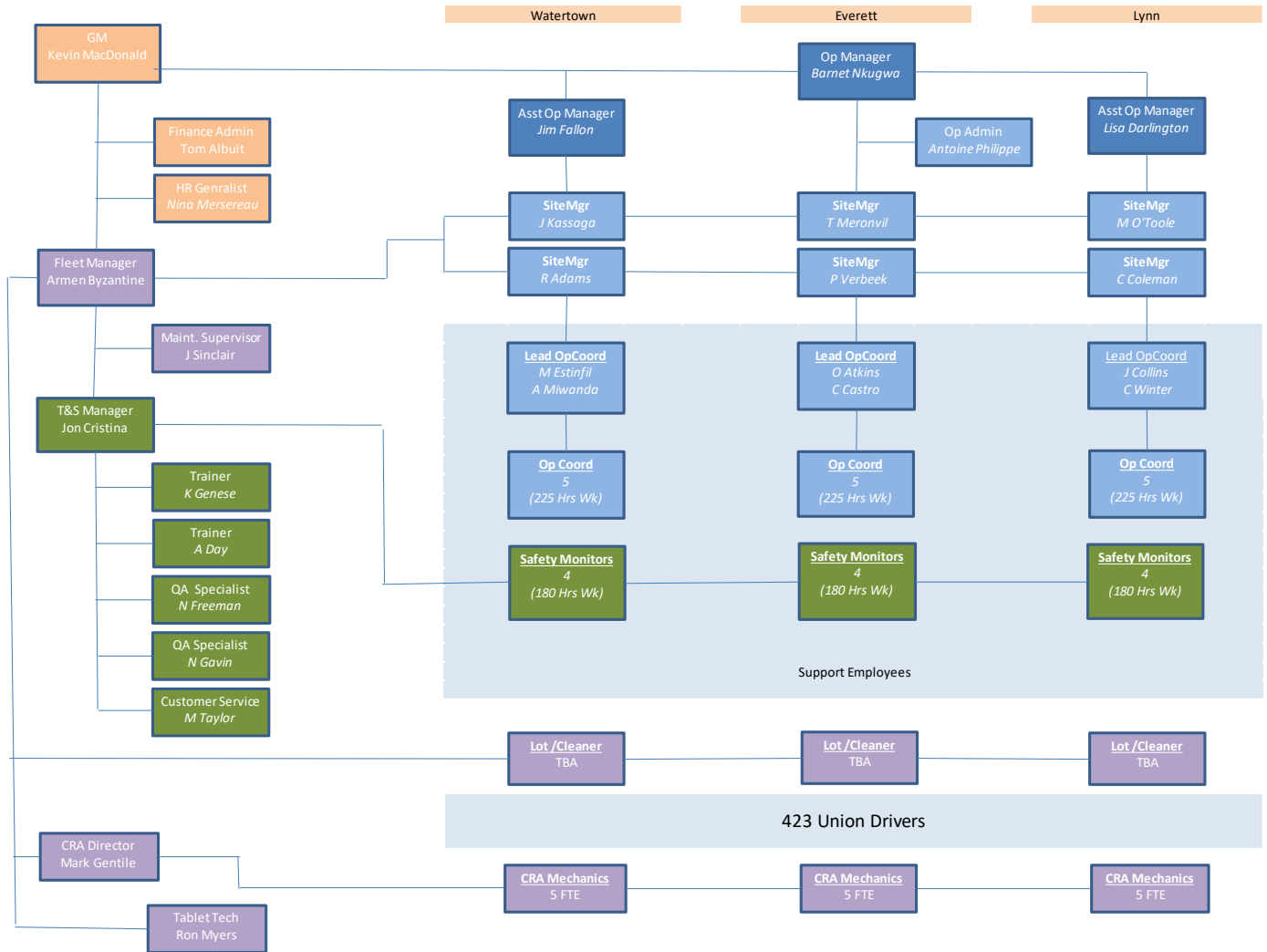
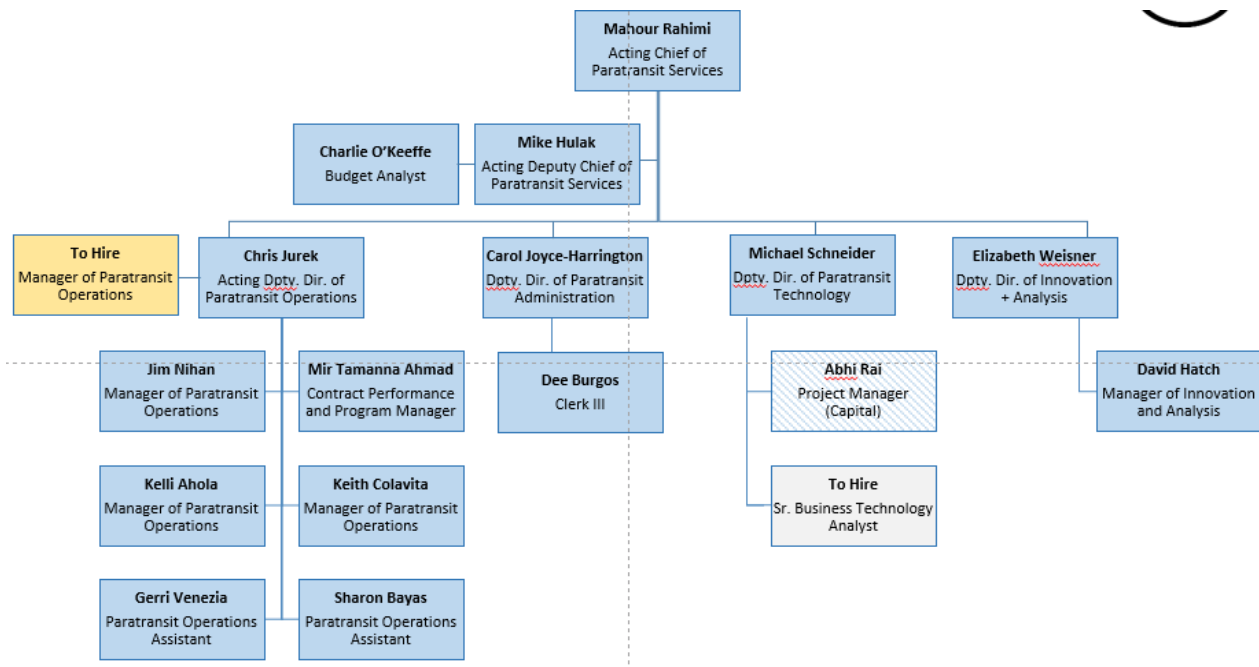


Figure 2: VTS Organizational Chart for MBTA Operations



Notably for this audit, MBTA Paratransit operations became subject to Safety Management System (SMS)-based program requirements upon the adoption of the initial MBTA Transit Safety Plan in 2020; prior to 2020, Paratransit safety program requirements were documented in the now-retired Bus Safety Plan. MBTA Safety oversight efforts over the past year have focused on aligning each vendor's Contractor Safety Plan with the Transit Safety Plan and ensuring that day-to-day hazard management, accident investigation, safety assurance, communications, training activities, and goal-setting are in alignment with the stipulations of the Transit Safety Plan.

Findings – Noncompliance (NC): None

Findings - Compliance with Recommendation (CWR):

1. There is no consistent process for MBTA Paratransit Contract Management to obtain updated versions of the MBTS Safety Plan.
 - a. The MBTA Safety audit team recommends that the MBTA Paratransit team work with MBTA Safety to create and document a formalized process for receiving the yearly update of the Safety Plan.
2. The competitive nature of awarded contracts limits information sharing between the MBTA, NEXT and VTS, causing some inconsistencies in areas such as training, policies, and safety procedures.
 - a. The MBTA Safety audit team recommends all parties (MBTA Safety, Paratransit, and Contractors) work together to best of their abilities to develop standardized training, policy, and safety procedures when possible. This could



- also take the form of a yearly or quarterly review to ensure all contractors have the most up-to-date information and their organization is compliant with MBTA Safety standards.
3. Vendors do not have a formalized timeline to complete changes to their own documentation upon updates to the MBTA Transit Safety Plan.
 - a. While both major vendors have documented a requirement to revise their plans and procedures based on updates to the MBTA Transit Safety Plan, the audit team recommends that vendors establish and formalize a 30-day timeline for review of each revised MBTA Transit Safety Plan and corresponding updates to reflect changes.
 4. NEXT and VTS do not consistently manage hazards in accordance with the safety risk management processes outlined in the MBTA Transit Safety Plan.
 - a. All hazards identified, including low-risk hazards and/or hazards that can be mitigated without the support of other departments, should be documented and assessed for associated safety risk. Both contractors have a sufficient process in place for reporting hazards that are associated with the operation of vehicles. However, hazard identification and reporting should be expanded beyond hazards associated with vehicles. Vendors should demonstrate that hazards are being managed in accordance with program requirements and employee training by providing documentation of both vehicle-based and other hazards that have been reported, formally documented, and managed or eliminated.
 5. NEXT does not have a formalized process for documenting and tracking Corrective Action Plans (CAPs) issued by MBTA management or Safety.
 - a. While NEXT does maintain a process for lower level disciplinary actions and corrective retraining, Safety recommends that NEXT work with the appropriate internal parties, as well as MBTA liaisons and MBTA Safety, to establish a formalized process for documenting, tracking, and closing the more-complex corrective action plans (CAPs) which may emerge from audits, investigations, and inspections.
 6. NEXT and VTS do not have a defined threshold on when to report hazards identified to MBTA Management or MBTA Safety.
 - a. The MBTA Safety audit team recommends defining a threshold or category of hazards to report. In addition, the MBTA Safety audit team recommends adding a bullet in the safety section of the quarterly reports for hazards identified under the new threshold.

Observations

1. NEXT did not provide a documented example of the training management system currently being utilized. MBTA Audit team recommends that NEXT provide some



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documentation from the Taleo learning system brought up during interviews.



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	1 Introduction	<u>Interview:</u> MBTA Paratransit staff are familiar with the MBTA Safety Plan, safety policies, and procedures. They are not in safety sensitive roles, but they are familiar with safety related information that comes from emails, meetings, and announcements.	<u>Compliant With Recommendation:</u> There is no consistent process for MBTA Paratransit Contract Management to obtain updated versions of the MBTS Safety Plan. The MBTA Safety audit team recommends that the MBTA Paratransit team work with MBTA Safety to create and document a formalized process for receiving the yearly update of the Safety Plan.	
Safety Management Policy	2 Purpose, Scope, Performance Objectives	<u>Interview:</u> NEXT and VTS corporate set high level safety goals and objectives. In the past, there have been monthly safety leadership meetings with T management and contractor leadership. These meetings have been on hold due to COVID-19 but should be starting again soon. There is a fine line at what can be shared at these meetings because of competitive market between contractors.	<u>Compliant With Recommendation:</u> The competitive nature of awarded contracts limits information sharing between the MBTA, NEXT and VTS, causing some inconsistencies in areas such as training, policies, and safety procedures. The MBTA Safety audit team recommends all parties (MBTA Safety, Paratransit, and Contractors) work together to best of their abilities to developed standardized training, policy,	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
			and safety procedures when possible. This could also take the form of a yearly or quarterly review to ensure all contractors have the most up-to-date information and their organization is compliant with MBTA Safety standards.	
Safety Management Policy	3 Overview of Management Structure	<u>Interview:</u> Both NEXT and VTS have management teams that include Safety Managers and safety staff that work across their associated facilities. Each contractor holds monthly safety meetings, with management, to review safety team findings and related issues. NEXT and VTS each work with MBTA Safety in the event of a major incident such as a fatality or serious injury, during a procurement, and when reviewing relevant safety plans.		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	4 Safety Plan Control and Update Procedure	<u>Interview:</u> NEXT and VTS are required to complete updates to their plans and procedures in response to MBTA Transit Safety Plan updates. MBTA updates are shared with contractors on a proactive basis, and contractor management post and communicate relevant information internally to operates. Local contractor management works with corporate staff to update safety plans to align with MBTA Transit Safety Plan. At this time MBTA paratransit staff and contractor staff are not aware of any gaps between safety activities and what is documented in the plan.	<u>Compliant With Recommendation:</u> Vendors do not have a formalized timeline to complete changes to their own documentation upon updates to the MBTA Transit Safety Plan. While both major vendors have documented a requirement to revise their plans and procedures based on updates to the MBTA Transit Safety Plan, the audit team recommends that vendors establish and formalize a 30-day timeline for review of each revised MBTA Transit Safety Plan and corresponding updates to reflect changes.	
Safety Management Policy	5 Safety Plan Implementation, Tasks, Activities and Responsibilities	<u>Interview:</u> There are some general challenges with HR, hiring for new positions, and on boarding new hires.		
		<u>Field:</u> A mix of employees		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		were interviewed, and they understood the safety rules and procedures for their area of work.		
Safety Management Policy	11 Emergency Management	<u>Interview:</u> All contractors are required to provide the MBTA with a business continuity plan. The plans will include review and update intervals. Contract administrators work with paratransit contractors to develop emergency and storm plans and procedures that meet MBTA standards. During severe weather events, MBTA paratransit will work with Storm Desk to distribute information to contractors who will then make operational decisions based on their emergency/storm plans.		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		<u>Field:</u> Safety documentation was readily available and located in the proper and easy to see location. There were also binders on additional safety topics that employees were free to review.		
Safety Risk Management	6 Safety Risk Management	<u>Interview:</u> Both VTS and NEXT perform proactive inspections on vehicles when they enter or leave the lot and after certain mileage milestones. NEXT also performs monthly safety facility inspections. If a hazard does occur, VTS drivers can contact dispatch using tablets and backup cellphones. The safety team has access to the tablets to see maps, event details and recordings to best address hazards. NEXT will take vehicles out of service if a hazard arises. Once hazard information is collected, both contractors have local management teams review the	<u>Compliant With Recommendation:</u> NEXT and VTS do not consistently manage hazards in accordance with the safety risk management processes outlined in the MBTA Transit Safety Plan. All hazards identified, including low-risk hazards and/or hazards that can be mitigated without the support of other departments, should be documented and assessed for associated safety risk. Both contractors have a sufficient process in place for reporting hazards that are associated with the	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		information. At VTS, these reviews can result in process modification to deal with hazards proactively.	<p>operation of vehicles. However, hazard identification and reporting should be expanded beyond hazards associated with vehicles. Vendors should demonstrate that hazards are being managed in accordance with program requirements and employee training by providing documentation of both vehicle-based and other hazards that have been reported, formally documented, and managed or eliminated.</p> <p><u>Compliant With Recommendation:</u> NEXT does not have a formalized process for documenting and tracking Corrective Action Plans (CAPs) issued by MBTA management or Safety. While NEXT does maintain a process for lower level disciplinary actions and corrective</p>	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
			<p>retraining, Safety recommends that NEXT work with the appropriate internal parties, as well as MBTA liaisons and MBTA Safety, to establish a formalized process for documenting, tracking, and closing the more-complex corrective action plans (CAPs) which may emerge from audits, investigations, and inspections.</p> <p><u>Compliant With Recommendation:</u> NEXT and VTS do not have a defined threshold on when to report hazards identified to MBTA Management or MBTA Safety. The MBTA Safety audit team recommends defining a threshold or category of hazards to report. In addition, the MBTA Safety audit team recommends adding a bullet in the safety section of the quarterly</p>	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
			reports for hazards identified under the new threshold.	
Safety Risk Management	7 Management of Change	<p><u>Interview:</u> At both VTS and NEXT, management is actively involved in the addition of new vehicles into their fleets. All new vehicles are inspected for mechanical operation, proper installation of operator tablets, and components. Vehicles are then added to a database with serialized tracking of any components which are added or removed from the vehicle. Through the MBTA, a consumer advocacy group is involved in discussions about vehicle configurations to assure the safety and comfort of RIDE customers.</p> <p>At VTS employees are notified of changes in policies and procedures via digital messaging screens while arriving at their work locations. Employees sign a paper</p>		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		acknowledgement, and this is placed in an employee's file. At NEXT employees are notified of changes via meetings and weekly safety talks at which attendance is documented.		
Safety Assurance	8 Safety and Security Certification	<u>Interview:</u> This is handled mainly by the MBTA and not the Paratransit contractors. In some cases, Paratransit contractor managers have been contacted to give feedback on upcoming construction projects.		
Safety Assurance	9 Data Collection and Analysis	<u>Interview:</u> At VTS, "Routemap" software provides automatic notifications for potential violations. Data is extracted, summarized, and put into reports that are shared with VTS and Paratransit management. At NEXT, "Sedgewick" software is used to track safety related data from accidents and workplace injuries. It is then uploaded to Domo, a dashboarding / visualization software for use		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		<p>by management.</p> <p>A claims administrator circulates a monthly report of accidents and injuries. Drivecam / Zonar are both systems that support pre- and post- accident compliance checks, defect tracking, operator performance, and live driver monitoring. These tools are available locally and to the national-level safety teams.</p>		
Safety Assurance	10 Accident Investigations	<p><u>Interview:</u> At Both VTS and NEXT there is a comprehensive procedure for handling the immediate and long-term aftermath of a RIDE vehicle accident. Typically, MBTA Safety is not involved in RIDE vehicle accidents, though this varies depending on the degree of the event.</p> <p>At VTS, a contractor Safety Supervisor will be dispatched to the scene of an accident to investigate, including</p>		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		<p>interviewing the driver and any witnesses. All the data, including video, is collected via Smart Sheet database.</p> <p>At NEXT, Safety Supervisors are dispatched to log the accident into the Sedgewick system while also conducting interviews and an investigation. Any driver deemed “at fault” is removed from service for retraining. For any accident video data is collected and the vehicle is taken out of service for inspection. There is also an escalation process for more serious events like fuel spills or fatalities.</p> <p>At both VTS and NEXT drivers and Safety Supervisors receive training on what to do in the direct aftermath of a vehicle accident.</p> <p>Both VTS and NEXT have a post-accident process in place which may include Post</p>		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		Accident Drug and Alcohol Testing, retraining, and possible disciplinary action.		
Safety Assurance	12 Internal Safety Reviews	<p>VTS conducts quarterly management reviews which include safety compliance. Safety employees use Smart Sheets software to complete a safety checklist. If any items are marked as deficient, management receive an automatic notification.</p> <p>At NEXT, Domo software is used for corporate to monitor performance. They have ongoing “audits” of overspeed events, drive-cam scores, driver risk ratings, seatbelt compliance and other rules compliance. New functions are routinely being added. The system also can document coaching or retraining after driver violations.</p>		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Assurance	13 Rules Compliance	<p><u>Interview:</u></p> <p>At VTS Drivecam is utilized to monitor and collect data on operations rules compliance. The data is then compiled and reported out to different management groups, including internal MBTA management.</p> <p>At NEXT, both Drivecam and Domo are utilized to monitor and collect data on operations rules compliance. The data is then compiled and reported out to different management groups, including internal MBTA management.</p>		
Safety Assurance	15 Maintenance Audits and Inspections	<p><u>Interview:</u></p> <p>At VTS every 5,000 miles preventative maintenance (PM) is conducted on the vehicles. The Dossier software tracks mileage-based PM's, an out of service (OOS) data base tracks all defects reported and repairs on the vehicles. Three members of management are tasked with Quality Assurance (QA) for the</p>		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		vehicles. At NEXT every 3000 miles PMs are conducted. Dossier software is also used to track the status of vehicles defects and PM's. There is no dedicated QA team member but the area maintenance manager monitors data from Dossier for trends.		
Safety Assurance	17 Configuration Management	<u>Interview:</u> Configuration management is mostly left up the MBTA procurement process. Contractors only engage in minor changes such as updates to vehicle technology. These updates are approved by the MBTA.		
Safety Assurance	21 Procurement	<u>Interview:</u> The procurement process is mostly managed through the internal MBTA departments. There is an opportunity for feedback from the vendors.		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Promotion	16 Training and Certification Program	<p><u>Interview:</u></p> <p>At VTS training starts with the requirements outlined in the vendor request for proposals (RFP). New hire training program consists of traditional classroom/online learning and mentorship with a senior driver. A follow-up evaluation is conducted after 40 days in service. Recertifications for various topics occur every 2-3 years. Most trainers have 10+ years' experience and a varied background in the industry.</p> <p>At NEXT many trainings are developed at the corporate level. There are corporate managers who help oversee the training program at the local level. New hired are trained on a variety of topics in a tradition classroom/online setting as well as receiving On the Job (OTJ) training. Trainers are reevaluated every 2 years.</p>		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Promotion	18 Workplace Safety	<p><u>Interview:</u></p> <p>At VTS, constant training and familiarization are relied upon to ensure employees are knowledgeable of workplace safety rules and procedures.</p> <p>At NEXT, the Taleo learning system is utilized to ensure employees are familiar with safety rules and procedures. Managers also meet with various MBTA departments to receive training and familiarization on different topics to disseminate that information where appropriate.</p>		
Safety Promotion	19 Hazardous Materials Programs	<p><u>Interview:</u></p> <p>At VTS, employees that work in areas with hazardous materials are trained and have access to Safety Data Sheets (SDS), spill kits and eyewash stations.</p> <p>At NEXT, employees that work in areas with hazardous materials are trained and have</p>		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		access to Safety Data Sheets (SDS), spill kits and eyewash stations.		
Safety Promotion	20 Human Factors	<p><u>Interview:</u></p> <p>At VTS, the drug and alcohol program is run in accordance with all rules and regulations put forth by both the RFP and State/Federal laws. Operators may not exceed 60 hours per week including schedules overtime. This is tracked through run cards.</p> <p>At NEXT, the drug and alcohol program is run in accordance with all rules and regulations put forth by both the RFP and State/Federal laws. Operators may not exceed 60 hours per week including schedules overtime. This is tracked through a third-party scheduler.</p>		
Accepted By:			Date: 1/7/22	
Completed By: Michael Catsos				

APPENDIX I

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various) Review Date(s): 9/20/21-9/22/21, 10/21 (various facility inspections)	Reviewer(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern Observer(s): Field Auditor(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern
Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans	

#	SSPP Element	General Requirements / Safety Management Policy	Department Response / Review Team Observations	Key
1.1	Element 1: Introduction	Are you familiar with the MBTA Safety Plan? How is it made available to all employees?	<p>All managers are familiar with the MBTA Transit Safety Plan. People are familiarized with the plan through trainings. In the past there have been some challenges getting a hold of copies from MBTA Safety – need a more formalized process for this.</p> <p>Compliant With Recommendation (CWR): There is no consistent process for MBTA Paratransit Contract Management to obtain updated versions of the MBTS Safety Plan. The MBTA Safety audit team recommends that the MBTA Paratransit team work with MBTA Safety to create and document a formalized process for receiving the yearly update of the Safety Plan.</p>	CWR
1.2	Element 1: Introduction	How are safety standards and policies communicated to employees?	For MBTA employees in the department, safety standards are communicated via email, internal meetings, posters, and bulletin boards.	COM
1.3	Element 1: Introduction	How are safety-related responsibilities incorporated into job descriptions and employee evaluations?	For contracted employees, job descriptions contain safety responsibilities. MBTA paratransit managers are not safety-sensitive employees but do understand the role involves safety activities.	COM
1.4	Element 2: Purpose, Scope, and Performance Objectives	Are safety goals regularly discussed at manager meetings? How does your department set and monitor	Contractor corporate management have high level goals and objectives. Some safety aspects tied into strategic planning. MBTA management noted challenges posed by what information can be shared from one contractor to another. Formerly held monthly safety	CWR

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various) Review Date(s): 9/20/21-9/22/21, 10/21 (various facility inspections)	Reviewer(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern Observer(s): Field Auditor(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern
Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans	

#	SSPP Element	General Requirements / Safety Management Policy	Department Response / Review Team Observations		Key
		a safety goal? Please provide an example.	<p>leadership meetings with T management and contractor leadership, MBTA paratransit management – this meeting will be resuming shortly. Documented with agendas and meeting minutes.</p> <p>Compliant With Recommendation (CWR): The competitive nature of awarded contracts limits information sharing between the MBTA, NEXT and VTS, causing some inconsistencies in areas such as training, policies, and safety procedures. The MBTA Safety audit team recommends all parties (MBTA Safety, Paratransit, and Contractors) should work together to best of their abilities to developed standardized training, policy, and safety procedures when possible. This could also take the form of a yearly or quarterly review to ensure all contractors have the most up-to-date information and their organization is compliant with MBTA Safety standards.</p>		
1.5	Element 3: Overview of Management Structure	Describe how the department is organized.	VTS In charge of fleet (380 units), three sites, staffing and coverage for all facilities, coordination with TRAC. 3 sites are quasi-autonomous. Safety team split up across different sites but can respond to needs anywhere in the system. Safety	NEXT GM, AGM, HR Manager, Safety Manager, Maintenance Manager, Customer Service Manager all filled. 9 Assistant Safety Managers, 10 Safety Road Supervisors. 4 Assistant Operations Managers.	COM

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various) Review Date(s): 9/20/21-9/22/21, 10/21 (various facility inspections)	Reviewer(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern Observer(s): Field Auditor(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern
Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans	

#	SSPP Element	General Requirements / Safety Management Policy	Department Response / Review Team Observations		Key
			team part of high-level support team represented on organization chart.	Various support staff. 14 window dispatchers. Approx. 249 drivers.	
1.6	Element 3: Overview of Management Structure	Describe participation in any committees devoted to safety issues, their roles and responsibilities, and a schedule for when meetings are conducted.	Monthly safety meeting at the management level being scheduled now. Each contractor holds safety meetings independently.		COM
1.7	Element 3: Overview of Management Structure	Describe interface with the Safety Department outside of safety committee meetings.	During major procurements and contract development, Safety is involved. Contractor safety plan review performed in 2020/2021 and will continue.		COM
1.8	Element 4: MBTA Safety Plan Control and Update	Describe involvement in periodic reviews and updates to the Safety Plan.	Contractors are required to complete updates to contractor safety plans in response to updates to the safety plan. This typically involves corporate safety teams in coordination with local managers. Compliant With Recommendation (CWR): Vendors do not have a formalized timeline to complete changes to their own documentation upon updates to the MBTA Transit Safety Plan. While both major vendors have documented a requirement to revise		CWR

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#	SSPP Element	General Requirements / Safety Management Policy	Department Response / Review Team Observations	Key
			their plans and procedures based on updates to the MBTA Transit Safety Plan, the audit team recommends that vendors establish and formalize a 30-day timeline for review of each revised MBTA Transit Safety Plan and corresponding updates to reflect changes.	
1.9	Element 4: MBTA Safety Plan Control and Update	Discuss management's process for distributing the latest approved Safety Plan and other new/updated safety procedures to impacted employees.	Updates are shared with contractors on a proactive basis. New procedures are posted and communicated internally with operators.	COM
1.10	Element 4: MBTA Safety Plan Control and Update	Are there any known gaps between department activities and the activities described in the Safety Plan?	Interviewees not aware of any major gaps between safety activities and what is documented in the plan.	COM
1.11	Element 5: Implementation, Tasks, Activities, and Responsibilities	Describe any challenges in carrying out the safety-related tasks as specified in the MBTA Safety Plan.	General challenges with bandwidth, working with position control, and human resources. Hiring and onboarding are also challenges.	COM

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#	SSPP Element	General Requirements / Safety Management Policy	Department Response / Review Team Observations	Key
1.12	Element 11: Emergency Management	Describe roles and responsibilities in the development of emergency management procedures.	Contract administrators and management work with contractors to develop plans and procedures. They work with the MBTA Storm Desk to distribute information to contractor and will make operational decisions based on specific events. All these thresholds are clearly defined in storm plans.	COM
1.13	Element 11: Emergency Management	Describe roles and responsibilities in the development of a continuity of operations plan.	All contractors are required to provide business continuity plans – defined quarterly update and review interval. All aspects of the operation are interconnected, which helps to keep the process moving – constantly evolving expectations and responsibilities.	COM
1.14	Element 5: Implementation, Tasks, Activities, and Responsibilities	[FIELD] Interview at least one employee and one supervisor to determine what they understand regarding their safety roles and responsibilities.	A mix of employees (Mechanics, Forepersons and Operations Supervisors) were interviewed on the topic of the safety related aspects of their job. All employees interviewed communicated an understanding of the safety rules and procedures for their area and the fact that there is a safety component to their job tasks.	COM
1.15	Element 11: Emergency Management	[FIELD] Verify that employees possess easily accessible versions of emergency SOPs, plans, call lists, etc.	Of the areas inspected safety documentation was readily available for employees. In the maintenance shops the documentation was located with the foreperson and in the operations lobbies audit team members observed there were many posted safety communications, as well as binders available to employees to review on various safety topics.	COM

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#	SSPP Element	Safety Risk Management	Veterans	NEXT	Notes	Key
2.1	Element 6: Safety Risk Management	How are reported or identified hazards addressed? What is the process for communicating these hazards to Paratransit management, MBTA Safety, and/or other relevant departments? Provide an example.	<p>TRAC notifies, VTS responds. Most issues are operational – there are few OSHA-type hazards like slip trip and fall.</p> <p>There is a tablet in each vehicle which allows operator to connect directly with dispatch. Backup cells are available with numbers only for dispatch and VTS.</p> <p>Full safety team has interconnected tablets with communication to operations team, maps,</p>	Vehicles taken out of service when hazards arise.	<p>Compliant With Recommendation (CWR):</p> <p>NEXT and VTS do not consistently manage hazards in accordance with the safety risk management processes outlined in the MBTA Transit Safety Plan. All hazards identified, including low-risk hazards and/or hazards that can be mitigated without the support of other departments, should be documented and assessed for associated safety risk. Both contractors have a sufficient process in place for reporting hazards that are associated with the operation of vehicles. However, hazard</p>	CWR

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			event recording capabilities. Capture photos and video.		identification and reporting should be expanded beyond hazards associated with vehicles. Vendors should demonstrate that hazards are being managed in accordance with program requirements and employee training by providing documentation of both vehicle-based and other hazards that have been reported, formally documented, and managed or eliminated.	
2.2	Element 6: Safety Risk Management	How are Paratransit staff and contractors involved with the implementation of Corrective Action Plans (CAPs)? Provide an example.	OTA Drivecam system – activated based on operational characteristics. Retraining often performed and then communicated back. For non-immediate events, management run event report and	There is not a process in place for formally documenting corrective actions according to interviewees.	Compliant With Recommendation (CWR): NEXT does not have a formalized process for documenting and tracking Corrective Action Plans (CAPs) issued by MBTA management or Safety. While NEXT does maintain a process for lower level disciplinary actions and	COM CWR

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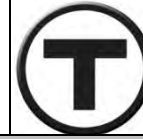
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			categorize by driver, take top 10% of violators, and bring them in for coaching. This report is generated every 30 to 60 days. Coaching program eventually transitions to disciplinary track if not successful. Decrease of 49% in coachable events over 5 months since implementation.		corrective retraining, Safety recommends that NEXT work with the appropriate internal parties, as well as MBTA liaisons and MBTA Safety, to establish a formalized process for documenting, tracking, and closing the more-complex corrective action plans (CAPs) which may emerge from audits, investigations, and inspections.	
2.3	Element 6: Safety Risk Management	Describe hazard reporting procedures and how they are communicated to employees to ensure safety hazards in the workplace are	Proactive hazard management – example is vehicle exhaust systems. Methods like circle checks are updated to deal with known mechanical issues / patterns. Safety staff meet drivers in the field	Facility safety inspections performed monthly.	N/A	COM

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		reported effectively.	either pre- or post- ride to assess conditions.			
2.4	Element 6: Safety Risk Management	Discuss sources of hazard information regularly reviewed by management and staff to identify hazards.	Management team reviews monthly reports during operations meetings. In this forum the management team decides to modify processes and procedures to deal with hazards proactively.	Vehicle-related hazards are discussed as a team.	N/A	COM
2.5	Element 7: Management of Change	Describe the involvement in vehicle and equipment changes and/or the review/testing of the equipment before implementation?	Vehicles provided by MBTA. VTS installs tablets. Vehicle added to database with serialized tracking of components added / removed from the vehicle. Out Of Service database tracks performance of actual components.	Vehicles inspected before being deployed on the road after delivery. Through MBTA, accessibility consumer advocacy group helps to inspect and evaluate features.	N/A	COM

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			Drivers, safety staff, technicians, and managers get directly involved in new vehicle procurements.			
2.6	Element 7: Management of Change	How is each employee notified of rule/procedure changes and how is this documented?	All locations have digital message screens for communicating changes to employees. There is a signoff process for individual signoff notes. Signoffs tracked in spreadsheet and placed in individual personnel file.	Communicated during meetings, weekly safety talks. Documentation captured in sign-in sheets. Major rule changes are posted and check-off used to confirm receipt. Drivers do not have company email addresses.	N/A	COM
2.7	Element 14: Facilities and Equipment Safety Inspections	Explain current facility inspection process/procedures. Are facility inspections routinely	OSHA contractors periodically perform onsite inspections. Facility inspections performed approximately quarterly. Individual site operations managers	Form covers all parts of the facility. Walkthrough inspection includes completion of a checklist style sheet – 4 pages. MBTA paratransit management periodically	N/A	COM

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		conducted by employees?	perform a daily walkaround. Final overnight inspection performed by overnight personnel.	inspect facilities. There has not been a recent OSHA inspection or similar activity. Checklist is required at every National Express location, not just locally.		
2.8	Element 14: Facilities and Equipment Safety Inspections	Describe how results from the inspections are stored and analyzed.	The results are mostly hard copy and then scanned and stored. Provided examples of hazards identified and corrected in the process of these inspections.	All scanned and uploaded to be shared with corporate.	N/A	COM
2.9	Element 6: Safety Risk Management	[FIELD] Verify via records review that hazards identified by personnel are documented and communicated to safety as needed.	Records review included memos to operators on relevant topics, post-accident damage reports and safety committee meeting agendas. These documents do highlight different hazards	Records review included memos to operators on relevant topics, post-accident damage reports and safety committee meeting minuetts. These documents do highlight different hazards identified	Compliant With Recommendation (CWR): NEXT and VTS do not have a defined threshold on when to report hazards identified to MBTA Management or MBTA Safety. The MBTA Safety audit team recommends	CWR

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			identified as well as the parties to which they disseminate the information. The documents do highlight the Quarterly Business Report presented to MBTA management with safety information. In the presentation there was no specific information for hazard identification.	as well as the parties to which they disseminate the information. The documents do highlight the Quarterly Business Report presented to MBTA management with safety information. In the presentation there was no specific information for hazard identification.	defining a threshold or category of hazards to report. In addition, the MBTA Safety audit team recommends adding a bullet in the safety section of the quarterly reports for hazards identified under the new threshold.	
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3.1	Element 8: Safety and Security Certification	Describe roles performed by Paratransit and contractor management in the Safety and Security Certification process. Give an example.	This is largely handled on the T side of the house. Paratransit management are sometimes contacted to weigh in on construction projects, etc.	N/A	N/A	COM
3.2	Element 8: Safety and Security Certification	Identify any thresholds used by the department to determine whether to initiate the	See above.	N/A	N/A	COM

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		Safety and Security Certification process.				
3.3	Element 9: Data Collection and Analysis	Explain how safety-related data is obtained, documented, analyzed, and shared with senior management. Provide an example.	Routemap software provides automatic notifications. Data is extracted, summarized, cleaned up, and put into reports that are shared with VTS and Paratransit management.	Program called "Sedgewick" to track safety related data from accidents and workplace injuries. Then uploaded to Domo, a dashboarding / visualization software.	N/A	COM
3.4	Element 9: Data	Explain how data from information systems is shared	There are many different types of safety data rolled into TRAC monthly report.	Claims administrator circulates a monthly report of accidents and injuries.	N/A	COM

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	Collection and Analysis	with MBTA Safety and other departments. Provide examples of this process, including any trends observed from rules compliance audits that may indicate quality or training issues.	Major safety events are raised with MBTA management immediately by TRAC.	Drivecam / Zonar – systems that support pre- and post- compliance checks, defect tracking, operator performance, live driver monitoring. These tools are available locally and to the national-level safety team.		
3.5	Element 10: Accident Investigation	Explain roles and responsibilities in the	Safety schedule based on how many personnel are out on the road. Ops and	All accidents and injuries logged by a safety supervisor in Sedgewick	N/A	COM

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		accident/incident investigation process, including notification and immediate response. Describe Paratransit and contractor management's process for coordination with MBTA Safety during the investigation process, including	safety coordinate after safety staffer is dispatched to scene. Talk to witnesses, document the scene. MBTA Safety is not typically engaged – there are a smaller number of relatively routine accident types. All information collected in Smart Sheet database. QA specialist coordinates collection of data, pulling video	system. Can be accessed by phone or tablet. Determination of liability is made. Every accident deemed “preventable” driver is taken off the road and must be retrained prior to returning to safety sensitive duties. Supervisor reportedly determines root cause through an interview with the operator. There is an escalation process for more serious events like fuel spills, fatalities – this		

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		for root cause identification, collection of training/maintenance/operational records, review of applicable rules and procedures.		launches a corporate-controlled investigation. Drivecam data is reviewed. Any vehicle involved in an accident is removed from the road and inspected.		
3.6	Element 10: Accident Investigation	Are there standardized incident response procedures for specific incident types? How are employees trained	Same process, different process flows based on severity. For training Safety Supervisors complete operator training and then additional training to	There is guidance for operators about not talking to police, press, etc. There is a folder system for the responding official to conduct their investigation. In the "Red Folder" drivers	N/A	COM

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		on the initial information to collect and necessary steps to follow?	learn systems, SOPs, reporting requirements, QA evaluation types. They also do ride along evaluations (has been less because of COVID) and participate in a controlled event that allows the supervisor to test their skills and the whole investigation process. Safety performs 4 types of QA activities - roll in and	are asked a series of questions about accident scene, potential causes, why driver was in that location, etc. Checklist criteria identify issues which must be referred to hotline. For injuries, there is a similar "Blue Folder".		

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			roll out inspections, spot checks, and ride along.			
3.7	Element 10: Accident Investigation	Describe the department's coordination with contractors and MBTA Safety to develop immediate mitigations and CAPs following safety events.	Case-specific. See earlier answers about targeted retraining.	Corrective actions come from the corporate organization. Any CAP requiring updates to MBTA docs lead to coordination meetings between both teams – for example, cell phone policies.	N/A	COM
3.8	Element 12: Internal Safety Audit	How does Paratransit review, implement, and track internal audit	Collaboration between Safety, Ops, and other management.	Some basic practices for tracking corrective actions.	N/A	COM

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		recommendations and corrective actions?				
3.9	Element 12: Internal Safety Audit	Describe internal reviews, observations, and audits conducted by Paratransit staff and contractors that are not a part of the Internal Safety Audit program.	Quarterly management reviews. Safety staff QA activities – use Smart Sheets to complete these. Checked off items generate an automatic alert to managers, who initiate next steps. Each includes a defined standard checklist.	Domo software – used for corporate to monitor performance. Ongoing “audits” of overspeed events, Drivecam scores, driver risk ratings, pre and post inspections, seatbelt wearing and other rules compliance. New functions routinely being added. The system also can document coaching or retraining after	N/A	COM

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				driver violations. Driver Safety Scorecard – gives driver a 6-month average of safety performance.		
3.10	Element 13: Rules Compliance	Discuss department involvement in updates to safety rules and procedures, including schedules, management responsibilities,	The contractor safety plan and SOPs are the main documents. Collaboration between Operations and Fleet Maintenance. These docs are shared in Smart Sheets. Management meetings are the forum for discussion of modifications or new procedures.	Taleo system – interactive learning to train on SOPs and can train on SOP updates. Most SOP updates are facilitated through corporate. Corporate does consult with local teams to help formulate these changes.	N/A	COM

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		and coordination with Safety.				
3.11	Element 13: Rules Compliance	Verify that the department documents how supervisors are evaluated to assess their effectiveness in overseeing implementation/compliance with operating and maintenance rules.	Manager receives and reviews all safety event reports and QA reports generated by the team. Senior management also use Drivecam to directly monitor and verify driver performance. With this information they can reinstruct when needed.	NEXT corporate is currently putting together a process for evaluating supervisors. Employees are tested on certain attributes so that evaluators can achieve certification.	N/A	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	VTS	NEXT	Notes	
3.12	Element 13: Rules Compliance	Discuss how the results of departmental safety rules compliance activities are communicated to Safety and other management.	The primary methods of communication with the MBTA are through quarterly operations meetings and written reports.	Emails, team meetings, Taleo system, literature, monthly safety meetings facilitated by MBTA management.	N/A	COM
3.13	Element 13: Rules Compliance	How does the training function ensure that updated procedures, bulletins, and rules	Examples include route map changes, tablet software changes. Trainers are notified of all process changes before they are rolled out.	Remedial and refresher trainings delivered annually or biannually. BBP, first aid, other topics. Operators out for longer periods of time must sit for	N/A	COM

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		are addressed in initial, remedial, and refresher training courses provided for employees?		retraining and are updated on any new or changed procedures. Driver training matrix is sent to MBTA monthly.		
3.14	Element 15: Maintenance Audits and Inspections	Describe quality assurance activities or programs for maintenance oversight.	PM schedules in place for equipment. "Dossier" software – tracks mileage-based PMs. Vehicles OOS are tracked on PM and repair sheet – includes failed circle checks, accidents in the field, etc., and then migrated to OOS	Dossier maintenance program is "most important tool in the shop". Mileage tracked for all vehicles, and all vehicles subject to 3000-mile interval PMs. Additionally, circle checks are conducted	N/A	COM

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			database. This information will be entered into other data bases to track more broadly on a monthly and yearly basis.	before each use of the vehicle.		
3.15	Element 15: Maintenance Audits and Inspections	How does QA/QC ensure each vehicle in the fleet is evaluated and maintained according to defined schedules?	PMs are mileage based. 5000 miles is base interval. Cambridge River Automotive mechanics perform CM work.	Dossier software tracks status of all vehicles and vehicles are removed from service when requiring PM / CM until released by maintenance in the system.	N/A	COM
3.16	Element 15: Maintenance	Describe the roles and responsibilities	3 managers cover QA for in-vehicle technology,	There is no dedicated QA staffer, but Dossier	N/A	COM

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	Audits and Inspections	of a QA/QC employee, including the number of employees dedicated to the QA/QC program.	mechanical issues. All documentation prepared on shop floor is reviewed by these individuals, including PM and repair sheets. Shop managers perform the actual day to day oversight for PM and CM activities.	information feeds up to area maintenance manager, who tracks trends and issues. "Finn-o-meter" tracks in service failures, parts costs, OT costs, and other key trends on a whiteboard. Board also lists PMs due, vehicles out of service.		
3.17	Element 15: Maintenance Audits and Inspections	Describe a recent QA/QC audit finding and how the department complied with the	Example – AC defects identified and managed through department oversight.	There are some patterns which are addressed through repairs under warranty.	N/A	COM

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		audit finding's corrective action.				
3.18	Element 17: Configuration Management	Is the department involved in the MBTA's Configuration Management and Control process, such as for new procurements or modifications to vehicles? Do employees have the ability to	Only modifications they handle is in vehicle tech like radios, cameras, etc. They start the process by building the template, passing it on to the MBTA, getting it approved, and then implemented.	N/A Only modifications they handle is in vehicle tech like radios, cameras, zonar etc. They start the process by building the template, passing it on to the MBTA, getting it approved, and then implemented.	N/A	COM

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		provide feedback on these projects?				
3.19	Element 17: Configuration Management	Discuss department coordination with the safety function in development, review, and documentation of proposed changes.	See above.	See above.	N/A	COM
3.20	Element 21: Procurement	Are procurements of new equipment/vehicles reviewed to verify the new	All vehicles still go through MBTA specs and the MBTA monitors the roll out to make sure it	N/A	N/A	COM

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		equipment or materials will not present a hazard to the existing system?	works. There is always a process for feedback. MBTA Safety not historically involved in procurement process.			
3.21	Element 10: Accident Investigation	[FIELD] Randomly select a recent accident and review the investigation report created, including the process and questions used to record events.	Records review included and SOP for accidents and incidents as well as sample accident report.	Records review included SOPs for accident investigation and post-accident procedures. As well as a sample of a completed post-accident form.	N/A	COM

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3.22	Element 13: Rules Compliance	[FIELD] Confirm that supervisors document rule violations observed. Confirm any actions taken by department management in response to violations observed.	Records review included review of a sample of Drivecam coachable events, the automated email for manager follow-up and SOPs for different SRCP's.	Records review included the quarterly business review PowerPoint which includes a slide for data on driver infractions.	N/A	COM

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4.1	Element 16: Training and Certifications	What types of training are offered to and required of employees such as operators, maintenance technicians, dispatchers, and supervisors? Describe both certification/recertification components.	Training requirements identified in contract with the MBTA. New hire program contains modules on vehicle familiarization, systems familiarization. Operators are certified on CPR, first aid, defensive driving, customer service skills. Combination of classroom and field training. Train on maps as well as GPS. Safety team is a part of	Maintenance and Ops training, first aid, BBP, etc. Includes refresher and recertification components.	N/A	COM

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			<p>this process. After training, new hires are mentored by a senior driver. This is considered OJT and is documented. Program ends with final evaluation. Follow-up evaluation after 40 days in service.</p> <p>Maintenance technicians complete right to know, hazardous materials,</p>			

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			<p>OSHA, lift certification, certs on specific vehicles.</p> <p>Supervisor and operations team complete role-specific training as well as operator training.</p> <p>Recertifications occur every 2 to 3 years for customer service, CPR, defensive driving.</p>			

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4.2	Element 16: Training and Certifications	Is there a responsible party who oversees all training? What are the requirements (e.g., years of experience, education, etc.) to become an Instructor? Please describe the qualification process.	Trainers have backgrounds in operations, education / training. Most have 10+ years of experience and all the necessary certifications required of operators.	There are managers in corporate and with the local team who help to oversee training. Many trainings are developed at the corporate level – content development is not a requirement of the role except in limited instances. There are many 'on the job' activities which require training certifications and knowledge of vehicle-	N/A	COM

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				borne equipment. NSC training instructor certification required. Instructors re-evaluated every 2 years.		
4.3	Element 16: Training and Certifications	How are changes to training programs communicated to Paratransit management and/or MBTA Safety prior to	Everything is in the RFP / contract for the year. If there is a major update or change it will be submitted to MBTA.	Corporate approves changes. Changes that impact service or are interlinked with MBTA policies are raised with MBTA Paratransit management.	N/A	COM

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		their implementation?				
4.4	Element 16: Training and Certifications	How are training employees notified of updated policies and procedures from Paratransit management and other applicable departments? What training or communication is required when these updates	Training employees notified by Operations or senior management in 1 on 1s or team meetings.	Notified same way all other employees are – emails, postings, or Taleo learning system.	N/A	COM

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		necessitate changes to procedures?				
4.5	Element 16: Training and Certifications	How are training records maintained and monitored? How does an employee, and their supervisor, know when they are due for training?	System called Training Manager is used to track training for all employees. Include required trainings, one off or recurring, deadlines and time requirements. Managers run upcoming training reports and view all upcoming trainings 90 days before they are due. Smart Sheets is used to	Weekly report from trainings management on trainings due and overdue. Goes to employee supervisors and the employees themselves if they have an email.	N/A	COM

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			generate training notifications themselves – individuals and management receive notification that they are due to be scheduled.			
4.6	Element 18: Workplace Safety	What processes are in place to ensure employees know and follow workplace safety rules and procedures?	Constant training and familiarization.	Handled through Taleo learning system. Managers meet with Environmental, HR, Ops, Safety to receive training and familiarization, and to familiarize all employees with management expectations.	N/A	COM

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4.7	Element 19: Hazardous Materials Program	What procedures are in place for employees when an incident occurs involving hazardous materials?	Charles River Automotive is one of the only areas where this may apply. Employees are trained, eyewash stations and spill kits are present. All shop computers include SDS database. Right to Know training includes some bloodborne pathogens training, but no specific certifications. Cleaners are available with special PPE. Cars are removed from	There are procedures for fuel spills, etc. Facility inspection includes check of spill kits, eye wash stations, etc. Safety data sheets available via the corporate website.	N/A	COM

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			service after bio events for cleaning and detailing.			
4.8	Element 20: Human Factors	Explain how Fitness for Duty and Drug & Alcohol policies for employees and managers are implemented.	Drivers report to Operations coordinator, who performs fitness for duty inspection and checks uniforms, ID, etc. At each site, Safety Supervisors on hand in the lots or supporting operations staff.	Drivers may be sent out for Department of Transportation test by a supervisor. Policies are distributed to all employees at time of hire. When updated, employees receive a new copy. "Hire Right" system used to track random pool, physical exams, and other testing requirements. There is not	N/A	COM

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				one dedicated contracted testing site. FFD checks are performed by window dispatchers / safety managers to check that drivers are fit to enter service.		
4.9	Element 20: Human Factors	Discuss applicable justifications for testing (reasonable suspicion, post-accident, random, etc.) and verify	Random pool maintained in accordance with FTA requirements. Contract with vendor to provide drug testing services. No findings from recent	Pre-employment, post-accident, random, reasonable suspicion are all valid test types. Reasonable suspicion training covers all	N/A	COM

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		that tests are administered in accordance with applicable standards.	review performed by MBTA Occupational Health Services team. Post-accident checklist is used to determine when drivers should be transported.	situations not covered under post-accident or random testing criteria. There is a checklist to determine whether person fulfills the requirement for testing.		
4.10	Element 20: Human Factors	Describe the process when notified that an employee has been selected for a random drug & alcohol test.	Program coordinator works with HR to arrange transportation for employees to and from mobile lab.	Schedule circulated the night before. Area safety manager notifies employee and escorts them to testing truck on site.	N/A	COM

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4.11	Element 20: Human Factors	Describe what processes managers use to monitor employee fatigue and hours of service.	Run cards to track scheduled shifts. Operators may not exceed 60 hours in a week including scheduled overtime. Signups for shifts take place on a weekly basis. Spreadsheet also shows total hours worked by operator.	The daily set-up includes schedules are shared with third party scheduler. Payroll records tell how much employee has worked and how many they are projected to work – max of 12 hours per day, 6 out of 7 days per week, and 60 hours total per week.	N/A	COM
4.12	Element 16: Training and Certifications	[FIELD] Review training program to verify:	Records review included an overview of the Kaizen training management	Records review included an excel file with employees and the last date of	N/A	COM

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		<p>a) How training records are maintained.</p> <p>b) That training consists of both classroom and hands-on training.</p> <p>c) Consistency with written training programs and/or syllabi.</p>	program utilized to track and report on training, as well as various transcript samples for employees.	completed training as well as a document that outlines training by job description.		

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#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	VTS	NEXT	Notes	Key
4.13	Element 16: Training and Certifications	[FIELD] Review the training and certification records for a sample of employees for the past three (3) years to determine if: a) The employee has completed the initial training program and refresher and	Samples of training records were provided, and no deficiencies were identified.	Samples of training records were provided, and no deficiencies were identified.	N/A	COM

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services

Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various)

Review Date(s): 9/20/21-9/22/21, 10/21 (various facility inspections)

Reviewer(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern

Observer(s):

Field Auditor(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern

Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	VTS	NEXT	Notes	Key
		remedial training as necessary. b) The course content was appropriate and adequate to meet training and recertification requirements.				
4.14	Element 16: Training and Certifications	[FIELD] Through a records review:	Records review included an overview of the Kaizen	Records review included an excel with employee training information.	Observation: NEXT did not provide a documented example of the	COM

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services

Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various)

Review Date(s): 9/20/21-9/22/21, 10/21 (various facility inspections)

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Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	VTS	NEXT	Notes	Key
		<p>a) Verify that a process for maintaining and accessing employee training records is in place.</p> <p>b) Verify that categories of safety-related work requiring training and certification</p>	training management program.		training management system currently being utilized. MBTA audit team recommends that NEXT provide some documentation from the Taleo learning system brought up during interviews.	

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services

Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various)

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Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	VTS	NEXT	Notes	Key
		have been identified. c) Verify that the MBTA has processes in place to assess compliance with its training and certification requirements.				
4.15	Element 18: Workplace Safety	[FIELD] Conduct a field inspection of	Facility inspections were conducted at all VTS facilities. All defects were	Facility inspections were conducted at all NEXT facilities. All defects were	N/A	COM

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services

Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various)

Review Date(s): 9/20/21-9/22/21, 10/21 (various facility inspections)

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Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	VTS	NEXT	Notes	Key
		a facility in order to: a) Verify basic OSHA or state equivalent requirements are being met. (e.g., general housekeeping of training facilities, employee use of PPE, SDS locations, provision of first	communicated to onsite management for mitigation.	communicated to onsite management for mitigation.		

2021 MBTA Safety Internal Audit Checklist: Paratransit



Department: Paratransit Services

Department Representative(s): Mahour Rahimi, Mike Hulak, Geri Venizia, Chris Jurek, Kelli Ahola, Vendor Management and Staff (various)

Review Date(s): 9/20/21-9/22/21, 10/21 (various facility inspections)

Reviewer(s): Mike Catsos, Jake Minevitz, Meghan McDonnell, Cimbria Dominick, Nick Stern

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Reference Criteria: 2021 MBTA Safety Plan, NEXT and VTS Contractor Safety Plans

#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	VTS	NEXT	Notes	Key
		aid kits, fire extinguishers, etc.) b) Determine compliance with 454 CMR 21 – the Massachusetts “Right-to-Know” Law.				

APPENDIX J



MBTA SAFETY

2021 Internal Safety Interview Report

Date: June 25, 2021

TO: Steve Hicks
Chief Mechanical Officer - Rail

FROM: Ronald Ester
Chief Safety Officer

CC: J. Gentilucci
T. Davis
G. Ientile
M. Catsos
M. McDonnell
A. Limacher
O. Sanchez
A. Modh, DPU

Area Audited: Rail Vehicle Maintenance

Audit Approach:

Assessment of the department's adequacy in meeting safety program requirements as outlined in the MBTA Safety Plan derived from the referenced documents listed below.

Reference Documents:

- 2020 MBTA Transit Safety Plan
- Department of Public Utilities (DPU) Regulation 220 CMR 151.03
- Federal Transit Administration (FTA) Regulation 49 CFR 673

Audit Date: March 22-24, 2021

Summary:

Heavy and Light Rail Vehicle Maintenance (RVM) are responsible for train maintenance, engineering changes, vehicle system modifications, carhouse/employee safety, and employee training. There are several independent teams within RVM, and each team collaborates with others to fulfil core safety responsibilities. The teams include staff dedicated or primarily focused on rail/carhouse maintenance, vehicle procurement, engineering, quality assurance/quality control (QA/QC), and training development and delivery.



MBTA Rail Maintenance Org Chart

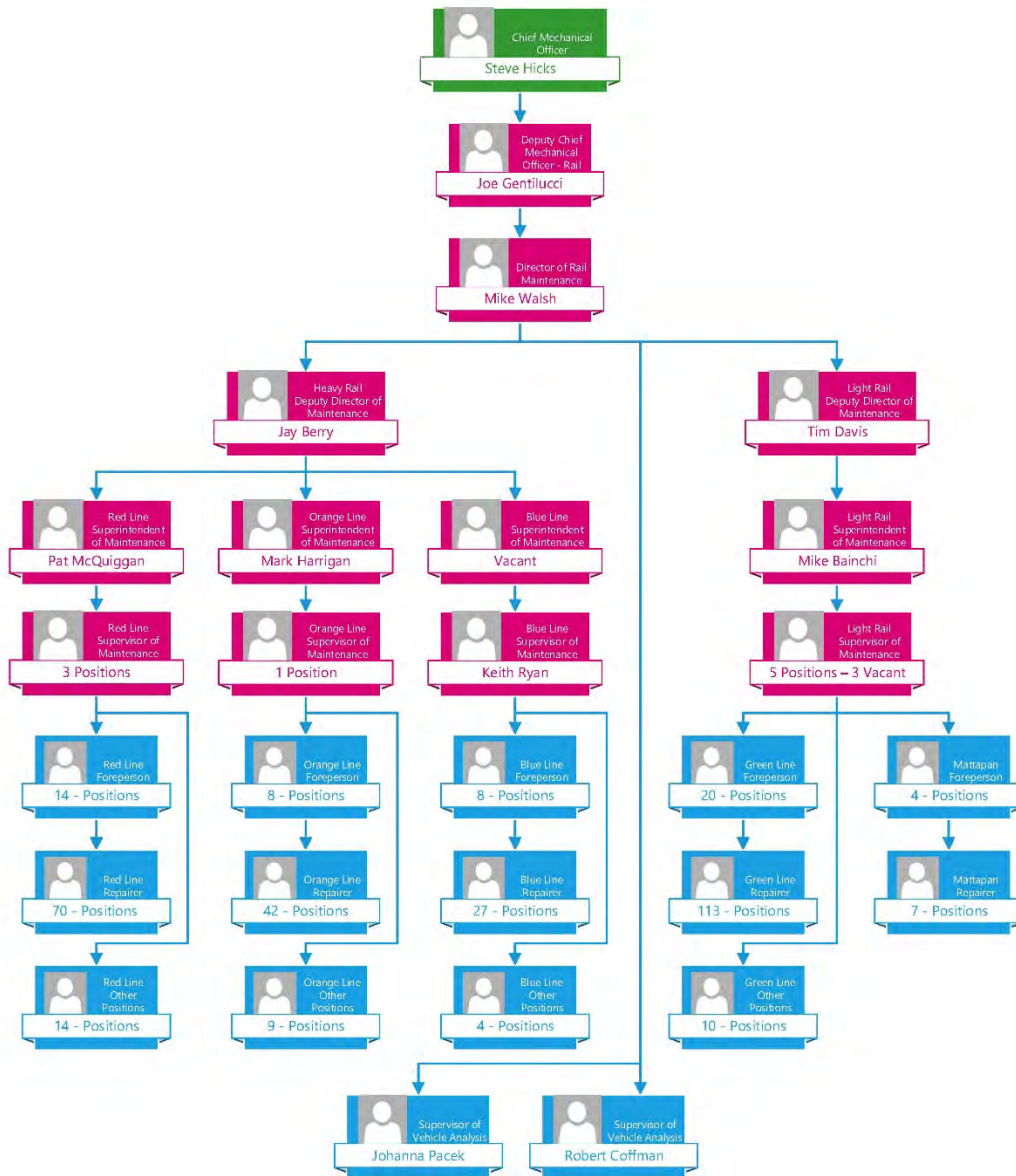


Figure 1: Rail Vehicle Maintenance Organizational Chart

RVM demonstrates a comprehensive understanding of safety by implementing the MBTA Transit Safety Plan, promoting communications between management and employees, and providing employee



training. The department utilizes methods described in the MBTA Transit Safety Plan to identify hazards and implements risk control strategies. RVM management are committed to open communication through one-on-one conversation with employees as well as tool box talks, monthly meetings and using the chain of command to address reported hazards. RVM management display a commitment to safety through providing copies of pertinent documentation in key facilities (MBTA Transit Safety Plan, Safety Flashes and Bulletins). Additionally, RVM management provided past examples of timely action in cases of reported hazards found through inspections, formal hazard identification activities, and conversations with employees.

Findings – Noncompliance (NC): None

Findings - Compliance with Recommendation (CWR):

1. Rail Vehicle Maintenance management have not formally approved safety goals and objectives since 2018. While documented, goals and objectives for 2021 were in draft form; approved goals for 2020 and 2019 were not available for review.
 - a. MBTA Safety recommends that Rail Vehicle Maintenance management establish a formal process or utilize an existing monthly/annual meeting to develop and formally adopt safety goals and objectives in alignment with the Authority-wide goals and objectives established in the Transit Safety Plan.

Observations

1. A Foreperson was interviewed regarding how to access Safety Data Sheets. They were able to navigate to the MBTA Intranet but required additional direction on how to open Sitehawk and view a specific SDS.



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
Safety Management Policy	1 Introduction	<u>Interview:</u> Employees have access to the Safety Plan on the intranet. Safety standards and policies are communicated through trainings, toolbox talks, and message boards. Critical standards or policies require employee policy verification receipts. Job descriptions and employee evaluations are prepared by the Human Resources department and incorporate safety-specific language into all job postings.		
Safety Management Policy	2 Purpose, Scope, Performance Objectives	<u>Interview:</u> Biweekly Rail Vehicle Maintenance (RVM) meetings include discussions on safety goals set out by the Chief Maintenance Officer (CMO). There is a separate meeting with Chief Engineer staff to review Safety audit findings from the previous audit.	Compliance with Recommendation: RVM management have not formally approved safety goals and objectives since 2018. While documented, goals and objectives for 2021 were in draft form; approved goals for 2020 and 2019 were not available for review. MBTA Safety recommends that RVM management establish a formal process or utilize an existing	



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
			monthly/annual meeting to develop and formally adopt safety goals and objectives in alignment with the Authority-wide goals and objectives established in the Transit Safety Plan.	
Safety Management Policy	3 Overview of Management Structure	<u>Interview:</u> According to the RVM Organization Chart, the Chief Maintenance Officer of Rail and Director oversee the department. There are two Deputies under the Director for Heavy Rail and Light Rail. Separately, a dedicated Superintendent oversees Training. Facility Superintendents participate in a range of line- and role-specific safety meetings. RVM continually works with the Safety Department.		
Safety Management Policy	4 Safety Plan Control and Update Procedure	<u>Interview:</u> Updated Safety Plans are distributed to each of the carhouses and the Intranet is updated. Employees sign off on receipt verifications and updates are discussed during toolbox		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		talks. Management consistently informs employees where to find the Transit Safety Plan (TSP). RVM plans to participate in the 2021 review to contribute to any updates made to the Transit Safety Plan.		
Safety Management Policy	5 Safety Plan Implementation, Tasks, Activities and Responsibilities	<u>Interview:</u> Every year, Safety reviews RVM employee tasks to ensure safety standards are followed. The Safety Plan outlines that employees have the ability to challenge any work as unsafe, which can sometimes present difficulties for management when assigning tasks.		
Safety Management Policy	11 Emergency Management	<u>Interview:</u> RVM coordinates regularly with MBTA's Senior Security and Emergency Management Coordinator. All carhouses are required to develop site specific Emergency Action Plans. RVM has supported these exercises historically with collaborative employee		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		participation. The CMO participates in the development and implementation of after action reports from emergency drills.		
Safety Risk Management	6 Safety Risk Management	<u>Interview:</u> RVM consults Safety if a supervisor is unable to resolve safety issues. When Corrective Action Plans (CAPs) are implemented, RVM creates a team to make a list of criteria to correct the problem around the CAP. RVM reports hazards up through the chain of command. Employees also report hazards directly to MBTA Safety. Superintendents report the condition of the shop floor weekly. Identified hazards are immediately mitigated or reported. Forepersons walk through their areas at the end of each shift.		
Safety Risk Management	7 Management of Change	<u>Interview:</u> RVM uses an Engineering Change Notification (ECN) system to manage changes. Many changes result from CAPs		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		issued by Safety or the Department of Public Utilities (DPU). Training sends training flashes to each carhouse. Rule and procedure changes are communicated directly to employees and signoffs are sometimes required.		
Safety Assurance	8 Safety and Security Certification	<u>Interview:</u> RVM plays a critical role in the Safety Certification process. Certifiable Items Lists (CIL) are used and meetings are scheduled to monitor progress. A clear testing process is developed and reviewed by Safety, Vehicle Maintenance, and Vehicle Engineering. Vehicle Engineering and Safety sign an approval sheet. Once all work is complete, the certification sheet receives approval signatures and the vehicle is ready to go into service.		
Safety Assurance	9 Data Collection and Analysis	<u>Interview:</u> RVM currently prepares a regular rail maintenance data report shared		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		with management up to the General Manager that documents maintenance and quality assurance / quality control (QA/QC) activities. RVM is working with consultants to ensure that QA/QC activities and sampling are structured properly. RVM's asset management team is working to expand the use of Trapeze in tracking of maintenance and QA/QC data.		
Safety Assurance	10 Accident Investigations	<u>Interview:</u> RVM management are typically notified of an event via the Operations Control Center (OCC), and the CMO or another manager will collect more information regarding the events at the scene. Designated maintenance personnel and managers respond, and connect with the incident commander to manage the scene safely. RVM staff are trained in the investigation process. There are trainings and refresher trainings available. Safety and Vehicle Maintenance work together to		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		develop CAPs with clear goals and objectives.		
Safety Assurance	12 Internal Safety Reviews	<u>Interview:</u> Any open items, Internal Safety Audit (ISA) recommendations, after action reports, safety improvements, and corrective actions are documented on a matrix and are monitored until closed. Internal reviews, observations, and audits are a part of everyday work, although may not be formalized. This includes spot-checking tools, observations, as well as forklift and hoist inspections.		
Safety Assurance	13 Rules Compliance	<u>Interview:</u> Rail Vehicle Maintenance participates in monthly meetings for the Safety Rules Compliance Program (SRCP). Supervisors are informally evaluated on ability to enforce compliance with safety rules, and the CMO is routinely involved in staffing and performance management issues. Toolbox talks include		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		safety items, bulletins, COVID discussion, rules, proper employee behavior, and refresher trainings. Every shift receives re-training via these methods when required.		
Safety Assurance	15 Maintenance Audits and Inspections	<u>Interview:</u> A designated Deputy Director and Superintendent oversee the QA/QC program. The QA/QC team comes on location to check mileage and ensures a proper inspection process of each vehicle chosen for inspection. 10% of the fleet per month is inspected to ensure that all vehicles are subject to review annually. The QA/QC program includes frequent visits to each of the carhouse locations for audits and consistent reporting.		
Safety Promotion	16 Training and Certifications	<u>Interview:</u> RVM's Superintendent of Training keeps track of all different courses offered to maintenance personnel and creates new		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		trainings and courses. Rail Vehicle Maintenance trainings are currently being transitioned into a virtual format using the Learning Management System (LMS); the system will provide automated notification to employees when they are due for training. Outside of the LMS, trainings are tracked in Excel and PeopleSoft. Maintenance Instructor positions require a minimum of 10 years of experience. The department treats policy/procedure updates as an ‘all hands on deck’ situation and strives to include most different levels.		
Safety Assurance	17 Configuration Management	<u>Interview:</u> Engineers are involved with establishing maintenance programs for new vehicles, which includes carhouse training, reviewing different systems, write-ups on failures, and looking at possible alterations on maintenance. In one example, there was a cable hanging too low requiring modification of Blue Line cars		



Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		to correct the issue. Proposed changes are discussed with personnel in the carhouse, with forepersons and supervisors, and are then are vetted through the engineering process including MBTA Safety.		
Safety Promotion	18 Workplace Safety	<u>Interview:</u> The department uses toolbox talks, an electronic message board, posting on employee bulletin boards for topics such as work place safety injury prevention and other public information campaigns. If anything changes for high-risk tasks such as lock-out/tag-out, hot works, or electrical tasks, more information is forwarded to employees on a role-specific basis.		
Safety Promotion	19 Hazardous Materials Program	<u>Interview:</u> The department utilizes outside contractors that Environmental has on an active will-call contract for pumping services. There is a designated contractor for body fluids cleanup. A weekly		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		environmental walk through is used to discuss topics such as oil storage, waste oil etc.		
Safety Promotion	20 Human Factors	<u>Interview:</u> All managers in Rail Vehicle Maintenance take reasonable suspicion training. In the past managers have referred employees to the clinic with a reasonable suspicion inquiry. All supervisors receive training on applicable justifications. If any employee is involved in an accident, the employee is required to go to the clinic to receive a drug and alcohol test. The department's requirements for hours of service and overtime are reportedly similarly to those on the Operations side, with no more than three overtime shifts allowed per week. Employees are prohibited from working more than 16 hours of overtime unless required during an emergency.		
Safety Promotion	21 Procurement	<u>Interview:</u> Original equipment manufacturer (OEM) parts are		



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Safety Management System (SMS) Component	System Safety Program Plan (SSPP) Element	Summary Remarks	Findings and Recommendations	Department Response
		received from vendors, and any safety-sensitive parts are subject to inspections recorded in PeopleSoft. It takes approximately 3 years to build up a supply of spare parts for new vehicles.		
Accepted By:			Date:	
Approved By: CSO Ronald Ester			Date: 6/25/21	

APPENDIX K

**2021 MBTA Safety Internal Audit Checklist
Rail Vehicle Maintenance**



Department: Rail Vehicle Maintenance

Department Representative(s): Steve Hicks, Joseph Gentilucci, Timothy Davis, Gary Ientile, Mike Walsh

Review Date(s): 3/22/21 – 3/24/21

Reviewer(s): Michael Catsos, Meghan McDonnell, Anya Limacher, Oceana Sanchez

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	General Requirements / Safety Management Policy (Includes activities and associated plans/procedures identified in Transportation Safety Plan (TSP Sections 1. Introduction, 2. Safety Management System (SMS) Policies, 3. Safety Performance and Documentation, 4. Organizational Structure and Responsibilities)	Department Response / Review Team Observations	Key
1.1	Element 1: Introduction	Are you familiar with the MBTA Safety Plan? How is it made available to all employees?	The MBTA Safety Plan is available to all Rail Vehicle Maintenance (RVM) personnel via the MBTA Intranet and will be soon available on the MBTA TStop webpage. The Intranet is updated by Safety when changes are made to the Safety Plan.	COM
1.2	Element 1: Introduction	How are safety standards and policies communicated to Rail Vehicle Maintenance employees?	<p>Safety standards and policies are communicated through trainings, toolbox talks, and message boards. Critical standards or policies require employees to sign off on policy verification receipts.</p> <p>As an example, there is a Standard Operating Procedure (SOP) created for accessing the underside of a light rail streetcar outside of the carhouse facility. The purpose of the SOP was to familiarize employees with the correct methods.</p>	COM

2021 MBTA Safety Internal Audit Checklist
Rail Vehicle Maintenance



Department: Rail Vehicle Maintenance

Department Representative(s): Steve Hicks, Joseph Gentilucci, Timothy Davis, Gary Ientile, Mike Walsh

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Reference Criteria: 2021 MBTA Safety Plan

1.3	Element 1: Introduction	How are safety-related responsibilities incorporated into Rail Vehicle Maintenance job descriptions and employee evaluations?	Job descriptions and employee evaluations prepared by the Human Resources department incorporate safety-specific language into all job postings within the department. In one example, there is a requirement that applicants have knowledge of the Safety Program. Evaluations are required for Managers.	COM
1.4	Element 2: Purpose, Scope, and Performance Objectives	Are safety goals regularly discussed at manager meetings? How does your department set and monitor a safety goal? Please provide an example.	<p>Every Rail Vehicle Maintenance meeting begins with a 'Safety Minute' even if not a safety related meeting. Biweekly rail and bus meetings include discussions on safety goals set out by the Chief Mechanical Officer (CMO). There is a separate meeting with Chief Engineer staff to review Safety audit findings from the previous audit. An example, a safety goal created in 2020 was to reduce reportable injuries on the Green Line. A pilot program for Safety Week was set up and found that there was a 30% reduction of reportable injuries.</p> <p>Compliance with Recommendation: Rail Vehicle Maintenance management have not formally approved safety goals and objectives since 2018.</p>	CWR

2021 MBTA Safety Internal Audit Checklist
Rail Vehicle Maintenance



Department: Rail Vehicle Maintenance

Department Representative(s): Steve Hicks, Joseph Gentilucci, Timothy Davis, Gary Ientile, Mike Walsh

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Reference Criteria: 2021 MBTA Safety Plan

			While documented, goals and objectives for 2021 were in draft form; approved goals for 2020 and 2019 were not available for review. MBTA Safety recommends that Rail Vehicle Maintenance management establish a formal process or utilize an existing monthly/annual meeting to develop and formally adopt safety goals and objectives in alignment with the Authority-wide goals and objectives established in the Transit Safety Plan.	
1.5	Element 3: Overview of Management Structure	Describe how the Rail Vehicle Maintenance department is organized.	Rail Vehicle Maintenance provided the audit team an Organization Chart. MBTA's Chief Mechanical Officer and a Director oversee the department. There are two Deputies under the Director for Heavy Rail and Light Rail. Separately, a dedicated Superintendent oversees Training.	COM
1.6	Element 3: Overview of Management Structure	Describe Rail Vehicle Maintenance's participation in any committees devoted to safety issues, their roles and responsibilities, and a schedule for when meetings are conducted.	Facility Superintendents participate in a range of line- and role-specific safety meetings, such as those related to the Green Line Extension, Green Line Safety Meeting, Occupational Health and Safety (OHS) monthly meetings, Derailment Committee, and Code 1 meetings. The CMO participates in Safety Rules Compliance Program (SRCP) meetings,	COM

2021 MBTA Safety Internal Audit Checklist
Rail Vehicle Maintenance



Department: Rail Vehicle Maintenance

Department Representative(s): Steve Hicks, Joseph Gentilucci, Timothy Davis, Gary Ientile, Mike Walsh

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Reference Criteria: 2021 MBTA Safety Plan

			Derailment Committee, Weekly meeting with Safety, Personal Protective Equipment (PPE) Working Group, Vehicle Performance. The CMO attends another meeting to catch any safety issues that do not fall within the other meetings.	
1.7	Element 3: Overview of Management Structure	Describe Rail Vehicle Maintenance's interface with the Safety Department outside of safety committee meetings.	<p>Rail Vehicle Maintenance continually works with the Safety Department on Good Faith Safety Challenges as well as having a conversation with a number of Safety Department staff and managers on specific maintenance-related topics. Rail Vehicle Maintenance reaches out to Safety with any issues as they arise.</p> <p>In one example, there was an issue with Type 9 Vehicle mirrors. Rail Vehicle Maintenance brought this issue to Safety and discussed the best course of action to resolve the issue. In another example, Safety and Rail Vehicle Maintenance work together on incident investigations.</p>	COM
1.8	Element 4: MBTA Safety	Describe Rail Vehicle Maintenance's involvement in periodic reviews and updates to the Safety Plan.	Updated Safety Plans are distributed to each of the carhouses and the Intranet is updated. If there are significant changes, employees sign off on receipt	COM

2021 MBTA Safety Internal Audit Checklist Rail Vehicle Maintenance



Department: Rail Vehicle Maintenance

Department Representative(s): Steve Hicks, Joseph Gentilucci, Timothy Davis, Gary Ientile, Mike Walsh

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Reference Criteria: 2021 MBTA Safety Plan

	Plan Control and Update		verifications. Significant updates are discussed during toolbox talks.	
1.9	Element 4: MBTA Safety Plan Control and Update	Discuss management's process for distributing the latest approved Safety Plan and other new/updated safety procedures to impacted employees.	Management consistently informs employees where to find the Transit Safety Plan (TSP). A few key employees review it regularly. Safety Plan content and updates are discussed at toolbox talks.	COM
1.10	Element 4: MBTA Safety Plan Control and Update	Confirm that all department safety-related activities are adequately described in the Safety Plan or associated documents.	Rail Vehicle Maintenance plans to participate in the 2021 review to contribute to any updates made to the Transit Safety Plan. Management is not aware of any notable gaps in the existing plan.	COM
1.11	Element 5: Implementation, Tasks, Activities, and Responsibilities	Describe any challenges that Rail Vehicle Maintenance experiences in carrying out the safety-related tasks as specified in the MBTA Safety Plan.	The main challenge is that some employees may not prefer to perform certain tasks. Every year, Safety reviews Rail Vehicle Maintenance employee tasks to ensure they follow safety standards. The Safety Plan outlines that employees have the ability to challenge any work as unsafe, which can sometimes present difficulties for management when assigning tasks.	COM
1.12	Element 11: Emergency Management	Describe Rail Vehicle Maintenance's role and responsibilities in the development of emergency management procedures.	Rail Vehicle Maintenance coordinates regularly with MBTA's Senior Security and Emergency Management Coordinator. All carhouses are required to develop site specific Emergency Action Plans, while many	COM

**2021 MBTA Safety Internal Audit Checklist
Rail Vehicle Maintenance**



Department: Rail Vehicle Maintenance

Department Representative(s): Steve Hicks, Joseph Gentilucci, Timothy Davis, Gary Ientile, Mike Walsh

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Reference Criteria: 2021 MBTA Safety Plan

			locations have completed plans. Each Emergency Action Plan is site specific.	
1.13	Element 11: Emergency Management	Describe Rail Vehicle Maintenance's involvement in emergency drills and exercises, including planning, implementation, and after-action report development.	Rail Vehicle Maintenance has supported these exercises historically with collaborative employee participation. The CMO participates in the development and implementation of after action reports from emergency drills.	COM
1.14	Element 5: Implementation, Tasks, Activities, and Responsibilities	[FIELD] Interview at least one employee and one supervisory personnel to determine what they understand regarding their safety roles and responsibilities.	One Repairer and a Deputy Director provided a summary of their safety roles and responsibilities that included identification of hazards, reporting to the proper personnel any safety related issues, injuries or property damage.	COM
1.15	Element 11: Emergency Management	[FIELD] Verify that Rail Vehicle Maintenance employees possess easily-accessible versions of emergency SOPs, plans, call lists, etc.	Emergency SOPs and materials are easily accessible, located in a binder in the foreperson's office and on the Intranet accessible by employees through a kiosk outside the foreperson's office. There is a large site plan of the facility posted visibly on the wall.	COM

2021 MBTA Safety Internal Audit Checklist
Rail Vehicle Maintenance



Department: Rail Vehicle Maintenance

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Review Date(s): 3/22/21 – 3/24/21

Reviewer(s): Michael Catsos, Meghan McDonnell, Anya Limacher, Oceana Sanchez

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.1	Element 6: Safety Risk Management	How does Rail Vehicle Maintenance address reported or identified hazards? What is the process for communicating these hazards to MBTA Safety and/or other relevant departments? Provide an example.	Employees have access to Form B, Hotline Number, and Good Faith Safety Challenge forms. RVM consults Safety if ever a supervisor is unable to resolve safety issues. Some examples include, a hoist was not working properly which resulted in the work being stopped and an investigation initiated; a forklift was breaking down consistently and required constant repair resulting in Rail Vehicle Maintenance purchasing a new forklift to proactively head off safety issues.	COM
2.2	Element 6: Safety Risk Management	How is Rail Vehicle Maintenance involved with the implementation of Corrective Action Plans (CAPs)? Provide an example.	When CAPs are implemented, Rail Vehicle Maintenance creates a team to make a list of criteria to correct the problem around the CAP. One recent example was an event where an employee suffered an electric shock in a wire car. Rail Vehicle Maintenance worked with the Power department to find a proper solution such as to increase the insulation on the spool within the car.	COM

2021 MBTA Safety Internal Audit Checklist Rail Vehicle Maintenance



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Reviewer(s): Michael Catsos, Meghan McDonnell, Anya Limacher, Oceana Sanchez

Reference Criteria: 2021 MBTA Safety Plan

#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.3	Element 6: Safety Risk Management	Describe the hazard reporting procedure and how it is communicated with employees to ensure safety hazards in the workplace are reported effectively.	Rail Vehicle Maintenance reports hazards up through the chain of command. Frontline employees report to the foreperson; if the foreperson cannot resolve the hazard, then the foreperson reports to the supervisor. Employees also report hazards directly to MBTA Safety in three ways; Form B, Good Faith Safety Challenge, and via the Safety Hotline.	COM
2.4	Element 6: Safety Risk Management	Discuss sources of hazard information regularly reviewed by Rail Vehicle Maintenance management and staff to identify hazards.	Superintendents are reporting out on the condition of the shop floor on a weekly basis. Identified hazards are immediately mitigated or reported through the ranks. Forepersons are required to walk through their areas at the end of each shift.	COM
2.5	Element 7: Management of Change	What is Rail Vehicle Maintenance's involvement in infrastructure and equipment changes and/or the review/testing of the equipment before implementation?	Rail Vehicle Maintenance use an Engineering Change Notification (ECN) system to manage changes. There are Class 1 and Class 2 designations depending on the level of change. A Class 1 change requires a sign-off by the CMO and Chief Investigation and Safety Assurance Officer. If a change is made to vehicles that impacts other departments, all affected areas	COM

2021 MBTA Safety Internal Audit Checklist Rail Vehicle Maintenance



Department: Rail Vehicle Maintenance

Department Representative(s): Steve Hicks, Joseph Gentilucci, Timothy Davis, Gary Ientile, Mike Walsh

Review Date(s): 3/22/21 – 3/24/21

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			<p>such as System-wide Accessibility (SWA) or Customer Experience (CX) are communicated the changes. Paperwork and change components are managed online through the Service Now system. Many changes result from Corrective Action Plans (CAP) issued by Safety or Department of Public Utilities (DPU).</p> <p>It is exceptionally rare for changes to escape the review process. One example, issues reported by a repairer resulted in a formal review by management.</p> <p>Rail Vehicle Maintenance Training is involved in this process. Any changes trigger a notification sent to Training. ECN's are not closed until the process is complete. Changes typically take anywhere from three months to a year to complete, including testing and engineering assessment of proposed changes.</p>	

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#	SSPP Element	Safety Risk Management (Includes activities and associated plans/procedures identified in TSP Section 5. Safety Risk Management)	Department Response / Review Team Observations	Key
2.6	Element 7: Management of Change	How is each Rail Vehicle Maintenance employee notified of rule/procedure changes and how is this documented?	If a change goes through the ECM process, Training gets involved and sends out a training flash via the electronic message board in each carhouse facility. Rule and procedure changes are communicated directly to employees by supervisors and signoffs are sometimes collected on paper sheets and filed.	COM
2.7	Element 14: Facilities and Equipment Safety Inspections	Explain Rail Vehicle Maintenance's current facility inspection process/procedures. Are facility inspections routinely conducted by Rail Vehicle Maintenance employees?	Rail Vehicle Maintenance maintains a hazardous material log to fulfill OSHA requirements. Rail Vehicle Maintenance performs fork truck and hoist inspections, and inspects a variety of other facility equipment not maintained by Transit Facilities Maintenance (TFM). Examples include fire and life safety inspections, eyewash stations, and first aid kits on a monthly basis. Inspections are documented on checklists and are maintained by supervisors.	COM
2.8	Element 14: Facilities and Equipment Safety Inspections	Describe how results from the inspections are stored and analyzed.	Results are stored on a common network drive shared by Rail Vehicle Maintenance supervisors. Inspection items identified by supervisors that repeatedly indicate problems or defective	COM

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			equipment are addressed; historically Rail Vehicle Maintenance has initiated major projects to deal with potential hazards identified via ongoing inspections.	
2.9	Element 6: Safety Risk Management	[FIELD] Verify via a records review that hazards identified by Rail Vehicle Maintenance personnel are documented and communicated to safety as needed.	Inspection records include filled out checklists with defects noted. The Deputy Director confirmed that identified hazards are reported to Safety and discussed in meetings.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.1	Element 8: Safety and Security Certification	Describe the role that Rail Vehicle Maintenance plays in the Safety and Security Certification process. Give an example.	Rail Vehicle Maintenance plays a critical role in the Safety Certification process. Certifiable Items Lists (CIL) are used and meetings are scheduled to monitor progress. A clear testing process is developed and reviewed by Safety, Vehicle Maintenance, and Vehicle Engineering. Static testing is done and open items are addressed. Work is divided to ensure completion. Vehicle Engineering and Safety sign an approval sheet. Once all work is complete, the certification sheet receives approval signatures and the vehicle is ready to go into service.	COM
3.2	Element 8: Safety and Security Certification	Identify any thresholds used by the department to determine whether to initiate the Safety and Security Certification process.	The Class 1 and Class 2 designations used by Rail Vehicle Maintenance serve as the thresholds for different types of safety certification. Issues that impact propulsion are Class 1, for example, while issues related to secondary systems like lighting are Class 2.	COM
3.3	Element 9: Data Collection and Analysis	Explain how safety-related information is obtained, documented, analyzed, and shared with senior management. Provide an example.	Rail Vehicle Maintenance currently prepares a regular rail maintenance data report shared with management up to the General Manager. The report documents maintenance and QAQC activities, and Rail Vehicle Maintenance	COM

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			coordinated with consultants to ensure that QAQC activities and sampling are structured properly. Rail Vehicle Maintenance's asset management team is working to expand the use of Trapeze in tracking of maintenance and QAQC data.	
3.4	Element 9: Data Collection and Analysis	Explain how safety data is collected by Rail Vehicle Maintenance employees and how data from information systems is shared with MBTA Safety and other departments. Provide examples of this process, including any trends observed from rules compliance audits that may indicate quality or training issues.	In one example, an inspection came up short during a QAQC audit. There was not a second shift foreperson in charge of the rail inspection. Currently Rail is short by five forepersons. It was determined that not having a dedicated foreperson, the paperwork was not 100% compliant. A substitute foreperson is now working on the second shift designated to review documentation and paperwork. Rail Vehicle Maintenance management continuously monitor safety data and the results of compliance audits to identify and mitigate negative trends.	COM
3.5	Element 10: Accident Investigation	Explain Rail Vehicle Maintenance's roles and responsibilities in the accident/incident investigation process, including notification and immediate	Rail Vehicle Maintenance plays a role in many accident and incident events. Rail Vehicle Maintenance management are typically notified of an event via the Operations Control Center (OCC), and the CMO or another manager will collect	COM

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		response. Describe the department's process for coordination with safety during the investigation process, including for root cause identification, collection of training/maintenance/operational records, review of applicable rules and procedures.	more information regarding the events at the scene. Designated maintenance personnel and managers respond, and connect with the incident commander to manage the scene safely. Rail Vehicle Maintenance staff are trained in the investigation process, including photography, measurements, and documentation which needs to be prepared at the site. Maintenance staff will then assist with the re-railing or removal of a vehicle if needed. Away from the scene, Rail Vehicle Maintenance staff review records including vehicle maintenance history, open/closed work orders, and maintenance staff training.	
3.6	Element 10: Accident Investigation	Are there standardized incident response procedures for specific incident types? How are Rail Vehicle Maintenance employees trained on the initial information to collect and necessary steps to follow?	There is a derailment training with refreshers available. There is also a training available for the Fire Department on how to remove a person from under a train. MBTA crews receive training along with other emergency responders. Engineers receive training on how to work on the scene and how to properly take measurements and notes.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.7	Element 10: Accident Investigation	Describe the department's coordination with safety to develop immediate mitigations and CAPs following safety events.	CAPs are developed when major issues are found. Safety and Vehicle Maintenance work together to develop CAPs that may include procedures, schedules, budget, etc. with clear goals and objectives.	COM
3.8	Element 12: Internal Safety Audit	How does Rail Vehicle Maintenance review, implement, and track MBTA Safety Internal Audit recommendations and corrective actions?	Any open items, Internal Safety Audit (ISA) recommendations, after action reports, safety improvements, and corrective actions are documented on a matrix and are monitored until closed. There have been approximately 80 closed items over the last three years. All lines and facilities receive notifications of upcoming due dates as necessary.	COM
3.9	Element 12: Internal Safety Audit	Describe internal reviews, observations, and audits conducted by Rail Vehicle Maintenance that are not part of the Safety Rules Compliance Program (SRCP).	Internal reviews, observations, and audits are a part of everyday work, although may not be formalized. There is a superintendent's weekly report that requires a walkthrough of the carhouse, making observations and suggestions on day-to-day activities. There is a calibration program that involves spot-checking tools, observations, audits, forklift and hoist inspections, and checking chains and cables. Pre-pandemic, the Deputy Director and	COM

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			Superintendents performed observations together for both Rail and Bus from a safety perspective.	
3.10	Element 13: Rules Compliance	Discuss department involvement in updates to safety rules and procedures, including schedules, management responsibilities, and coordination with Safety.	Rail Vehicle Maintenance participates in monthly meetings for the Safety Rules Compliance Program (SRCP). Rail Vehicle Maintenance is also involved in pilot programs for new or updated rules or procedures prior to and during implementation. A designated Deputy Director is directly involved the implementation phase, while the CMO participates in the final approval group.	COM
3.11	Element 13: Rules Compliance	Verify that the department documents how supervisors are evaluated to assess their effectiveness in overseeing implementation/compliance with operating and maintenance rules.	Supervisors are informally evaluated on ability to enforce compliance with safety rules, and the CMO is routinely involved in staffing and performance management issues.	COM
3.12	Element 13: Rules Compliance	Discuss how the results of departmental safety rules compliance activities are communicated to the safety department and other management.	MBTA Safety and other departments receive notification of the results of SRCP activities via reports shared and discussed in the monthly SRCP Committee Meeting.	COM

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#	SSPP Element	Safety Assurance (Includes activities and associated plans/procedures identified in TSP Section 6. Safety Assurance)	Department Response / Review Team Observations	Key
3.13	Element 13: Rules Compliance	How does Rail Vehicle Maintenance ensure that updated procedures, bulletins, and rules are addressed in initial, remedial, and refresher training courses provided for employees?	There is a clear list of required training for all employees; Rail Vehicle Maintenance Training coordinates with vendors to ensure that all updated rules, procedures, and processes reflect in the training program. Toolbox talks include safety items, bulletins, COVID discussion, rules, proper employee behavior, and refresher trainings. Every shift receives re-training via these methods when required.	COM
3.14	Element 15: Maintenance Audits and Inspections	Describe the Rail Vehicle Maintenance/Engineering Quality Assurance program for maintenance and oversight.	A designated Deputy Director and Superintendent oversee the QAQC program. Certain other Quality-related activities are coordinated directly with the Office of the Chief Engineer.	COM
3.15	Element 15: Maintenance Audits and Inspections	How does Rail Vehicle Maintenance QA/QC ensure each car in the fleet is reviewed according to defined schedules?	There are reports listing out vehicle mileage for the fleet automatically distributed to Rail Vehicle Maintenance management. The QAQC team comes on location to check mileage and ensures a proper inspection process. The audit process extends to 10% of the fleet per month to ensure that all vehicles are subject to review annually. A new QAQC item includes looking at the vehicle history report	COM

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			and any work orders to ensure that there are no additional issues.	
3.16	Element 15: Maintenance Audits and Inspections	Describe the roles and responsibilities of a Rail Vehicle Maintenance QA/QC employee, including the number of employees dedicated to the QA/QC program.	The QAQC program includes frequent visits to each of the carhouse locations for audits and consistent reporting. As noted above, certain other Quality-related activities are coordinated directly with the Office of the Chief Engineer.	COM
3.17	Element 15: Maintenance Audits and Inspections	Describe a recent Rail Vehicle Maintenance QA/QC audit finding and how the department complied with the audit finding's corrective action.	In one recent example, QAQC audits noted that repairers were not consistently inspecting a switch on Red Line vehicles that were removed. In coordination with Rail Vehicle Maintenance management, QAQC arranged a reinstruction event for repairers and performed follow-up inspections.	COM
3.18	Element 17: Configuration Management	How is Rail Vehicle Maintenance involved in the MBTA's Configuration Management and Control process, such as for new procurements or modifications to Rail Vehicle Maintenance? Do employees have	Engineers are involved with establishing maintenance programs for new vehicles, which includes carhouse training, reviewing different systems, write-ups on failures, and looking at possible alterations on maintenance. In one example, there was a cable hanging too low requiring modification of Blue Line cars to correct the issue.	COM

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		the ability to provide feedback on these projects?	Transportation, Training, and OCC were involved in discussing the resolution.	
3.19	Element 17: Configuration Management	Discuss department coordination with the safety function in development, review, and documentation of proposed changes.	Proposed changes are discussed with personnel in the carhouse, with forepersons and supervisors, and are then vetted through the engineering process. MBTA Safety participates directly in the formal review and approval of major changes via the established ECN process.	COM
3.20	Element 21: Procurement	Are procurements of new equipment/vehicles reviewed by Rail Vehicle Maintenance to verify the new equipment or materials will not present a hazard to the existing system?	Original equipment manufacturer (OEM) parts are received from vendors, and any safety-sensitive parts are subject to inspections recorded in PeopleSoft. Parts not to standard receive a rejection or a configuration change notice is entered into the system. Certain parts may also receive inspection on site at the manufacturer's facility. It takes approximately 3 years to build up a supply of spare parts for new vehicles. Capital spares are available for all existing fleets.	COM
3.21	Element 10: Accident Investigation	[FIELD] Randomly select a Rail Vehicle Maintenance Engineer who investigated a major incident and review the incident	An example includes incident report (IR-2107 3606-3821 Auto/Trolley at Greycliff on February 24, 2021 by Green Line Engineering). This report included logistics, weather, a	COM

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		report created, including the process and questions used to record incidents.	description of the incident, information about the event recording, graphics indicating the vehicle speed and location, a brake test, safety check, damage, photos, a conclusion of the investigation, with approval signatures by management.	
3.22	Element 13: Rules Compliance	[FIELD] Records review: Confirm that supervisors document rule violations observed. Confirm any actions taken by department management in response to violations observed.	Management did not report any documented rule violations to the audit team, but informally manage deviations from safety rules through direct oversight and supervision of employees.	COM
3.23	Element 15: Maintenance Audits and Inspections	[FIELD] Observe a Rail Vehicle Maintenance QA/QC audit.	Due to COVID-related restrictions, the audit team did not directly observe a QAQC/QC audit. However, MBTA Safety is in continuous coordination with Rail Vehicle Maintenance and OCE to discuss QAQCQC audit trends.	COM

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#	SSPP Element	Safety Promotion (Includes activities and associated plans/procedures identified in TSP Sections 7. Safety Promotion, 8. Safety Training)	Department Response / Review Team Observations	Key
4.1	Element 16: Training and Certifications	What types of training are offered to and required of Rail Vehicle Maintenance employees such as Cleaners, Machinists, Forepersons, Supervisors and Instructors? Describe both certification/recertification components.	RVM's Superintendent of Training keeps track of all different courses offered to maintenance personnel and creates new trainings and courses. Rail Vehicle Maintenance provided the audit team with a list of all training required in each role. Rail Vehicle Maintenance trainings are currently being transitioned into a virtual format using the Learning Management System (LMS); the system will provide automated notification to employees when they are due for training. Management audits records for 10 to 20 employees weekly to ensure that trainings are current.	COM
4.2	Element 16: Training and Certifications	Is there a responsible party within Rail Vehicle Maintenance who oversees all training? What are the requirements (e.g. years of experience, education, etc.) to become an Instructor? Please describe the qualification process.	Maintenance Instructor positions require a minimum of 10 years of experience; a college degree is not required. Most instructors come from the repairer ranks rather than the foreperson position.	COM

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4.3	Element 16: Training and Certifications	How are changes to training programs communicated to MBTA Safety and any relevant departments prior to their implementation?	RVM's Superintendent of Training oversees the training program and is generally responsible for communicating any major changes to MBTA Safety. In one example, currently the department is developing an OSHA-10 course working in conjunction with the Chief of Environmental to produce the content.	COM
4.4	Element 16: Training and Certifications	How are training employees notified of updated policies and procedures from Rail Vehicle Maintenance and other applicable departments? What training or communication is required when these updates necessitate changes to Rail Vehicle Maintenance procedures?	The department treats policy/procedure updates as an 'all hands on deck' situation and strives to include most different levels. Training receives notification of changes due to their role in creating re-training or reinstruction materials for other employees.	COM
4.5	Element 16: Training and Certifications	How are training records maintained and monitored? How does an employee, and their supervisor, know when they are due for training?	The Learning Management System (LMS) is utilized for the courses that have already been uploaded, especially the email notification feature. Outside of the LMS, trainings are tracked in Excel and PeopleSoft. Rail Vehicle Maintenance has planned a training class for all upper management on	COM

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			how to manage employees on the LMS system; additional guidance is provided to Superintendents and Supervisors.	
4.6	Element 18: Workplace Safety	What processes are in place to ensure employees know and follow workplace safety rules and procedures?	The department uses toolbox talks, an electronic message board, posting on employee bulletin boards for topics such as work place safety injury prevention and other public information campaigns. If anything changes for high-risk tasks such as lock-out/tag-out, hot works, or electrical tasks, more information is forwarded to employees on a role-specific basis.	COM
4.7	Element 19: Hazardous Materials Program	What procedures are in place for employees when an incident occurs involving hazardous materials?	Safety Data Sheets (SDS) are available through Sitehawk and computer kiosks in each facility. Employees that do not have access to email received a generic login for Sitehawk. The department utilizes outside contractors that Environmental has on an active will-call contract for pumping services. There is a designated contractor for body fluids cleanup. A weekly environmental walk through is used to discuss topics such as oil storage, waste oil etc.	COM

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4.8	Element 20: Human Factors	Explain how Rail Vehicle Maintenance implements the MBTA's Fitness for Duty and Drug & Alcohol policies for employees and managers.	All managers in Rail Vehicle Maintenance take reasonable suspicion training. In the past managers have referred employees to the clinic with a reasonable suspicion inquiry.	COM
4.9	Element 20: Human Factors	Discuss applicable justifications for testing (reasonable suspicion, post-accident, random, etc.) and verify that tests are administered in accordance with applicable standards.	All supervisors receive training on applicable justifications. If any employee is involved in an accident, the employee is required to go to the clinic to receive a drug and alcohol test. Procedures are followed with questions relayed to the clinic. Some questions are directed to Transportation, as their staff are more experienced in implementing the drug and alcohol program.	COM
4.10	Element 20: Human Factors	Describe Rail Vehicle Maintenance's process when notified that an employee has been selected for a random drug & alcohol test.	One recent example, there was a random drug & alcohol test requested of a senior manager. The individual received a notification that they had one (1) hour to arrive at the clinic with directions on where to go. The individual signed in upon arrival and completed a test. Once the test was complete, the clinic provided paper work that was turned	COM

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			into a supervisor when they returned to their primary work location.	
4.11	Element 20: Human Factors	Describe what processes managers use to monitor employee fatigue and hours of service.	The department's requirements for hours of service and overtime are reportedly similarly to those on the Operations side, with no more than three overtime shifts allowed per week. Employees are prohibited from working more than 16 hours unless required during an emergency.	COM
4.12	Element 16: Training and Certifications	[FIELD] Review training program for Machinists, Forepersons, Supervisors, and Instructors to verify: a) How training records are maintained. b) That training consists of both classroom and hands-on training. c) Consistency with written training programs and/or syllabi.	A sample of training records across three rail lines included different positions and job duties. Training records are maintained in a digitized format. The records display both hands on and in the classroom training. The training appears consistent with the program file provided to MBTA Safety.	COM
4.13	Element 16: Training and Certifications	[FIELD] Review the training and certification records for a sample of	A sample of training records across all three lines included different positions and job duties.	COM

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		employees for the past three (3) years to determine if: a) The employee has completed the initial training program and refresher and remedial training as necessary. b) The course content was appropriate and adequate to meet training and recertification requirements.	The records were compliant with both initial training and recertification for Right of Way (ROW).	
4.14	Element 16: Training and Certifications	[FIELD] Through a records review: a) Verify that a process for maintaining and accessing employee training records is in place. b) Verify that categories of safety-related work requiring training and certification have been identified. c) Verify that the MBTA has processes in place to assess compliance with its	Through the records review process, all documentation was maintained in an organized manner. Both the ease of gaining access to the documentation and the detailed content of the documents, including the course titles, dates completed, and training history, sufficiently display that the department has a process in place for compliance in training and certification.	COM

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		training and certification requirements.		
4.15	Element 18: Workplace Safety	<p>[FIELD] Conduct a field inspection of an Rail Vehicle Maintenance facility in order to:</p> <p>a) Verify basic OSHA or state equivalent requirements are being met. (e.g. general housekeeping of training facilities, employee use of PPE, SDS locations, provision of first aid kits, fire extinguishers, etc.)</p> <p>b) Determine Rail Vehicle Maintenance's compliance with 454 CMR 21 – the Massachusetts "Right-to-Know" Law.</p>	<p>During the field inspection of Riverside carhouse, a facility inspection sheet, based on OSHA 1310 requirements was completed. The area was maintained and did not present any major issues or hazards. There were minor housekeeping issues noted and discussed with the Deputy Director.</p> <p>Observation: A Foreperson was interviewed regarding how to access Safety Data Sheets. They were able to navigate to the MBTA Intranet but required additional direction on how to open Sitehawk and view a specific SDS.</p>	COM



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



February 25, 2022

Ms. Elizabeth Cellucci
Director, Transportation Oversight Division
Massachusetts Department of Public Utilities (DPU)
Transportation Oversight Division
One South Station
Boston, MA 02110

Re: General Manager's Certification of Compliance

Dear Ms. Cellucci:

The Massachusetts Bay Transportation Authority ("MBTA"), as required by 220 CMR 151.05 "Internal Safety and Security Audits" and 49 CFR 673, submits MBTA's 2021 Annual Internal Safety Audit Report.

Based on the results of the internal audits conducted, I, Steve Poftak, General Manager, do hereby certify that the MBTA is in compliance with its MBTA Transit Safety Plan.

MBTA values its relationship with you, and joint efforts to work cooperatively in providing a safe and reliable rail service. Should you have any questions, comments, or concerns, please feel free to contact Ronald Ester, Chief Safety Officer, at (617) 352-4881.

Sincerely,

Steve Poftak
General Manager

February 24, 2022
Dated: _____

Enc: 2021 Annual Internal Safety Audit

Report cc: R. Ester, Chief Safety Officer

Paige Sopher

From: Catsos, Michael
Sent: Friday, February 25, 2022 11:39 AM
To: Cellucci, Elizabeth (DPU)
Cc: Limlengco, Ivana (DPU); Ester, Ronald; McDonnell, Meghan
Subject: 2021 Annual Internal Safety Audit Report and Certification of Compliance
Attachments: 2021 Annual Internal Safety Audit Report FINAL.pdf; 2021 Annual Certification of Compliance.pdf

Dear Ms. Cellucci,

On behalf of General Manager Steve Poftak and Chief Safety Officer Ronald Ester, the MBTA hereby submits the 2021 Annual Internal Safety Audit Report and GM's Certification of Compliance in accordance with 220 CMR 151.05 and 49 CFR 673.

Hard copies of these documents can be provided to DPU upon request.

Should you have any questions, please feel free to contact me.

Thank you,
Mike

Michael Catsos
Deputy Director of Safety Assurance and SMS Implementation
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com





THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

BETHANY A. CARD
SECRETARY OF ENERGY
AND ENVIRONMENTAL AFFAIRS

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BOSTON, MA 02110
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MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

December 28, 2022

VIA Electronic Mail

Mr. Ronald Ester
MBTA Chief Safety Officer
185 Kneeland Street, Floor 3
Boston, MA 02110

RE: 2022 MBTA Transit Safety Plan

Dear Mr. Ester:

The Department of Public Utilities ("Department") has completed its review of the 2022 MBTA Transit Safety Plan ("Plan"), submitted by the MBTA to the Department on December 16, 2022.

The Department conducted the review in accordance with 220 CMR 151.03(3), 49 CFR Part 674.29, and 49 CFR Part 673.13. The Department utilized Version 3 of the Public Transportation Agency Safety Plan ("PTASP") checklist for Rail Transit Agencies and State Safety Oversight Agencies, which includes the current Bipartisan Infrastructure Law PTASP requirements at 49 U.S.C. § 5329(d), to verify the Plan's compliance with current federal and Department regulations. The checklist completed by the Department is attached.

The Department hereby approves the 2022 MBTA Transit Safety Plan.

Sincerely,

/s/
Elizabeth Cellucci
Director
Transportation Oversight Division

/s/
Dave Carvalho
Assistant Director
Transportation Oversight Division

Enc.

cc:

Steve Poftak, General Manager

Jeffrey Gonneville, Deputy General Manager

David Panagore, Chief Administrative Officer

Kenneth Green, Acting Police Chief

David Carney, AGM Bus Operations

James Neider, Chief of Capital Programs

Steven Culp, Chief Investigation and Safety Assurance Officer

Michael Catsos, Deputy Director

Smith, Christopher MF. (DOT)

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Monday, April 4, 2022 3:46 PM
To: DeDonato, Matthew
Cc: Dawley, Leah (DPU)
Subject: Accepted CAPs
Attachments: MBTA CAP 8221 CAP Approval.pdf; MBTA CAP 8241 CAP Approval.pdf; MBTA CAP 8281 CAP Approval.pdf

Hi Matt,

I recently reconciled DPU's CAPs and letters, and I wanted to inform you that the below CAPs were reviewed and approved with the following approval dates, for your records. I've also attached the corresponding letters.

MBTA CAP Number	DPU Approval Date
8221	3/18/22
8241	3/17/22
8281	3/17/22

Please let me know if you have any questions.

Sincerely,
Ivana

IVANA LIMLENGCO

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Wdqvsvrudwlrq#R yhuviJkw#G lyWlrq#
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CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

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MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

December 19, 2022

VIA ELECTRONIC MAIL

Asia Williams, Deputy Director
Safety Investigations
MBTA Safety Department
185 Kneeland Street
Boston, MA 02111

RE: Somerville Fire Department Unauthorized in Right-of-Way (ROW)

Dear Ms. Williams,

On December 15, 2022, the Operations Control Center (OCC) sent an All-Page notification at 10:20 A.M. stating that the Somerville Fire Department was on the Right of Way without authorization. The notification was as follows:

“Green Line: Unauthorized in ROW Between Ball & Medford Sq. Somerville Fire was conducting a training drill without prior knowledge. They were contacted and cleared the ROW. Service stood by for 5 mins.”

Previously the Department of Public Utilities (DPU) and MBTA Safety have discussed our shared concerns about unauthorized persons – specifically fire departments – entering the ROW without MBTA authorization. Despite the MBTA’s efforts to educate fire departments on the dangers of entering the ROW without authorization, fire departments continue this unsafe practice.

First, DPU directs MBTA Safety to submit this incident as a State Reportable near-miss event, consistent with previous similar incidents of unauthorized ROW entries. Second, the DPU directs

MBTA Safety to develop a CAP to retrain the Somerville Fire Department on the notifications and procedures required prior to entering the ROW.

DPU suggests that the MBTA reinstructs Emergency Service Providers along the newly opened GLX Branches on how to notify MBTA if entry on the ROW is necessary, as well as the dangers of entering the ROW, and do so on a regular basis.

Please contact me should you have any questions.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

Cc:

R. Ester, MBTA
M. Catsos, MBTA
S. Culp, MBTA
D. Carvalho, DPU



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MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

July 26, 2022

VIA ELECTRONIC MAIL

Ronald L. Ester, Jr.
Chief Safety Officer
Massachusetts Bay Transportation Authority
10 Park Plaza, 3rd Floor
Boston, MA 02116
rester@mbta.com

CC: Steven Poftak, General Manager

RE: Uncontrolled Movement of Train Incident on July 25, 2022

Dear Mr. Ester,

I am writing regarding the Uncontrolled Movement of a Train that happened on July 25, 2002, in Caddigan Yard (the "Incident").

Based on the information presented today by the MBTA to the Department of Public Utilities (the "Department"), as well as the Federal Transit Administration (FTA), it appears that Motorpersons are not utilizing a checklist to verify basic safety features of a train prior to putting the train into service or moving a train in the yard. The Department understands and acknowledges that Motorpersons are not solely responsible for verifying a train's safety, and that several other procedures and personnel are, and should be, involved in pre-service inspections and verifications. However, this latest incident indicates that the Motorperson should have the tools and training to conduct a safety check as the last step before putting a train into service or moving a train within a yard.

Therefore, the Department directs the MBTA to submit a written checklist to be used by Motorpersons to conduct a safety check of a train prior to putting the train into service or moving

a train in the yard. Certainly, there are other issues that must be addressed as MBTA conducts a full investigation into this incident, but the creation and dissemination of a Safety Checklist is an immediate measure that will address one of many concerns raised by this incident. Please submit the Safety Checklist to the Department by close of business on July 28, 2022.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division



**THE COMMONWEALTH OF MASSACHUSETTS
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MATTHEW H. NELSON
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ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

December 2, 2022

VIA ELECTRONIC MAIL

Michael Catsos, Director
SMS and Safety Oversight
MBTA Safety Department
185 Kneeland Street
Boston, MA 02111

RE: MBTA CAP 7080 Request for Closure, Item #2.

Dear Mr. Catsos,

On November 4, 2022, the MBTA submitted a request for closure of Corrective Action Plan (CAP) 7080 item #2, related to the "Derailments while utilizing sled."

Pursuant to 220 CMR 151.07, the Department of Public Utilities ("DPU") has reviewed the MBTA's CAP and grants the request for closure of Item #2. CAP "Item #2 - Procure four (4) new dollies based on the 2015 (or newer) design. The DPU has reviewed supporting documentation that was provided and grants closure of Item #2. As both corrective action items are now closed, the DPU has closed CAP 7080.

FAX: (617) 345-9101

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

cc: P. Roman, DPU
J. Berry, MBTA



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

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MATTHEW H. NELSON
CHAIR

ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

November 21, 2022

VIA ELECTRONIC MAIL

Michael Catsos, Director
SMS and Safety Oversight
MBTA Safety Department
185 Kneeland Street
Boston, MA 02111

RE: MBTA CAP 8041 Extension Request

Dear Mr. Catsos,

The Department of Public Utilities ("DPU"), in accordance with the provisions of 220 CMR Section 151.07, has reviewed the request for extension of Item 1 of Corrective Action Plan (CAP) #8041. This CAP addresses 2020 Triennial Audit Finding 1:

"On a quarterly basis, the MBTA will provide updates on the SMS program and SMS implementation during the standing DPU / MBTA Hazard Tracking Log and CAP Review meeting. Topics will include updates on the MBTA SMS Implementation Plan milestones and related SMS activities (e.g. SRM Workshop outputs)".

The MBTA offered a new target date of completion of February 2, 2024. The Department accepts this new target date of completion.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

cc:

S. Culp, MBTA



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

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MATTHEW H. NELSON
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ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

November 21, 2022

VIA ELECTRONIC MAIL

Michael Catsos, Director
SMS and Safety Oversight
MBTA Safety Department
185 Kneeland Street
Boston, MA 02111

RE: MBTA CAP #8061 Extension Request

Dear Mr. Catsos,

The Department of Public Utilities ("DPU"), in accordance with the provisions of 220 CMR Section 151.07, has reviewed the request for extension of Item #1 of Corrective Action Plan (CAP) #8061. This CAP addresses 2020 Triennial Audit Finding #2. Item #1 states:

"MBTA Safety will review and update Section 6.4.2 'Corrective Action Plan' of the MBTA Transit Safety Plan to ensure consistency with Section 5.5 of the Massachusetts DPU Standard Operating Guidelines".

The MBTA offered a new target date of completion of December 31, 2022. The Department accepts this new target date of completion.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

cc:

S. Culp, MBTA



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

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GOVERNOR

KARYN E. POLITO
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ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

December 19, 2022

VIA ELECTRONIC MAIL

Michael Catsos, Director
SMS and Safety Oversight
MBTA Safety Department
185 Kneeland Street
Boston, MA 02111

RE: MBTA CAP 8201 Item #1 closed

Dear Mr. Catsos,

On December 13, 2022, the MBTA submitted a request for closure of Corrective Action Plan (CAP) 8201 item #1, related to "Failing to immediately report and preserve the scene of an incident / accident." Pursuant to 220 CMR §151.07, the Department of Public Utilities ("DPU") has reviewed the supporting documentation provided by MBTA and grants closure of Item #1.

Item #1 stated: Senior Director of Engineering and Maintenance with MBTA Safety will conduct remedial training to all E&M leadership, Supervisor and above, on the MBTA PADT Policy and Safety Event Investigation Manual, emphasizing the importance of following the processes in place, including the immediate notification to the OCC and supervisor when an event occurs.

Both corrective action items associated with CAP 8201 are now completed, therefore the DPU has closed CAP 8201.

Please contact me should you have any questions or concerns.

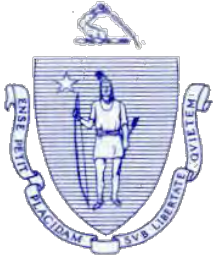
Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

cc:

P. Roman, DPU
J. Cheever MBTA
K. Murphy, MBTA



**THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES**

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GOVERNOR

KARYN E. POLITO
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ROBERT E. HAYDEN
COMMISSIONER

CECILE M. FRASER
COMMISSIONER

November 21, 2022

VIA ELECTRONIC MAIL

Michael Catsos, Director
SMS and Safety Oversight
MBTA Safety Department
185 Kneeland Street
Boston, MA 02111

RE: MBTA CAP 8501, Request for Extension, Item #1

Dear Mr. Catsos,

On October 25, 2022, the MBTA requested an extension for Corrective Action Plan (CAP) 8501, Item 1, "The Power Department will retrain the Power Dispatchers on the roles, responsibilities skills necessary to successfully execute their duties. This training will include, but not be limited to: Print Reading, Cable Isolation and Record keeping and Review" with a new completion date of January 31, 2023.

The Department approves the extension of CAP 8501, Item 1 from September 2, 2022, to January 31, 2023. Please note that the Department will perform risk monitoring activities to ensure the corrective actions have been completed by January 31, 2023.

Please contact me should you have any questions or concerns.

Sincerely,

/s/

Elizabeth Cellucci, Director
Transportation Oversight Division

cc:

D. Carvalho, DPU
S. Culp, MBTA
W. Charrette, MBTA

Paige Sopher

From: Catsos, Michael
Sent: Friday, December 16, 2022 10:21 AM
To: Cellucci, Elizabeth (DPU); Limlengco, Ivana (DPU)
Cc: Dawley, Leah (DPU); Ester, Ronald; SafetyManagers DL
Subject: MBTA 2022 Transit Safety Plan
Attachments: MBTA 2022 Transit Safety Plan - Approved Final.pdf; 2022 Transit Safety Plan - Key Revisions.pdf

Dear Ms. Cellucci:

The Massachusetts Bay Transportation Authority ("MBTA"), as required by 220 CMR 151.04(4) "Public Transportation Agency Safety Plan" and 49 CFR 673.13 "Certification of Compliance," submits the updated 2022 MBTA Transit Safety Plan for your review and approval.

In compliance with the Bipartisan Infrastructure Law, MBTA's joint labor-management safety committee approved the plan on November 22, 2022. MBTA's SMS Accountable Executive, General Manager Steve Poftak, signed the updated plan on December 9, 2022, and the MBTA Board of Directors approved the plan on December 15, 2022, pursuant to 49 CFR 673.11(a)(1).

To assist with the review process, we have also enclosed a record of revision which summarizes all key changes made between the 2021 and 2022 versions of the plan.

MBTA values its relationship with you, and the joint efforts to work cooperatively in providing a safe and reliable public transportation service. Should you have any questions, comments, or concerns, please feel free to contact me or Chief Safety Officer Ronald Ester.

Sincerely,
Mike Catsos

Michael Catsos
Director of SMS and Safety Oversight
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com



Paige Sopher

From: Catsos, Michael
Sent: Friday, December 16, 2022 10:21 AM
To: Cellucci, Elizabeth (DPU); Limlengco, Ivana (DPU)
Cc: Dawley, Leah (DPU); Ester, Ronald; SafetyManagers DL
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MBTA values its relationship with you, and the joint efforts to work cooperatively in providing a safe and reliable public transportation service. Should you have any questions, comments, or concerns, please feel free to contact me or Chief Safety Officer Ronald Ester.

Sincerely,
Mike Catsos

Michael Catsos
Director of SMS and Safety Oversight
MBTA Safety
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Cell: (617)352-6044
mcatsos@mbta.com





Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poflak, General Manager



MEMORANDUM

TO: Elizabeth Cellucci
*Director, Transportation Oversight Division
Department of Public Utilities (DPU)*

FROM: Michael Catsos
*Deputy Director of Safety Assurance and Promotion
Massachusetts Bay Transportation Authority (MBTA)*

DATE: February 15, 2022

SUBJECT: Request for Extension: MBTA Annual Internal Safety Audit Report

Per 220 CMR 151.05(3), the MBTA shall file an Annual Internal Safety Audit (ISA) Report with the Department of Public Utilities (DPU) for review and approval on or before February 15th documenting the internal audits conducted during the past calendar year.

On behalf of Chief Safety Officer Ronald Ester, I am writing to respectfully request a two-week extension to the deadline established in the DPU standard. MBTA's internal review of the Annual ISA Report is ongoing, and full approval by MBTA's executive leadership team is expected shortly.

Should you have any questions or require further clarification regarding this extension request, please contact me at (617) 352-6044 or mcatsos@mbta.com.

CC: I. Limlengco, *Assistant Director, Department of Public Utilities*
R. Ester, *Chief Safety Officer*
M. DeDonato, *Deputy Director of Safety Oversight and Planning*



MEMORANDUM

TO: Elizabeth Cellucci
Director, Transportation Oversight Division, Massachusetts Department of Public Utilities (DPU)

FROM: Ronald Ester
Chief Safety Officer, Massachusetts Bay Transportation Authority (MBTA)

DATE: August 20, 2022

SUBJECT: Completion of PTSCTP Training Requirements

This memorandum outlines commitments by the Massachusetts Bay Transportation Authority (MBTA) to complete Public Transportation Safety Certification Training Program (PTSCTP) training requirements for all designated personnel in accordance with 49 Code of Federal Regulations (CFR) Part 672 and the Federal Transit Administration's (FTA) December 2020 Notice of Enforcement Discretion.

In accordance with 49 CFR Part 672, the MBTA has designated employees directly responsible for safety oversight of the system as subject to PTSCTP training requirements. As of this date, a total of thirty-two (32) designated employees are enrolled in the PTSCTP and in active employment with MBTA's Safety Department. Four (4) employees previously designated under the PTSCTP have announced their resignation or retirement in the previous two weeks and will be removed from active status by MBTA. Of the 32 active employees, MBTA and the Department of Public Utilities (DPU) have identified two (2) employees yet to complete all required trainings offered under the PTSCTP. While these employees represent a small overall percentage of Safety Department staff, Safety shares DPU's concern regarding timely completion of the PTSCTP training program.

As described in previous meetings with DPU and partly documented in FTA's Notice of Enforcement Discretion, the following factors have impacted the ability of MBTA's designated personnel to complete applicable trainings following the effective date of the PTSCTP regulation in August 2018:

- **Restriction of Course Offerings:** Required trainings for the PTSCTP certification are scheduled on-site at the discretion of the United States Department of Transportation's Transportation Safety Institute (TSI) in coordination with FTA. MBTA's ability to complete trainings is closely dependent on TSI's ability to offer these trainings locally. While MBTA requested to host six (6) classes on-site in Fiscal Year 2022 and seven (7) classes on-site in FY 2023, TSI awarded only two (2) on-site training offerings in both

Fiscal Years, despite MBTA's large headcount and a historic rate of course offerings at six to seven per year.

- Cancellation of Course Offerings: Between March and September of 2020, twenty five (25) in-person offerings of PTSCTP required courses were cancelled by TSI.
- Headcount Restrictions: All training courses offered on-site, including TSI trainings, have been subject to headcount limitations to comply with COVID-19 safety protocols. Between 2020 and 2022, the total number of seats allotted to MBTA personnel in each on-site TSI training was reduced from approximately fifteen (15) to seven (7) employees per course.
- Travel Restrictions: Restrictions on out-of-state travel instituted by the Commonwealth of Massachusetts and MBTA between July 2020 and March 2021 prevented designated personnel from accessing out-of-state training courses, including those offered by TSI.

Safety management have established the following plan to ensure that all designated employees achieve and maintain compliance with the requirements of the PTSCTP, and will provide periodic updates to DPU regarding implementation of these action steps:

- Additional Course Offerings: Safety staff are in active dialogue with TSI representatives to expand the availability of on-site training in FY 2023 and beyond. This dialogue will ensure that courses currently scheduled to be delivered on-site align with the most critical outstanding needs of designated employees under the PTSCTP.
- Cost-Recovery Course Offerings: Management are in active negotiation with TSI regarding delivery of additional training courses funded through Safety's existing budget for staff training and certification. These trainings, while not directly supported by TSI's existing program, will allow Safety to offer additional on-site trainings that are available only to MBTA personnel and target specific MBTA training needs under the PSTCTP.
- Off-Site Training: Management-level budget discussions are being expanded to include active review of department support for off-site training opportunities, which would allow persons not in compliance or at risk of falling out of compliance to expedite their individual training program.
- Existing Safety Training Program: All MBTA Safety employees are required to complete an extensive program of internally-developed trainings prepared and released in response to key federal and state safety and regulatory requirements. The training curricula, supporting materials, and core competencies addressed via these trainings align directly with topics and concepts represented in TSI's training program. As an interim measure, Safety management will continue to monitor the training status of all PTSCTP-designated employees to ensure that they have completed all required equivalent MBTA trainings prior to PTSCTP certification.
- Waiver Process: 49 CFR Part 672.13 notes that FTA may evaluate trainings and certifications previously obtained from another entity to determine if the training satisfies applicable training requirements under the regulation; Safety management are exploring the suitability of a waiver request based on the designated employees' completion of

internal trainings and extensive programs of additional training in areas including Construction Safety and Occupational Safety and Health.

PTSCTP Required Training	Equivalent MBTA Trainings
SMS Awareness - e-learning delivery	<ul style="list-style-type: none"> • SMS Fundamentals for All Employees
Safety Assurance - e-learning delivery	<ul style="list-style-type: none"> • SMS Fundamentals for All Employees • MBTA Safety Internal Safety Audit (ISA) Training • MBTA Safety Performance and Oversight
SMS Principles for Transit	<ul style="list-style-type: none"> • SMS Fundamentals for All Employees • Safety Risk Management at the MBTA • Safety Risk Management Facilitation Training • SMS Leadership Responsibilities • MBTA Safety Performance and Oversight
Rail System Safety	<ul style="list-style-type: none"> • SMS Fundamentals for All Employees • Safety Risk Management at the MBTA • Safety Risk Management Facilitation Training • SMS Leadership Responsibilities • MBTA Safety Performance and Oversight
Effectively Managing Transit Emergencies	<ul style="list-style-type: none"> • MBTA Security Awareness and Emergency Preparedness Employee Training (SAEPET)
Rail Incident Investigation	<ul style="list-style-type: none"> • Agency Leadership • Employee Injury Response • Safety Event Response Team (SERT) • On-Scene Signals • On-Scene MOW • On-Scene Power • On-Scene Bus Transportation • On-Scene Rail Transportation

Completion of PTSCTP Training Requirements

August 20, 2022

Page 4 of 4

	<ul style="list-style-type: none">• On-Scene Rail Vehicle Maintenance• Effective Interviewing• On-Scene Safety Responder• Photographing and Video Recording the Scene – Part A• Photography Techniques Using DSLR Camera Equipment – Part B• Sketching the Scene• Post-On-Scene Investigation Activities• Causal Factors and Root Cause Analysis• Report Writing and Mitigating Actions• Signals Familiarization• MOW Familiarization• Power Familiarization• Bus Transportation Familiarization• Rail Transportation Familiarization• Rail Vehicles Familiarization
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MBTA Safety's management team acknowledges the significance of the PTSCTP as it extends to designated employees and the importance of completing remaining training requirements as expediently as possible.

Please feel free to contact me if you have any questions. Thank you.

cc: I. Limlengco, DPU
S. Culp
M. Catsos

Paige Sopher

From: Dawley, Leah (DPU) <Leah.Dawley@mass.gov>
Sent: Friday, March 25, 2022 12:09 PM
To: DeDonato, Matthew
Cc: Culp, Steven; Limlengco, Ivana (DPU); Rao, Tobias (DPU)
Subject: RE: DPU Report FY22-00139 - Derailment of Contractor Geometry Rail Pod - 011322

Matt,

DPU control number E22-024 on behalf of MBTA control number FY22-00139 is now closed in the DPU Rail database.

Thank you,

Leah Dawley

Auditor
Department of Public Utilities
Transportation Oversight Division
One South Station, Boston, MA 02110
857.260.4727

From: Culp, Steven V (MBTA) <sculp@mbta.com>
Sent: Monday, March 14, 2022 1:25 PM
To: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Cc: Roman, Paul (DPU) <paul.roman@mass.gov>; Raine, Kendrick (DPU) <Kendrick.Raine2@mass.gov>; Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>; Modh, Arun (DPU) <Arun.Modh@mass.gov>; Morris, John T (DPU) <John.T.Morris@mass.gov>; Murphy, Kathleen (MBTA) <kamurphy@MBTA.com>; Ester, Ronald (MBTA) <rester@MBTA.com>; Carvalho, David (DPU) <David.Carvalho@mass.gov>; DeDonato, Matthew (MBTA) <mddonato@MBTA.com>; Dawley, Leah (DPU) <Leah.Dawley@mass.gov>; Maher, Thomas (MBTA) <tmaher@MBTA.com>; Gomes, Alicia (MBTA) <AGomes@MBTA.com>
Subject: DPU Report FY22-00139 - Derailment of Contractor Geometry Rail Pod - 011322

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Dear Ms. Limlengco,

Attached for your review is MBTA Safety's Final Incident Report #22-00139, involving a derailment of the geometry rail pod at Riverside Yard on January 13, 2022. This report was completed for the Transportation Oversight Division of the Massachusetts Department of Public Utilities Per Requirement 220 C.M.R.§151.09(1), for your review and acceptance.

Please feel free to contact me, should you have any questions.

Thank you,
Steven

Steven V. Culp, WSO-CSSD
Chief Investigation and Safety Assurance Officer

MBTA Safety
Phone: 617-222-3471
Cell: 617-908-3143



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Smith, Christopher MF. (DOT)

From: Catsos, Michael
Sent: Friday, December 16, 2022 11:07 AM
To: Dawley, Leah (DPU)
Subject: RE: CAP 6620 - Closure Request
Attachments: CAP 6620 - DPU Standpipe CAP 2A Closure Request.doc; 20220805 Standpipe Compliance Tracker.xls

Trying again with older format closure request and spreadsheet.

From: Dawley, Leah (DPU) <leah.dawley@state.ma.us>
Sent: Wednesday, December 14, 2022 2:59 PM
To: Catsos, Michael <mcatsos@MBTA.com>
Subject: RE: CAP 6620 - Closure Request

Hi Mike,

We are unable to open this attachment. Is it just a CAP closure form?

From: Catsos, Michael <mcatsos@MBTA.com>
Sent: Wednesday, December 14, 2022 10:18 AM
To: Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>; Dawley, Leah (DPU) <Leah.Dawley@mass.gov>
Cc: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Subject: CAP 6620 - Closure Request

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.

Smith, Christopher MF. (DOT)

From: DeDonato, Matthew
Sent: Friday, June 3, 2022 1:46 PM
To: 'Limlengco, Ivana (DPU)'
Cc: 'Dawley, Leah (DPU)'; 'Morris, John T (DPU)'; 'Carvalho, David (DPU)'; Cargill, Jennifer (DPU); Connell, John
Subject: RE: CAP 8063 - DPU 2020 Triennial Audit - Capital Delivery - Request for closure
Attachments: DPU CAP Form_8063 - 2020 Triennial Finding 5 - Request for closure 6.3.22.docx; 2022.05.05 DPU Capital Programs Bimonthly Meeting Agenda.pdf; 2022.05.05 DPU Capital Programs Bimonthly Meeting Minutes.pdf

Assistant Director Limlengco,

Please see the attached request to close CAP 8063 (DPU C22-005) related to 2020 Triennial Audit Finding #5. MBTA Safety and Capital Delivery have established a bi-monthly meeting cadence during which a number of topics are discussed including the Capital Programs Master Schedule and project team list and assists in allowing the MBTA Safety Engineering Team to facilitate DPU access to Capital Delivery. In addition to the updated CAP Form, enclosed are the Meeting Agenda and Meeting Minutes from the most recent Safety / Capital Meeting. Feel free to reach out to me directly if you have any questions.

Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Wednesday, February 23, 2022 1:38 PM
To: DeDonato, Matthew <mdedonato@MBTA.com>
Cc: Dawley, Leah (DPU) <leah.dawley@state.ma.us>; Morris, John T (DPU) <john.t.morris@state.ma.us>; Carvalho, David (DPU) <david.carvalho@state.ma.us>; Cargill, Jennifer (DPU) <jennifer.cargill@state.ma.us>
Subject: RE: Report of 2020 Triennial Audit

Good afternoon Mr. DeDonato,

In accordance with the provisions of 220 CMR 151.07 (05) and (06), the DPU has completed a review of the four submitted Corrective Action Plans (CAPs) submitted on February 2, 2022. MBTA CAPs #8041, 8601, 8062, and 8063 have been accepted and added to the DPU's CAP Tracking Log.

Should you have any questions or concerns, please do not hesitate to reach out to me.

Sincerely,
Ivana

IVANA LIMLENGCO

Dvvlwdq#G lnhfr#r i#Jdl#Wdqv#Wdinw#
Ghsdwp hgw#r #Sxedf#K wldhv#
Wdqv#rwdwq#R yhu#ljkw#G ly#lvrq#
R qh#r#xwk#Wdwrq#B*#lrru#Ervwrq#P D #85443#
P relh#k#D4:16899;89#

From: Limlengco, Ivana (DPU)
Sent: Thursday, February 10, 2022 3:09 PM
To: DeDonato, Matthew (MBTA) <mdedonato@mbta.com>
Cc: Dawley, Leah (DPU) <Leah.Dawley@mass.gov>
Subject: RE: Report of 2020 Triennial Audit

Hi Matt,
I want to thank you again for resubmitting the CAPs in four separate forms. Below please find the assigned DPU control numbers:

MBTA CAP #	DPU CAP #
8041	C22-002
8061	C22-003
8062	C22-004
8063	C22-005

These CAPs are currently under DPU review. Feel free to reach out at any time if you have any questions or concerns.

Sincerely,

Ivana

From: DeDonato, Matthew (MBTA) <mdedonato@mbta.com>
Sent: Tuesday, February 8, 2022 2:41 PM
To: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Cc: Dawley, Leah (DPU) <Leah.Dawley@mass.gov>; SafetyManagers DL <SafetyManagers@MBTA.com>; Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>
Subject: RE: Report of 2020 Triennial Audit

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Assistant Director Limlengco,

In accordance with your request, attached is the updated CAP forms for the DPU 2020 Triennial Audit Findings. A separate corrective action plan has been created for each of the four open findings in the Triennial Report. Substantively, the resulting corrective actions remain the same as previously submitted. Feel free to reach out to me directly if you have any questions or concerns.
Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning

MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: DeDonato, Matthew
Sent: Wednesday, February 2, 2022 4:01 PM
To: 'Cellucci, Elizabeth (DPU)' <elizabeth.cellucci@state.ma.us>
Cc: Limlengco, Ivana <ivana.limlengco@massmail.state.ma.us>; 'Dawley, Leah (DPU)' <Leah.Dawley@mass.gov>;
SafetyManagers DL <SafetyManagers@MBTA.com>
Subject: RE: Report of 2020 Triennial Audit

Director Cellucci,

In accordance with the provisions of 220 CMR 151.07(1)(b), MBTA Safety submits the attached Corrective Action Plan to address the Department of Public Utilities 2020 Triennial Audit Findings.

Four (4) corrective actions were developed in response to the four (4) DPU findings that were still open at the time of the audit report's dissemination.

Please feel free to contact me directly if you have any further questions or concerns.

Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Cellucci, Elizabeth (DPU) <elizabeth.cellucci@state.ma.us>
Sent: Wednesday, November 3, 2021 9:55 AM
To: Ester, Ronald <rester@MBTA.com>
Cc: Poftak, Steve <spoftak@MBTA.com>; Culp, Steven <SCulp@MBTA.com>; Cargill, Jennifer (DPU) <jennifer.cargill@state.ma.us>; Limlengco, Ivana (DPU) <ivana.limlengco@state.ma.us>; Maria Wright (maria1.wright@dot.gov) <maria1.wright@dot.gov>; DeDonato, Matthew <mdedonato@MBTA.com>
Subject: Report of 2020 Triennial Audit

Ron Ester, Chief Safety Officer
Massachusetts Bay Transportation Authority
185 Kneeland Street, Suite 300
Boston, MA 02111

Dear Mr. Ester,

Pursuant to 49 CFR Part 674: State Safety Oversight; Final Rule (Part 674), the Massachusetts Department of Public Utilities (DPU) has completed a Triennial Audit of the MBTA's compliance with its Public

Transportation Agency Safety Plan (Agency Safety Plan or PTASP). Enclosed please the final report of the 2020 Triennial Audit of the Safety Program.

Elizabeth Cellucci
Director, Transportation Oversight Division
Department of Public Utilities
One South Station, 5th Floor, Boston, MA 02110
Email: Elizabeth.Cellucci@Mass.Gov
Mobile: 617.571.2247

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Smith, Christopher MF. (DOT)

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Tuesday, March 8, 2022 11:33 AM
To: DeDonato, Matthew
Cc: Raine, Kendrick (DPU); Dawley, Leah (DPU)
Subject: RE: DPU Report FY21-02540 - Derailment Riverside Yard at Track #10 -Switch #69 - 080721
Attachments: MBTA CAP # 8021 DPU # C22-006_3 8 22.pdf

Hi Matt,

Please see the attached letter regarding the acceptance of MBTA CAP #8021.

Sincerely,
Ivana

IVANA LIMLENGCO

Dv1w1dqw#G lnhfwu#r i#Jdl1#udqv1#Vdihw# #
Ghsdwp hgw#r i#Sxedf#K wldwh#
Wudqvsruwdwrg#R yhu1jkw#G ly1z1rq#
R qh#rxwk#Vdw1rg#B*#Lorru#Ervwrg#P D #B5443#
P relh#k#D4:16899;89#

From: Culp, Steven
Sent: Monday, February 7, 2022 3:41 PM
To: Limlengco, Ivana (DPU)
Cc: Roman, Paul (DPU) ; 'Lavin, Michael (DPU)' ; Raine, Kendrick (DPU) ; Cellucci, Elizabeth (DPU) ; Modh, Arun (DPU) ; Morris, John T (DPU) ; Murphy, Kathleen (MBTA) ; Ester, Ronald (MBTA) ; Carvalho, David (DPU) ; DeDonato, Matthew (MBTA) ; Dawley, Leah (DPU) ; Rosario, Stephanie (MBTA)
Subject: DPU Report FY21-02540 - Derailment Riverside Yard at Track #10 -Switch #69 - 080721

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Dear Ms. Limlengco,

Attached for your review is MBTA Safety's Final Incident Report #21-02540, involving an Light Rail Vehicle Derailment at Riverside Yard, Track #10, Switch #69 on the August 7, 2021. This report was completed for the Transportation Oversight Division of the Massachusetts Department of Public Utilities Per Requirement 220 C.M.R. §151.09(1), for your review and acceptance.

Additionally, MBTA Safety has included CAP Form #8021 for your review and acceptance.

Please feel free to contact me, should you have any questions.

Thank you,
Steven

Steven V. Culp, WSO-CSSD
Chief Investigation and Safety Assurance Officer

MBTA Safety

Phone: 617-222-3471

Cell: 617-908-3143



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Smith, Christopher MF. (DOT)

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Wednesday, February 23, 2022 1:38 PM
To: DeDonato, Matthew
Cc: Dawley, Leah (DPU); Morris, John T (DPU); Carvalho, David (DPU); Cargill, Jennifer (DPU)
Subject: RE: Report of 2020 Triennial Audit
Attachments: CAP Acceptance Letter 8041 C22 002_2 23 22.pdf; CAP Acceptance Letter 8603 C22005_2 23 22.pdf; CAP Acceptance Letter 8061 C22-003_2 23 22.pdf; CAP Acceptance Letter 8062 C22004_02 23 22.pdf

Good afternoon Mr. DeDonato,

In accordance with the provisions of 220 CMR 151.07 (05) and (06), the DPU has completed a review of the four submitted Corrective Action Plans (CAPs) submitted on February 2, 2022. MBTA CAPs #8041, 8601, 8062, and 8063 have been accepted and added to the DPU's CAP Tracking Log.

Should you have any questions or concerns, please do not hesitate to reach out to me.

Sincerely,
Ivana

IVANA LIMLENGCO

DvvlwqW#G lnhfwu#i#Jdl#Wdqvl#Wdihw| #
Ghsdup hqwr#i#Sxedf#K wdlhv#
Wudqvsruwdwrcq#R yhuwljkw#G lykvlrq##
R qh#rxwk#Wdwrcq/#B*#arru#Erwrcq#P D##B5443#
P relh#B#D4:169D;89#

From: Limlengco, Ivana (DPU)
Sent: Thursday, February 10, 2022 3:09 PM
To: DeDonato, Matthew (MBTA)
Cc: Dawley, Leah (DPU)
Subject: RE: Report of 2020 Triennial Audit

Hi Matt,
I want to thank you again for resubmitting the CAPs in four separate forms. Below please find the assigned DPU control numbers:

MBTA CAP #	DPU CAP #
8041	C22-002
8061	C22-003
8062	C22-004
8063	C22-005

These CAPs are currently under DPU review. Feel free to reach out at any time if you have any questions or concerns.

Sincerely,

Ivana

From: DeDonato, Matthew (MBTA) <mdedonato@mbta.com>
Sent: Tuesday, February 8, 2022 2:41 PM
To: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Cc: Dawley, Leah (DPU) <Leah.Dawley@mass.gov>; SafetyManagers DL <SafetyManagers@MBTA.com>; Cellucci, Elizabeth (DPU) <Elizabeth.Cellucci@mass.gov>
Subject: RE: Report of 2020 Triennial Audit

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Assistant Director Limlengco,

In accordance with your request, attached is the updated CAP forms for the DPU 2020 Triennial Audit Findings. A separate corrective action plan has been created for each of the four open findings in the Triennial Report. Substantively, the resulting corrective actions remain the same as previously submitted. Feel free to reach out to me directly if you have any questions or concerns. Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111
(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: DeDonato, Matthew
Sent: Wednesday, February 2, 2022 4:01 PM
To: 'Cellucci, Elizabeth (DPU)' <elizabeth.cellucci@state.ma.us>
Cc: Limlengco, Ivana <Ivana.limlengco@massmail.state.ma.us>; 'Dawley, Leah (DPU)' <Leah.Dawley@mass.gov>; SafetyManagers DL <SafetyManagers@MBTA.com>
Subject: RE: Report of 2020 Triennial Audit

Director Cellucci,

In accordance with the provisions of 220 CMR 151.07(1)(b), MBTA Safety submits the attached Corrective Action Plan to address the Department of Public Utilities 2020 Triennial Audit Findings. Four (4) corrective actions were developed in response to the four (4) DPU findings that were still open at the time of the audit report's dissemination. Please feel free to contact me directly if you have any further questions or concerns.

Thank you,

Matthew DeDonato
Deputy Director of Safety Oversight and Planning
MBTA Safety
185 Kneeland St
Boston, MA 02111

(office) 617-222-3074
(cell) 857-274-9888
(e-mail) mdedonato@mbta.com

From: Cellucci, Elizabeth (DPU) <elizabeth.cellucci@state.ma.us>
Sent: Wednesday, November 3, 2021 9:55 AM
To: Ester, Ronald <rester@MBTA.com>
Cc: Poftak, Steve <spoftak@MBTA.com>; Culp, Steven <SCulp@MBTA.com>; Cargill, Jennifer (DPU) <jennifer.cargill@state.ma.us>; Limlengco, Ivana (DPU) <ivana.limlengco@state.ma.us>; Maria Wright (maria1.wright@dot.gov) <maria1.wright@dot.gov>; DeDonato, Matthew <mdedonato@MBTA.com>
Subject: Report of 2020 Triennial Audit

Ron Ester, Chief Safety Officer
Massachusetts Bay Transportation Authority
185 Kneeland Street, Suite 300
Boston, MA 02111

Dear Mr. Ester,

Pursuant to 49 CFR Part 674: State Safety Oversight; Final Rule (Part 674), the Massachusetts Department of Public Utilities (DPU) has completed a Triennial Audit of the MBTA's compliance with its Public Transportation Agency Safety Plan (Agency Safety Plan or PTASP). Enclosed please the final report of the 2020 Triennial Audit of the Safety Program.

Elizabeth Cellucci
Director, Transportation Oversight Division
Department of Public Utilities
One South Station, 5th Floor, Boston, MA 02110
Email: Elizabeth.Cellucci@Mass.Gov
Mobile: 617.571.2247

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CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.

Smith, Christopher MF. (DOT)

From: Limlengco, Ivana (DPU) <ivana.limlengco@mass.gov>
Sent: Monday, January 10, 2022 4:32 PM
To: DeDonato, Matthew
Cc: Connell, John; Roman, Paul (DPU); Dawley, Leah (DPU); Maher, Thomas
Subject: RE: Standpipe CAP 6620 Update
Attachments: CAP Request for Extension MBTA #6620 CAP Item 2_1 10 22.pdf

Hi Matt,

The DPU grants the extension of Item #2 for MBTA CAP #6620. Please see the attached letter.

Please let me know if you have any questions or concerns.

Ivana

IVANA LIMLENGCO

DvvlwdqwlGlnfwur#r#JdlbWdqvWdihw#
Ghsdwp hqwr#i#Sxedf#Kwlnv#
Wudqvsruwdlrg#R yhuwjkw#G lyLlrg#
R qh#rxwk#Wdlrg/B*#arru#Ervwrg#P D ##85443#
P relh#4:6899;89#

From: Connell, John (MBTA)
Sent: Thursday, December 23, 2021 3:32 PM
To: Leaman, Elizabeth (DPU)
Cc: Cheever, Joseph (MBTA) ; Hall, Andrew (MBTA) ; Gauthier, John (MBTA) ; White, Sean (MBTA) ; Tanner, AJ ; Soltys, Thaddeus (MBTA) ; Limlengco, Ivana (DPU) ; Roman, Paul (DPU) ; Lavin, Michael (DPU) ; SafetyManagers DL
Subject: RE: Standpipe CAP 6620 Update

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CAUTION: This email originated from outside of the MBTA organization. Do not click links, open attachments, or respond unless you recognize the sender and know the content is safe.

FRA



U.S Department of Transportation

Federal Railroad Administration

Grant Agreement

1. RECIPIENT NAME AND ADDRESS

10 Park Plz Ste 1
Boston, MA 02116-3933

2. AGREEMENT NUMBER:

3. AMENDMENT NO.

4. PROJECT PERFORMANCE PERIOD: FROM TO

5. FEDERAL FUNDING PERIOD: FROM TO

1A. IRS/VENDOR NO.

1B. UEL. 1C. DUNS.

6. ACTION New

7. CFDA#:

TITLE

FEDERAL

NON-FEDERAL

TOTAL

8. PROJECT TITLE

Worcester Union Station Accessibility and Infrastructure
Improvements

9. PREVIOUS AGREEMENTS

0.00

0.00

0.00

10. THIS AGREEMENT

29,303,350.00

29,303,350.00

58,606,700.00

11. TOTAL AGREEMENT

29,303,350.00

29,303,350.00

58,606,700.00

12. INCORPORATED ATTACHMENTS

THIS AGREEMENT INCLUDES THE FOLLOWING ATTACHMENTS, INCORPORATED HEREIN AND MADE A PART HEREOF:

Standard Terms and Conditions, Attachment 1; Federal-State Partnership for State of Good Repair Clauses, Attachment 1A; Statement of Work, Attachment 2; Deliverables and
Approved Project Schedule, Attachment 3; Approved Project Budget, Attachment 4; Performance Measurements, Attachment 5

13. STATUTORY AUTHORITY FOR GRANT/ COOPERATIVE AGREEMENT

49 U.S.C. 24911 / Consolidated Appropriations Act, 2019, Public Law No. 116-6 (February 15, 2019)

14. REMARKS

GRANTEE ACCEPTANCE

AGENCY APPROVAL

15. NAME AND TITLE OF AUTHORIZED GRANTEE OFFICIAL

Ms. Mary Ann O'Hara
Chief Financial Officer

17. NAME AND TITLE OF AUTHORIZED FRA OFFICIAL

Jamie Rennert
Director, Office of Infrastructure Investment

16. SIGNATURE OF AUTHORIZED GRANTEE OFFICIAL

Electronically Signed

16A. DATE

02/22/2022

18. SIGNATURE OF AUTHORIZED FRA OFFICIAL

Electronically Signed

18A. DATE

02/24/2022

AGENCY USE ONLY

19. OBJECT CLASS CODE: 41010

20. ORGANIZATION CODE: 9022000000

21. ACCOUNTING CLASSIFICATION CODES

DOCUMENT NUMBER

FUND

BY

BPAC

AMOUNT

FR-FSP-0009-22-01-00

**U.S. Department of
Homeland Security**

**United States
Coast Guard**



Commander
First Coast Guard District

408 Atlantic Ave.
Boston, MA 02110-3350
Staff Symbol: (dpb)
781-901-0348

16593
July 15, 2022

Federal Transit Administration
Attn: Peter Butler
Regional Administrator
Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093

Re: MBTA North Station Draw 1 Bridge Replacement Project

Dear Mr. Butler:

This letter is in response to your letter dated July 12, 2022, inviting the U.S. Coast Guard to be a Cooperating Agency in the environmental review process for the MBTA North Station Draw 1 Bridge Replacement Project (the project). The Coast Guard accepts designation as a Cooperating Agency. Our intent is to work with the project team to develop an Environmental Assessment (EA) or Environmental Impact Statement (EIS) which the Coast Guard can adopt. In determining whether the EA or EIS adequately addresses the impacts of the project within the Guard's area of concern, the Coast Guard utilizes the attached EA/EIS Review Checklist. Each item on the checklist should be addressed.

To date, the Coast Guard's involvement has included attending preliminary meetings and issuing a Preliminary Navigation Clearance Determination (PNCD, Enclosure 1). The PNCD is a critical planning document in that it establishes the clearances for the new drawbridges at North Station that the Coast Guard is likely to approve, absent additional information being discovered during the permitting process. Next steps for the Coast Guard's involvement include (not necessarily in order):

Receipt of a Project Initiation Request from the bridge owner (MBTA)
Development of a project plan with the FTA in accordance with the 2014 MOU
Preparation of Coast Guard Plan sheets
Coordination of removal requirements for the existing bridge with DCR and Army Corps
Receipt of a Coast Guard Permit Application from the MBTA

The Coast Guard looks forward to working with the FTA and the MBTA on this project to upgrade capacity at North Station to better serve the transportation needs of Boston and northern New England. Please contact me at 516-241-5152 or Jeffrey Stieb, Senior Bridge Management Specialist, at 781-901-0348 if you have any questions.

Sincerely,

D.A. Fisher
Bridge Program Supervisor
U.S. Coast Guard
By direction

Copy: Karl Eckstrom, P.E, MBTA
Tess Paganelli, Manager of Environmental Construction, MBTA
Tim Chase, Coast Guard Sector Boston

Encl: Preliminary Navigation Clearance Determination, March 25, 2021
Coast Guard EA and EIS Review Checklist



16590

March 25, 2021

Massachusetts Bay Transportation Authority
Attn: Karl E. Eckstrom, PE
Sr. Project Manager – Bridge & Tunnel Group
10 Park Plaza, Suite 5170
Boston, MA 02116

Re: Preliminary Navigation Determination for MBTA Draw 1 Bridge, Charles River, Boston

Dear Mr. Eckstrom:

The Coast Guard has reviewed the Navigation Impact Report prepared by STV Incorporated submitted in July 2020, revised in November 2020, and supplemented with the Department of Conservation and Recreation concurrence on February 1, 2021. The MBTA requested the Coast Guard provide a preliminary navigation determination that a clearance envelope of 45' horizontal and 32.17' vertical above Maintained Water Level (MWL) for a new MBTA Draw 1 Bridge across the Charles River meets the current and prospective needs of navigation. Our understanding is that the present intention of the MBTA is to replace the two side by side bascule spans with three side by side lift spans which will increase the number of tracks across the river from four to six.

Based on the information presently available, we have made a preliminary determination that replacement bridges with these clearances, whether lift or bascule, will meet the current and future needs of navigation. However, if additional information is discovered during the bridge permitting process this Preliminary Navigation Determination may need to be revisited to ensure the reasonable needs of navigation are met. Please note that this preliminary determination does not constitute an approval or final agency determination, which we can make only by completing the permitting process. Please contact me or Mr. Jeffrey Stieb at jeffrey.d.stieb@uscg.mil, 617-223-8364, or 781-901-0348(m), with any questions. We look forward to working with the MBTA and moving this project forward.

Sincerely,

D.A. Fisher
Bridge Program Manager
U.S. Coast Guard
By direction

Copy: (1) Tim Chase, LCDR Lyons - Coast Guard Sector Boston
(2) William Gode-von Aesch, Director, DCR Flood Control & Navigational Operations
(3) Kristin Wood, FTA, Director of Planning and Program Development – Region 1

EA/EIS REVIEW CHECKLIST USCG LEAD AND NON-LEAD FEDERAL AGENCY

YES	NO	N/A		PAGE #	Comments
			NEPA Documentation		
			Date of EA/EIS.		
			Brief description of proposed action.		
			Statement of purpose and need for proposed action.		
			Citation that a USCG permit is needed.		
			Alternatives considered, including the proposed action.		
			Description of alternatives, including the proposed action and no-action in comparative form.		
			Description of Site History.		
			States the Lead Federal Agency.		
			States the Cooperating Agencies for project.		
			States whether the EA or EIS has been modified, reevaluated, supplemented or rescinded for the proposed action.		

			Mitigation – USCG LFA ONLY		
			EA/EIS must contain a mitigation matrix or table. This may be documented in a separate chapter.		
			Mitigation commitments include compensatory mitigation.		
			Description of the anticipated benefit of the mitigation. Environmental planning documents must identify those measures that result from regulatory compliance requirements such as ESA consultation or MMPA permitting.		
			Criteria for evaluating the efficacy of mitigation applied to avoid significance or reduce the severity or intensity of the impacts of an action.		
			Description of how the mitigation measures will be implemented and monitored.		
			Assignment of command/program responsibility for implementing mitigation measures and determining their effectiveness (i.e. through monitoring).		
			Estimated completion date for implementation of the mitigation, as applicable.		

			Environmental Effects Abroad – Executive Order 12114		
			Does the proposed project involve a bridge connection to Canada or Mexico?		
			If yes, any CEQ and DOS comment, as appropriate.		

EA/EIS REVIEW CHECKLIST USCG LEAD AND NON-LEAD FEDERAL AGENCY

			Water Quality – Clean Water Act		
			Description of water resources.		
			Discusses impacts to water resources from bridge.		
			States whether Water Quality Certification is required and the status of the application (if applicable).		
			Discusses mitigation measures.		
			Consultation and coordination (letters, meeting minutes, reports). EPA comment, if applicable.		

			Wetlands – Executive Order 11990		
			Description of wetlands.		
			Discusses impacts to wetlands (temporary and permanent) from bridge.		
			Discusses mitigation measures.		
			Consultation and coordination (letters, meeting minutes, reports) with USACE if mitigation measures are taken.		

			Coastal Zone Management Act		
			States if project is within boundaries of State(s) CZM Program.		
			Identifies State(s) Coastal Zone Management (CZM) Program, if applicable.		
			Certifies that project is consistent with CZM program(s).		
			State concurrence for CZM, if applicable.		

			Floodplains – Executive Order 11988		
			States if project is located in the base floodplain.		
			Gives 100-year flood elevation.		
			Discusses impacts of bridge project on floodplains.		
			Consultation and coordination (letters, meeting minutes, reports) with FEMA.		

			Wild and Scenic Rivers Act		
			Is the river involved in the proposed bridge project a designated Wild and Scenic River segment or listed on the Nationwide Rivers Inventory?		

EA/EIS REVIEW CHECKLIST USCG LEAD AND NON-LEAD FEDERAL AGENCY

			If yes, discusses impacts to the river segment, mitigation, and other compliance with Section 7 of the Wild and Scenic Rivers Act of 1968 (including correspondence with the river-administering agency).		
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			Coastal Barrier Resources Act		
			Does the proposed project connect to a unit of the Coastal Barrier Resources System?		
			If yes and the project is federally funded, does the EA/EIS discuss impacts to the coastal barrier resource, mitigation, and includes Section 6 exception and coordination with FWS?		

			Land and Water Conservation Fund Act		
			States if the project will require a conversion of land funded by the LWCFA.		
			Correspondence with the NPS, State Liaison Officer (SLO), and authorization from the Secretary of the Interior, if applicable.		

			National Marine Sanctuary Act and Marine Protected Areas		
			States if the proposed project is in or adjacent to a National Marine Sanctuary or Marine Protected Area.		
			If so, is the proposed bridge likely to destroy, cause loss of, or injure a resource of a National Marine Sanctuary? If so, include a sanctuary resource statement.		
			Gives mitigation measures and correspondence with NOAA's ONMS or the relevant MPA.		
			If yes, includes consultation and coordination (letter of authorization) with NMFS.		

			Endangered and Threatened Species Act		
			Description of endangered, threatened, and candidate species, and critical habitat.		
			Discusses impacts to endangered, threatened, and candidate species, and critical habitat.		
			Provides date of Biological Assessment (separate or included in NEPA document).		
			Provides mitigation measures.		
			Timeline of consultation with FWS and/or NMFS.		

EA/EIS REVIEW CHECKLIST USCG LEAD AND NON-LEAD FEDERAL AGENCY

			Provides relevant correspondence with USFWS/NMFS (Review the Final EA or EIS for the concurrence, if not final at this point).		
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			Essential Fish Habitat – Magnuson-Stevens Fishery Conservation and Management Act		
			Description of Essential Fish Habitat (EFH).		
			Discusses impacts to EFH from proposed bridge.		
			Provides mitigation measures.		
			Consultation and coordination (letters, meeting, minutes, reports) with the NMFS.		

			Fish and Wildlife Coordination Act		
			Description of fish and wildlife.		
			Discusses impacts to fish and wildlife.		
			Discusses mitigation measures.		
			Correspondence with USFWS and the relevant state wildlife agency(ies) regarding FWCA coordination.		

			Marine Mammals Protection Act		
			Description of marine mammals.		
			Discusses impacts to marine mammals.		
			Will the proposed project involve a “take” of marine mammals?		
			Discusses mitigation measures.		
			Correspondence with NMFS and/or FWS.		

			Migratory Bird Treaty Act and Executive Order 13186		
			Description of migratory birds.		
			Discusses impacts to migratory birds.		
			Will the project involve a potential take of migratory birds?		
			Is a permit from USFWS required?		
			Discusses mitigation measures.		
			Correspondence with USFWS if a permit is required.		

			Bald and Golden Eagle Protection Act		
			Description of eagles in the project area.		
			Discusses impacts to eagles.		

EA/EIS REVIEW CHECKLIST USCG LEAD AND NON-LEAD FEDERAL AGENCY

			Will the proposed project take or disturb bald or golden eagles (including nests)?		
			Is a permit from USFWS required?		
			Correspondence with USFWS.		

			Invasive Species – Executive Order 13112		
			Description of invasive species.		
			Discusses impacts to invasive species and their spread.		
			Discusses mitigation measures.		

			National Historic Preservation Act – Section 106		
			Description of historic, archaeological, and cultural resources.		
			Discusses impacts to historic, archaeological, and cultural resources.		
			Discusses mitigation measures.		
			If the project has potential to impact Section 106 properties, does the EA or EIS provide evidence of consultation with the State Historic Preservation Officer (and the Advisory Council on Historic preservation, if applicable)?		
			Date of Memorandum of Agreement (MOA), if applicable (Make note to review Final EA or EIS for the MOA, if not final at this point)		
			If project is located on federal or Native American land, provide compliance with Archeological Resources Protection Act of 1979 (ARPA) and/or Antiquities Act of 1906.		
			If project involves collection of human remains, funerary objects, sacred objects, or other similar objects associated with Indian tribes and native Hawaiian organizations, provide compliance with the Native American Graves Protection and Repatriation Act.		
			If project involves the disturbance or destruction of shipwrecks located on state submerged lands, provide compliance with the Abandoned Shipwreck Act of 1987.		

			Clean Air Act		
			Description of air quality in the project area.		
			Discusses impacts from construction and operation.		
			Discusses mitigation measures.		

EA/EIS REVIEW CHECKLIST USCG LEAD AND NON-LEAD FEDERAL AGENCY

			States whether the project is in an area of attainment, maintenance, or nonattainment for each of the criteria pollutants in the NAAQS.		
			If project occurs in a nonattainment or maintenance area, states if the transportation or general conformity regulations, or both, apply.		
			If applicable, provides exemption (s) from a transportation conformity analysis for any of the reasons listed in 40 CFR 93.126 and provides the reason.		
			If applicable, provides exemption (s) from a general conformity analysis for any of the reasons listed in 40 CFR 93.153(c) and provides the reason.		
			If transportation conformity applies, is the project listed in a conforming SIP, FIP, TIP, and/or RTP.		

			Environmental Justice – Executive Order 12898		
			Discusses impacts to minority or low-income populations and determines whether those impacts are disproportionately adverse.		
			Discusses mitigation measures.		
			Interagency Working Group on Environmental Justice comment, if applicable.		

			CERCLA – RCRA – Hazardous Materials, Substances, or Wastes		
			Description of contaminated sites.		
			Discusses compliance with Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA) or State law regulating hazardous materials, substances, or wastes.		



U.S Department of Transportation

Federal Railroad Administration

Grant Agreement

1. RECIPIENT NAME AND ADDRESS

10 Park Plz Ste 1
Boston, MA 02116-3933

2. AGREEMENT NUMBER:

3. AMENDMENT NO.

4. PROJECT PERFORMANCE PERIOD: FROM TO

5. FEDERAL FUNDING PERIOD: FROM TO

1A. IRS/VENDOR NO.

1B. UEL. 1C. DUNS.

6. ACTION New

7. CFDA#:

TITLE

FEDERAL

NON-FEDERAL

TOTAL

8. PROJECT TITLE

Worcester Union Station Accessibility and Infrastructure
Improvements

9. PREVIOUS AGREEMENTS

0.00

0.00

0.00

10. THIS AGREEMENT

29,303,350.00

29,303,350.00

58,606,700.00

11. TOTAL AGREEMENT

29,303,350.00

29,303,350.00

58,606,700.00

12. INCORPORATED ATTACHMENTS

THIS AGREEMENT INCLUDES THE FOLLOWING ATTACHMENTS, INCORPORATED HEREIN AND MADE A PART HEREOF:

Standard Terms and Conditions, Attachment 1; Federal-State Partnership for State of Good Repair Clauses, Attachment 1A; Statement of Work, Attachment 2; Deliverables and
Approved Project Schedule, Attachment 3; Approved Project Budget, Attachment 4; Performance Measurements, Attachment 5

13. STATUTORY AUTHORITY FOR GRANT/ COOPERATIVE AGREEMENT

49 U.S.C. 24911 / Consolidated Appropriations Act, 2019, Public Law No. 116-6 (February 15, 2019)

14. REMARKS

GRANTEE ACCEPTANCE

AGENCY APPROVAL

15. NAME AND TITLE OF AUTHORIZED GRANTEE OFFICIAL

Ms. Mary Ann O'Hara
Chief Financial Officer

17. NAME AND TITLE OF AUTHORIZED FRA OFFICIAL

Jamie Rennert
Director, Office of Infrastructure Investment

16. SIGNATURE OF AUTHORIZED GRANTEE OFFICIAL

Electronically Signed

16A. DATE

02/22/2022

18. SIGNATURE OF AUTHORIZED FRA OFFICIAL

Electronically Signed

18A. DATE

02/24/2022

AGENCY USE ONLY

19. OBJECT CLASS CODE: 41010

20. ORGANIZATION CODE: 9022000000

21. ACCOUNTING CLASSIFICATION CODES

DOCUMENT NUMBER

FUND

BY

BPAC

AMOUNT

FR-FSP-0009-22-01-00

AWARD ATTACHMENTS

Massachusetts Bay Transportation Authority

69A36522403180FSPMA

1. Standard Terms and Conditions, Attachment 1
2. Federal-State Partnership for State of Good Repair Clauses, Attachment 1A
3. Statement of Work, Attachment 2
4. Deliverables and Approved Project Schedule, Attachment 3
5. Approved Project Budget, Attachment 4
6. Performance Measurements, Attachment 5



U.S. Department of
Transportation
Federal Highway
Administration

Notice of Funding Opportunity (NOFO) Number
693JJ322NF00002

*“Commuter Authority Rail Safety Improvement (CARSI)
Grants-Round 2”*

NOFO Issue Date: 2/14/2022
Info Webinar Date: 3/3/2022 (see page 4 for info)
Application Due Date: 4/14/2022
Estimated Award Date: July 2022

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The U.S. Department of Transportation is using www.grants.gov for issuance of this Notice of Funding Opportunity and for receipt of all applications. Applicants must register and use the system to submit applications electronically. Applicants are encouraged to register in advance of the submission deadline and to register to receive notifications of updates/amendments to this notice. Approval of user registrations for the site may take multiple weeks. It is the Applicant's responsibility to monitor www.grants.gov for any updates to this notice.

SUMMARY INFORMATION

Funding Opportunity Summary:	\$59,744,250 in Federal funding available to award Commuter Authority Rail Safety Improvement Grants to eligible entities.
Federal Agency Name:	U.S. Department of Transportation Federal Highway Administration (FHWA) 1200 New Jersey Avenue, SE Mail Drop: E62-204 Washington, DC 20590
Funding Opportunity Title:	Commuter Authority Rail Safety Improvement (CARSI) Grants – Round 2
Announcement Type:	This is a follow-on announcement for the CARSI Round 2 funding opportunity. (See CARSI Round 1 project selections at: https://cms8.fhwa.dot.gov/newsroom/us-department-transportation-awards-40-million-grants-improve-safety-highway-railway .)
Funding Opportunity Number:	693JJ322NF00002
Type of Award:	Multiple Grants
Assistance Listing Number (ALN):	20.205 Highway Planning and Construction (formerly Catalog of Federal Domestic Assistance)
Application Due Date:	April 14, 2022, BY 11:59 PM EASTERN via Grants.gov
Questions:	Sarah Tarpgaard, FHWA Agreement Officer FHWA Office of Acquisition and Grants Management Sarah.Tarpgaard@dot.gov
Estimated Announcement of Selected Awardees:	July 2022

Funding Opportunity Informational Webinar – Date March 3, 2022

The FHWA will host an *Informational Webinar* regarding this funding opportunity, to help potential applicants understand the opportunity requirements and answer applicant questions. Participation in this session is not mandatory in order to submit an application under this solicitation. However, we encourage potential applicants to take advantage of this opportunity to gather information regarding this funding opportunity.

Webinar Date: March 3, 2022, from 2:00 to 3:30 pm Eastern

To Register: Send participant name, title, email, and organization name to Sarah.Tarpgaard@dot.gov by March 1, 2022, to receive Meeting Invite with Webinar link.

Recording: FHWA intends to post the webinar recording to the Grants.gov notice.

SECTION A – PROGRAM DESCRIPTION

1. STATEMENT OF PURPOSE

The purpose of this grant program is to improve safety at public railway-highway crossings. The program provides funding to eligible entities for the construction of projects for the elimination of hazards at railway-highway crossings.

2. LEGISLATIVE AUTHORITY

Funding for this Notice of Funding Opportunity (NOFO) is available from two separate Fiscal Year (FY) Appropriations Acts, FY 2020 and FY 2021, as described below.

1. FY 2020: The Transportation, Housing and Urban Development, and Related Agencies Appropriations Act, 2020 (Public Law 116-94) (FY 2020 Appropriations Act), appropriated \$50 million to the U.S. Department of Transportation (DOT) to award competitive grants for activities described in Section 130(a) of Title 23, United States Code (U.S.C.) railway-highway crossings.

Per the FY 2020 Appropriations Act, which requires that the funds be administered as if they are apportioned under Chapter 1 of Title 23, and 23 U.S.C. 130(f)(3), the Federal share shall be not more than 90 percent.

In August 2020, DOT issued a NOFO for CARSI round 1 which resulted in the selection and award of five grant projects with a cumulative Federal value of \$40,255,750. The DOT announced the selected CARSI round 1 projects in January 2021. A list of the selected projects is available at:
<https://cms8.fhwa.dot.gov/newsroom/us-department-transportation-awards-40-million-grants-improve-safety-highway-railway>.

Federal funding in the amount of \$9,744,250, which was not committed to projects during CARSI round 1, is now available through this NOFO for CARSI round 2.

2. FY 2021: The Transportation, Housing and Urban Development, and Related Agencies Appropriations Act, 2021 (Public Law 116-260) (FY 2021 Appropriations Act), appropriated \$50 million to DOT to award competitive grants for activities described in Section 130(a) of Title 23, U.S.C. railway-highway crossings, which states:

130(a) Subject to section 120 and subsection (b) of this section, the entire cost of construction of projects for the elimination of hazards of railway-highway crossings, including the separation or protection of grades at crossings, the reconstruction of existing railroad grade crossing structures, the relocation of highways to eliminate grade crossings, and projects at grade crossings to eliminate hazards posed by blocked grade crossings due to idling trains, may be

paid from sums apportioned in accordance with section 104 of this title. In any case when the elimination of the hazards of a railway-highway crossing can be effected by the relocation of a portion of a railway at a cost estimated by the Secretary to be less than the cost of such elimination by one of the methods mentioned in the first sentence of this section, then the entire cost of such relocation project, subject to section 120 and subsection (b) of this section, may be paid from sums apportioned in accordance with section 104 of this title.

Per the FY 2021 Appropriations Act, which requires that the funds be administered as if they are apportioned under Chapter 1 of Title 23, and 23 U.S.C. 130(f)(3), the Federal share shall be 100 percent.

SUMMARY	FY 2020 Appropriation Act	FY 2021 Appropriation Act	Total
Funding Available under this NOFO	\$9,744,250 (Available until expended)	\$50,000,000 (Available until September 2024)	\$59,744,250
Cost Share Required per Legislation	10% of project cost	0%	

3. GOALS

Specific program goals include:

- 1) Improve safety at railway-highway crossings through the elimination of hazards at public railway-highway crossings;
- 2) Reduce fatalities, serious injuries, and crashes at public railway-highway crossings;
- 3) Reduce the number of existing public at-grade crossings by closure or grade separation; and
- 4) Reduce delays or improve system performance by eliminating hazards posed by blocked grade crossings due to idling trains.

4. ELIGIBLE PROJECTS

The funds must support the construction of projects for the elimination of hazards at railway-highway crossings. See Section C, Eligibility Information, for details.

5. PROJECT DESCRIPTION

The Recipient shall perform the project in accordance with the Recipient's approved

Project Narrative, which will be incorporated into the award as an attachment.

6. MILESTONES/DELIVERABLES

Recipients will be required to meet the following milestones/deliverables:

Grant Milestones/Deliverables	Approximate Due Date	Section 508 Compliant?
Kick-off Meeting – conduct a kick-off meeting with FHWA at a mutually-agreed-upon location. Kick-off Meeting may be virtual or in-person based on mutual agreement of the parties, and is estimated not to exceed 2 hours.	Within 3 weeks after the effective date of award.	No
Quarterly Progress Reports – document activities performed, anticipated activities, and any changes to schedule or anticipated issues. See Quarterly Progress Report clause for required content.	Within 30 days of the end of each quarter.	No
Annual Budget Review and Program Plan – provide a detailed schedule of activities, estimate of specific performance objectives, include forecasted expenditures, and schedule of milestones for the upcoming year. See Annual Review and Program Plan clause for required content.	60 days prior to the anniversary date of this agreement.	No

SECTION B – FEDERAL AWARD INFORMATION

1. FUNDING AND NUMBER OF AWARDS

This notice announces the availability of up to \$59,744,250 in Federal funding for eligible projects, available to eligible entities.

The Government's obligation under the planned grants is contingent upon the availability of funding from which payment for grant purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available for the award and until the awardee receives notice of such availability, to be confirmed in writing by the Agreement Officer (AO) or authorized FHWA personnel.

The FY 2020 funds provided for this program shall remain available until expended. The FY 2021 funds provided for this program shall remain available until September 2024.

The Government anticipates making multiple grant awards under this NOFO, subject to the availability of funds. The Government reserves the right to make one or none if determined to be in the best interest of the Government based on applications received.

Selection of an application to receive grant funding is not a commitment of any future funding.

There are no required minimum or maximum award amounts.

2. TYPE OF AWARD

The planned award type is a cost-reimbursable grant agreement by direct award to the applicant, or through an allocation of funding to the relevant State department of transportation (State DOT). Upon completion of a project, funds that are not expended are to be recovered and returned to FHWA.

3. PERIOD OF PERFORMANCE

The grant period of performance will vary by award and must be proposed by the applicant depending upon the needs of the proposed project. Estimated duration of grant awards is 1 to 4 years.

4. DEGREE OF FEDERAL INVOLVEMENT

The FHWA will monitor performance and conduct financial oversight.

SECTION C – ELIGIBILITY INFORMATION

To be selected for a grant award, an applicant must be an Eligible Applicant and the projects must be Eligible Projects.

1. ELIGIBLE APPLICANTS

This competition is open to all eligible applicants. Applicants **MUST** meet the following eligibility criteria to be considered for award. Applicants who do not meet the eligibility criteria should not respond to this NOFO.

An applicant must be a “commuter authority” as defined in 49 U.S.C. 24102, which is a State, local, or regional entity established to provide, or make a contract for, commuter rail passenger transportation. An eligible commuter authority must have experienced at least one accident investigated by the National Transportation Safety Board (NTSB) between January 1, 2008, and December 31, 2018, and for which the NTSB issued an accident report.

The applicant must be either: (1) a commuter authority that meets the eligibility requirements listed above; OR (2) a public or non-profit entity partnering with an eligible commuter authority.

NOTE: Applicants are encouraged to partner with their State department of transportation (State DOT) and are encouraged to have their State DOT apply as the prime applicant for receipt of DOT Federal funding. As appropriate, awards may be made to State DOTs as pass-through grantees for administration of the funds to a commuter authority as a subawardee. Per Title 2, Code of Federal Regulations (CFR), Part 200.1, a pass-through entity is a non-Federal entity that provides a subaward to a subrecipient to carry out part of a Federal program.

NOTE: If eligible commuter authority applicants operate on a rail corridor owned by an entity other than the commuter authority, a letter from the rail owners is required supporting the proposed project. See Section D, below.

NOTE: Those Applicants who received grant awards under CARS round 1 remain eligible for CARS round 2 with no restrictions.

2. COST SHARING OR MATCHING

Cost sharing or matching is required for the FY 2020 portion of the NOFO funding available as follows. Cost sharing or matching means the portion of project costs not paid by Federal funds. For a more complete definition, please see 2 CFR 200.306 on Cost Sharing or matching. Other Federal funds cannot be considered as part of the matching funds, unless otherwise allowed by statute. No cost sharing or matching is required for the FY2021 portion of the NOFO funding. See table below.

SUMMARY	FY 2020	FY 2021
Funding Available under this NOFO	\$9,744,250	\$50,000,000
Cost Share Required per Legislation	10% of project costs	0%

For selected projects funded with FY 2020 funds, a minimum non-Federal cost share of 10 percent of the project cost is required. For selected projects funded with FY 2021 funds, no cost share is required. The DOT will decide which fiscal year funding is used on individual selected grants, taking into account the cost share requirements of the funding.

Note: If applicable, any program income generated under the project must be handled in accordance with SECTION F.

3. ELIGIBLE PROJECTS

Eligible projects under this grant program are limited to the following:

- the separation or protection of grades at crossings;
- the reconstruction of existing railroad grade crossing structures;
- the relocation of highways to eliminate grade crossings; or
- projects at grade crossings to eliminate hazards posed by blocked grade crossings due to idling trains.

NOTE: The proposed location of the project is not required to be the location of the accident previously investigated by the NTSB. The proposed location of the project is up to the discretion of the applicant.

SECTION D – APPLICATION AND SUBMISSION INFORMATION

1. APPLICATION PACKAGE

Applicants may obtain application forms at www.Grants.gov under the NOFO number cited herein. The Applicant must complete and submit all forms included in the application package for this notice as contained at www.Grants.gov.

NOTE: Applicants must have a registered Grants.gov account to use the system. Obtaining an account can involve multiple steps and numerous days. Please see the Grants.gov Website for detailed instructions, training videos, an online user guide, and a help desk.

2. CONTENT AND FORMAT OF APPLICATION SUBMISSION

Format:

- Application must be prepared on 8½ x 11-inch pages. Pages that exceed this size, such as foldout size or legal size, are not allowable.
- Narrative text must be printed using a font size no less than 12-point font.
- Tables are permitted. Text in tables may be smaller than 12-point font but must be legible.
- Page margins must be a minimum of 1-inch top, bottom and each side.
- Page numbers may be located within the 1-inch margins.
- A Header or Footer identifying the Applicant/Team and the Volume or Part, may be located within the 1-inch margins.
- PAGE LIMITS: Application volumes shall adhere to the page count limitations listed below. In the event an application volume exceeds the page limitation the Government will evaluate only the pages identified within the page limitation. The page count limitations include all narrative, figures, tables, appendices, and all other ancillary materials with the exception of the following.
- EXCEPTIONS ON PAGE LIMITS: The following items do NOT count against the page limitations.
 - a. Document covers;
 - b. Cover letters/cover pages;
 - c. Title pages;
 - d. Divider pages;
 - e. Tables of contents;
 - f. Lists of acronyms;
 - g. Letters of support or intent to participate from proposed subcontractors, consultants, partners, and proposed new hires; and
 - h. Resumes. (Note: Resumes are not required, but if submitted are limited to two-pages each.)

Content of Application Submission:

The application must include the following two Volumes:

1. Volume 1 – Project Application

- a. Cover Page
- b. Project Narrative (30-page limit on Project Narrative section)
- c. Project Readiness (no page limit)
- d. Letters of Support (no page limit)
- e. Benefit-Cost Analysis (no page limit)

2. Volume 2 – Budget Application - no page limit

- a. Application Forms
- b. Cost Breakdown
- c. Other Business Information

Volume 1 – Project Application – include the following:

- a. Cover Page. Include the project name, project location, name of eligible entity applying to receive Federal funding, total project cost (from all sources), amount Federal funding requested, and amount of non-Federal share proposed if applicable.
- b. Project Narrative (30-page limit). Include the information necessary for FHWA to determine that the project satisfies the eligibility criteria described in Section C above and to assess how the application addresses the selection criteria specified in Section E. Provide the following information at a minimum:
 - i. Statement of applicant eligibility. Provide written confirmation and an explanation of how the applicant complies with NOFO Section C.1, Eligible Applicants, which states an Applicant must be a commuter authority, or a public or non-profit entity partnering with an eligible commuter authority, that has experienced at least one accident investigated by the NTSB between January 1, 2008, and December 31, 2018, and for which the NTSB issued an accident report.
 - ii. Statement of project eligibility. Provide written confirmation and an explanation of how the project complies with NOFO Section C.3, Eligible Projects.
 - iii. Project description. Provide a concise description of the proposed project, the safety problem(s) it is expected to address, and how it will address the identified safety problem(s). Describe the project location and the entities involved in implementation of the project including their respective roles in supporting the project.

NOTE: The proposed location of the project is not required to be the location of the accident previously investigated by the NTSB. The proposed location of the project is up to the discretion of the applicant.

- iv. Safety impacts. Provide a description of the safety impacts that will result from the project. Describe how the project will deliver the following safety impacts, as applicable to the project:
 1. Improve safety at railway-highway crossings through the elimination of hazards at public railway-highway crossings;
 2. Reduce fatalities, serious injuries, and crashes at public railway-highway crossings;
 3. Reduce the number of existing public at-grade crossings by closure or grade separation; and
 4. Reduce delays or improve system performance by eliminating hazards posed by blocked grade crossings due to idling trains.
- v. Safety impact and performance metrics. Provide proposed quantifiable projections, measures and metrics for the project, such as:
 - Provide proposed quantifiable system performance improvement projections, such as reducing traffic-related crashes, congestion, and costs; optimizing system efficiency; and improving access to transportation services.
 - Provide proposed quantifiable safety, mobility, and environmental benefit projections such as data-driven estimates of how the project will improve the commuter rail authority's system efficiency or reduce delay, fatalities, serious injuries or crashes, or idling.
- vi. Quality of Life Impact. Describe how the project addresses quality of life in the following priority areas if applicable.
 1. Racial Equity and Barriers to Opportunity: Describe the extent to which the project, (i) increases transportation choices and equity for individuals; (ii) expands access to essential services for communities across the United States, particularly for underserved or disadvantaged communities; (iii) improves connectivity for citizens to jobs, health care, and other critical destinations, or (iv) proactively addresses racial equity and barriers to opportunity, as reflected in [Executive Order 13985](#), Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, through the planning process or through incorporation of design elements.

Describe how the project addresses equity issues as identified in the

Executive Order, including but not limited to the following examples if applicable: (a) A racial equity impact analysis has been completed for the project; (b) The project sponsor has adopted an equity and inclusion program/plan or has otherwise instituted equity-focused policies related to project procurement, material sourcing, construction, inspection, hiring, or other activities designed to ensure racial equity in the overall project delivery and implementation.

2. Climate Change and Sustainability: Describe the extent to which the project demonstrates effort to consider climate change and sustainability impacts in support of Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad* (86 FR 7619). Describe how the project addresses climate change and sustainability issues as identified in the Executive Order.
3. Rural Outcomes: If applicable, describe the extent to which the project addresses rural transportation networks, consistent with DOT's R.O.U.T.E.S. initiative (<https://www.transportation.gov/rural>). The Department recognizes that rural transportation networks face unique challenges in safety, infrastructure condition, and passenger and freight usage.

vii. Summary of benefit-cost analysis. Summarize the conclusions of the project's benefit-cost analysis including estimates of the project's benefit-cost ratio and net benefits. Describe other data-supported benefits that are not included in the benefit-cost analysis. NOTE: The benefit-cost analysis itself should be provided separately in Volume 1, Section e.

c. Project Readiness. The Project Readiness section should include information that, when considered with the project budget information presented elsewhere in the application, is sufficient for the Department to evaluate whether the project is reasonably expected to begin construction in a timely manner and the likelihood of a successful project. Provide the following at a minimum:

- i. Technical Feasibility. Demonstrate the technical feasibility of the project with engineering and design studies and activities; the development of design criteria and/or a basis of design; the basis for the cost estimate presented in the CARSI application, including the identification of contingency levels appropriate to its level of design; and any scope, schedule, and budget risk-mitigation measures. Include a detailed statement of work that focuses on the technical and engineering aspects of the project and describes in detail the project to be constructed.
- ii. Project Schedule. Include a detailed project schedule that identifies all major project milestones. Examples of such milestones include State and local planning approvals (programming on the Statewide Transportation

Improvement Program (STIP)), start and completion of National Environmental Policy Act (NEPA) and other Federal environmental reviews and approvals including permitting; design completion; right-of-way acquisition; approval of plans, specifications and estimates; procurement; State and local approvals; project partnership and implementation agreements including agreements with railroads; and construction. The project schedule should be sufficiently detailed to demonstrate that:

- (1) All necessary activities will be completed to allow CARSI funds to be obligated in a timely manner;
- (2) The project can begin construction quickly upon obligation of CARSI funds, and that the grant funds will be spent expeditiously once construction starts; and
- (3) All real property and right-of-way acquisition will be completed in a timely manner in accordance with 49 CFR part 24, 23 CFR part 710, and other applicable legal requirements or a statement that no acquisition is necessary.

iii. Required Approvals, Environmental Permits and Reviews. Demonstrate receipt (or reasonably anticipated receipt) of all environmental approvals and permits necessary for the project to proceed to construction on the timeline specified in the project schedule, including satisfaction of all Federal, State, and local requirements and completion of the NEPA process. Specifically, the application should include:

- (1) Information about the NEPA status of the project. Indicate the date of completion of the NEPA process and provide a Website link or other reference to the final Categorical Exclusion, Finding of No Significant Impact, Record of Decision, and any other NEPA documents prepared. If the NEPA process is underway, but not complete, detail the type of NEPA review underway, where the project is in the process, and indicate the anticipated date of completion of all milestones and of the final NEPA determination. If the last agency action with respect to NEPA documents occurred more than 3 years before the application date, describe why the project has been delayed and include a proposed approach for verifying and, if necessary, updating this material in accordance with applicable NEPA requirements.
- (2) Information on reviews, approvals, and permits by other agencies. Indicate whether the proposed project requires reviews or approval actions by other agencies, indicate the status of such actions, and provide detailed information about the status of those reviews or

approvals. Demonstrate compliance with any other applicable Federal, State, or local requirements, including when such approvals are expected. Provide a Website link or other reference to copies of any reviews, approvals, and permits prepared. NOTE: Projects that may impact protected resources such as wetlands, species habitat, cultural or historic resources require review and approval by Federal and State agencies with jurisdiction over those resources.

- (3) Environmental studies or other documents—preferably through a Website link—that describe in detail known project impacts, and possible mitigation for those impacts.
- (4) A description of discussions with the appropriate FHWA field or Headquarters office regarding the project's compliance with NEPA and other applicable Federal environmental reviews and approvals.
- (5) A description of public engagement about the project that has occurred, including details on the degree to which public comments and commitments have been integrated into project development and design.
- (6) State and Local Approvals. Demonstrate receipt of State and local approvals on which the project depends, such as State and local environmental and planning approvals and STIP or Transportation Improvement Program funding. Additional support from relevant State and local officials is not required; however, an applicant should demonstrate that the project has broad public support.

- iv. Assessment of Project Risks and Mitigation Strategies. Project risks, such as procurement delays, environmental uncertainties, increases in real estate acquisition costs, uncommitted local match, or lack of legislative approval, affect the likelihood of successful project start and completion. Identify all material risks to the project and the strategies that the lead applicant and any project partners have undertaken or will undertake to mitigate those risks. Assess the greatest risks to the project and identify how the project parties will mitigate those risks.
- d. Letters of Support. Include letters of support for all identified partners, if applicable, and if one of the following situations exists:
- If the eligible commuter authority applicant operates on a rail corridor owned by an entity other than the commuter authority, a letter from the rail owners supporting the proposed project is required.
 - As applicable, a letter from agencies that will partner on the proposed project by contributing funding or other resources, including the match requirement, or as applicable, serving as the State DOT pass through

entity for the proposed project is required.

- A letter of support from the authority responsible for operation and maintenance, if other than the eligible commuter authority, is required.
- e. Benefit-Cost Analysis. This Benefit-Cost Analysis section should include the recommended approach for the completion and submission of a benefit-cost analysis (BCA) as an appendix to the Project Narrative. The results of the analysis should be summarized in the Project Narrative directly.

Applicants should delineate each of their project's expected outcomes in the form of a complete BCA to enable FHWA to consider cost-effectiveness (small projects), determine whether the project will be cost effective (large projects), estimate a benefit-cost ratio and calculate the magnitude of net benefits and costs for the project. In support of each project for which an applicant seeks funding, the applicant should submit a BCA that quantifies the expected benefits and costs of the project against a no-build baseline. Applicants should use a real discount rate (i.e., the discount rate net of the inflation rate) of 7 percent per year to discount streams of benefits and costs to their present value in their BCA.

The primary economic benefits from projects eligible for CARSII grants are likely to include savings in travel time costs, vehicle operating costs, and safety costs for both existing users of the improved facility and new users who may be attracted to it as a result of the project.

Reduced damages from vehicle emissions and savings in maintenance costs to public agencies may also be quantified. Applicants may describe other categories of benefits in BCA that are more difficult to quantify and value in economic terms, such as improving the reliability of travel times or improvements to the existing human and natural environments (such as increased connectivity, improved public health, storm water runoff mitigation, and noise reduction), while also providing numerical estimates of the magnitude and timing of each of these additional impacts wherever possible. Any benefits claimed for the project, both quantified and unquantified, should be clearly tied to the expected outcomes of the project.

The BCA should include the full costs of developing, constructing, operating, and maintaining the proposed project (including both previously incurred and future costs), as well as the expected timing or schedule for costs in each of these categories. The BCA may also consider the present discounted value of any remaining service life of the asset at the end of the analysis period (net of future maintenance and rehabilitation costs) as a deduction from the estimated costs. The costs and benefits that are compared in BCA should also cover the same project scope.

The BCA should carefully document the assumptions and methodology used to produce the analysis, including a description of the baseline, the sources of data

used to project the outcomes of the project, and the values of key input parameters. Applicants should provide all relevant files used for their BCA, including any spreadsheet files and technical memos describing the analysis (whether created in-house or by a contractor). The spreadsheets and technical memos should present the calculations in sufficient detail and transparency to allow the analysis to be reproduced by FHWA evaluators. Detailed guidance for estimating some types of quantitative benefits and costs, together with recommended economic values for converting them to dollar terms and discounting to their present values, are available in DOT's guidance for conducting BCAs for projects seeking funding under the Department's discretionary grant programs (see <https://www.transportation.gov/office-policy/transportation-policy/benefit-cost-analysis-guidance>).

Volume 2 – Budget Application – include the following:

a. Application Forms. Including:

- i. SF 424 Application for Federal Assistance
- ii. SF 424C Budget Information for Construction Programs
- iii. SF 424D Assurances for Construction Programs
- iv. SFLLL (Note: The form must be completed and submitted even if no lobbying to report. If no lobbying to report, insert none or n/a in the relevant blocks.)

NOTE: On the SF 424, the information in block 8a (Applicant's "Legal Name") must be the same as entered for registration in www.SAM.gov and for the Applicant's Data Universal Numbering System number.

b. Cost Breakdown. Provide an estimate of the project costs including:

- i. Funding. Document all funds to be used for eligible construction costs and the source and amount of those funds, including past or pending Federal funding requests for this project. Include the size, nature, and source of the required match for those funds, if applicable.
- ii. Budget Detail.
 - Federal Share. Provide a detailed project budget showing how the Federal funds will be spent over the proposed period of performance. The budget should estimate – by dollar amount and percentage of cost – the cost of construction work for each project component.
 - Cost Share. If applicable, describe proposed cost share, percent of project costs proposed as cost share, and demonstrate how the cost share can be achieved. Describe how your organization will obtain the necessary resources to fund and fulfill the proposed cost share, as applicable. For

non-Federal (cost share) funds to be used for eligible project costs, documentation of the funding commitments should be referenced and included with the application.

- If subcontractors/subrecipients (lower tiered organizations and individual consultants) will be used in carrying out this project, the following minimum information concerning such, must be furnished:
 1. Name and address of the organization or consultant.
 2. Description of the portion of work to be conducted by the organization or consultant.
 3. Cost details for that portion of work.
 4. Applicant's cost/price analysis of each subrecipient/contractor(s) showing how their price is fair and reasonable.
- c. Other Business Information. Provide responses to the following items with respect to the prime Applicant only:
- i. Provide a list of past projects managed and completed by the Applicant. The past projects should be of similar size and scope to the project being proposed and have occurred within the past 10 years. Describe the project, cost, dates, and duration. This information will be used to assess past performance capabilities in the risk assessment.
 - ii. A statement to indicate whether your organization has previously completed an A-133 Single Audit and, if so, the date that the last A-133 Single Audit was completed.
 - iii. A statement regarding Conflicts of Interest. The Applicant must disclose in writing any actual or potential personal or organizational conflict of interest in its application that describes in a concise manner all past, present or planned organizational, contractual or other interest(s), which may affect the Applicant's ability to perform the proposed agreement in an impartial and objective manner. Actual or potential conflicts of interest may include but are not limited to any past, present or planned contractual, financial, or other relationships, obligations, commitments or responsibilities, which may bias the Applicant or affect the Applicant's ability to perform the agreement in an impartial and objective manner. The AO will review the statement(s) and may require additional relevant information from the Applicant. All such information, and any other relevant information known to FHWA, will be used to determine whether an award to the Applicant may create an actual or potential conflict of interest. If any such conflict of interest is found to exist, the AO may (a) disqualify the Applicant, or (b) determine that it is otherwise in the best interest of the United States to contract with the Applicant and include appropriate provisions to mitigate or avoid such conflict in the agreement pursuant to 2 CFR 200.112.

- iv. A statement to indicate whether a Federal or State organization has audited or reviewed the Applicant's accounting system, purchasing system, and/or property control system. If such systems have been reviewed, provide summary information of the audit/review results to include (as applicable) summary letter or agreement, date of audit/review, Federal or State point of contact for such review.
- v. Terminated Contracts. List any contract/agreement awarded to the Applicant and subsequently terminated for convenience of the Government within the past 3 years, and any contract/agreement that was terminated for default within the past 5 years. Briefly explain the circumstances in each instance.
- vi. The Applicant is directed to review Title 2 CFR 170 (https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title02/2cfr170_main_02.tpl) dated September 14, 2010, and Appendix A thereto, and acknowledge in its application that it understands the requirement, has the necessary processes and systems in place, and is prepared to fully comply with the reporting described in the term if it receives funding resulting from this notice. The text of Appendix A will be incorporated in the award document as a General Term and Condition as referenced under this notice's Section F, Federal Award Administration Information.
- vii. Disclose any violations of Federal criminal law involving fraud, bribery, or gratuity violations. Failure to make required disclosures can result in any of the remedies described in 2 CFR 200.338 entitled Remedies for Noncompliance, including suspension or debarment. (See also 2 CFR Part 180 and 31 U.S.C. 3321).
- viii. If a nonprofit or not-for-profit status, please provide evidence of this status preferably from the Internal Revenue Service.
- ix. Acknowledgement of acceptance of the NOFO terms and acknowledgement and acceptance of any Amendments issued to this NOFO. List Amendment numbers and issue dates, if any.

3. UNIQUE ENTITY IDENTIFIER (UEI) AND SYSTEM FOR AWARD MANAGEMENT (SAM)

NOTE TO APPLICANTS: Effective April 4, 2022, the Data Universal Numbering System (DUNS) number will no longer be required for entities doing business with the Federal government and will be replaced by the SAM UEI. As of that date, Applicants will need to use a UEI issued during the SAM.gov registration process. Active registrants in SAM.gov have had their SAM UEI automatically assigned and it is currently viewable within SAM.gov; there is no action for registered entities to take at this time to obtain their SAM UEI. Please see

<https://www.grants.gov/web/grants/applicants/applicant-faqs.html#UEI> for more

information on the transition from DUNS to SAM UEI, including what UEI to enter into the UEI field on grants.gov and on application package forms.

The Applicant is required to: (i) be registered in SAM before submitting its application; (ii) provide a valid unique entity identifier (UEI) in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding Agency.

The Federal awarding Agency may not make a Federal award to an Applicant until the Applicant has complied with all applicable unique entity identifier and SAM requirements. If an Applicant has not fully complied with the requirements by the time the Federal awarding Agency is ready to make a Federal award, the Federal awarding Agency may determine that the Applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another Applicant.

NOTE TO APPLICANTS: The SAM requires the registrant to provide a UEI number to complete the registration. These processes can take several weeks to complete so should be started well before the application deadline.

4. GRANTS.GOV

Applicants must follow the instructions on Grants.gov to successfully use the website to submit an application. Use of Grants.gov may entail the following steps for those setting up new accounts or first time users.

- a. Register with SAM at www.SAM.gov
- b. Obtain a valid UEI;
- c. Create a *Grants.gov* account; and
- d. Respond to the registration email sent to the E-Business Point of Contact from *Grants.gov*, and login at *Grants.gov* to authorize the Applicant as the Authorized Organization Representative (AOR). Please note that there can be more than one AOR for an organization.

****Please note that the *Grants.gov* registration process may take two to four weeks.**

5. GRANTS.GOV HELP

For Grants.gov training resources, including video tutorials, refer to: [Home | GRANTS.GOV](#)

Applicant Support: For assistance with Grants.gov registration and application submittal, refer to the Grants.gov Support Center: [Support | GRANTS.GOV](#). Grants.gov provides applicants 24/7 support, except federal holidays, via the toll-free number 1-800-518-4726, email at support@grants.gov, or generate a ticket for assistance online at Grants.gov **Applicant Support**.

The FHWA will generally not consider late applications that are the result of failure to register or comply with *Grants.gov* Applicant requirements in a timely manner. For information and instruction on each of these processes, please see instructions at <http://www.grants.gov/web/grants/applicants/applicant-faqs.html>.

If you are experiencing difficulties with your submission, it is best to contact the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist FHWA with tracking your issue and understanding background information on the system issue in the event of a late application.

6. SUBMISSION DATES AND TIMES

The application must be received electronically through Grants.gov by the application due date/time listed in this NOFO, page 3.

The deadline stated is the date and time by which the Applicant must submit the full and completed application to Grants.gov, including all required sections.

A late application will not be reviewed or considered unless the AO determines that doing so is in FHWA's best interest.

If Applicants are unable to use the system due to verifiable technical difficulties, Applicants must email complete applications directly to the FHWA point of contact listed in the NOFO Section G no later than the NOFO application deadline cited herein, with explanation and support regarding the nature of the technical difficulties.

7. INTERGOVERNMENTAL REVIEW

An application under this NOFO is not subject to the State review under Executive Order 12372.

8. FUNDING RESTRICTIONS

The FHWA will not reimburse any pre-award costs or application preparation costs.

9. USE OF INFORMATION FOR OTHER DEPARTMENTAL PURPOSES

Information collected from all applicant submissions may be used for Government purposes. In addition, information gathered through this notice may be used to conduct outreach and engagement related future similar opportunities.

SECTION E – APPLICATION REVIEW INFORMATION

1. CRITERIA FOR SELECTION OF AWARDEES

The FHWA will award the CARSI Program funds based on the selection criteria and policy considerations outlined below.

Note: These criteria are distinct from eligibility criteria (see Section C) that are addressed before an application is accepted for review.

A. SAFETY IMPACTS

The FHWA will assess the safety impacts that will result from the project. Specifically, FHWA will assess the degree to which the project will:

1. Improve safety at railway-highway crossings through the elimination of hazards at public railway-highway crossings;
2. Reduce fatalities, serious injuries, and crashes at public railway-highway crossings;
3. Reduce the number of existing public at-grade crossings by closure or grade separation; and
4. Reduce delays or improve system performance by eliminating hazards posed by blocked grade crossings due to idling trains.

NOTE: Priority will be given to applications that bundle safety improvements to eliminate hazards at more than one public railway-highway crossing.

NOTE: Priority will be given to applications that include grade separation project(s) with closing more than one existing public at-grade railway-highway crossing.

B. PROJECT READINESS

The FHWA will assess project readiness to determine whether the project is reasonably expected to begin construction in a timely manner and the likelihood of a successful project. Specifically, FHWA will assess the following:

NOTE: Priority will be given to applications that propose projects for construction as opposed to engineering and design.

1. **Technical Feasibility.** The degree to which the project is demonstrated to be technically feasible. This includes feasibility demonstrated through engineering and design studies and activities; the development of design criteria and/or a basis of design; the basis for the cost estimate presented in the CARSI application, including the identification of contingency levels appropriate to its level of design; any scope, schedule, and budget risk-mitigation measures, and a detailed statement of work that adequately

demonstrates the technical and engineering aspects of the project and describes in detail the project to be constructed.

2. Project Schedule. Adequacy of proposed project schedule including major project milestones.
3. Required Approvals, Environmental Permits and Reviews. Feasibility of receipt (or reasonably anticipated receipt) of all required approvals, environmental permits and reviews necessary for the project to proceed to construction on the timeline specified in the project schedule, including satisfaction of all Federal, State, and local requirements and completion of the NEPA process.
4. Assessment of Project Risks and Mitigation Strategies. Adequacy of project risk assessment and risk mitigation strategies to increase likelihood of successful project start and completion.

C. ECONOMIC VITALITY

The FHWA will consider the extent to which a project would support the economic vitality of either the Nation or a region. To the extent possible, FHWA will rely on quantitative, data-supported analysis to assess how well a project addresses this criterion, including an assessment of the applicant-supplied benefit-cost analysis described in Section D. In addition to considering the anticipated outcomes of the project that align with this criterion, the Department will consider estimates of the project's benefit-cost ratio and net quantifiable benefits.

Based on FHWA's assessment, the Agency will group projects into ranges based on their estimated benefit costs ratio (BCR) and assign a level of confidence associated with each project's assigned BCR ratings. The Department will use these ranges for BCR: Less than 1; 1–1.5; 1.5–3; and greater than 3. The confidence levels are high, medium, and low.

D. COST SHARE

The FHWA will consider the extent to which the project has costs matched by funds that are not provided under the CARS Program or Titles 23 or 49 by giving preference to:

1. Projects with over 30 percent in non-CARS Program funding, with additional preference given to projects that exceed even this threshold; followed by
2. Projects with between 20 percent and 29 percent in non-CARS Program funding; followed by
3. Projects with between 10 percent and 19 percent in non-CARS Program funding; followed by
4. Projects with between 0 percent and 9 percent in non-CARS Program funding.

The FHWA will also consider the extent to which the project is supported by funds, other than funds received under the CARSI Program, to construct, maintain, and operate the facility. The FHWA will consider what other funds exist, besides those available for match, to aid in maintenance and operation of the facility, as well as the reasonable expectation that those funds will remain available. Historical trends, current policy, or future feasibility analyses can be used as evidence to substantiate or support the claims in the application.

E. QUALITY OF LIFE: EQUITY, CLIMATE, AND RURAL OUTCOMES

The DOT will consider the extent to which the project incorporates the following priorities:

1. **Racial Equity and Barriers to Opportunity.** The DOT will consider the extent to which the project: (i) increases transportation choices and equity for individuals; (ii) expands access to essential services for communities across the United States, particularly for underserved or disadvantaged communities; (iii) improves connectivity for citizens to jobs, health care, and other critical destinations, or (iv) proactively addresses racial equity and barriers to opportunity, as reflected in Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* (86 FR 7619), through the planning process or through incorporation of design elements. The DOT will assess whether the project addresses quality of life, including but not limited to the following examples:
 - A racial equity impact analysis has been completed for the project.
 - The project sponsor has adopted an equity and inclusion program/plan or has otherwise instituted equity-focused policies related to project procurement, material sourcing, construction, inspection, hiring, or other activities designed to ensure racial equity in the overall project delivery and implementation.
2. **Climate Change and Sustainability.** The DOT will consider the extent to which the project demonstrates effort to consider climate change and sustainability impacts in support of Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad* (86 FR 7619).
3. **Rural Outcomes.** If applicable, DOT will consider the extent to which the project addresses rural transportation networks, consistent with the Department's R.O.U.T.E.S. Initiative (<https://www.transportation.gov/rural>). The Department recognizes that rural transportation networks face unique challenges in safety, infrastructure condition, and passenger and freight usage.

2. REVIEW AND SELECTION PROCESS

The DOT will screen applications received to confirm Applicant eligibility, project

eligibility, completeness of submittal, and compliance with NOFO application requirements. An application determined to be ineligible, incomplete, and/or non-compliant with the NOFO application requirements may be removed from the competition and from further consideration for award or continued evaluation.

The DOT will utilize the following merit review process to evaluate applications: A panel of DOT experts will collectively evaluate and rate all eligible applications using the selection criteria listed above. An application that receives an unacceptable rating in one or more selection criteria may be removed from the competition and from further consideration for award or continued evaluation. The panel will recommend awards to the selection official based on the results of the panel's review. The panel will recommend for award the applications that are considered the most advantageous to DOT using the selection criteria.

NOTE: Award recommendations will consider the best use of the funds, given the differing cost share requirements of the FY 2020 and FY 2021 funding sources. Award recommendations will consist of a group of projects that collectively assign the available CARSI grant funding, and also satisfy the cost share requirements of the funding sources.

As determined necessary to support the evaluation and selection process, FHWA may conduct discussions with Applicants to clarify elements of the technical and budget applications and request additional detailed and itemized cost information.

Applicants should be aware that the NEPA review may have to include evaluation of all project components as connected, similar, or cumulative actions, as detailed at 40 CFR 1508.25.

The selection official responsible for final award decisions is the FHWA Administrator or designee.

The Government is not obligated to make any award as a result of this notice.

Risk Assessment: Prior to award, each selected Applicant will be subject to a risk assessment required by 2 CFR 200.205. If the Federal awarding Agency determines that a Federal award will be made, special conditions that correspond to the degree of risk assessed may be applied to the Federal award.

This Risk Assessment will include evaluation of some or all of the following items relative to the Applicant and sub-applicants as applicable:

- (1) Applicant's financial stability;
- (2) Applicant's quality of management systems and ability to meet the management standards prescribed in 2 CFR Part 200;
- (3) Applicant's history of performance;

Note: History of performance includes the Applicant's record in managing Federal awards, if it is a prior Recipient of Federal awards, including timeliness

of compliance with applicable reporting requirements, conformance to the terms and conditions of previous Federal awards, and if applicable, the extent to which any previously awarded amounts will be expended prior to future awards. The Government will evaluate the relevant merits of the Applicant's history of performance based on its reputation and record with its current and former customers with respect to quality, timeliness and cost control. The history of performance will be reviewed to assure that the Applicant has relevant and successful experience and will be considered in the risk assessment. In evaluating history of performance, the Government may consider both written information provided in the application, as well as any other information available to the Government through outside sources.

(4) Applicant's audit reports and findings from audits performed on the Applicant pursuant to 2 CFR Part 200 Subpart F — Audit Requirements or the reports and findings of any other available audits;

(5) Applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities;

(6) Applicant's potential for conflict of interest if applicable; and

Note: FHWA will review information provided by the Applicant, and any other relevant information known to FHWA, to determine whether an award to the Applicant may create an actual or potential conflict of interest. If any such conflict of interest is found to exist, FHWA may (a) disqualify the Applicant, or (b) determine that it is otherwise in the best interest of the United States to award to the Applicant and include appropriate provisions to mitigate or avoid such conflict in the agreement pursuant to 2 CFR 200.112.

(7) Applicant's eligibility to receive Federal funding. Per the guidelines on governmentwide suspension and debarment in 2 CFR Part 180, the Government will confirm that the Applicant and any named sub-applicants are not debarred, suspended or otherwise excluded from or ineligible for participation in Federal programs or activities.

Pursuant to 2 CFR Part 200.205, prior to making a Federal award, the Federal awarding Agency is required to review information available through any Office of Management and Budget (OMB) designated repositories of governmentwide eligibility qualification or financial integrity information, such as Federal Awardee Performance and Integrity Information System (FAPIIS), D&B, and Sam.gov. The Government's review of this information will occur as part of the risk assessment. An Applicant may review information in FAPIIS and comment on any information about itself. The FHWA will consider comments by the Applicant, in addition to other information in FAPIIS, in making a judgment about the Applicant's integrity, business ethics, and record of performance under Federal awards when completing the risk assessment. The FHWA reserves the right to deny an award based on the results of the risk assessment.

SECTION F – FEDERAL AWARD ADMINISTRATION INFORMATION

1. FEDERAL AWARD NOTICES

Following the evaluation outlined in Section E, FHWA will notify the selected Applicants and announce the selected projects. Notice that an Applicant has been selected for award does not constitute approval of the application as submitted. Before the award, FHWA may contact the Applicant's point of contact listed in the SF 424 to initiate negotiation of a project-specific agreement, if applicable. If the negotiations do not result in an acceptable submittal, FHWA reserves the right to terminate the negotiation and decline to fund the Applicant. Only the AO or other authorized representative can commit FHWA and bind the Federal Government to the expenditure of funds.

2. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

In connection with any program or activity conducted with or benefiting from funds awarded under this notice, recipients of funds must comply with all applicable requirements of Federal law, including, without limitation, the Constitution of the United States; statutory, regulatory, and public policy requirements, including without limitation, those protecting free speech, religious liberty, public welfare, the environment, and prohibiting discrimination; the conditions of performance, non-discrimination requirements, and other assurances made applicable to the award of funds in accordance with regulations of DOT; and applicable Federal financial assistance and contracting principles promulgated by OMB. In complying with these requirements, recipients, in particular, must ensure that no concession agreements are denied or other contracting decisions made on the basis of speech or other activities protected by the First Amendment. If the Department determines that a recipient has failed to comply with applicable Federal requirements, the Department may terminate the award of funds and disallow previously incurred costs, requiring the recipient to reimburse any expended award funds.

GOVERNING REGULATIONS

Performance under this agreement will be governed by and in compliance with the following regulations:

- 2 CFR Part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards" as adopted by DOT at 2 CFR Part 1201.
- Cost Principles For-profit Organizations: 48 CFR 31 (Federal Acquisition Regulations) Subpart 31.2, as applicable.
- 23 U.S.C. and 23 CFR, as applicable.
- Applicable Federal laws, rules, and regulations also apply.

GENERAL TERMS AND CONDITIONS

NOTE TO APPLICANTS: The following link contains General Terms and Conditions that may be incorporated into grant awards. As needed and appropriate to the awarding agency/office, the General Terms and Conditions may differ to reflect the administrative procedures of the awarding agency/office. However, the following link contains representative General Terms and Conditions to be incorporated into resulting grant awards:

https://www.fhwa.dot.gov/cfo/contractor_recip/gtandc_generaltermsconditions.cfm

SPECIAL TERMS AND CONDITIONS:

NOTE TO APPLICANTS: The following paragraphs contain Special Terms and Conditions that may be incorporated into grant awards. As needed and appropriate to the awarding agency/office, the Special Terms and Conditions may differ to reflect the administrative procedures of the awarding agency/office. However, the following paragraphs are representative Special Terms and Conditions to be incorporated into resulting grant awards:

A. AVAILABLE FUNDING

The total estimated amount of Federal funding that may be provided under this agreement is \$_____ (to be filled in at award) for the entire period of performance, subject to the limitations shown below:

- (1) Currently, Federal funds identified on page 1 of the award document, are obligated to this agreement.
- (2) Subject to availability of funds, and an executed document by the AO, the difference between the current funding and the total estimated amount of Federal funding may be obligated to this agreement.
- (3) The FHWA's liability to make payments to the Recipient is limited to those funds obligated under this agreement as indicated above and any subsequent amendments.

B. PROGRAM INCOME

Pursuant to 2 CFR 200.307, program income earned during the agreement period must be added to the Federal award and used for the purposes and under the conditions of the Federal award, unless otherwise approved by the AO. Program income must not be used to offset the Federal or Recipient contribution to this project.

C. SUBAWARDS

Note: See 2 CFR §200.1, Sub-recipient and contractor determinations, for definitions of sub-recipient (who is awarded a subaward) versus contractor (who is awarded a contract).

Note: Recipients with a procurement system deemed approved and accepted by the Government or by the AO are exempt from the requirements of this clause. See 2 CFR 200.317 through 200.326.

Unless described in the application and funded in the approved award, the Recipient must obtain prior written approval from the AO for the sub-award, transfer, or contracting out of any work under this award above the Simplified Acquisition Threshold. This provision does not apply to the acquisition of supplies, material, equipment, or general support services.

Approval of each sub-award or contract is contingent upon the Recipient's submittal of a written fair and reasonable price determination, and approval by the AO for each proposed contractor/sub-recipient. Consent to enter into subawards or contracts will be issued through written notification from the AO or a formal amendment to the agreement.

The following sub-awards and contracts are currently approved under the agreement by the AO. This list does not include supplies, material, equipment, or general support services which are exempt from the pre-approval requirements of this clause.

Name
(*** to be filled in at award or by amendment***)

D. ORDER OF PRECEDENCE

The Recipient's project narrative and budget application are accepted, approved, and incorporated herein as Attachments A and B. In the event of any conflict between this agreement document and the Recipient's project narrative and budget application, this agreement document shall prevail.

E. DESIGNATION AS RESEARCH AND DEVELOPMENT OR NON-RESEARCH AND DEVELOPMENT

This agreement is designated as: NON-RESEARCH

F. DISPUTES

The parties to this agreement will communicate with one another in good faith and in a timely and cooperative manner when raising issues under this provision. Any dispute, which for the purposes of this provision includes any disagreement or claim, between

FHWA and the Recipient concerning questions of fact or law arising from or in connection with this agreement and whether or not involving alleged breach of this agreement, may be raised only under this Disputes provision.

Whenever a dispute arises, the parties will attempt to resolve the issues involved by discussion and mutual agreement as soon as practical. In no event will a dispute which arose more than 3 months prior to the notification made under the following paragraph of this provision constitute the basis for relief under this article unless FHWA waives this requirement.

Failing resolution by mutual agreement, the aggrieved party will document the dispute by notifying the other party in writing of the relevant facts, identify unresolved issues and specify the clarification or remedy sought. The AO will conduct a review of the matters in dispute and render a decision in writing within 30 calendar days of receipt of such written request. Any decision of the AO is final and binding unless a party will, within 5 calendar days, request further review as provided below.

Within 5 working days after receipt of the AO decision, the aggrieved party may, in writing, request a decision from FHWA Director, Office of Acquisition and Grants Management or designee. Upon written request to FHWA Director, Office of Acquisition and Grants Management or designee, made within 5 calendar days after the AO's written decision or upon unavailability of a decision within the stated time frame under the preceding paragraph, the dispute will be further reviewed. This review will be conducted by the Director, Office of Acquisition and Grants Management. Following the review, the Director, Office of Acquisition and Grants Management, will resolve the issues and notify the parties in writing. Such resolution is not subject to further administrative review and to the extent permitted by law, will be final and binding. Nothing in this agreement is intended to prevent the parties from pursuing disputes in a U.S. Federal Court of competent jurisdiction.

G. INDIRECT COSTS – if applicable

Indirect costs are allowable under this agreement in accordance with the Recipient's Federally Negotiated Indirect Cost Rates as documented in writing and approved by the Recipient's cognizant Government Agency. In the absence of such Government-approved indirect rates, the following rates are hereby approved for use under this agreement as shown below: **(Information to be filled in at award)**

In the event the Recipient determines the need to adjust the above listed rates, the Recipient will notify the AO of the planned adjustment and provide rationale for such adjustment. In the event such adjustment rates have not been audited by a Federal Agency, the adjustment of rates must be pre-approved in writing by the AO.

This Indirect Cost provision does not operate to waive the limitations on Federal funding provided in this document. The Recipient's audited final indirect costs are allowable only insofar as they do not cause the Recipient to exceed the total obligated funding.

3. REPORTING

A. QUARTERLY PROGRESS REPORT

Once the agreement is signed, the Recipient must submit an electronic copy of the SF-PPR, to the AOR and the Agreement Specialist/AO on or before the 30th of the month following the calendar quarter being reported. Final SF-PPRs are due 90 days after the end of the agreement period of performance. The SF-PPR is available online: http://www.whitehouse.gov/sites/default/files/omb/grants/grants_forms.html.

Calendar quarters are defined as:

1st: January – March
2nd: April – June
3rd: July – September
4th: October – December

Reports due on or before:

April 30th
July 30th
October 30th
January 30th

The quarterly progress report must include the required certification pursuant to 2 CFR 200.415.

The quarterly progress report must consist of the SF-PPR cover page and all the following required attached information:

To fulfill the SF-PPR Block 10, Performance Narrative requirement, the Recipient must complete the Quarterly Reporting Template (expand as necessary) that will provide a formatted report of:

- a. Work performed for the current quarter;
- b. Work planned for the upcoming quarter;
- c. Description of any problem encountered or anticipated that will affect the completion of the work within the time and fiscal constraints as set forth in the agreement, together with recommended solutions to such problems; or, a statement that no problems were encountered; and
- d. A tabulation, clearly delineated by Federal share, cost share and total, of the current and cumulative costs expended by quarter versus budgeted costs.

In the SF-PPR Block 11, Other Attachments, include the following information as attached pages:

- a. SF-425, Federal Financial Report; and
- b. SF-425A, Federal Financial Report Attachment (if applicable).

B. ANNUAL BUDGET REVIEW AND PROGRAM PLAN

The Recipient must submit an electronic copy of the Annual Budget Review and

Program Plan to the AOR and one electronic copy to the Agreement Specialist 60 days prior to the anniversary date of this agreement. The Annual Budget Review and Program Plan must include the required certification pursuant to 2 CFR 200.415. The Annual Budget Review and Program Plan must provide a detailed schedule of activities, estimate of specific performance objectives, include forecasted expenditures, and schedule of milestones for the upcoming year. If there are no proposed deviations from the Approved Project Budget, the Annual Budget Review must contain a statement stating such. The Recipient must meet via teleconference or Webconference with FHWA to discuss the Annual Budget Review and Program Plan. Work proposed under the Annual Budget Review and Program Plan must not commence until AO's written approval is received.

SECTION G – FEDERAL AWARDING AGENCY CONTACTS

Address any questions to: Sarah.Tarpgaard@dot.gov

Secondary point of contact is: Robin.Hobbs@dot.gov

SECTION H – OTHER INFORMATION

PROTECTION OF CONFIDENTIAL BUSINESS INFORMATION

All information submitted as part of or in support of any application shall use publicly available data or data that can be made public and methodologies that are accepted by industry practice and standards, to the extent possible. If the application includes information you consider to be a trade secret or confidential commercial or financial information, the applicant should do the following:

(1) Note on the front cover that the submission "Contains Confidential Business Information (CBI)," (2) mark each affected page "CBI," and (3) highlight or otherwise denote the CBI portions.



Massachusetts Bay
Transportation Authority

PRESENTATION
MBTA CONTRACT NO. H32PS01

FTA/SHPO Section 106 Consultation Meeting

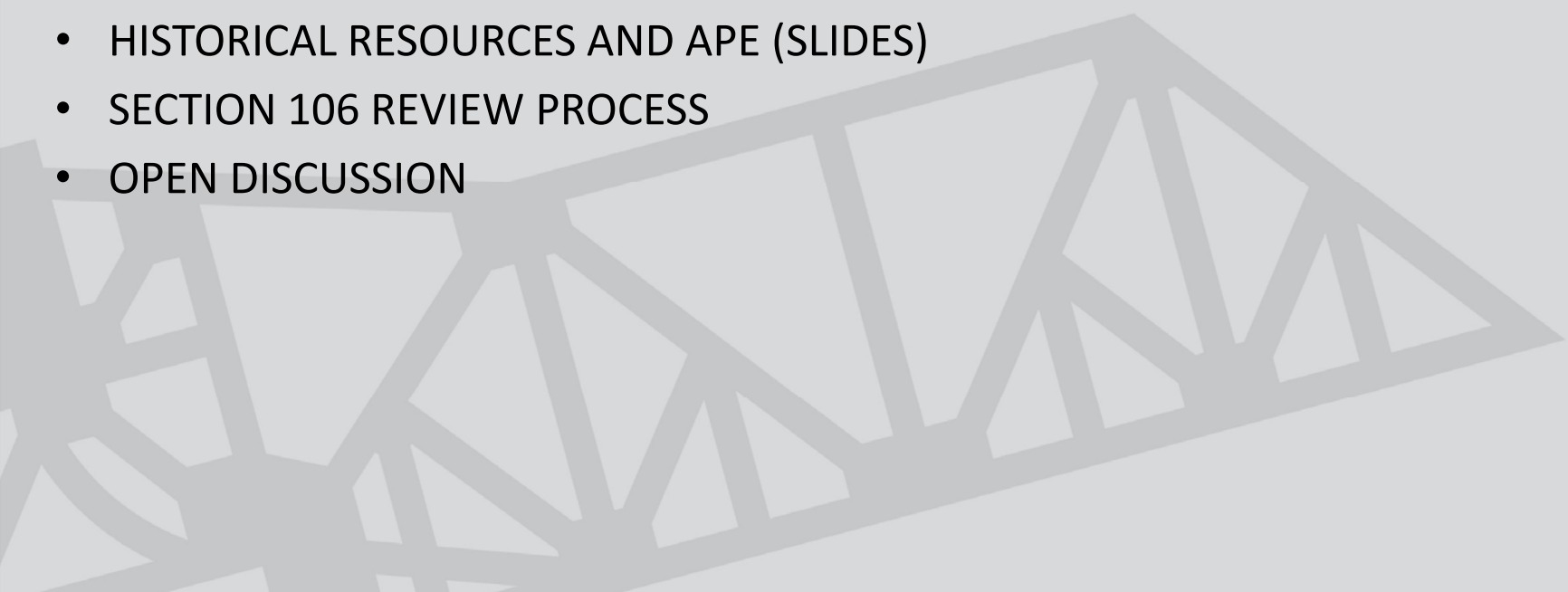
May 24, 2022

ENGINEERING SERVICES FOR

NORTH STATION DRAW 1 BRIDGE REPLACEMENT AND ASSOCIATED TRACK AND SIGNALS UPGRADES



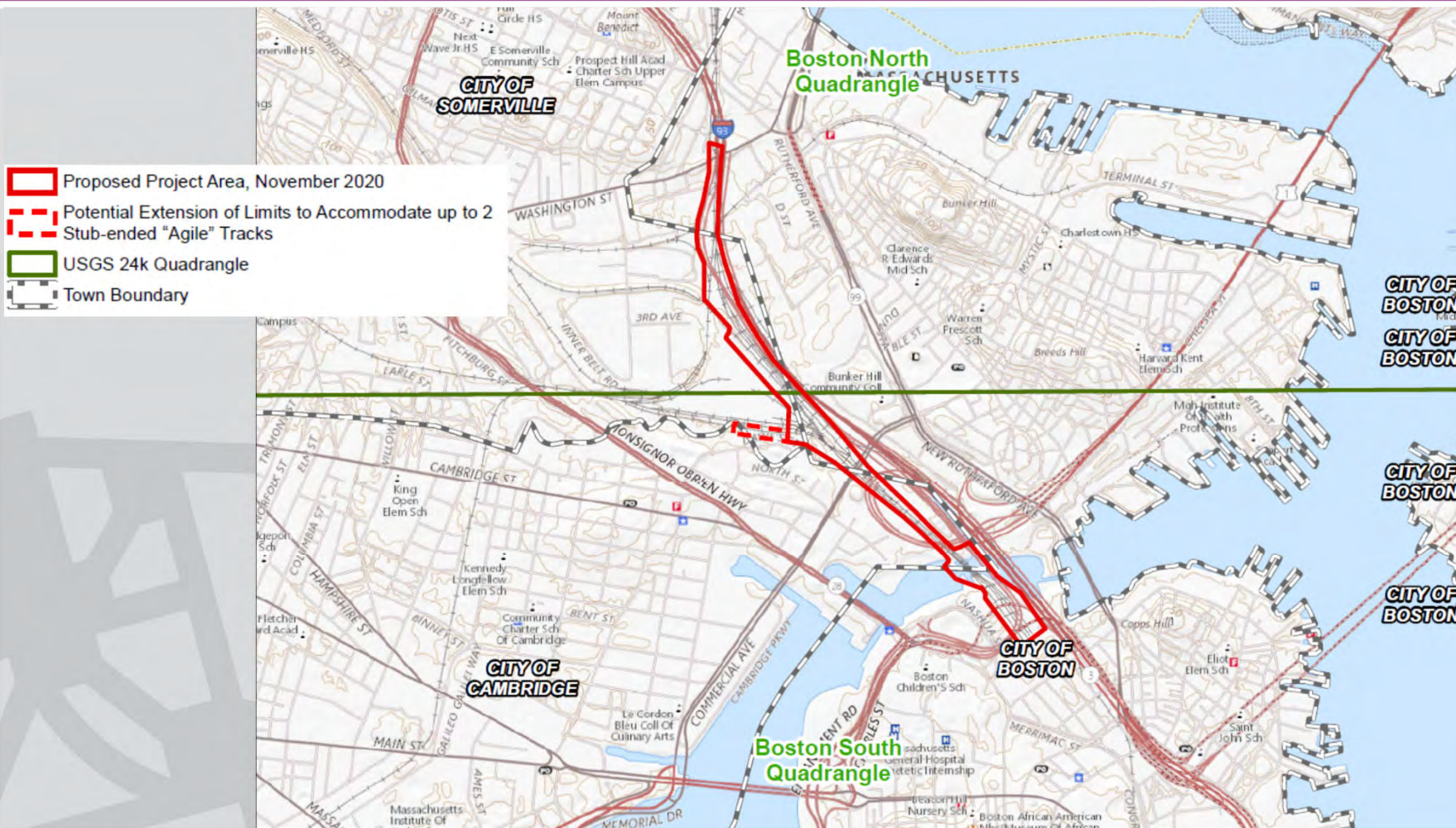
AGENDA

- INTRODUCTIONS
 - FTA INTRODUCTION
 - FTA/NEPA ROLE, REVIEW PROCESS
 - PROJECT OVERVIEW/VIRTUAL TOUR (SLIDES)
 - HISTORICAL RESOURCES AND APE (SLIDES)
 - SECTION 106 REVIEW PROCESS
 - OPEN DISCUSSION
- 

PROJECT OVERVIEW



PROJECT AREA



Existing Site Overview

DCR PARK

A

BOSTON SAND
& GRAVEL

B

NORTH BANK
BRIDGE

C

TOWER A

D

DRAW 1
BRIDGES

E

LEVERETT CIRCLE
CONNECTOR BRIDGE

F



G

NORTH STATION

H

MGH BUILDING
(FORMERLY SPAULDING REHAB)

I

CHARLES
RIVER DAM

J

TEMPORARY
STEEL FRAME
CONTROL TOWER

K

MILLERS RIVER

L

DUCK BOAT RAMP

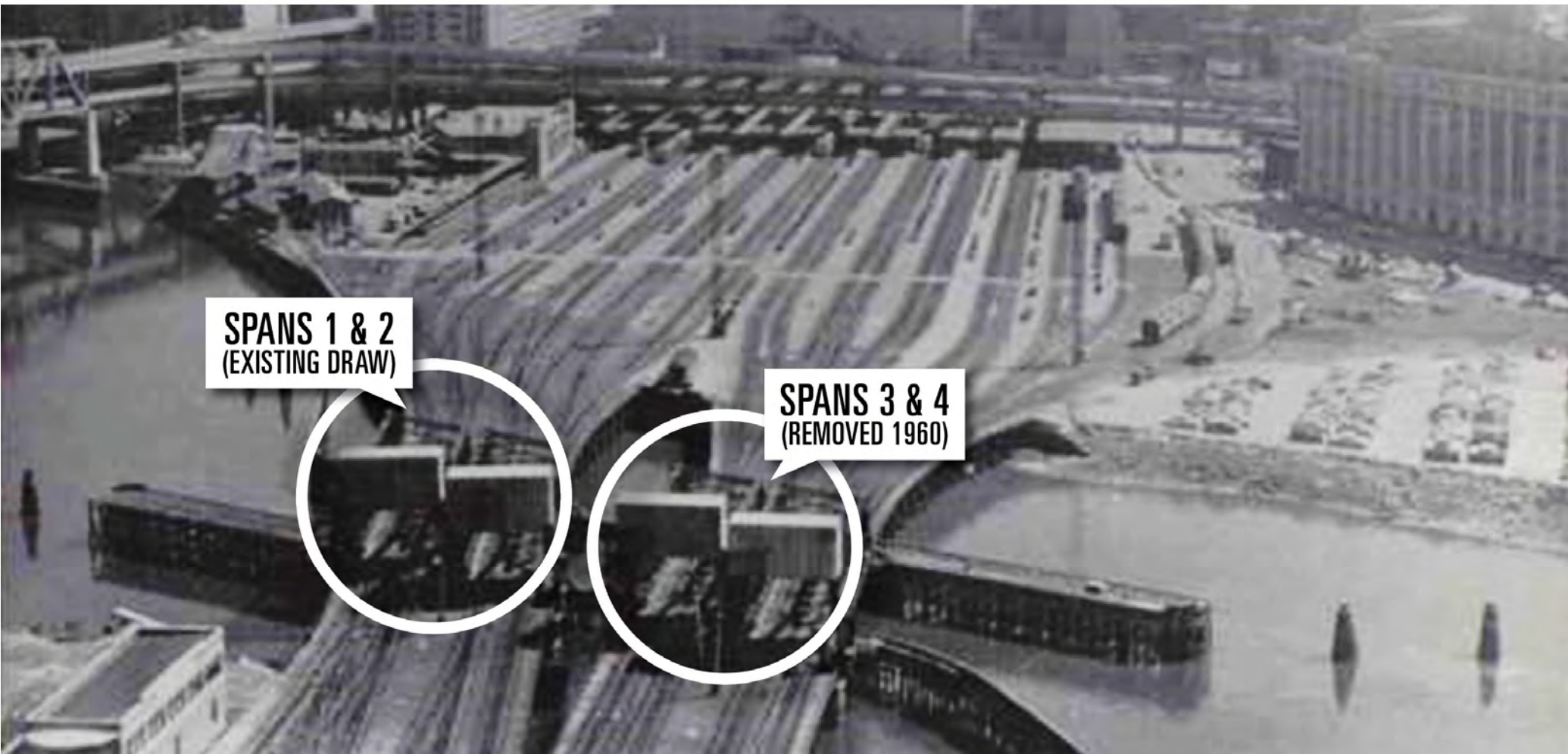
M

ZAKIM BRIDGE

Draw 1 1930s Final Conditions, Looking South

SPANS 1 & 2
(EXISTING DRAW)

SPANS 3 & 4
(REMOVED 1960)



Historical Modifications

1880



1930s



TODAY



AREA OF POTENTIAL EFFECT



Draw 1 – MHC Historical Inventory Form F Summary



- **Town(s):** Boston/Cambridge
- **Place:** North Station
- **Historic/Common Name:** Draw 1
- **Ownership:** MBTA
- **Bridge Type:** Sherzer Rolling Lift Bascule
- **Date of Construction:** 1930
- **Source:** Date Plaque
- **Engineer/Designer:** Keller & Harrington, Chicago, IL
- **Bridge Company/Contractor:** Phoenix Bridge Company, Phoenixville, PA
- **Material(s):** Steel with case concrete counterweights
- **Alterations:** 1960: 2nd Set of draw trestles demolished. 1984: original south approach trestle replaced with cast concrete trestle and flanking sidewalks

Historical Modifications

Draw 1 Construction, 1930s



Draw 1 – Representative Photos

Draw 1, Spans 1 and 2, Boston Terminal. September 29, 1946



South ends of West Span (l) and East Span (r), looking northwest. 2010



Draw 1 – Representative Photos

- North approach and north ends of east span (l) and west span (r), looking southwest. 2010



Detail of Date Plaque on southeast corner of east span. 2010



Tower A – MHC Historical Inventory Form B Information



- **Town(s):** Boston/Cambridge
- **Place:** North Station
- **Historic/Common Name:** Boston and Maine Railroad Signal Tower A
- **Uses:** Railroad Signal Tower
- **Style/Form:** No Style
- **Date of Construction:** 1931
- **Source:** MBTA Archives; Barret (1996:75)
- **Architect/Builder:** Boston and Maine Railroad
- **Exterior Material(s):**
 - *Foundation: Concrete*
 - *Wall-Trim: Brick/Concrete*
 - *Roof: Metal*
- **Alterations:** Numerous window openings have been resized and window sash replaced. Most signaling equipment has been removed from interior

Tower A – Representative Photos

“Tower A” courtesy of B&M RR Historical Soc. Archives.
Date unknown

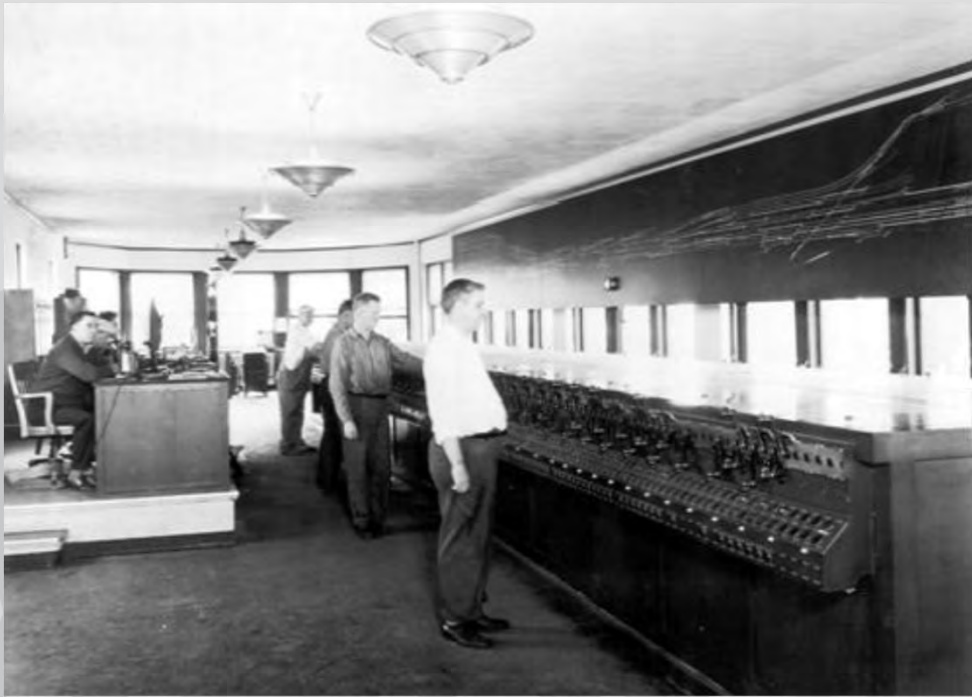


South bay and east elevation, looking northwest. 2010



Tower A – Representative Photos

Interior of Signal Tower A control room. Date unknown



Director's Room (asbestos containment to the left). 2020



Tower A – Representative Photos

Interior of Signal Tower A control room. Date unknown



Current control room without bridge control consoles.
2020



Tower A – Representative Photos

Switching machinery, second floor control room, since moved to current control tower. 2010



Detail of frieze panel on west elevation, 2010



Historical Modifications



Old Tower A Control Room, 1884



Old Tower A Fire, 1914

Historical Modifications



Causeway Street, 1884



North Station Train Shed, 1902

Existing Conditions



Rendered Model – Design Team Update



RDV SYSTEMS | North Station Draw 1 Virtual tour

[North Station Draw 1 Virtual tour \(123bim.com\)](http://123bim.com)





Massachusetts Bay
Transportation Authority

PRESENTATION

MBTA CONTRACT NO. H32PS01

QUESTIONS & ANSWERS

THANK YOU

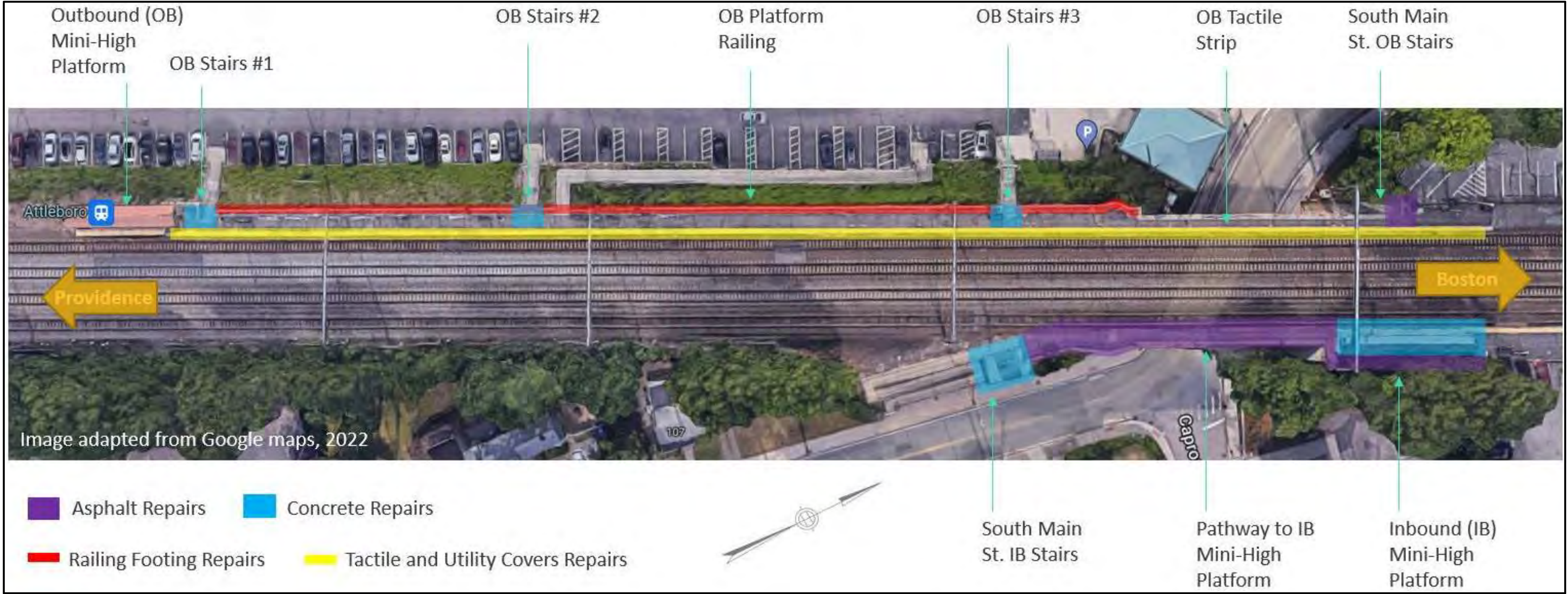




Massachusetts Bay Transportation Authority

ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS

REPAIR AREA KEY PLAN



DRAWING LIST	
Sheet Number	Sheet Name
S000	COVER SHEET
S001	GENERAL NOTES & ABBREVIATIONS
D100	OUTBOUND PLATFORM DEMOLITION PLAN
D101	INBOUND PLATFORM DEMOLITION PLAN
D102	INBOUND PLATFORM DEMOLITION PART PLANS
S100	OUTBOUND PLATFORM REPAIR PLANS
S101	OUTBOUND PLATFORM REPAIR PART PLANS
S102	INBOUND PLATFORM REPAIR PLANS
S103	INBOUND PLATFORM REPAIR PLANS
S104	INBOUND PLATFORM REPAIR PLANS
S200	CONCRETE REPAIR DETAILS
S201	CONCRETE REPAIR DETAILS
S202	ASPHALT REPAIR DETAILS
S203	ASPHALT REPAIR DETAILS
S204	ASPHALT REPAIR DETAILS
S205	FENCE POST FOUNDATION DETAILS
Grand total: 16	

NOT FOR CONSTRUCTION

T

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

ATTLEBORO STATION REPAIRS

PHASE 1 STRUCTURAL REPAIRS

COVER SHEET

APPROVED BY:

DOMINIC J. KELLY

Project Manager

APPROVED BY:

VICTOR CALLAHAN

Project Manager

DATE: 10.26.2022

DES. BY: HC

DR. BY: MTW

CHK. BY: DJK

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

APPROVED BY:

VICTOR CALLAHAN

Project Manager

DATE:

PLAN NO.

SHEET S000

ISSUE

A

ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.
A	10/26/22	DESIGN DEVELOPMENT - 60% DRAWING SET	HC	JEH	DJK

GENERAL

-
-
- The project consists of repairs to various elements of the existing Attleboro Commuter Rail Station at 133 S. Main Street, Attleboro, Massachusetts, including stairs, walkways, platforms, paved surfaces, handrails, and utility covers. These elements and the scope of work related to each of them are described in the 18 March 2022 Attleboro Commuter Rail Station Scope of Work for FTA Agreement document ("MBTA-FTA 18 March 2022 Agreement"). These repairs are called Phase I Repairs and described in detail in Table 1 within that document.
- The purpose of the repairs is to address several existing safety hazards and ensure the continued use of the station by the public.
- The FTA has attached a special condition to this work that states: "Patching areas of concern where there are hazards is permitted. There shall be no digging, cutting, or reconstruction of the platform. Where tactile edging is being installed, any feathering cannot extend beyond six (6) inches into the platform. Where the stairs meet the platform patching only will be permitted; there is to be no replacement or reconstruction of the stairs. Any changes to the scope of work as described in this grant and this condition of award, will require consultation with FTA's Office of Civil Rights and FTA concurrence prior to any additional work being undertaken or changes being made to the existing station conditions. This temporary repair and maintenance work is being done with the assumption and expectation that a design for a new accessible station will be completed in the near future."
- The FTA also requires the MBTA to monitor and oversee its contractor to ensure that all work be completed as repairs to remove hazards and will not result in altering the platform or stairs.
- Engineer-of-record (EOR): Simpson Gumpertz & Heger (SGH) 480 Totten Pond Road, Waltham, MA 02451.
- The contractor must verify existing dimensions and geometry shown in these drawings sketch, and field measure dimensions and geometry not provided or provided approximately. Notify the MBTA project manager and EOR if any existing conditions differ from those shown on these drawings.
- Unless otherwise noted, details, sections and notes contained in the structural repair contract documents shall be considered typical for all similar conditions even if not explicitly referenced.
- Contractor shall not scale drawings to obtain any missing information or to interpret any information not specifically dimensioned for exact detailing or construction purposes.
- Deficient work and/or work not in conformance with the contract documents shall be repaired at the contractor's expense. The contractor shall compensate the client for services arising from deficient work, review of modifications/contractor substitution, or expediting of submittals.
- Cost of investigation and/or redesign incurred by the Engineer of Record due to contractor errors will be at the contractor's expense.
- The CM shall be completely responsible for the safety of adjacent structures, property, his workmen, and the public, as affected by the construction of this project.
- The useful life of these repairs is no more than ten years. Regular inspection and maintenance of all repairs is required within that 10 year period.
- The contractor shall submit a single dimensioned and coordinated drawing for each area of work incorporating work of multiple subcontractors as required for review by the EOR. If work is not coordinated on the shop drawings, this will be a reason for the EOR to reject the submittal.
- Loads imposed on the existing platforms, mini-high platforms, bridge, and other existing structures due to temporary conditions intended to accommodate construction means and methods are not explicitly considered in this design. The contractor shall advise the Engineer of Record regarding construction loads and temporary conditions imposed on the building structure and shall compensate the Engineer of Record for reviewing these conditions. Contractor shall be responsible for the design of temporary bracing, shoring, and strengthening if required to protect existing structures. Submit design and supporting calculations sealed by a Massachusetts Professional engineer for review.
- The contractor shall be completely responsible for the safety of adjacent structures, property, his workmen, and the public, as affected by the construction of this project.

BUILDING CODE

The following building codes and standards, including all specifications referenced within, shall apply to the design, construction, quality control, and safety of all work performed to implement this project:

1. International building code (IBC) – 2015 with MA amendments.
2. Massachusetts state building code – 780 CMR, 9th ed.

WORK AREAS

1. The work on these drawings addresses the structural scope items listed below and complements the MBTA-FTA 18 March 2022 Agreement:
 - A. South Main Street Inbound Stairs
 - B. Asphalt Pathway to Inbound Mini-High Platform (Including Railing Post Foundations)
 - C. Inbound Mini-High Platform
 - D. South Main Street Outbound Stair
 - E. Outbound Platform Stairs #1, #2, and #3
 - F. Outbound Platform Railing and Post Foundations
 - G. Outbound Platform Tactile Edge and Utility Boxes

SPECIFICATIONS

There are no specifications for this immediate repair work. Repairs shown on these drawings and described in the general notes constitute the entire design for the project.

SUBMITTALS

The list of submittals in this section of the general notes is not a complete list for the project. Please see other general notes sections for other required submittals.

1. Pre-construction photo survey of project site, including detailed photos of the areas to be repaired.
2. Digital level survey of existing platform tactile edge elevations every 4'-0" along the length of the outbound platform.
3. Pre-construction sequencing plan identifying the contractor's proposed sequencing of work. Tasks in the sequencing plan should reference both details from the drawing set and the corresponding repair items from Table 1 in the 18 March 2022 MBTA - FTA scope document.
4. Overall work sequencing plan - including references to work areas shown on these drawings.
5. Concrete mix design and placement plan.
6. Certificate confirming non-reactive aggregate in foundation concrete mix.
7. Product data for all products listed in the Concrete general notes section (shear pins, adhesive anchors, anodes, rebar couplers, reinforcement coating, bonding grid, specialty concrete/mortar, etc.)
8. Steel reinforcement shop drawings.
9. Asphalt mix design and placement plan.
10. Steel fence shop drawings (including field measurements and piece drawings).
11. Tactile strip material product data.
12. Tactile strip placement plan.

COORDINATION

1. The contractor shall coordinate the work with MBTA, Keolis, and Amtrak, including completing all applicable safety training, scheduling tasks, and ancillary meetings or coordination associated with the work.
2. Completion of the work at some work areas will require flagging, may require diversions, and access limitations are at the discretion of MBTA, Keolis, and Amtrak. Exclusive ROW access may be required for tactile edge repairs.
3. The contractor shall meet all MBTA requirements regarding quality control staff, safety staff, and engineering staff on site during the work.

SELECTIVE DEMOLITION

1. Summary of work
 - A. Protect all adjacent piping, ducts, conduits, utilities, handrails, structures, etc. to remain.
 - B. Demolish, remove, and dispose of areas of deteriorated concrete and asphalt pavement, as shown on the drawings.
2. Field Conditions
 - A. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. If suspected hazardous materials are encountered, do not disturb; immediately notify the MBTA and EOR. Hazardous materials will be removed by the MBTA under a separate contract.
3. Disposal of Demolished Materials
 - A. Remove demolished materials from the Project site and legally dispose of them.

FOUNDATIONS

1. Work areas addressed in this general notes section are those at which pathways, platforms, or post base foundations may require new backfill material or compaction of new or existing backfill material to support new repairs.
2. Excavation
 - A. All foundation excavation to be inspected by the EOR.
 - B. The elevations shown on the drawings are anticipated and actual elevations are to be established in the field by the EOR, but in no case shall the bottom of new footings be located less than 4'-0" below the lowest adjacent surface exposed to freezing.
 - C. The bottom 3 in. of excavations shall be finished by hand shovel, unless otherwise directed by the EOR.
3. Backfill under concrete or asphalt pavement slabs on grade
 - A. Backfill where required by the EOR below slabs (at platform repairs, top of stair repairs, asphalt pathway repairs, etc.) with approved granular soil placed in 6 in. layers and compacted to 95% density at optimum moisture content as defined by ASTM D-1557, Method D.
 - B. Slab on grade area may be poured in as large an area as can be handled provided that saw cut joints are cut as soon as the concrete will support a person's weight without permanent deformation and the joint process does not dislodge aggregates.
4. Backfill against walls and existing structures:
 - A. Backfill with approved material placed in 6 in. layers and compacted to 95% density at optimum moisture content as defined by ASTM D-1557, Method D.
 - B. Unless the RMA, compact granular material within 2% of optimum moisture content, to 95% of the modified proctor (ASTM D-1557) maximum dry density. Provide laboratory compaction curve and statement of optimum moisture content prior to construction. Provide 2 field tests of in-place density prior to proceeding.
5. Foundation placement and protection
 - A. Do not place foundation concrete in water or on frozen ground.
 - B. Foundations shall bear on undisturbed natural soil, surface compacted natural soil, or compacted engineered fill.
 - C. Protect in-place foundations and slabs from frost penetration until the project is complete. Do not use salt or chloride compounds to de-ice the site.
 - D. All foundation elements shall be centered under supported members, unless otherwise shown on plans.
 - E. No horizontal movement or vertical settlement shall occur to existing structures, streets, soil, or utilities adjacent to or in the project site. Sheet piling, shoring, and bracing for the lateral support of excavation, if required, shall remain in place until all permanent repairs at and below ground level are complete.
 - F. Unless otherwise noted, all footings shall be centered under supported members.

ASPHALT

1. The construction of HMA pavement shall terminate before 15 November and shall not be resumed prior to 1 April except as determined and directed in writing by the EOR.
2. Surface course: Provide surface course meeting Hot Mix Asphalt Pavement per MassDOT Standard Specifications for Highways and Bridges, 2019 supplemental specifications. Section 450. Provide mixture type meeting "SUPERPAVE Surface Course – 12.5 – Polymer" designation SSC-12.5-P in Table 450.1 of Standard.
3. Bottom course: Provide bottom course meeting Hot Mix Asphalt Pavement per MassDOT Standard Specifications for Highways and Bridges, 2019 supplemental specifications. Section 450. Provide mixture type meeting "SUPERPAVE Intermediate Course – 19.0 – Polymer" designation SIC-19.0-P in Table 450.1 of Standard.
4. Compact pavement to 95 % of maximum theoretical density as determined by AASHTO T209. A vibratory plate compactor is acceptable. The finished pavement surface shall be to match existing grades along the entire perimeter of the repair area. The finished surface is to be flat and smooth. The patch is not to be "mounded" or constructed higher than adjacent pavement grade in anticipation of traffic compaction or future settlement. The contractor is to provide the Job Mix Formula (JMF) and a ticket for the record from the HMA supplier.
5. Complete compaction before mix temperature cools to 185 deg F (85 deg C).
6. Apply tack coat uniformly to surfaces of existing and fresh pavement before placing the new pavement. Recommended Tack coat application residual rate shall be in accordance with MassDOT section 450.42/G.
7. See foundations general notes for backfill compaction requirements.

STEEL

1. New steel fence pieces and guards are to match existing style (including thicknesses, widths, etc.).
2. New steel assemblies are to be field measured and fabricated in the shop.
3. New steel assemblies are to be ASTM A36 hot-dipped galvanized (See note 5) and touched-up as-necessary after installation with cold galvanizing paint.
4. Welding electrodes: conform to AWS specifications for electrodes based on welding process and the type and grade of steel. Electrodes have a minimum tensile strength of 70 ksi.
5. All new steel must be hot-dipped galvanized. Follow the below requirements for the galvanizing coating:
 - A. Comply with ASTM A123 for fabricated products.
 - B. Touch-up with cold galvanizing repair paint required at all areas on new steel and existing surfaces affected by welding or installation operations.

CONCRETE

PRODUCTS

- CONCRETE**
- A. Specialty concrete/mortar for patch repairs, any of the following:
 - a. MasterEmaaco S 440 CI (formerly LA40 Repair Mortar) by BASF Corporation Building Systems, Shakopee, Minnesota.
 - b. Sika Top - 111 Plus by Sika corporation, Lyndhurst, New Jersey
 - c. Other approved equal.
 - B. Ready-mix concrete for fence post foundation elements:
 - a. 28-Day Strength: 5,000 psi
 - b. W/C Max.: 0.40
 - c. Air Content: 6% \pm 1.5
 - d. Exposure Categories and Classes (ACI 318-14 Section 19.3): F3, S0, W1, C2
 - e. Portland Cement: ASTM C150, Type II, UON and Approved
 - f. Density: Normal Weight: 145 pcf UON
 - g. Aggregates shall be non-reactive.
 - C. Base plate grout: 8,000 psi 28-day compressive strength
- 2. STEEL REINFORCEMENT**
- A. Rebaring bars shall conform to ASTM A615, Grade 60, deformed, epoxy coated.
 - B. Deformed welded wire reinforcement (WWR) 2 9x2-9-D4xD4, epoxy coated, shall conform to ASTM A1022 and shall be fabricated from sheets or fully flattened from rolls.
 - C. #6 chair bars, high chairs, ties, clips, slab bolster, standees, and other accessories were not specified on the drawing in accordance with ACI 315 Manual of Standard Practice of Detailing Reinforcing Concrete Structures or CRSI Manual of Standard Practices.
 - D. Plastic tips on all chairs in contact with steel and concrete work.
- 3. MINIMUM REINFORCEMENT**
- A. Unless otherwise noted, provide at least one 0.0018 times the area of concrete in each direction.
- 4. SHEAR PINS**
- A. Stainless steel "Spira-Loc" anchors by Blok-Loc or stainless steel "Stitch-Tie" anchors by Construction Tie Products, Michigan City, Indiana, or approved equal.
 - a. 10 mm diameter by 150 mm long or 10 mm diameter by 200 mm long.
 - b. Set a minimum of 2 in. into existing concrete.
- 5. ADHESIVE ANCHORS**
- A. Hilti HIT-HY 200R Adhesive anchors by Hilti, Inc., Tulsa, Oklahoma.
 - B. Install per Hilti installation recommendations.
 - C. Provide standard depth of embedment as listed by Hilti, U.O.N.
 - D. Do not use in an overhead application.
 - E. Provide stainless steel anchors and hardware in all exterior applications.
- 6. GALVANIC PROTECTION**
- A. Galvanic Anodes (for concrete patch repairs greater than 2SF):
 - a. Galvashield XPT 1A-P (1"x1"x5"), by Vector Corrosion Technologies, Wesley Chapel, Florida.
 - b. FerroGard 650, by Sika Corporation, Lyndhurst, New Jersey.
 - c. Sentinel Silver, by The Euclid Chemical Company, Cleveland, Ohio.
 - d. Approved equal.
- 7. MECHANICAL REBAR COUPLER**
- A. D250SCA Bar Lock S/CA Series Couplers, by Dayton Superior.
- 8. REINFORCEMENT COATING:**
- A. Sika Armotec 110 Epoxem by Sika Corporation, Lyndhurst, New Jersey.
- 9. BONDING GROUT FOR SPECIALTY REPAIR CONCRETE/MORTAR**
- A. Bonding grout for specialty repair mortar, if required, shall be in accordance with the manufacturer's written requirements, or site mixed bonding grout that shall consist of one part cement, one part sand, and enough water (\pm 1/2 part) to form the consistency of thick paint. Sand shall pass a No. 30 sieve.
 - B. Epoxy-based bonding grout shall not be used.

EXECUTION OF REPAIRS

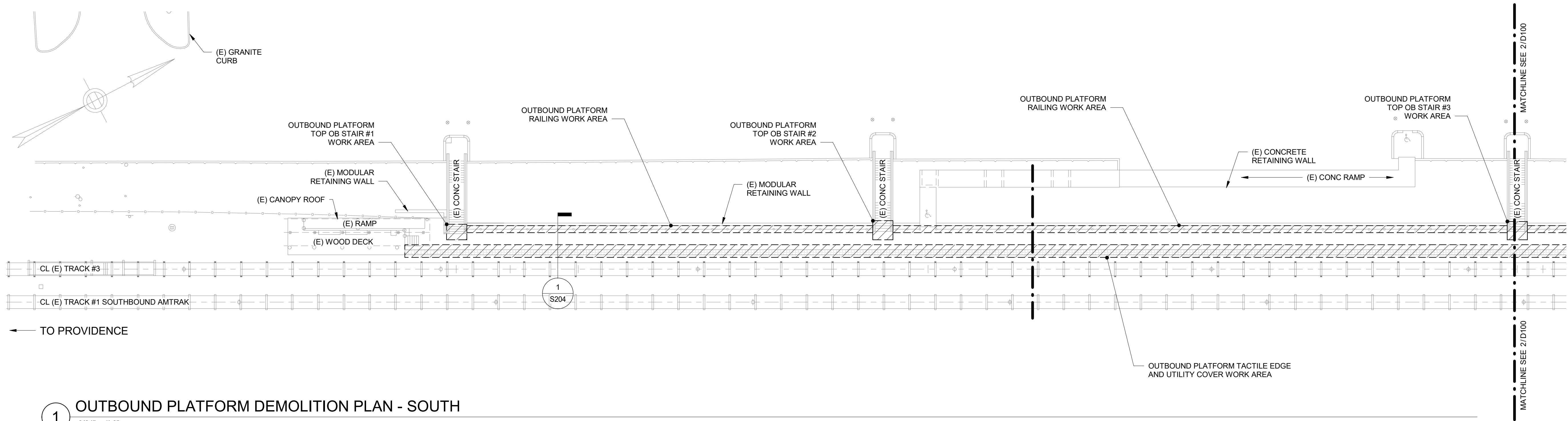
2. CONCRETE REPAIR QUALITY CONTROL AND TESTING
- A. Perform concrete repair work in accordance with the following
- a. ACI 301 - Specifications for Structural Concrete
 - b. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials
 - c. ACI 305 - Hot Weather Concreting
 - d. ACI 315 - ACI Detailing Manual
 - e. ACI 347 - Guide to Formwork for Concrete
 - f. CRSI Manual of Standard Practice
 - g. ASTM C1583/C1583M-13 - Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).
 - h. ICRI Guideline No. 210.3 - Guide to Using In-Situ Tensile Pull-Off Tests to Evaluate Bond of Concrete Surface Materials.
- B. Concrete Protection and Curing
- a. Cure concrete in accordance with the recommendations of the ACI Manual for Concrete Practice using only in-form curing or moist curing procedures specified in Para. 5.3.6 of ACI 301. Submit proposed curing procedures to Engineer for approval prior to use.
 - b. Curing compounds are prohibited.
 - c. For specialty repair mortar repairs, surfaces shall receive a moist cure for a minimum of seven days. Care shall be exercised to ensure that the curing cover is installed in accordance with the manufacturer's written instructions and that it is placed immediately after finishing.
- C. Inspection and Testing
- a. Appearance of cracks due to inadequate proportioning, mixing, placement, or curing shall be cause for rejection of the work so affected. Rejected concrete shall be removed and replaced at Contractor's expense.
 - b. Appearance of unconsolidated or "honeycombed" concrete shall be cause for rejection of the work so affected. Rejection shall be cause for removal and replacement at Contractor's expense.
 - c. For Specialty Concrete/Mortar, the average direct-tension bond strength shall meet or exceed the manufacturer's published values for the given age and no single test shall fall below 100 psi, or the bond strength shall be governed by failure in the substrate (at a location deeper than 1/4 in. from the bond interface) that is not caused by concrete damage due to surface preparation. Debonding or fracture during coring shall be considered as a direct-tension strength of 0 psi. Testing for compliance may be performed by a qualified independent Testing Agency if elected by, and supported by, the Owner:
- A. Bond Strength Test: After curing, drill partial-depth cores to a depth of 1 in. below the bond line to allow direct tension testing. The testing shall be done at a concrete age requested by the Contractor (maximum twenty-eight days).
- a. A minimum of four tests, distributed through all repair areas.
 - b. Or wherever the appearance or installation procedures bring her repair into question, as determined by Engineer.
- B. Test results will be reported in writing to the Owner, Engineer, and Contractor within 24 hrs after tests. Include the project identification name and number, name of concrete testing service, test locations, and results.
- C. If the concrete does not meet the requirements listed above, the repair shall be removed and replaced at the Contractor's expense.

GENERAL CONCRETE REPAIR PROCEDURE

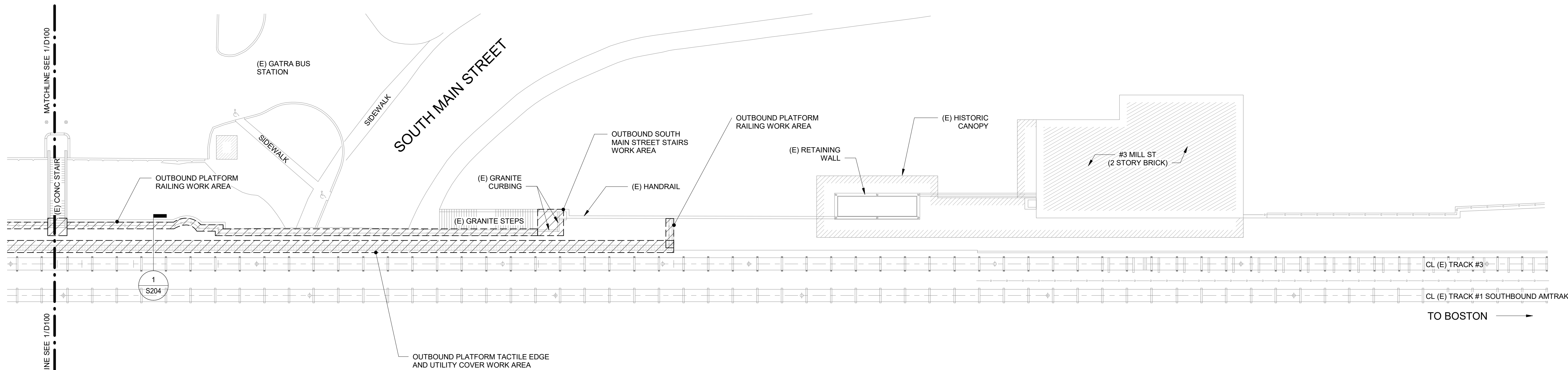
1. See Sheet S200.

<u>ABBREVIATION</u>	<u>WORD OR PHRASE</u>
&	AND
@	AT
ADD'L	ADDITIONAL
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
BC	BOTTOM OF CURB
BOL	BOTTOM OF LANDING
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT
CL, 1	CENTER LINE
CONC	CONCRETE
CONT	CONTINUOUS
DET	DETAIL
DIA, Ø	DIAMETER
DIM	DIMENSION
DND	DO NOT DISTURB
DWG(S)	DRAWING(S)
(E)	EXISTING
EL	ELEVATION
EMBED	EMBEDMENT
EQ	EQUAL
EOR	ENGINEER OR RECORD
FTA	FEDERAL TRANSIT ADMINISTRATION
FDN	FOUNDATION
FG	FINISH GRADE
FT OR ' "	FOOT, FEET
FTG	FOOTING
GATRA	GREATER ATTLEBORO TRANSPORTATION AUTHORITY
GR	GRADE
HMA	HOT MIX ASPHALT
IB	INBOUND
IN OR " "	INCH, INCHES
JMF	JOB MIX FORMULA
JT	JOINT
L.O.W.	LIMIT OF WORK
LP	LOW POINT
L=	LENGTH
MAX	MAXIMUM
MBTA	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
ME	MATCH EXISTING GRADE
MFR	MANUFACTURER
MIN	MINIMUM
(N)	NEW
NO., #	NUMBER
NTS	NOT TO SCALE

[illegible]



1 OUTBOUND PLATFORM DEMOLITION PLAN - SOUTH
3/64" = 1'-0"



2 OUTBOUND PLATFORM DEMOLITION PLAN - NORTH
3/64" = 1'-0"

SHEET NOTES
1. DEMOLITION WORK AREAS SHOWN ON THIS DRAWING ARE APPROXIMATE. ONLY SELECT ELEMENTS IN THE DEMOLITION AREAS ARE TO BE DEMOLISHED. SEE DETAILS FOR DEMOLITION AND REPAIR LOCATIONS.
2. DEMOLITION WORK OUTSIDE THE AREAS SHOWN IN PLAN IS PROHIBITED PER MBTA & FTA 18 MARCH 2022 AGREEMENT.

LEGEND
APPROXIMATE DEMOLITION WORK AREA

NOT FOR CONSTRUCTION

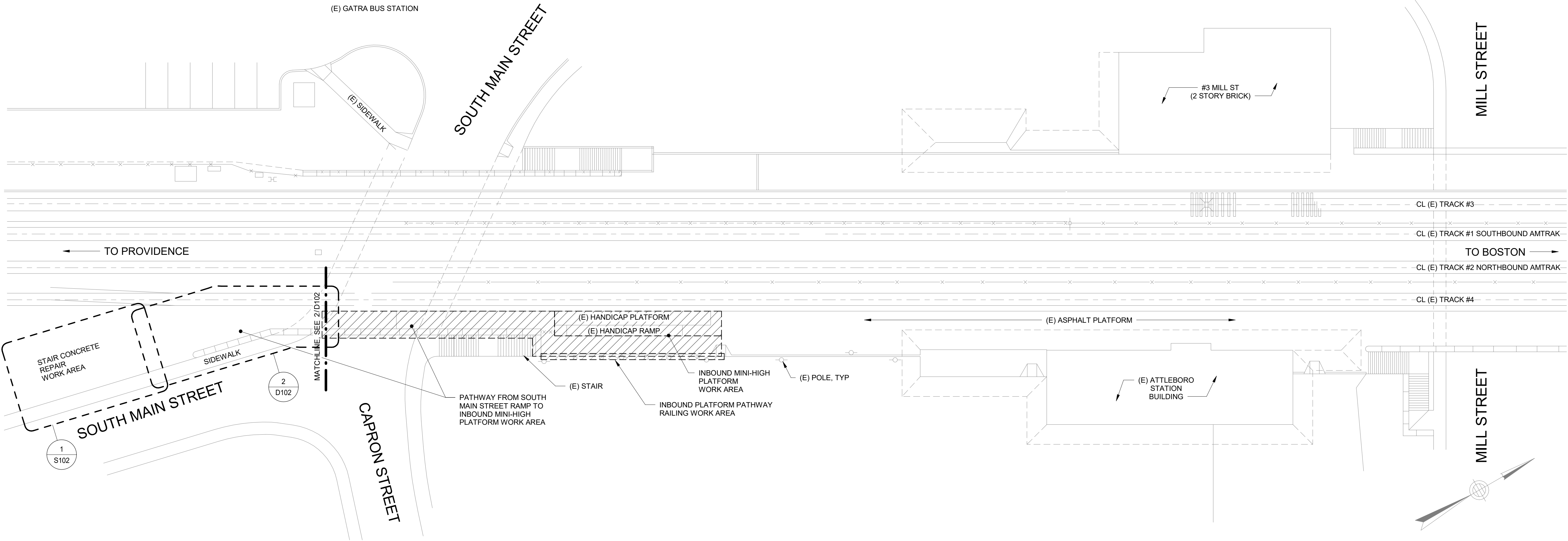
T

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
ATTLEBORO STATION REPAIRS
PHASE 1 STRUCTURAL REPAIRS

OUTBOUND PLATFORM DEMOLITION PLAN

APPROVED BY: DOMINIC J. KELLY				APPROVED BY: VICTOR CALLAHAN			
Project Manager				Project Manager			
HORIZ: AS NOTED				PLAN NO.			
VERT: AS NOTED				SHEET D100			
DATE: 10.26.2022				ISSUE A			

A	10/26/22	DESIGN DEVELOPMENT - 60% DRAWING SET	HC	JEH	DJK				
ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.				



1

INBOUND PLATFORM DEMOLITION PLAN

3/64" = 1'-0"

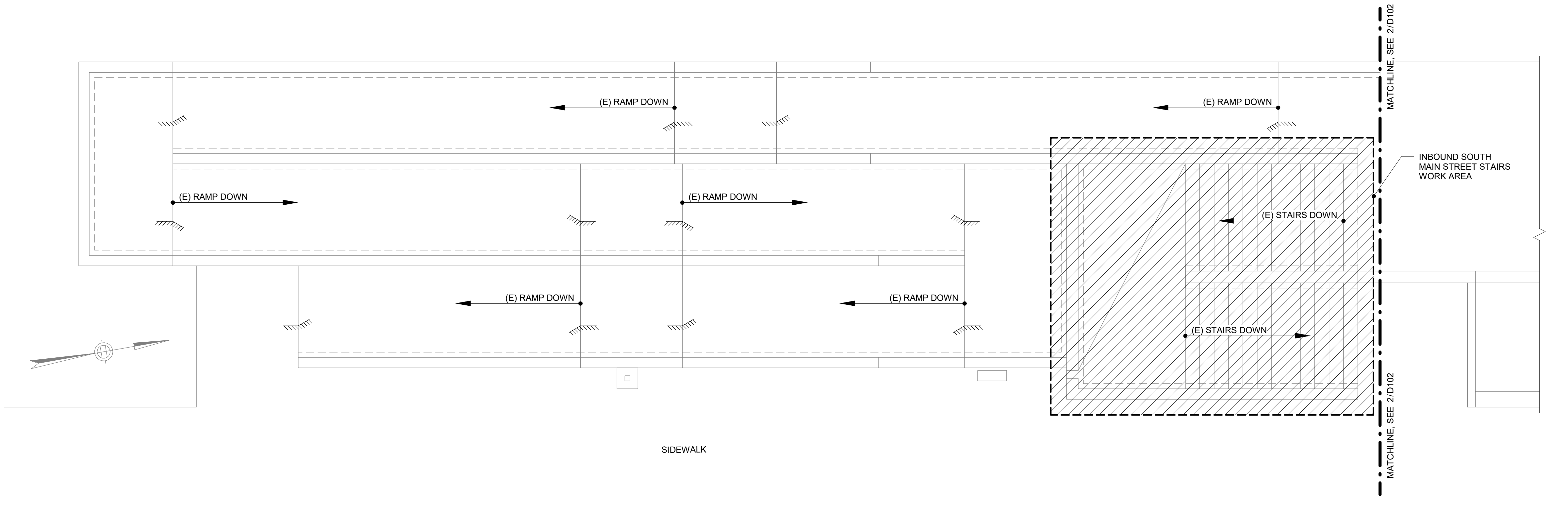
SHEET NOTES

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LEGEND

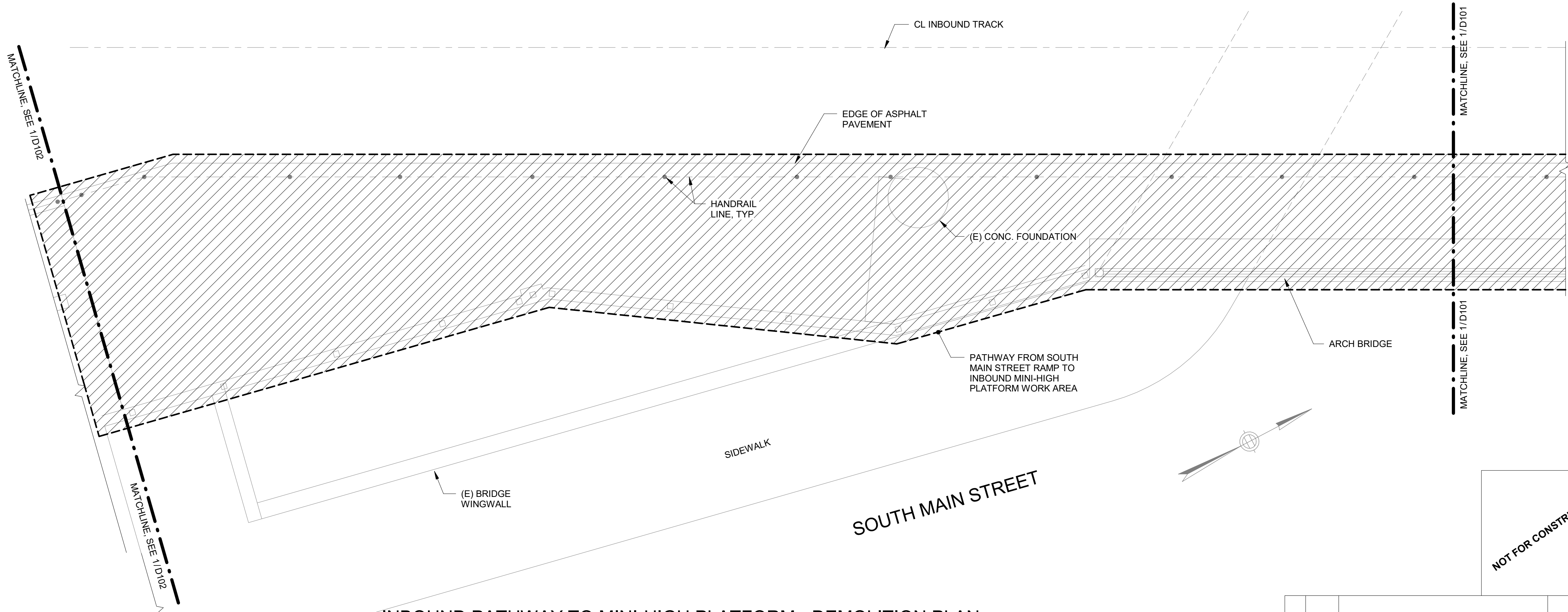
APPROXIMATE DEMOLITION WORK AREA

<div>NOT FOR CONSTRUCTION</div>		<div><div>T</div></div>		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY																	
		ATTLEBORO STATION REPAIRS																			
		PHASE 1 STRUCTURAL REPAIRS																			
		INBOUND PLATFORM DEMOLITION PLAN																			
		APPROVED BY: DOMINIC J. KELLY								MASSACHUSETTS BAY TRANSPORTATION AUTHORITY											
		Project Manager								APPROVED BY: VICTOR CALLAHAN											
		HORIZ: AS NOTED								Project Manager											
		VERT: AS NOTED								PLAN NO.											
A		10/26/22		DESIGN DEVELOPMENT - 60% DRAWING SET				HC		JEH		DJK		DATE: 10.26.2022		SHEET D101		A			
ISSUE		DATE		DESCRIPTION				BY		CHKD		APP.		DES. BY		DR. BY		CHK. BY		ISSUE	
														HC		MTW		DJK			



1 INBOUND RAMP AND STAIR DEMOLITION PLAN
1/4" = 1'-0"

SOUTH MAIN STREET



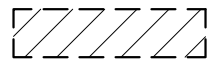
2 INBOUND PATHWAY TO MINI-HIGH PLATFORM - DEMOLITION PLAN
1/4" = 1'-0"

SOUTH MAIN STREET

SHEET NOTES

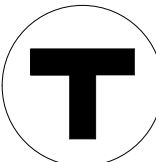
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LEGEND



APPROXIMATE DEMOLITION WORK AREA

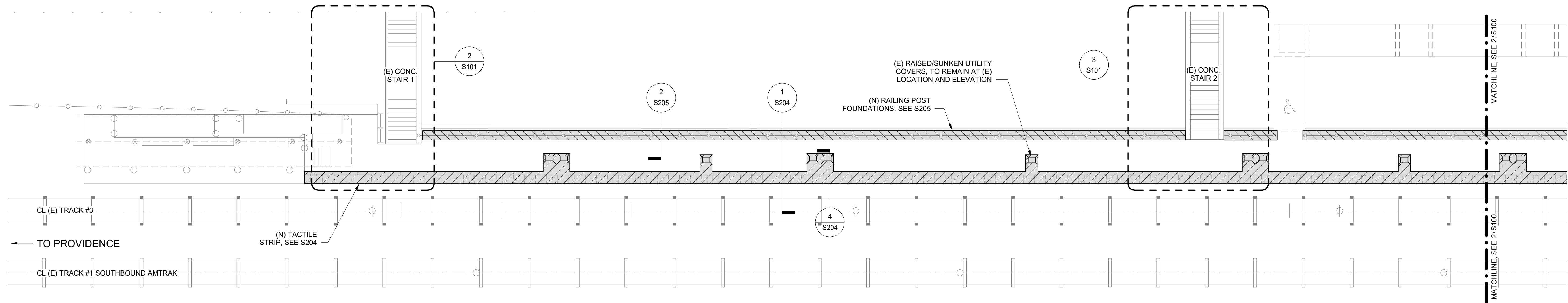
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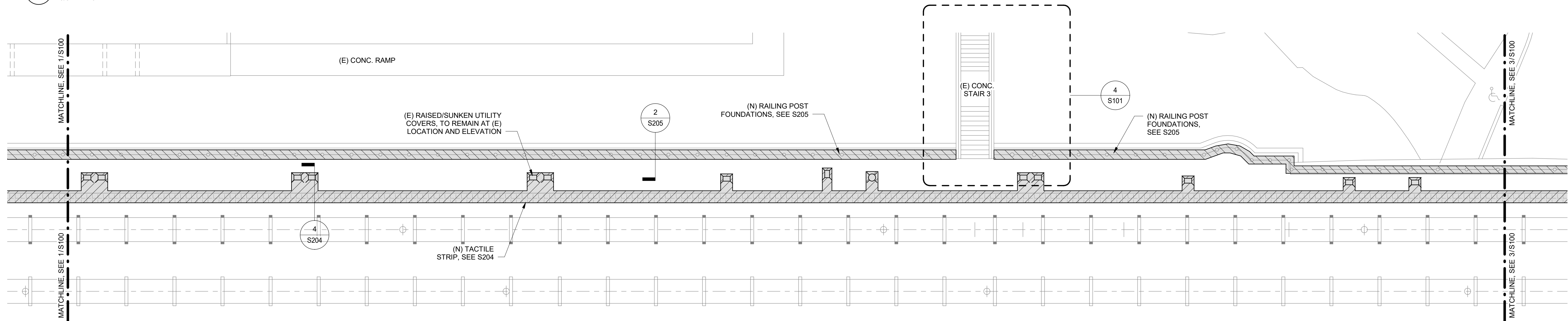
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

ATTLEBORO STATION REPAIRS
PHASE 1 STRUCTURAL REPAIRS

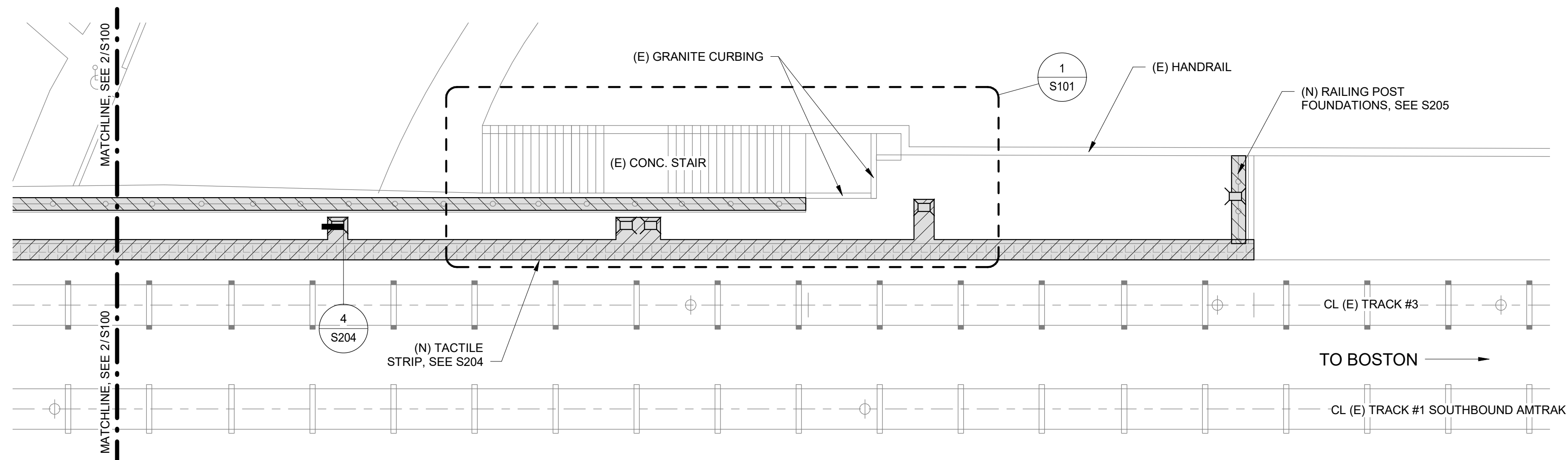
INBOUND PLATFORM DEMOLITION PART PLANS



1 OUTBOUND PLATFORM REPAIR PLAN - SOUTH
3/32" = 1'-0"



2 OUTBOUND PLATFORM REPAIR PLAN - CENTER
3/32" = 1'-0"

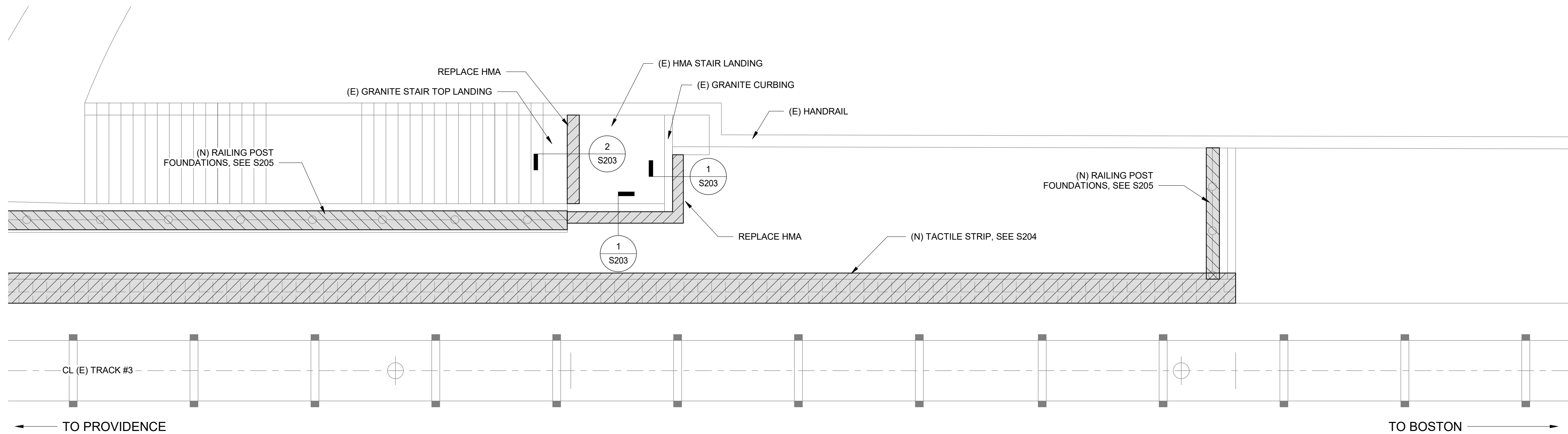


3 OUTBOUND PLATFORM REPAIR PLAN - NORTH
3/32" = 1'-0"

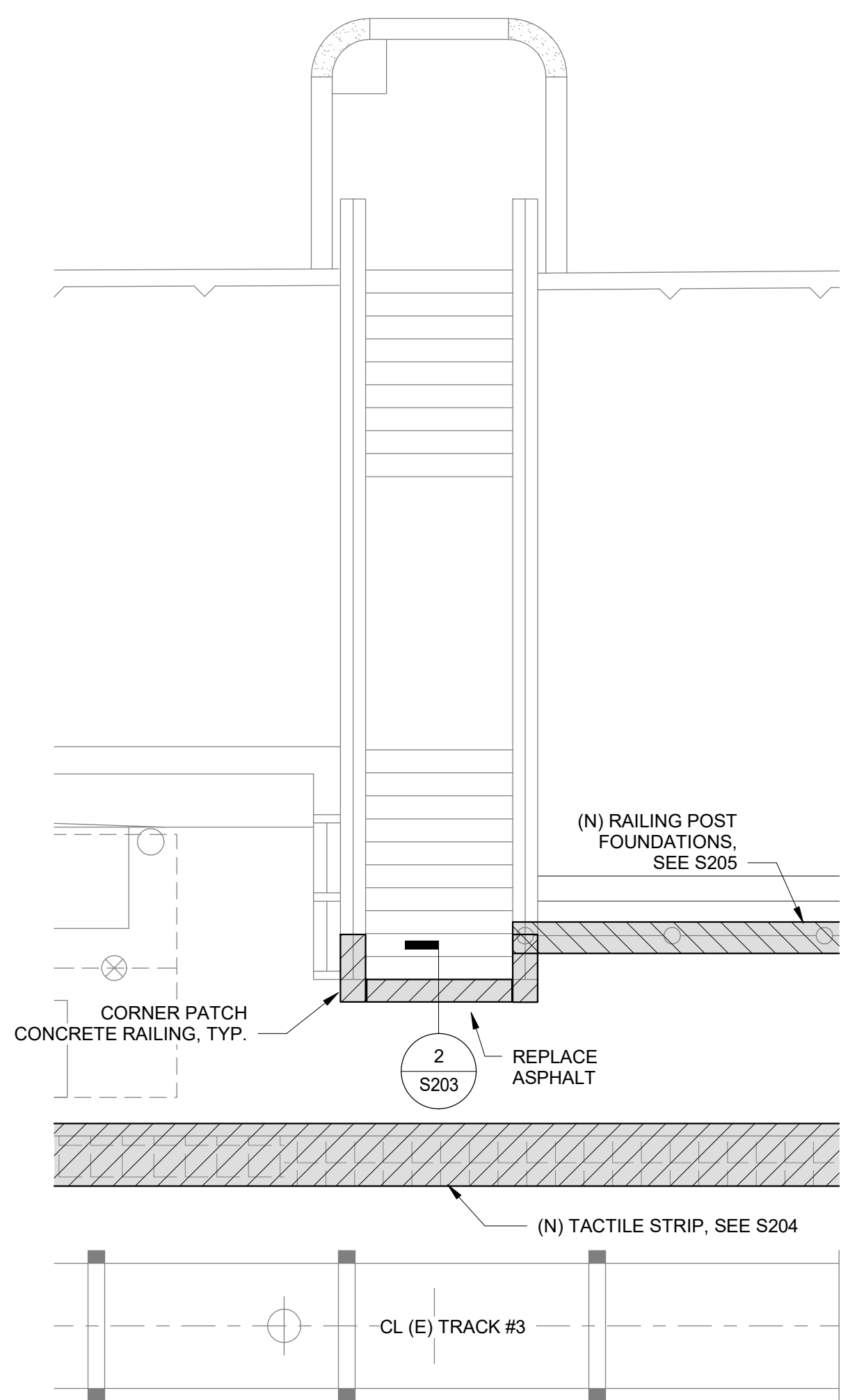
SHEET NOTES
1. REPAIR WORK AREAS SHOWN ON THIS DRAWING ARE APPROXIMATE. SEE DETAILS FOR REPAIR LOCATIONS.
2. REPAIRS AT LOCATIONS OUTSIDE THE AREAS SHOWN IN PLAN ARE PROHIBITED PER MBTA & FTA 18 MARCH 2022 AGREEMENT.

LEGEND	
	CONC. OR ASPHALT REPAIR WORK AREA
	RAILING POST FOUNDATION REPAIR WORK AREA

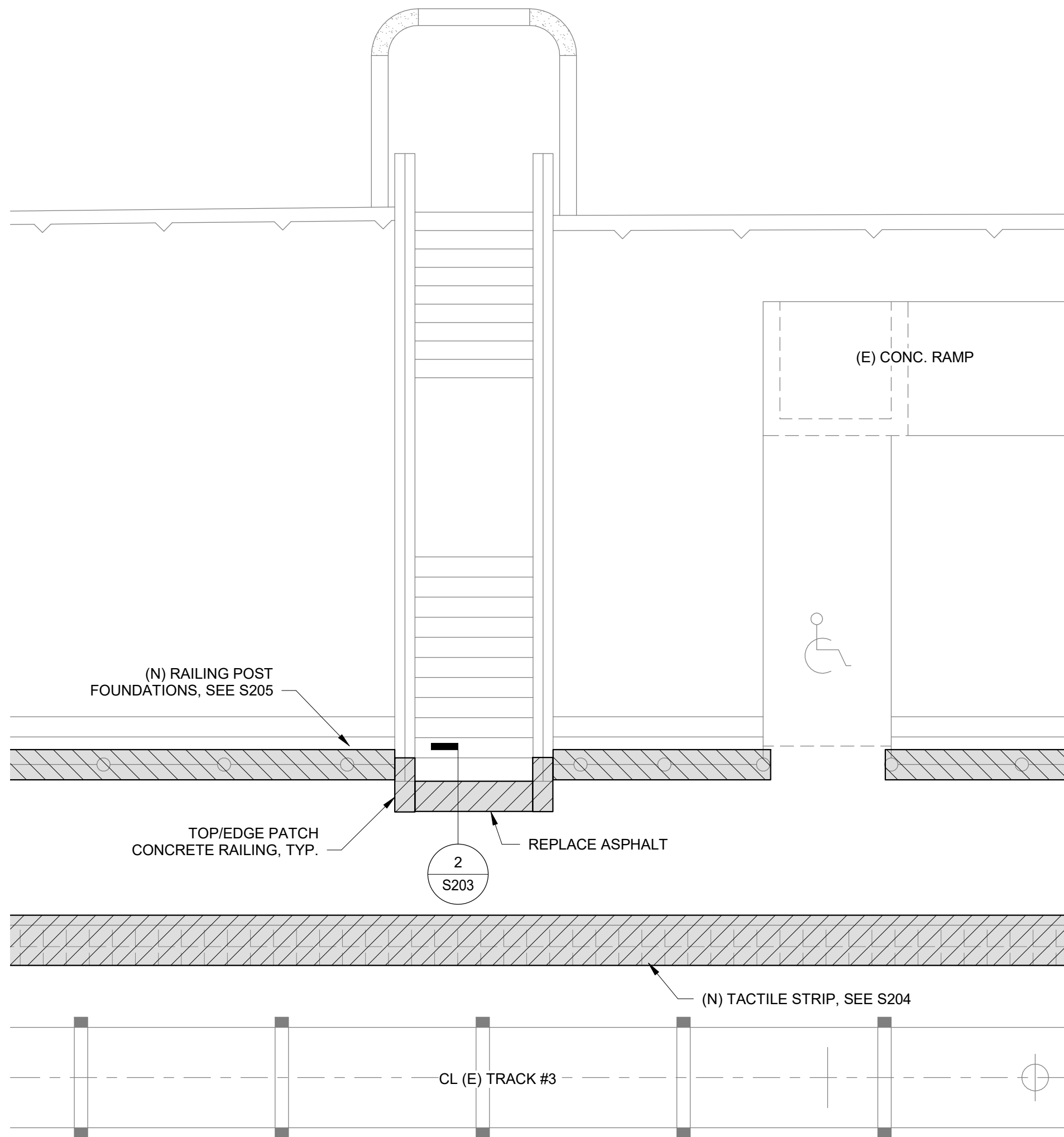
NOT FOR CONSTRUCTION				MASSACHUSETTS BAY TRANSPORTATION AUTHORITY																					
				ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS																					
OUTBOUND PLATFORM REPAIR PLANS																									
<table><tr><td>APPROVED BY:</td><td colspan="3">DOMINIC J. KELLY</td></tr><tr><td>Project Manager</td><td>DES. BY</td><td>DR. BY</td><td>CHK. BY</td></tr><tr><td>HORIZ: AS NOTED</td><td>DATE</td><td></td><td></td></tr><tr><td>VERT: AS NOTED</td><td>HC</td><td>MTW</td><td>DJK</td></tr><tr><td>DATE: 10.26.2022</td><td></td><td></td><td></td></tr></table>		APPROVED BY:	DOMINIC J. KELLY			Project Manager	DES. BY	DR. BY	CHK. BY	HORIZ: AS NOTED	DATE			VERT: AS NOTED	HC	MTW	DJK	DATE: 10.26.2022				MASSACHUSETTS BAY TRANSPORTATION AUTHORITY		APPROVED BY:	
APPROVED BY:	DOMINIC J. KELLY																								
Project Manager	DES. BY	DR. BY	CHK. BY																						
HORIZ: AS NOTED	DATE																								
VERT: AS NOTED	HC	MTW	DJK																						
DATE: 10.26.2022																									
		VICTOR CALLAHAN																							
Project Manager		PLAN NO.	ISSUE																						
SHEET S100		A																							



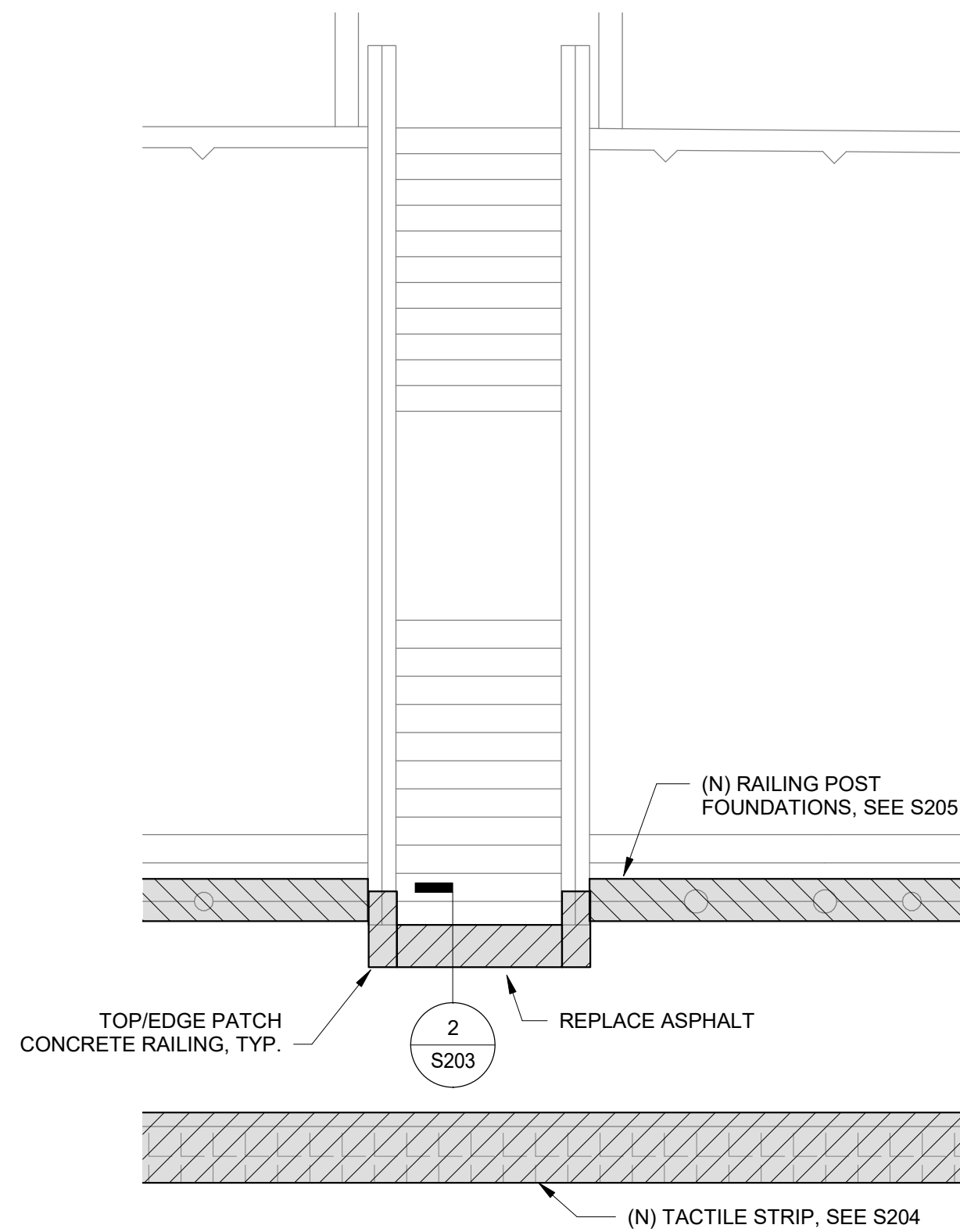
1 OUTBOUND SOUTH MAIN STREET TOP STAIRS
3/16" = 1'-0"



2 OUTBOUND PLATFORM TOP OB STAIR #1
3/16" = 1'-0"



3 OUTBOUND PLATFORM TOP OB STAIR #2
3/16" = 1'-0"



4 OUTBOUND PLATFORM TOP OB STAIR #3
3/16" = 1'-0"

- LEGEND
- CONC. OR ASPHALT REPAIR WORK AREA
 - RAILING POST FOUNDATION REPAIR WORK AREA

SHEET NOTES
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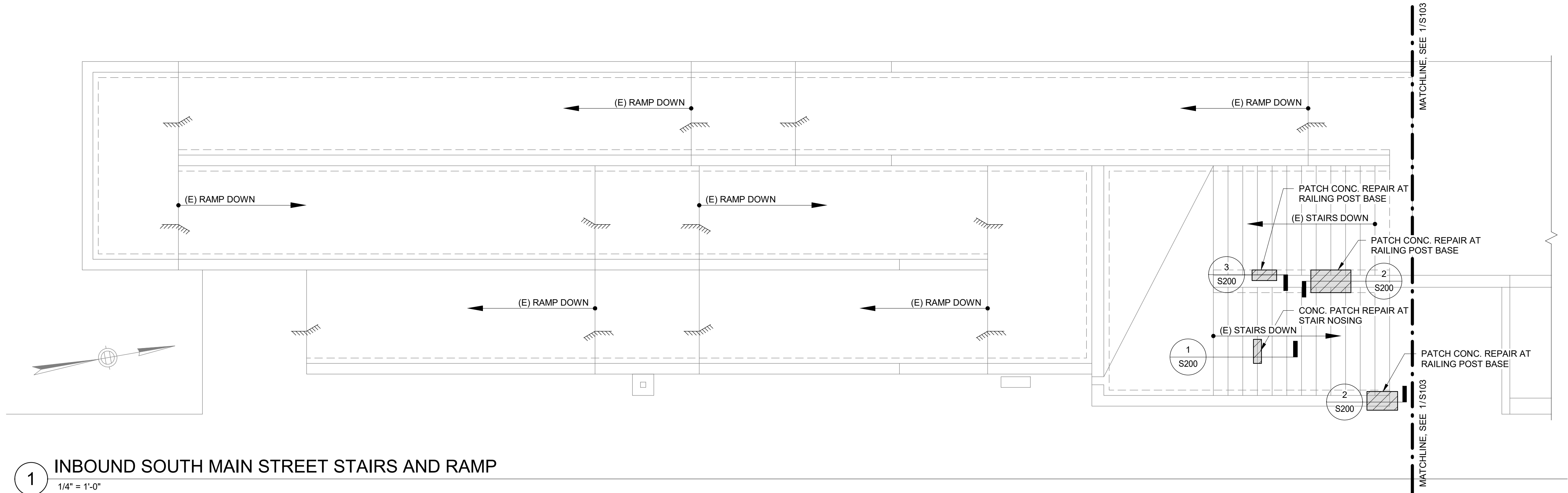
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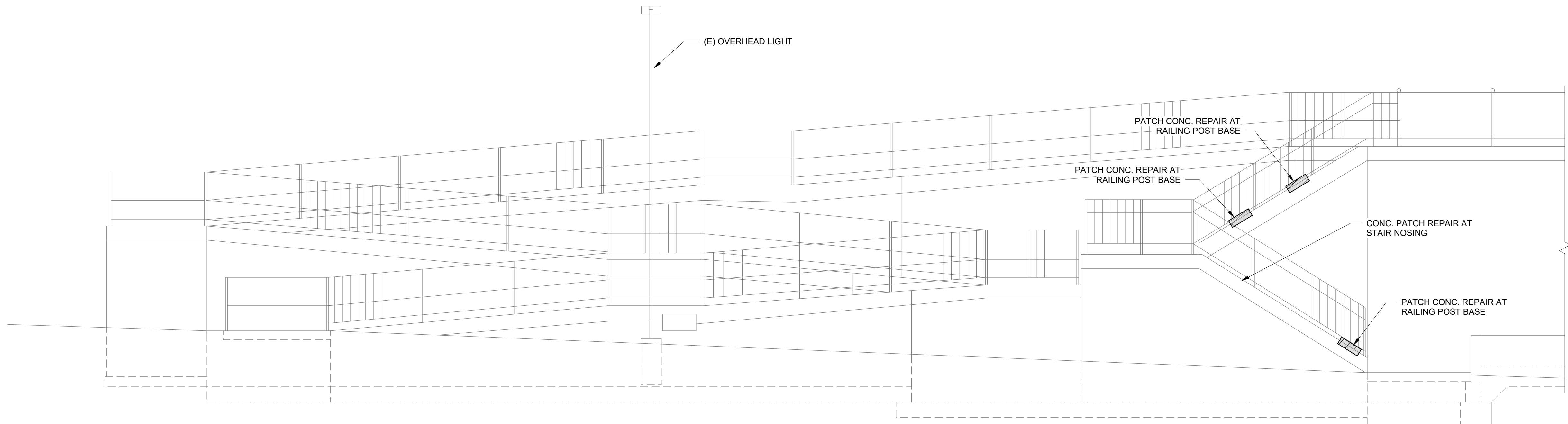
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
ATTLEBORO STATION REPAIRS
PHASE 1 STRUCTURAL REPAIRS

OUTBOUND PLATFORM REPAIR PART PLANS

												MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			

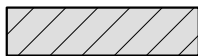


1 INBOUND SOUTH MAIN STREET STAIRS AND RAMP
1/4" = 1'-0"

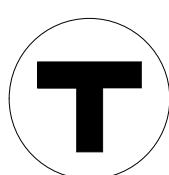



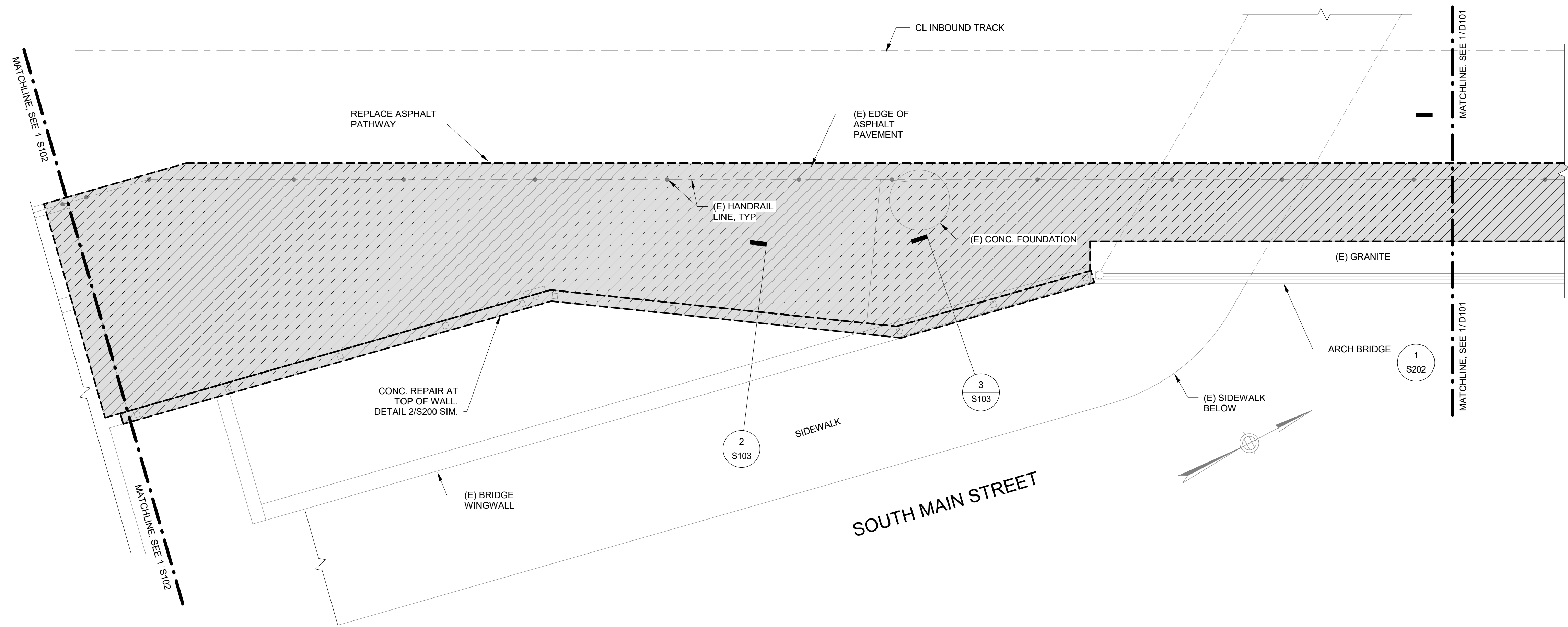
2 INBOUND SOUTH MAIN STREET STAIRS AND RAMP ELEVATION
1/4" = 1'-0"

SHEET NOTES
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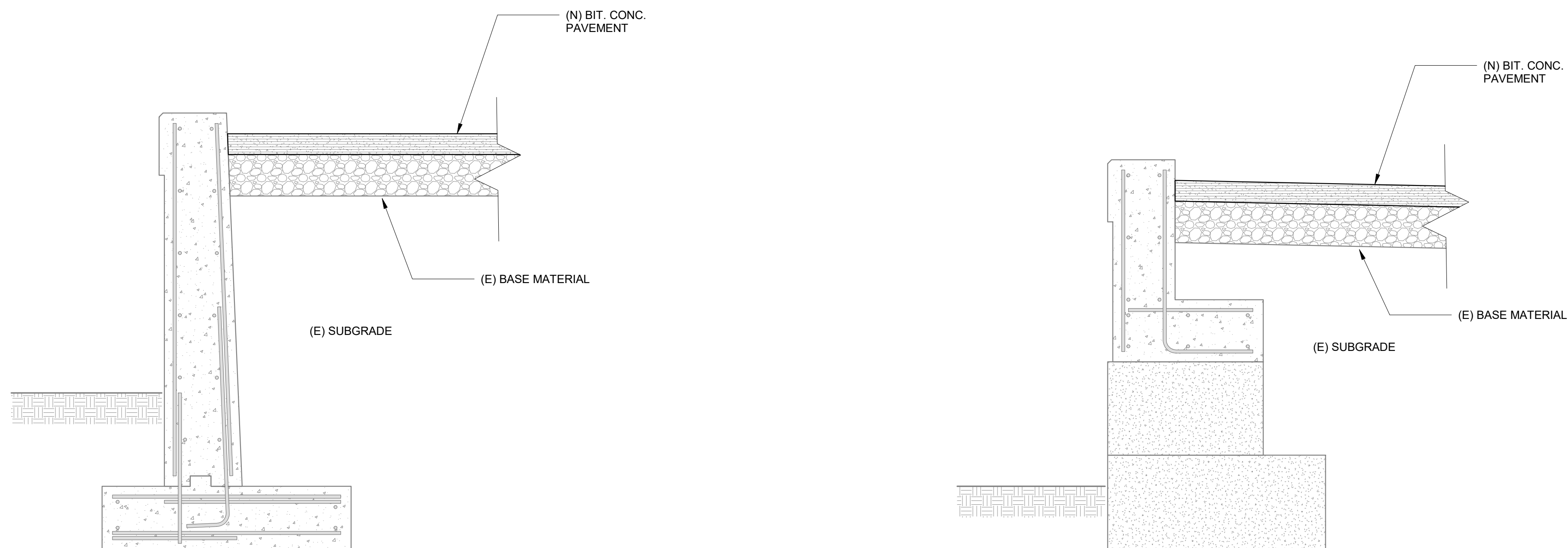
LEGEND
 CONC. OR ASPHALT REPAIR WORK AREA

NOT FOR CONSTRUCTION

	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY					
	ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS					
	INBOUND PLATFORM REPAIR PLANS					
	APPROVED BY: DOMINIC J. KELLY		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			
	Project Manager		APPROVED BY: VICTOR CALLAHAN			
	Date		Project Manager			
	Date		Date			
HORIZ: AS NOTED		DES. BY	DR. BY	CHK. BY	PLAN NO.	ISSUE
VERT: AS NOTED		HC	MTW	DJK	SHEET S102	A
DATE: 10.26.2022						



1 PATHWAY FROM SOUTH MAIN STREET RAMP TO INBOUND MINI-HIGH PLATFORM
1/4" = 1'-0"



2 RETAINING WALL SECTION AT PATHWAY, RAMP & STAIRS
3/4" = 1'-0"

3 WALL SECTION AT GRANITE BLOCKS
3/4" = 1'-0"

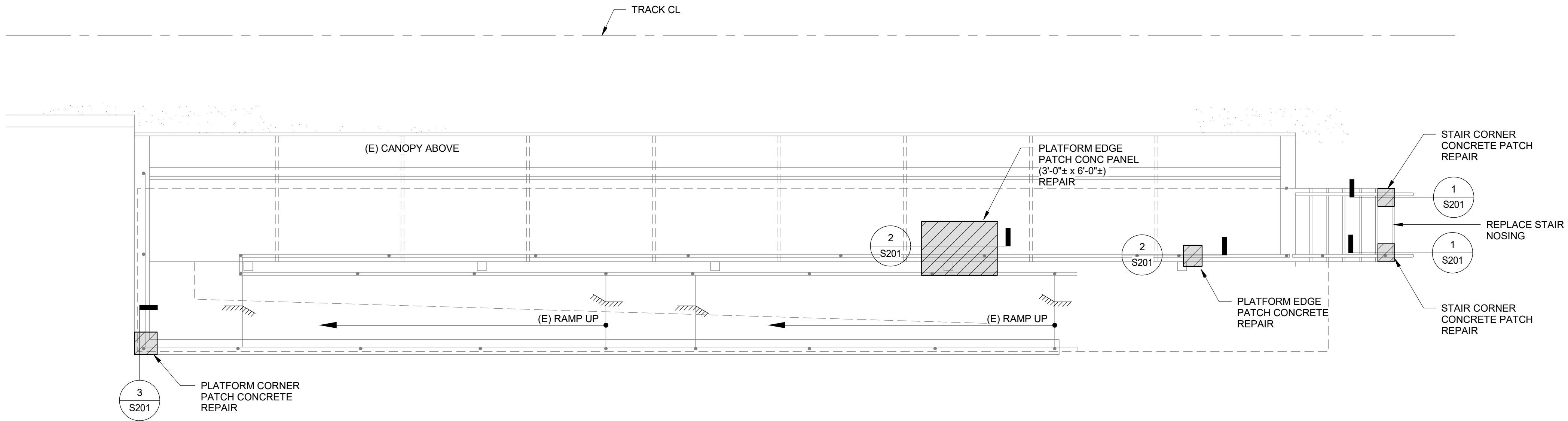
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 CONC. OR ASPHALT REPAIR WORK AREA

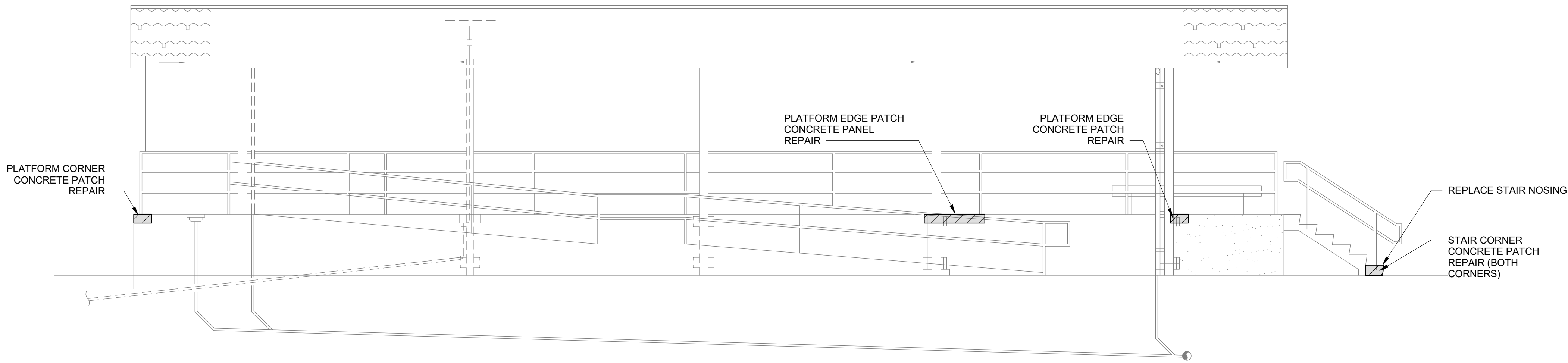
SHEET NOTES

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NOT FOR CONSTRUCTION	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY									
	ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS									
	INBOUND PLATFORM REPAIR PLANS									
APPROVED BY: DOMINIC J. KELLY					APPROVED BY: VICTOR CALLAHAN					
Project Manager					Project Manager					
Date					Date					
HORIZ: AS NOTED					DES. BY	DR. BY	CHK. BY	PLAN NO.		ISSUE
VERT: AS NOTED					HC	MTW	DJK	SHEET S103		
DATE: 10.26.2022										A



1 INBOUND MINI-HIGH PLATFORM PLAN
1/4" = 1'-0"



2 INBOUND MINI-HIGH PLATFORM ELEVATION
1/4" = 1'-0"

SHEET NOTES
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LEGEND
[Hatched Box] CONC. OR ASPHALT REPAIR WORK AREA

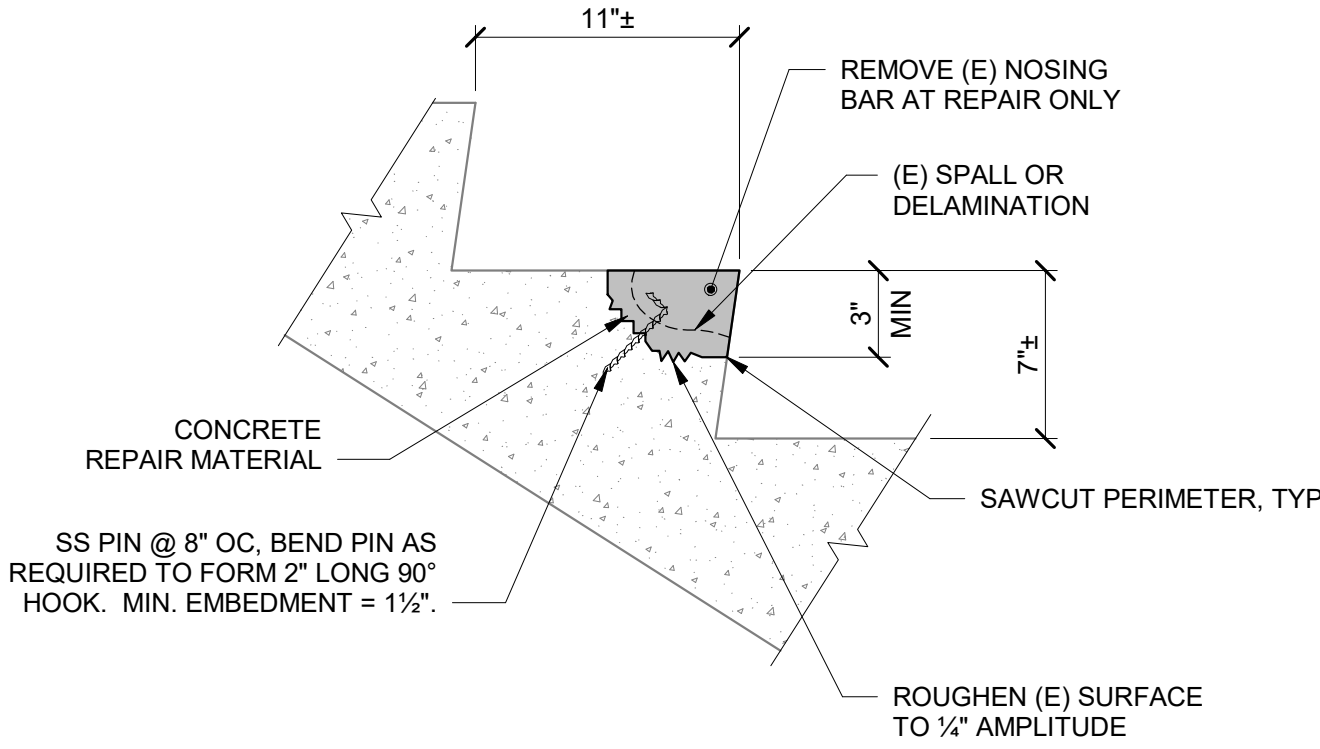
NOT FOR CONSTRUCTION

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	ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS									
	INBOUND PLATFORM REPAIR PLANS									
	APPROVED BY: DOMINIC J. KELLY Project Manager					APPROVED BY: VICTOR CALLAHAN Project Manager				
A		10/26/22		DESIGN DEVELOPMENT - 60% DRAWING SET		HC	JEH	DJK		
ISSUE	DATE	DESCRIPTION				BY	CHKD	APP.		
HORIZ: AS NOTED		DES. BY		DR. BY	CHK. BY	DATE		PLAN NO.		
VERT: AS NOTED		HC		MTW	DJK			SHEET S104		
DATE: 10.26.2022								A		

GENERAL CONCRETE REPAIR PROCEDURE

The Contractor shall perform concrete repair in accordance with the Details in the S200 Series Drawings in this set and the following procedure.

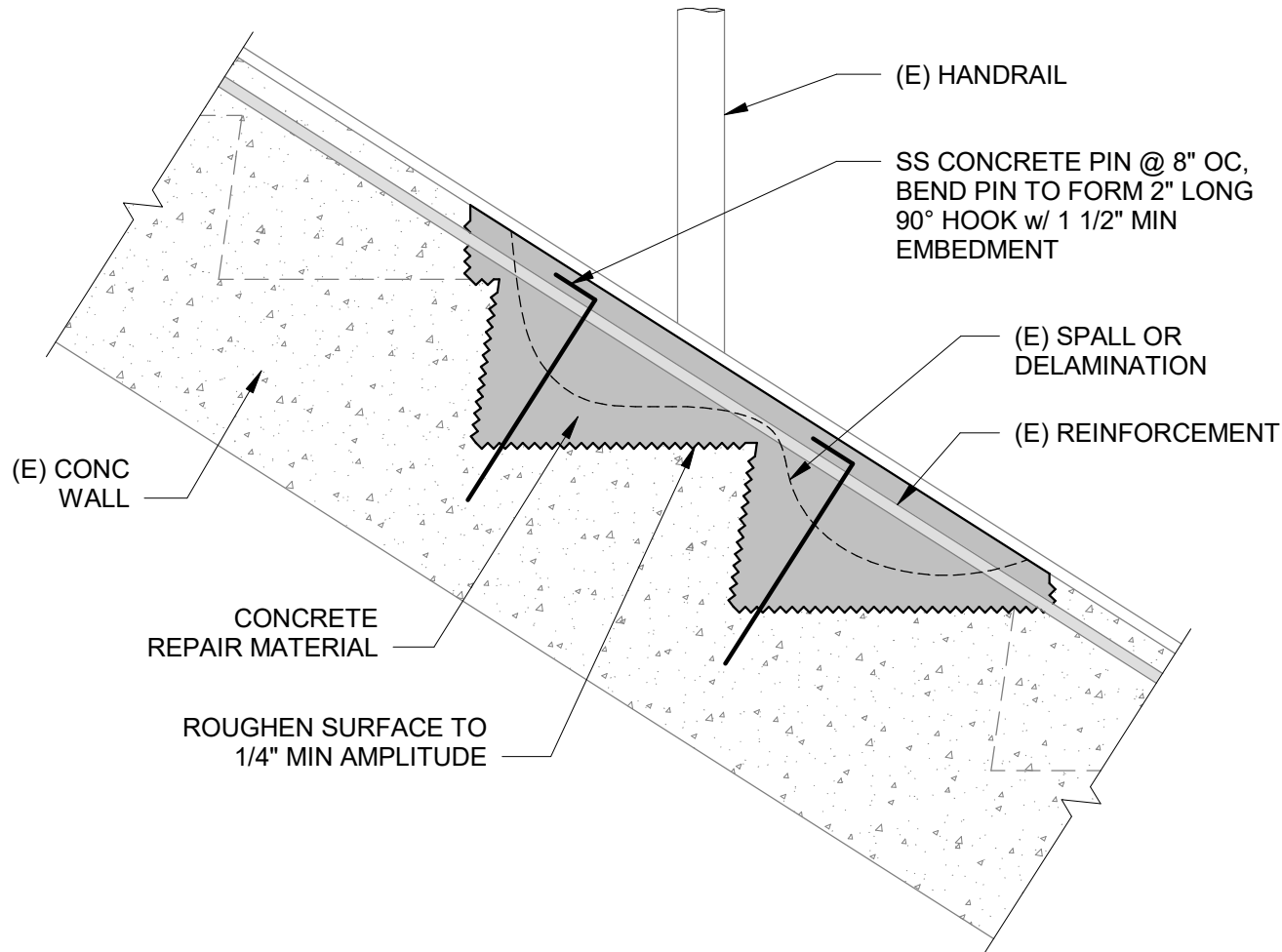
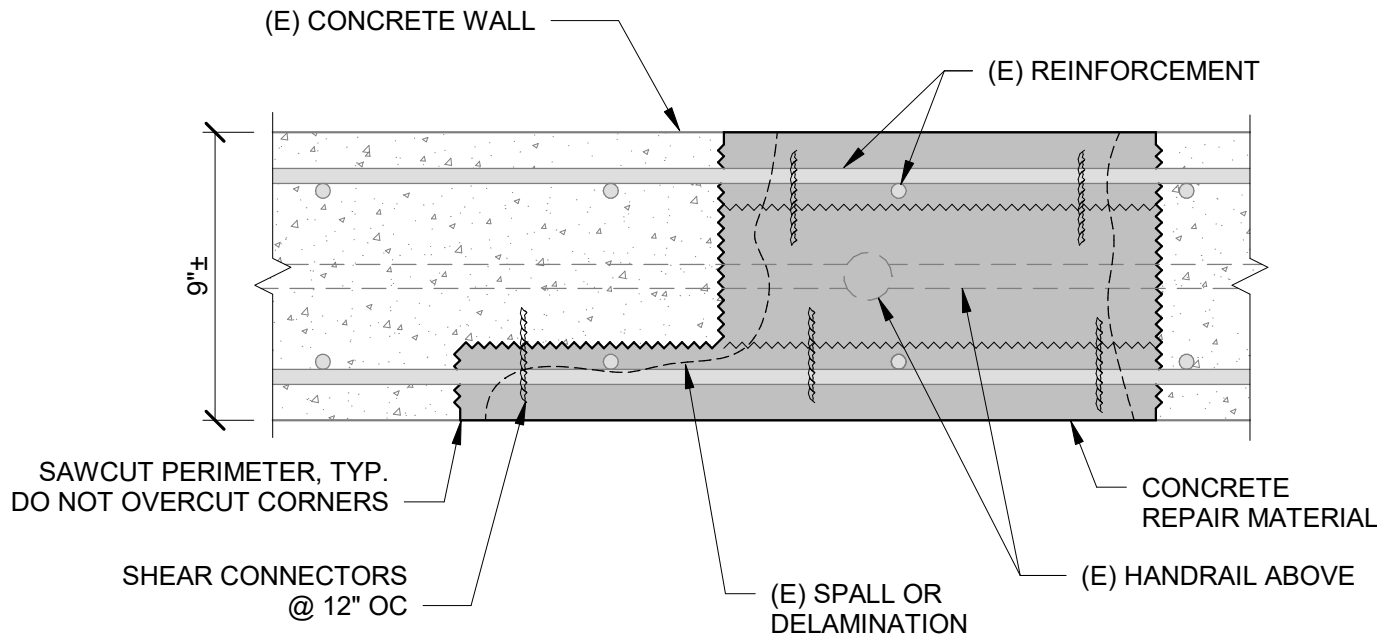
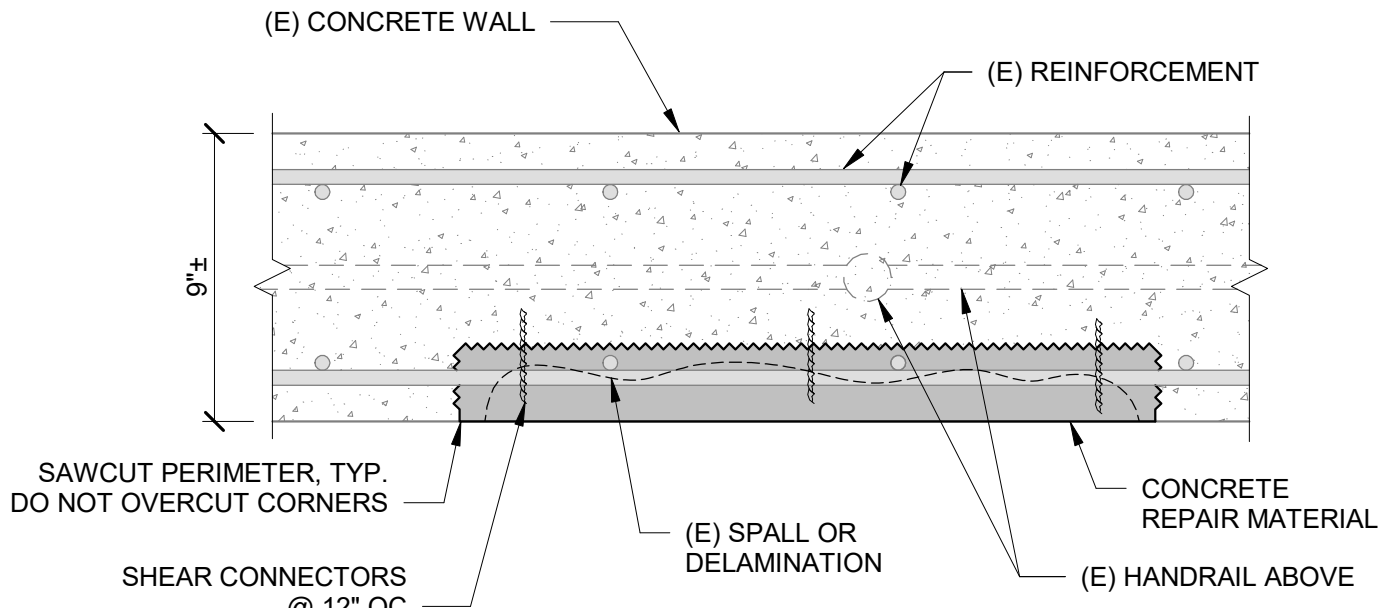
1. Locate the Repair Area:
 - a. The general locations of delaminated/spalled concrete are indicated on Drawings S101 - S104.
 - b. The Contractor is responsible for visually inspecting and sounding all concrete surfaces at these areas to refine the exact extents of the repairs.
2. Access: coordinate with the MBTA, Keolis, and Amtrak, as necessary.
3. Perform demolition and surface preparation:
 - a. Install protection at adjacent pipes, conduits, ducts, utility boxes, platforms, structures, etc.
 - b. Provide 3/4 in. deep saw-cut edges around the perimeter of the repair area, normal to the face of the surrounding concrete. The saw cuts shall form polygons that have 90° corners and enclose the area to be repaired. Modify as required to avoid cutting the reinforcement.
 - c. Remove all spalled, delaminated, and sound concrete in the area to be repaired. Remove concrete to such additional width and depth as required to expose uncorroded reinforcing bars and a surface of sound uncontaminated concrete or to limits indicated on details and section cuts of the Drawings. Remove concrete to a minimum depth of 3/4 in. beyond the innermost layer of reinforcement. Roughen concrete surface to minimum amplitude of 1/4 in.
 - d. Conduct concrete removal in a manner to prevent cutting, nicking, bending, or otherwise damaging the existing reinforcement. All damage will be repaired at no cost to the Owner
 - e. Remove all loose particles and deleterious materials from the exposed sound concrete, exposed reinforcing bars, and accessories by sandblasting. Clean reinforcing bars to SSPC-6, commercial blast finish, or better.
5. Install the sacrificial anodes where existing reinforcement is exposed by concrete demolition:
 - a. Install anodes in accordance with the manufacturer's written instructions.
 - b. Install anode units immediately following preparation and cleaning of the steel reinforcement.
 - c. Provide sacrificial anodes at the reinforcing bar frame, attaching anode tie wires to the exposed bare, cleaned, uncoated steel reinforcement. The tie wires shall be wrapped around the steel reinforcement and twisted tight to allow no free movement. Mask the existing steel reinforcement and steel tie wires to prevent applying protective coating within 1 in. of the anode-to-reinforcement connection.
 - d. Provide sufficient clearance between anodes and the concrete substrate to allow a minimum concrete or mortar cover over the anode of 1 in.
 - e. Provide a minimum depth of 3/4 in. between the anode and the concrete substrate. Increase the size of the repair cavity as necessary to accommodate the anodes.
 - f. Pack the galvanic embedding mortar between the anode and the substrate concrete to create a conductive grout bridge, ensuring that no voids exist.
 - g. Confirm electrical continuity between the tying points on the anodes and the reinforcing steel.
 - h. Confirm continuity.
 - i. Confirm electrical connection between anode tie wire and reinforcing steel by measuring DC resistance (ohm, Ω) or DC potential with a multimeter.
 - ii. Confirm electrical continuity of the exposed reinforcing steel within the repair area. If necessary, electrical continuity shall be established with steel tie wire.
 - iii. Electrical continuity is acceptable if the DC resistance measured with multimeter is 1 or less or the DC potential is 1 mV or less.
 - iv. Install formwork and place the concrete repair material ensuring that the anode units are not disturbed.
6. Supplemental reinforcement and coating of existing and supplement reinforcement
 - a. Reinforcing bars with metal loss greater than 15% of the original bar cross section shall be brought to the attention of the Engineer prior to continuing repair work
 - b. Provide supplemental reinforcement as shown on the drawings and as directed by the Engineer. Tie the reinforcement to existing bars with a minimum lap of 48 bar diameters or 60 bar diameters for epoxy-coated reinforcement.
 - c. Where lap splices are not possible or where directed by the Engineer remove corroded portion of existing reinforcement and splice supplemental reinforcement with mechanical bar splices.
 - d. Provide supplemental accessories to support exposed reinforcement in accordance with the requirements of CRSI and as directed by the Engineer.
 - e. Coat all exposed reinforcement and accessories with protective coating in accordance with the manufacturers written instructions.
7. Splicing new reinforcement or new to existing reinforcement
 - a. Install couplers at locations identified by the Engineer.
 - b. Remove additional concrete as required to expose ends of undamaged steel and to allow proper installation of couplers.
 - c. Provide all hardware and equipment to install couplers in accordance with the manufacturer's written instructions.
 - d. Provide new lengths of steel bars to replace damaged bars. New bars shall match existing strand size.
 - e. Install couplers in accordance with the manufacturer's written instructions and maintain stressing logs and submit to the Engineer.
 - f. The concrete section may be enlarged in order to maintenance the minimum concrete cover to the coupler and associated new reinforcement, as directed by the Engineer.
8. Install the formwork
 - a. Construct forms to match configuration of existing surrounding concrete, unless otherwise approved by the Owner and the Engineer.
 - b. The Contractor shall design forms in accordance with ACI 347R. Forms shall be designed to withstand safely the pressure developed by the weight and load of repair material, and the pump pressure if used. Maximum pressure exerted on formwork occurs after the cavity is full and pressurized.
 - c. Provide impermeable watertight forms at vertical and underside repair areas. Preformed foam gaskets or cash-in-place foam shall be used to address difficult-to-match surfaces. Tape the boundaries of the forms with two-sided rubberized asphalt tape. Provide a secondary seal around the perimeter of the form with silicone sealant. Keep bentonite-impregnated oakum on the job for emergency sealing of form edges. Provide valved ports as required to ensure complete draining of water used for substrate conditioning.
 - d. Provide openings or valved ports for introduction of the repair concrete and valved ports to vent air at the top of the lifts. Place vent holes at a minimum of one vent hole per 8 sq ft of repair area, not more than 8 ft apart, with at least two vent holes per repair.
 - e. Immediately prior to erecting formwork, remove dust and debris from the previously prepared surfaces of sound concrete and reinforcement with a high-pressure water cleaner capable of pressures in excess of 6,000 psi.
 - f. Erect formwork and preload all anchors for attachment of the formwork to the existing structure to prevent slippage during concrete placement. Forms shall be constructed to fit tightly against existing concrete surfaces.
 - g. For formed repairs, provide formwork that provides 1-1/2 in. minimum cover over reinforcing steel, unless otherwise approved by the Engineer. Extend formwork beyond existing adjacent formed surface if required to maintain this cover; provide a smooth transition to the adjacent concrete.
9. Perform concrete placement
 - a. After the formwork is in place, fill the repair area with water and allow it to stand for 24 hrs immediately preceding placement. Drain the form 4 hrs before concrete placement.
 - b. Place the new repair concrete using form-and-pour or form-and-pump method.
 - c. Place repair concrete in accordance with manufacturer's written procedure.
 - d. Ensure proper consolidation in the form using mechanical vibrators as required.
10. Provide concrete protection and curing
 - a. Moist cure repair concrete for a minimum of seven days.
 - b. Cure formed concrete surfaces: If forms remain during curing period, moist cure after loosening forms. Leave forms in place for a minimum of seven days. If removing forms before end of curing period, continue curing for the remainder of the curing period.
 - c. During the curing period, protect the concrete from damage due to mechanical disturbances, such as shock and vibration due to adjacent construction activity. All finished concrete surfaces shall be protected from damage.
11. Removal of surface deposits
 - a. Remove stains, efflorescence, fins, and other surface deposits resulting from the work of this Section deemed objectionable by the Engineer by methods acceptable to the Engineer.



NOTE:
PROVIDE RADIUS OF CURVATURE AT THE LEADING
EDGE OF THE TREAD TO MATCH (E) CONDITIONS.

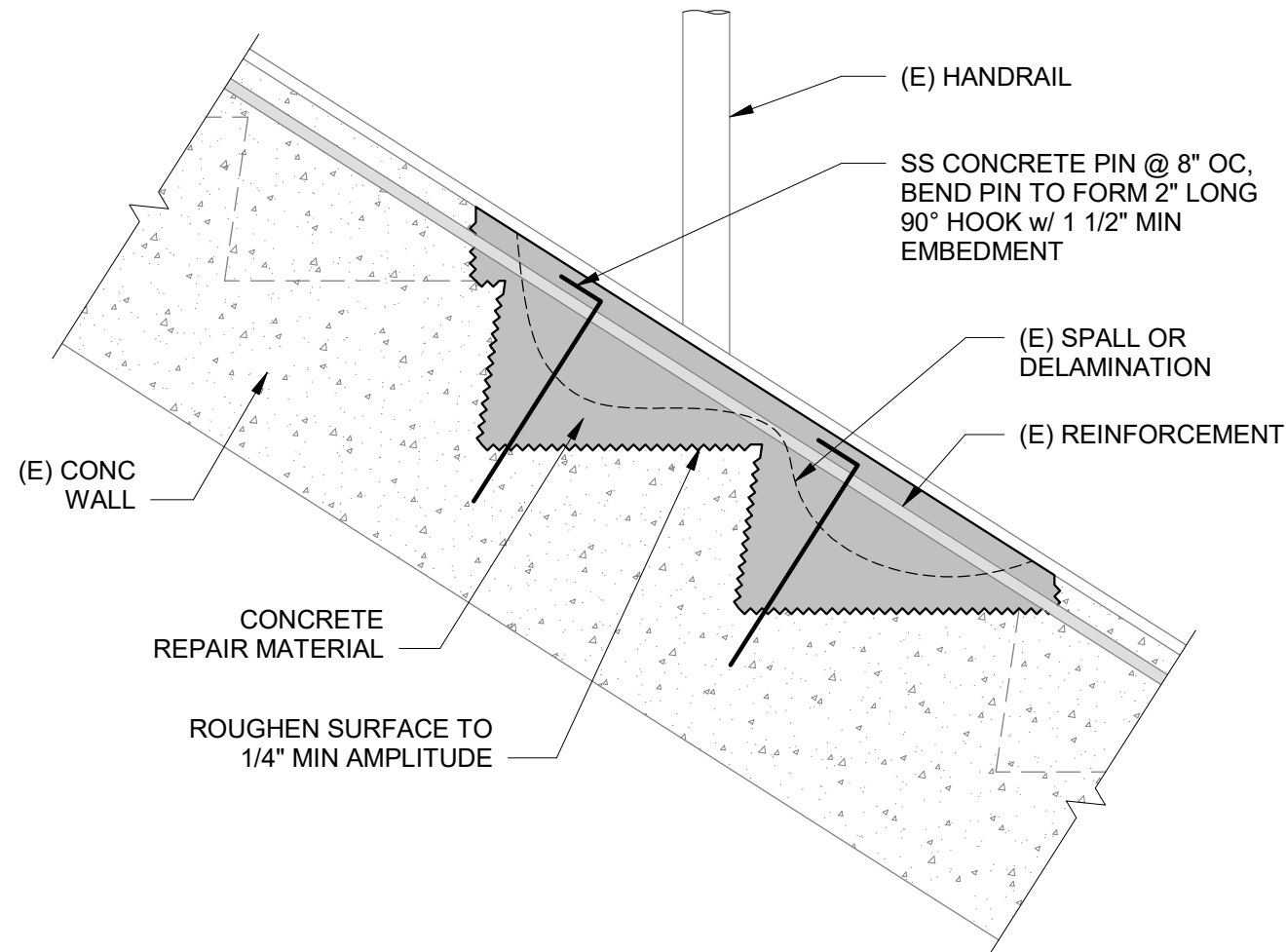
1 STAIR NOSING CONCRETE PATCH

1 1/2" = 1'-0"



2 TOP/EDGE CONCRETE PATCH AT RAILING

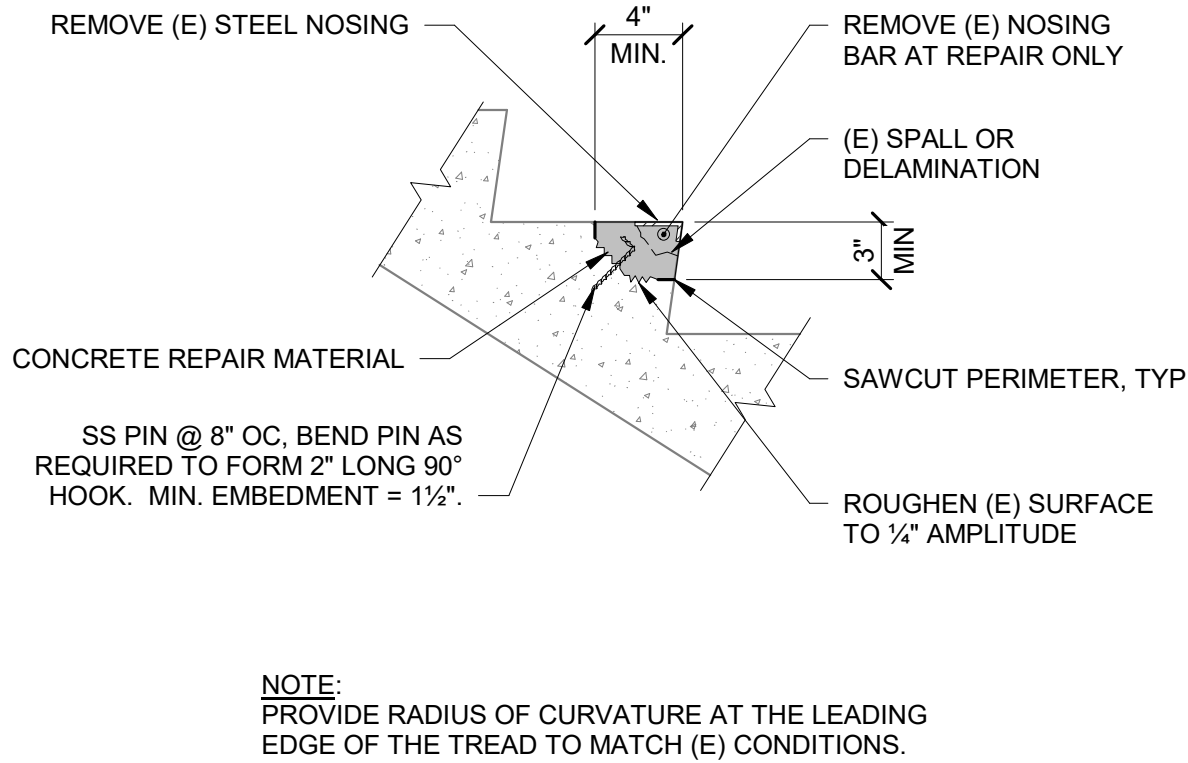
1 1/2" = 1'-0"



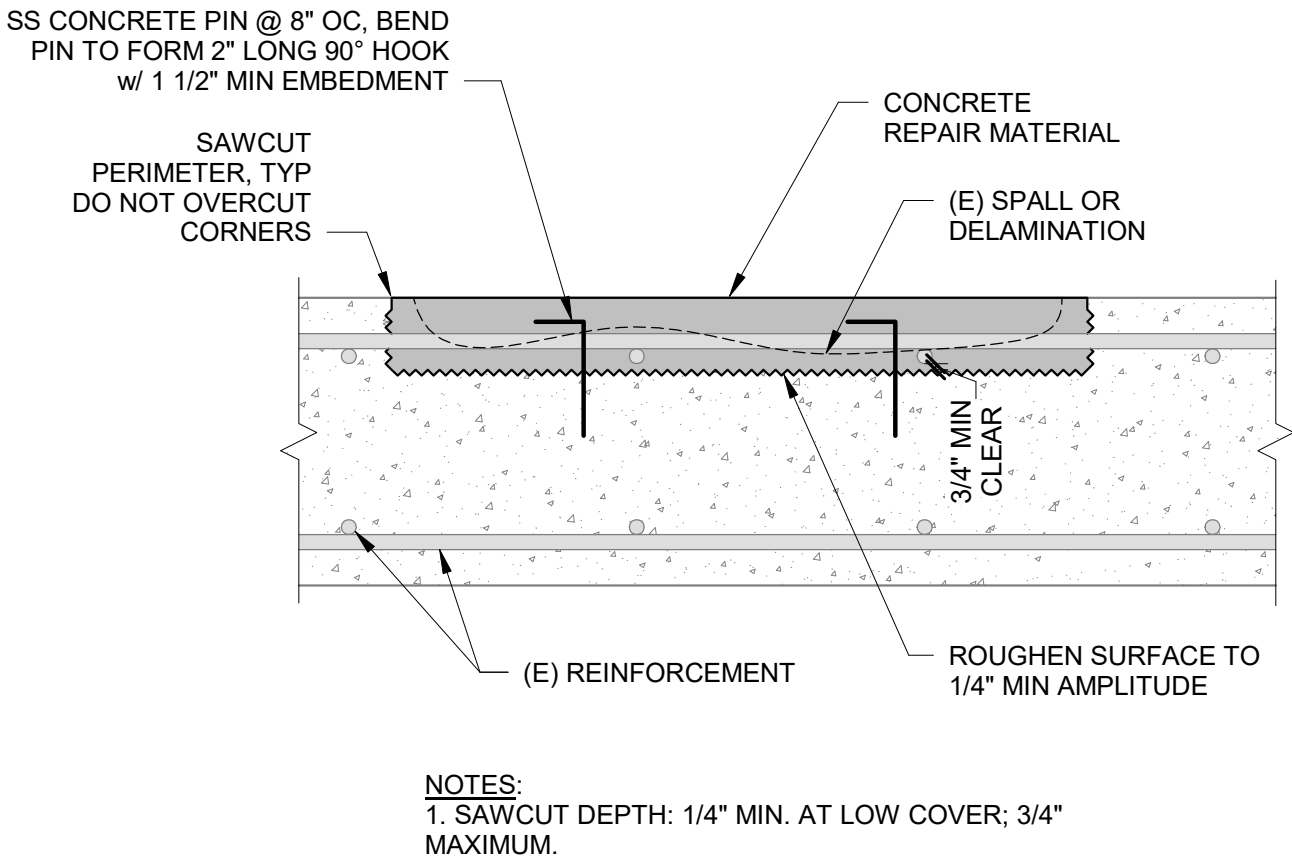
3 INTERIOR EDGE CONCRETE PATCH AT RAILING

1 1/2" = 1'-0"

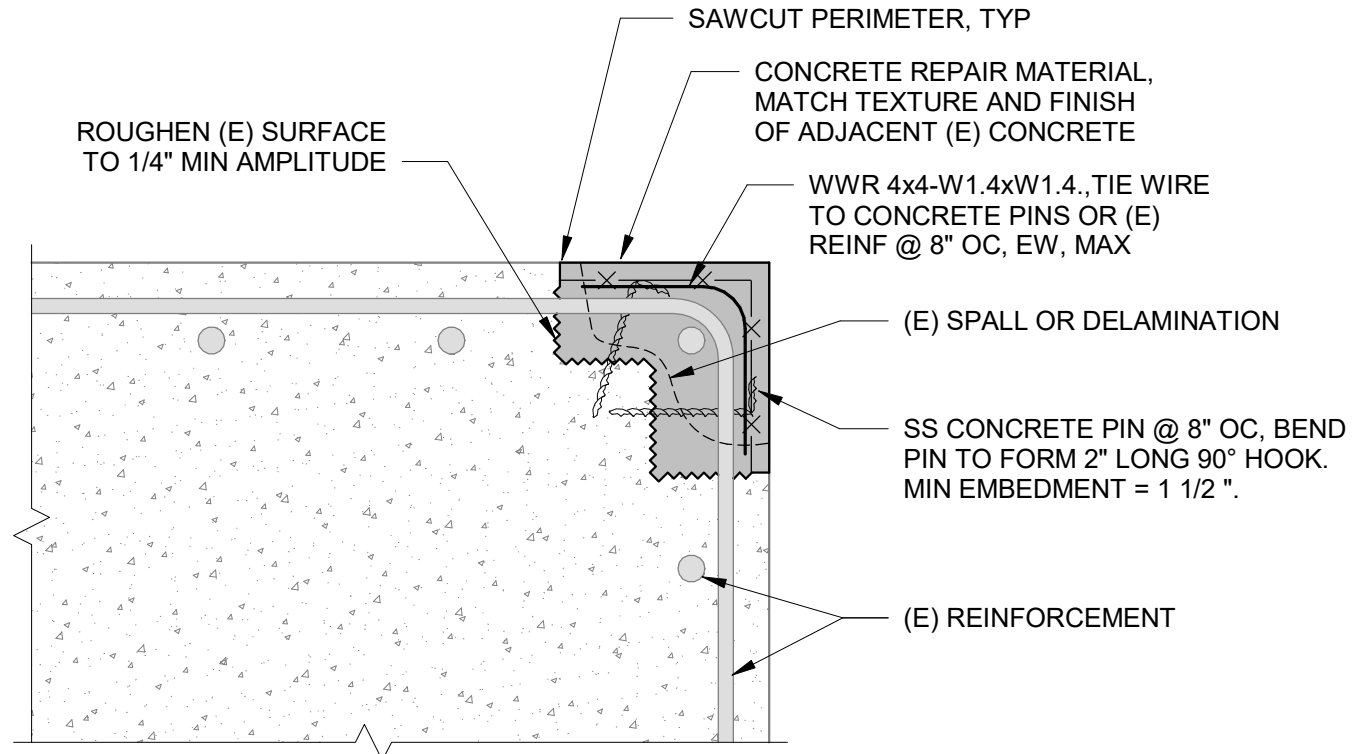
NOT FOR CONSTRUCTION		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
		ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS	
		CONCRETE REPAIR DETAILS	
APPROVED BY: DOMINIC J. KELLY		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
Project Manager		APPROVED BY: VICTOR CALLAHAN	
Date		Project Manager	
HORIZ: AS NOTED		PLAN NO.	
VERT: AS NOTED		SHEET S200	
DATE: 10.26.2022			



1 STAIR CORNER CONCRETE PATCH
1" = 1'-0"



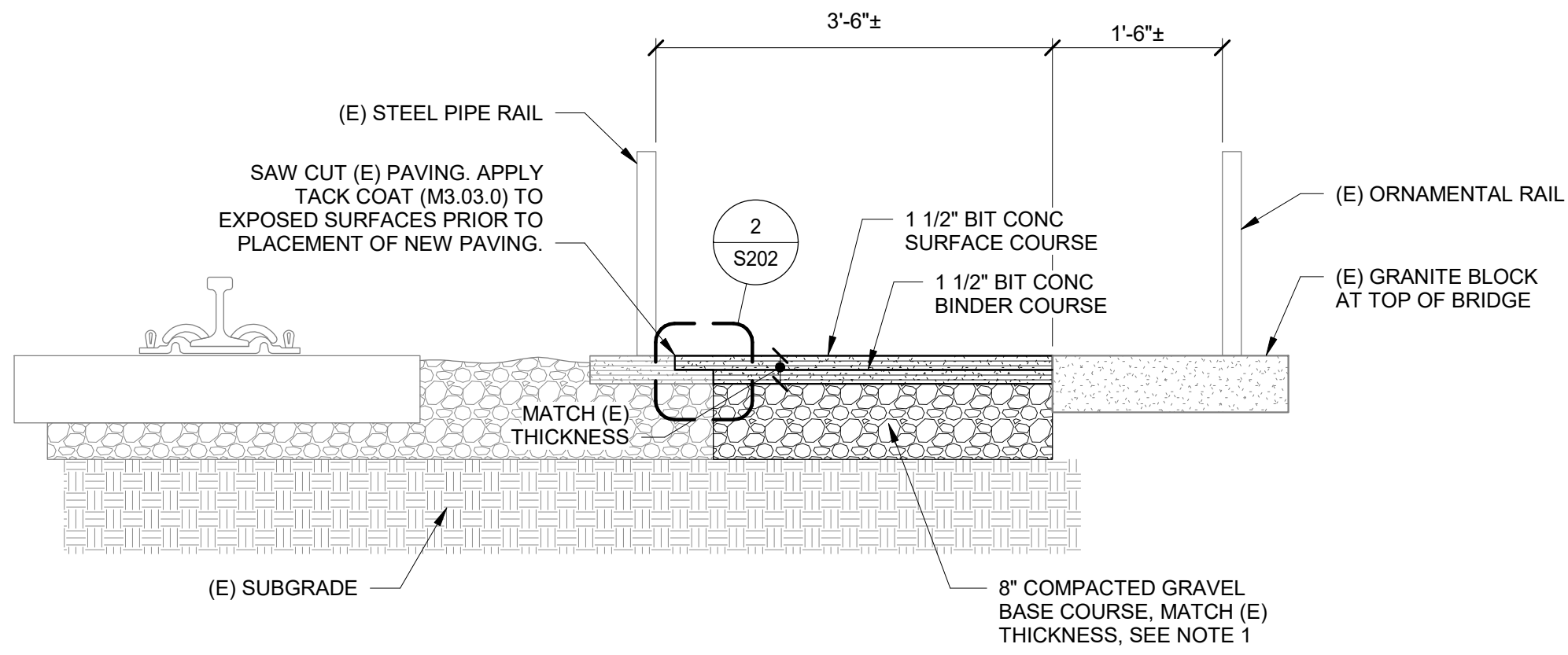
2 PLATFORM EDGE CONCRETE PATCH
1 1/2" = 1'-0"



- NOTES:**
- 1. HAND LAYUP IS ACCEPTABLE AT LOCATIONS LESS THAN 1 SQ FT.
 - 2. WWR NOT REQUIRED IF REPAIR EXPOSES MORE THAN TWO BARS IN EACH DIRECTION.
 - 3. WHERE HAND APPLIED REPAIR MATERIAL IS USED, THE CONCRETE PINS SHALL ENGAGE THE OUTER LIFT.

3 PLATFORM CORNER CONCRETE PATCH
1 1/2" = 1'-0"

<div>NOT FOR CONSTRUCTION</div>		<div>T</div>		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY																					
		ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS																							
CONCRETE REPAIR DETAILS												MASSACHUSETTS BAY TRANSPORTATION AUTHORITY													
												APPROVED BY: DOMINIC J. KELLY										APPROVED BY: VICTOR CALLAHAN			
A		10/26/22		DESIGN DEVELOPMENT - 60% DRAWING SET				HC		JEH		DJK		Project Manager		Date		Project Manager		Date					
ISSUE		DATE		DESCRIPTION				BY		CHKD		APP.		HORIZ: AS NOTED		DES. BY		DR. BY		CHK. BY		PLAN NO.		ISSUE	
														VERT: AS NOTED		HC		MTW		DJK		SHEET S201		<div>A</div>	
														DATE: 10.26.2022											



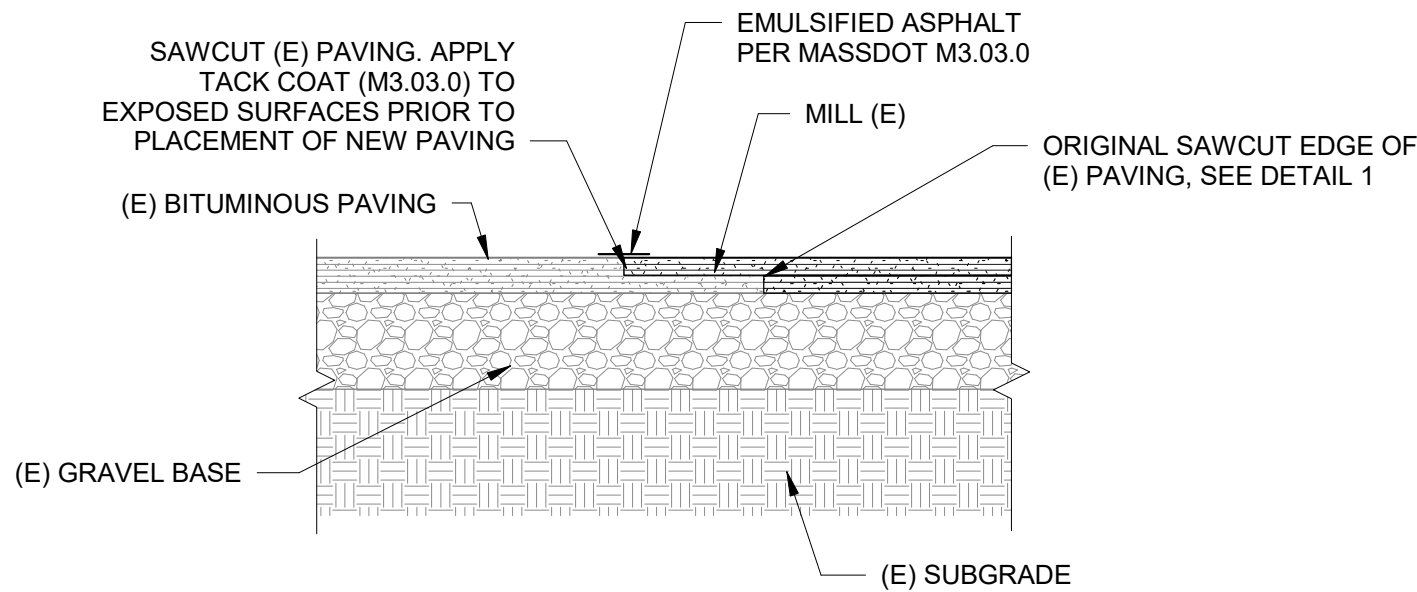
NOTES:

1. INSPECT, CONFIRM THICKNESS, AND SUBMIT MATERIAL TEST RESULTS OF THE EXISTING GRAVEL BASE FOR EOR AND CITY REVIEW.

1

ASPHALT PAVEMENT

3/4" = 1'-0"



NOTES:

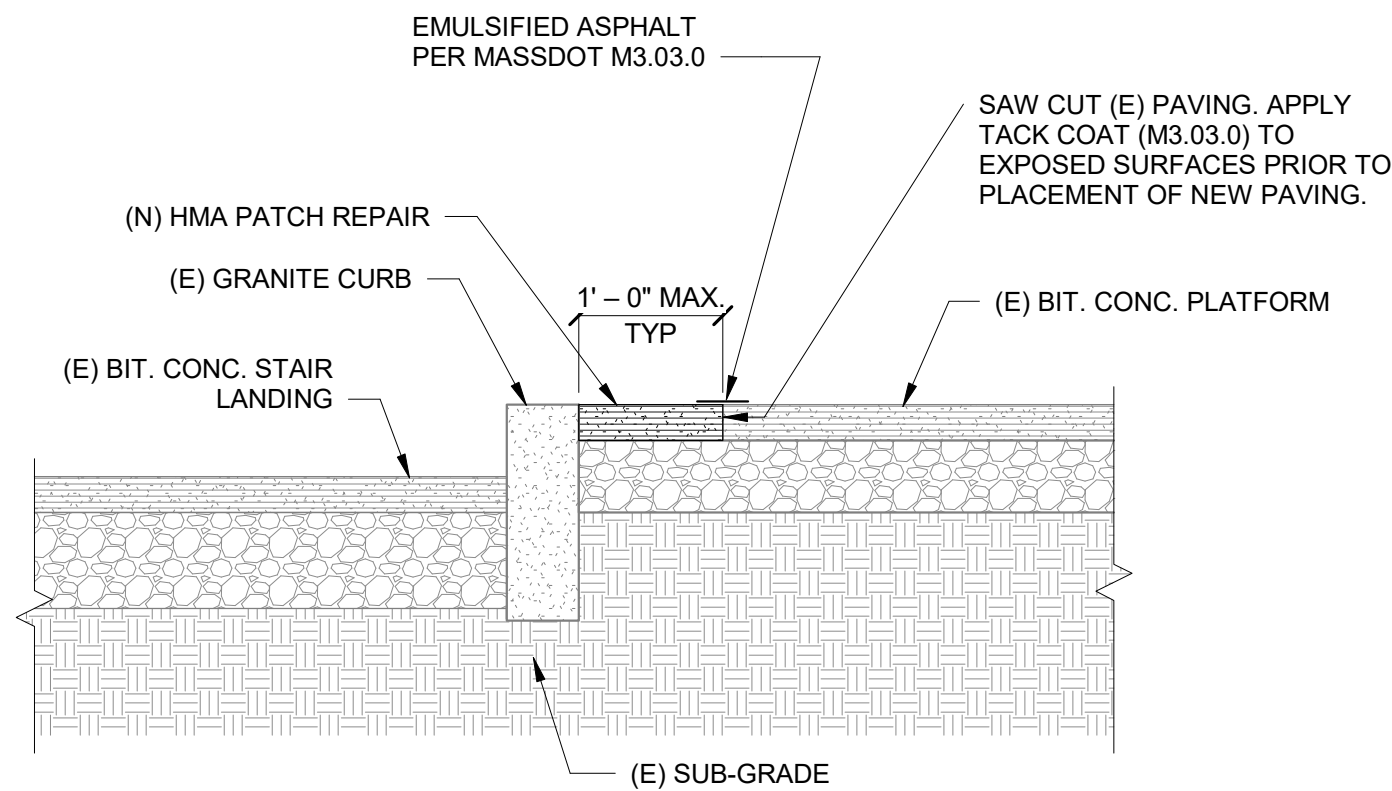
1. EXISTING, ADJOINING PAVEMENT SHALL BE DRY AND FREE OF DEBRIS.

2

ASPHALT TRANSITION

3/4" = 1'-0"

NOT FOR CONSTRUCTION				MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			
				ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS			
				ASPHALT REPAIR DETAILS			
				MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			
				APPROVED BY: DOMINIC J. KELLY			
				APPROVED BY: VICTOR CALLAHAN			
				PROJECT MANAGER			
				DATE			
				HORIZ: AS NOTED			
				VERT: AS NOTED			
				DATE: 10.26.2022			
				DES. BY: HC			
				DR. BY: MTW			
				CHK. BY: DJK			
				PLAN NO.			
				SHEET S202			
				ISSUE			
				A			



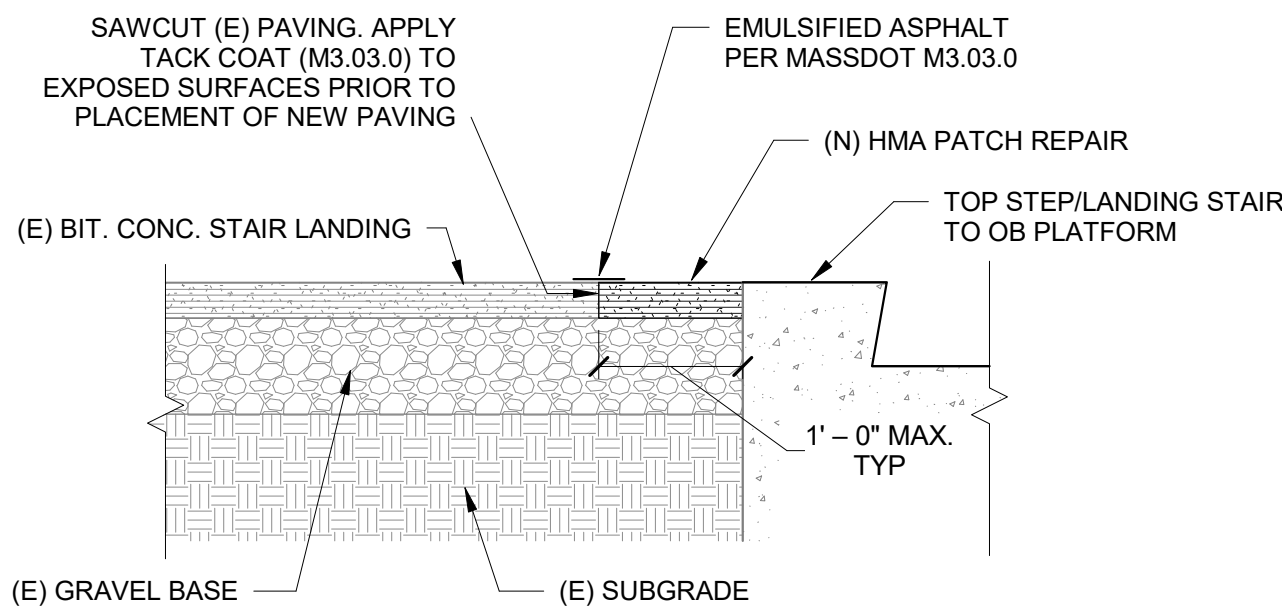
NOTES:

1. EXISTING, ADJOINING PAVEMENT SHALL BE DRY AND FREE OF DEBRIS.

1

ASPHALT PATCH REPAIR AT VERTICAL GRANITE CURB

3/4" = 1'-0"



NOTES:

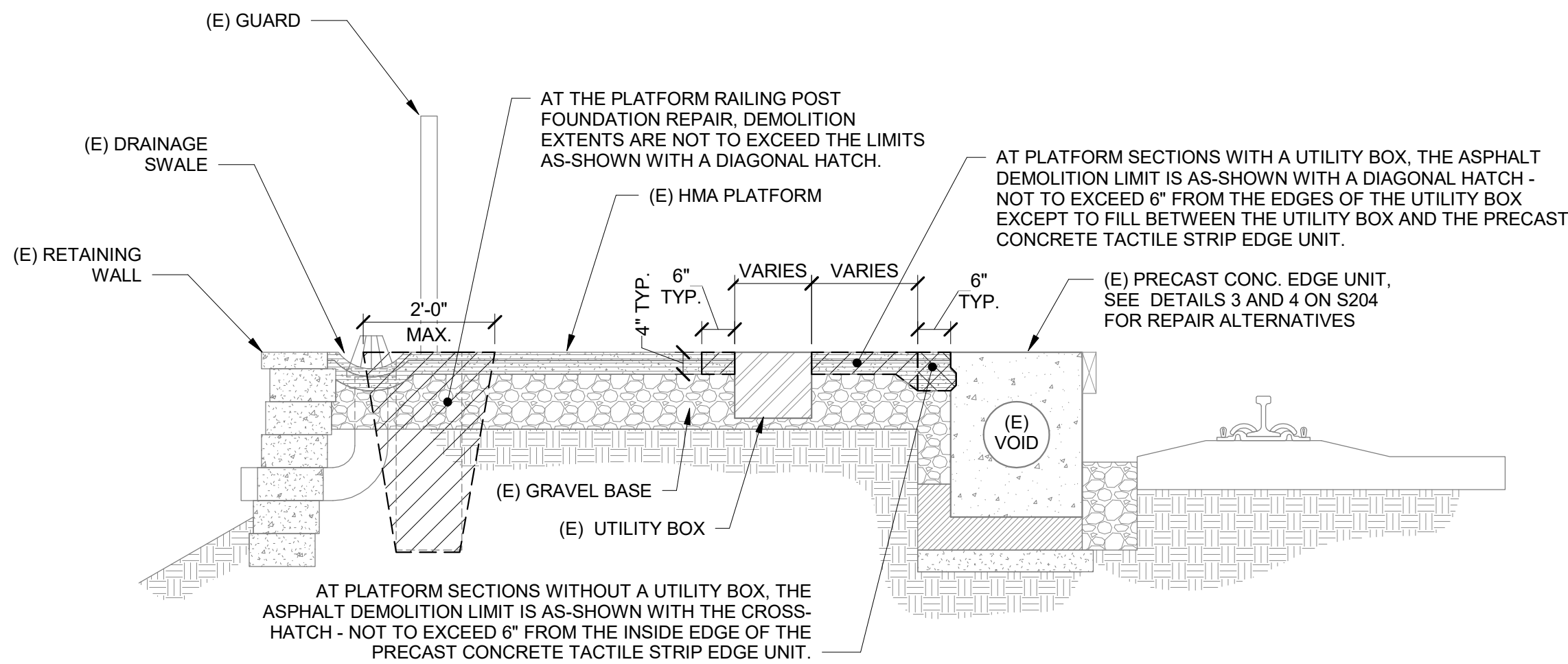
1. EXISTING, ADJOINING PAVEMENT SHALL BE DRY AND FREE OF DEBRIS.

2

ASPHALT PATCH REPAIR AT TOP LANDING STAIR

3/4" = 1'-0"

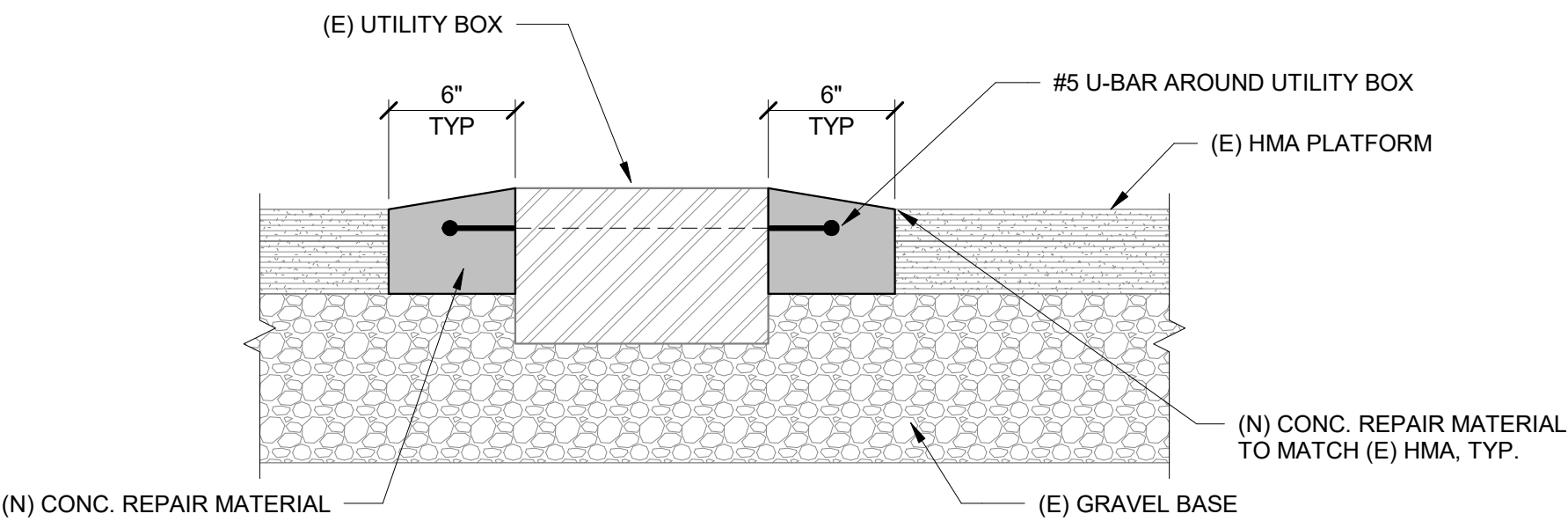
NOT FOR CONSTRUCTION		<div>T</div>		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY																					
				ATTLEBORO STATION REPAIRS																					
				PHASE 1 STRUCTURAL REPAIRS																					
ASPHALT REPAIR DETAILS																									
<div></div>		APPROVED BY: DOMINIC J. KELLY								MASSACHUSETTS BAY TRANSPORTATION AUTHORITY															
		Project Manager								APPROVED BY: VICTOR CALLAHAN															
		Date								Project Manager															
		Date								Date															
A		10/26/22		DESIGN DEVELOPMENT - 60% DRAWING SET				HC		JEH		DJK		HORIZ: AS NOTED		DES. BY		DR. BY		CHK. BY		PLAN NO.		ISSUE	
DATE		DESCRIPTION		BY		CHKD		APP.		HC		MTW		DJK		DATE: 10.26.2022		SHEET		S203		A			



NOTES
1. THE CONTRACTOR SHALL NOT EXCEED DEMOLITION EXTENTS SHOWN IN THIS DRAWING WITHOUT EXPLICIT WRITTEN APPROVAL FROM MBTA AND FTA.
2. FOR CONCRETE DEMOLITION EXTENTS AT NON-PLATFORM AREAS, PLEASE SEE CONCRETE REPAIR PROCEDURE NOTES ON S200.

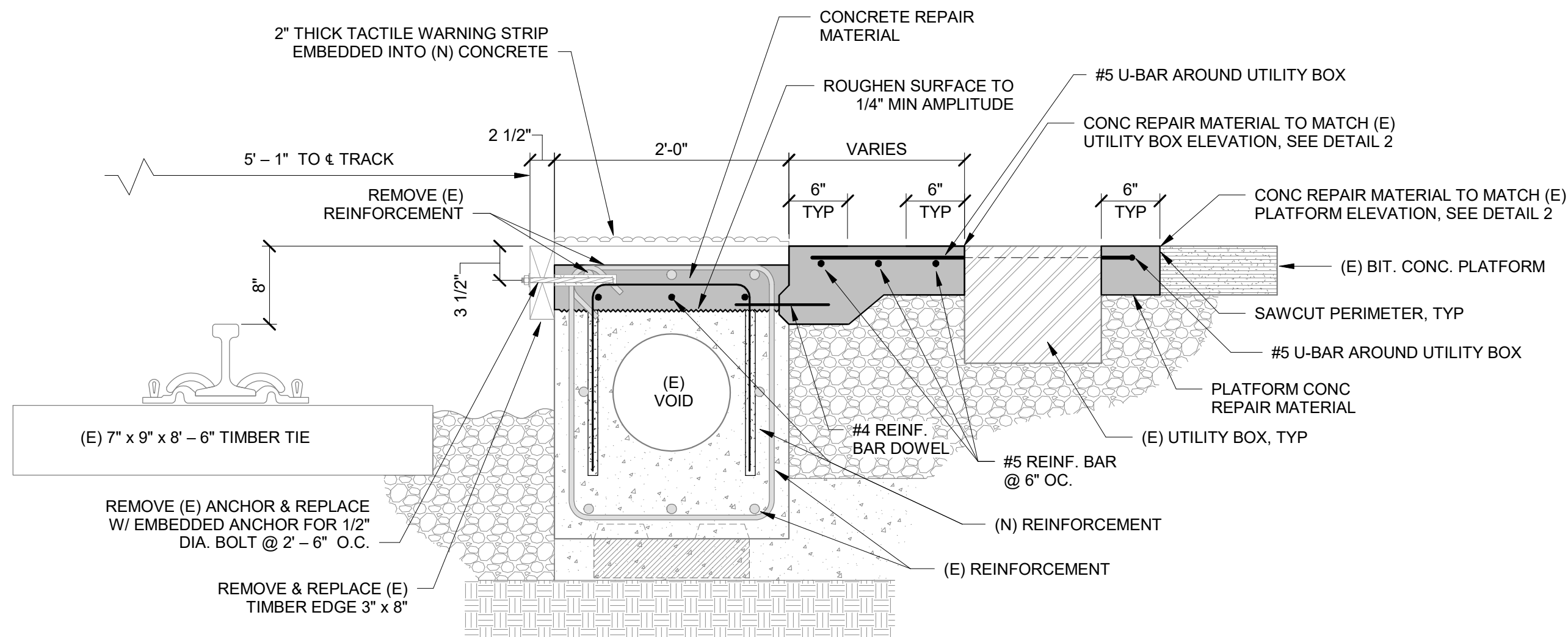
1 PLATFORM DEMOLITION CROSS-SECTION

1/2" = 1'-0"



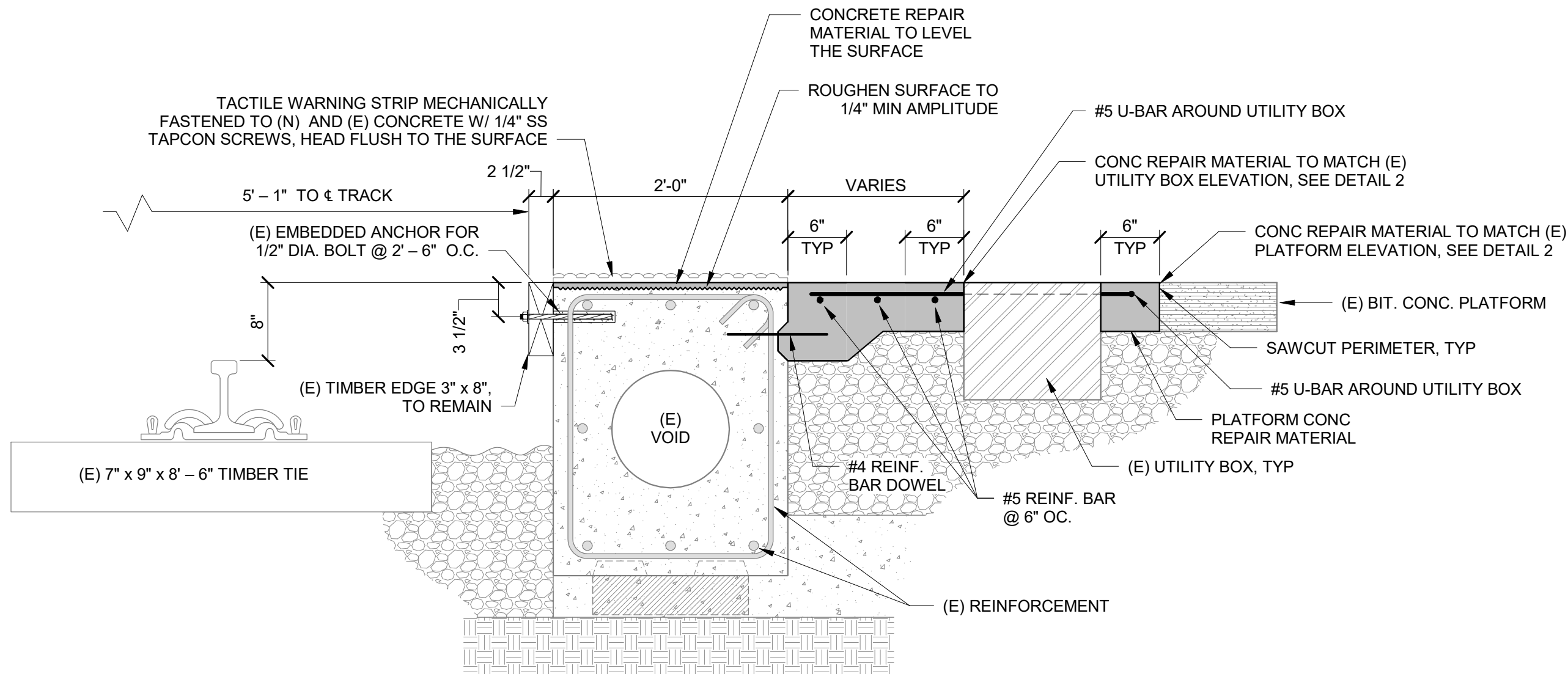
2 CONCRETE PAVEMENT FILL AT PROTRUDING UTILITY COVER

1 1/2" = 1'-0"



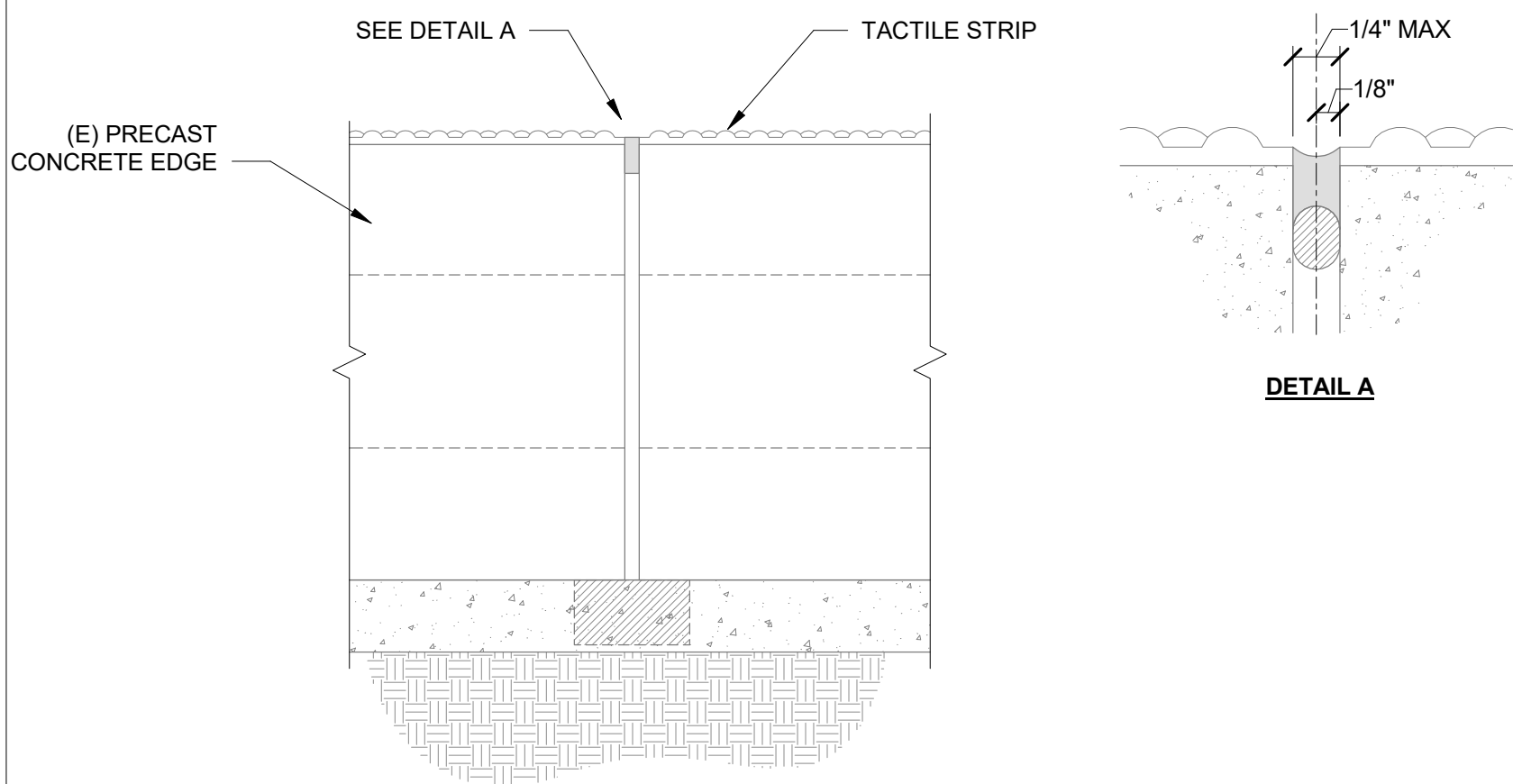
4 PRECAST CONCRETE EDGE UNIT ALTERNATIVE A - CONCRETE TACTILE

1" = 1'-0"



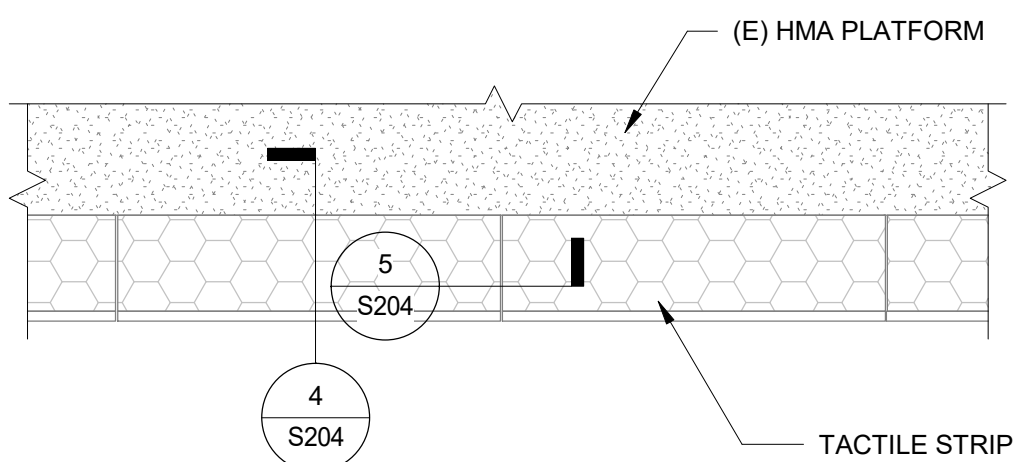
3 PRECAST CONCRETE EDGE UNIT ALTERNATIVE B - POLYMER TACTILE

1" = 1'-0"



5 EDGE UNIT JOINT ELEVATION

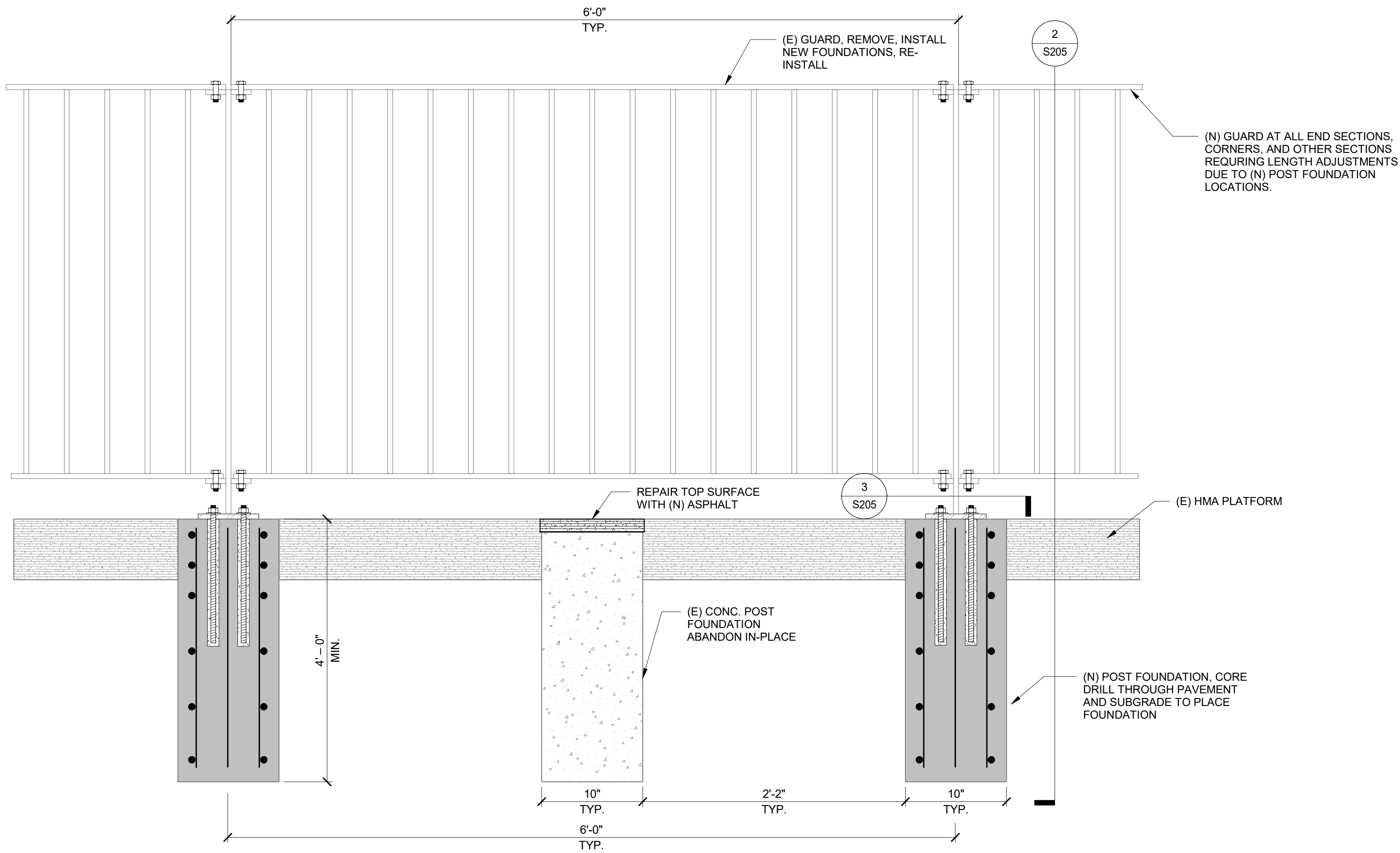
1" = 1'-0"



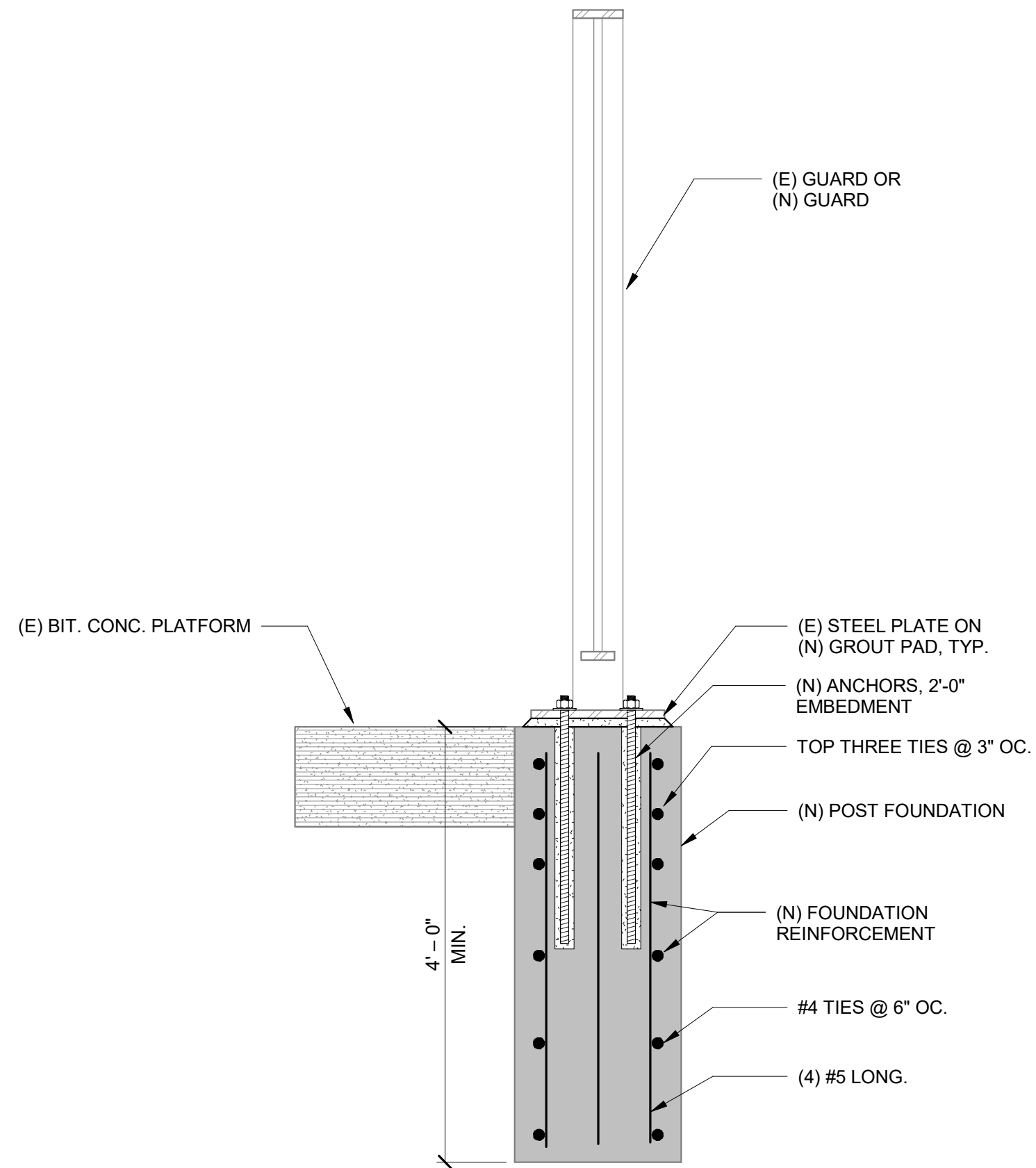
6 EDGE UNIT JOINT PLAN

1/2" = 1'-0"

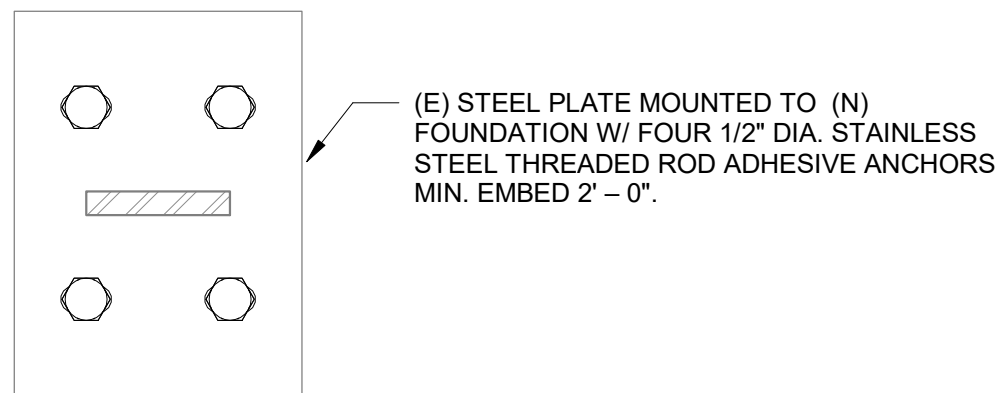
NOT FOR CONSTRUCTION		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY			
		ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS			
		ASPHALT REPAIR DETAILS			
		APPROVED BY: DOMINIC J. KELLY Project Manager		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY APPROVED BY: VICTOR CALLAHAN Project Manager	
A		10/26/22	DESIGN DEVELOPMENT - 60% DRAWING SET	HC	JEH DJK
ISSUE	DATE	DESCRIPTION		BY	CHKD APP.
		HORIZ: AS NOTED		DES. BY	DR. BY
		VERT: AS NOTED		CHK. BY	PLAN NO.
		DATE: 10.26.2022		HC	MTW DJK
				SHEET S204	
				ISSUE	



1 TYPICAL PLATFORM FENCE POST ELEVATION
1 1/2" = 1'-0"



2 NEW POST BASE FOUNDATION
1 1/2" = 1'-0"



3 DETAIL: SURFACE MOUNTED PLATE
3" = 1'-0"

NOT FOR CONSTRUCTION		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
		ATTLEBORO STATION REPAIRS PHASE 1 STRUCTURAL REPAIRS	
		FENCE POST FOUNDATION DETAILS	
		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
		APPROVED BY: DOMINIC J. KELLY	
		APPROVED BY: VICTOR CALLAHAN	
		PROJECT MANAGER	
		DATE	
		HORIZ: AS NOTED	
		VERT: AS NOTED	
		DATE: 10.26.2022	
		SHEET S205	
		A	



Judlau Contracting, Inc.
26-15 Ulmer Street, College Point, NY 11354-1137
Main: (718) 554-2320

**MBTA Contract
No. X72CN01**

To:

Christopher Sullivan, Jason Carmichael

Date: 3/3/2022

MBTA

10 Park Plaza, Room ---

Boston, MA 02116

Project: Worcester Union Station Accessibility and Infrastructure Improvements

Subject: 01322-003-R1 - Baseline Schedule

We are sending you:

☒ Attached

☐ Change Order

☐ Subcontractor/Supplier
Info

☐ Shop Drawings

☐ Samples

☒ Other: Baseline Schedule

☐ Letter

☐ Specifications

e-Builder Item No: 025-1

Submittal No: 01322-003-R1

Submittal Description: Baseline Schedule

Spec Section: 01322 - 1.2 B; 3 B

Drawing No: N/A

These are transmitted:

☒ For Approval

☐ For Information

☒ As Required

REMARKS:

Attached please find submittal 01322-003-R1 - Baseline Schedule for review and approval. All relevant documents & files are uploaded to e-Builder.

(This is submitted within the e-Builder process tab & submittal register due to the "MBTA - Schedule Deliverable Process" requiring a Submittal #)

Copy to:

Kevin Eagers, Jaclyn Henry, Keyur Parikh,
Andrew Glabicky, Kayla Lang

Signed:

Kayla Lang
Kayla Lang

Narrative Report

Worcester Union Station Accessibility and Infrastructure Improvements

**Worcester
Massachusetts**

MBTA Contract No. X72CN01

**Baseline Schedule
File Name: WUS BL-R1– X72CN01**

**Contractor: Judlau Contracting, Inc.
26-15 Ulmer Street
College Point, NY 11354**

**Prepared by: Arnold Engineering Company, Inc.
20 Muron Avenue
Bellingham, Massachusetts 02019**

This Narrative Report will explain the Baseline Schedule submittal, *Rev 1*:

Executive Summary

From a high summary level, the Worcester Union Station project consists of building a new outdoor train platform between two station tracks, three new elevators and staircases, two entrances, a pedestrian bridge, greenspace landscaping, and new HVAC/Electrical work. The project scope has roughly been divided into three phases over the 23-month work period:

PHASE 1:

- Track 1 and Station Track remain in service
- Build temporary platform in-between Station Track and Track 1 at east end of job
- Build temporary platform stairs and ramp
- Install temporary fencing along pedestrian path
- Install temporary lighting along pedestrian path
- Repair pedestrian path

PHASE 2:

- Station Track is out of service for the rest of the job (Track 1 is active)
- Passengers board via the new temp platform on the east end
- STATION (all daytime revenue service work)
 - Build barricades inside station
 - Decommission/demo existing fixtures and conduits inside existing station space
 - Build new walls and ceiling
 - Install new fire piping, lighting and HVAC
 - Paint, install doors and place terrazzo
 - Install signs and finishes
 - Open at the end of this phase so customers can use this to access the platform for Phase 3
- WORK IN THE ROW
 - Install Vertical track shield along Track 1 (Non-revenue)
 - Install Vibration monitoring on Track 1 (Non-revenue)
 - Install SOE for Elevator 1 / Stair 1 (Nights/Non-revenue)
 - Construct Elevator 1 & Machine Room and Stair 1 (rest of sequence is revenue service until indicated) – Commission Elevator 1 by end of this phase.
 - Excavate/Install/BF Central conduit bank at east end
 - Construct West 2/3 of platform support (micropiles, foundations and pile caps)
 - Construct West 2/3 of platform (FRP, structural steel canopy, roofing, signs)

- Complete electrical work on West portion of platform (lights, comm, fire alarm)
 - Waterproof & set steel and precast platform footings at Grafton Street (WEEKEND)
 - Demo existing Station Track & ballast
 - Install new ballast & track for Station Track
 - Demo & Install 65% of Track 1 on weekends (WEEKEND)
 - Bring new National Grid service from Parking Lot Electrical Rooms down to Elevator 1
- PARKING LOT (all daytime revenue service work)
 - Coordinate installation of new National Grid service (manholes, switchgear, conduits into new electrical room)
 - SOE for Greenspace work
 - Install retaining wall
 - Construct head house lower level (micropiles, mud mats, pile caps, foundations, walls) for Elevator 3 and Stair 3
 - Construct comm and electrical rooms next to Stair 3
 - Install generator & fencing

PHASE 3:

- Station Track remains out of service
- Passengers will board the train using the newly constructed West portion of the platform
- STATION (all daytime revenue service work)
 - Completed in Phase 2
- WORK IN THE ROW
 - Extend Vertical track shield and install vibration monitoring for Track 1 (Non-revenue)
 - Install SOE for Elevator 2/Stair 2 (Nights/Non-Revenue)
 - Construct Elevator 2 & Machine Room and Stair 2 (rest of sequence is revenue until indicated otherwise)
 - Construct East 1/3 of platform support (micropiles, foundations and pile caps)
 - Construct East 1/3 of platform (FRP, structural steel canopy, roofing, signs)
 - Complete electrical work on East portion of platform (lights, comm, fire alarm)
 - Demo existing Station Track & ballast
 - Install new ballast & track for Station Track
 - Demo & Install 35% of Track 1 on a weekend (WEEKEND)
 - Erect Pedestrian bridge off-site / on the ground
 - Set Pedestrian bridge connecting Elevator/Stair 2 to Elevator/Stair 3 (WEEKEND)

- Remove Temporary Platform at east end of job (Nights or WEEKEND)
- PARKING LOT (all daytime revenue service work)
 - Construct Elevator 3 and Stair 3 (steel framing, glass/glazing, handrails)
 - Demo parking lot asphalt & excavate for drainage
 - Install Drainage & Sewer systems
 - Construct detention basin/pond
 - Install Hydrant & connect to existing water
 - Install bollards/guardrail/curb/sidewalk
 - Mill/pave/stripe parking lot
 - Landscaping (lawn)
- Restore Station Track to full operational capacity

Phase 1 is three months long and consists of the construction of a temporary platform to the east of the work area, which will be used to board and unload passengers in future phases. Also in Phase 1 are improvements to the pedestrian walkway connecting the station to the temporary platform. A temporary chain link fence will be erected along this path to separate passengers from the live tracks, as the existing condition has no barrier. All customers will continue to board the train at the existing platform during Phase 1, with no interruptions or detours to their path of travel. Trains currently run on the innermost of the two tracks, which is identified as Station Track, and will continue to do so during Phase 1. When the temporary platform is completed, work will shift into Phase 2.

In this next phase, which is 12 months long, all passengers will use the temporary platform to board the train. The trains will access the temporary platform via Track 1 (which is the outermost of the two tracks). The Station Track will be taken out of service for the remainder of the project so that full depth replacement of ballast and tracks can begin. The track and platform work are not split equally between phases 2 and 3; roughly two-thirds of the work will take place during Phase 2. There will be three primary work zones: Station interior, West end of the Platform, and Greenspace (Parking Lot). In the station, the existing utilities will be decommissioned and removed behind a wooden barricade Judlau will construct to separate passengers from the work area. This includes existing speakers, lights, fire suppression and HVAC equipment. Additionally, the existing walls in this area will be demolished and reconstructed in a new layout, as this will be the primary path of travel for passengers travelling from the station to the platform. To connect this hallway to the new platform, Judlau will demolish two entry points on either side of the existing structure: one for the new elevator and one for the new staircase (referred to as Elevator #1 and Stair #1). Judlau will install SOE (support of excavation) around the area, excavate down to the existing structure, demolish a portion of the structure to make the connection, then begin placing rebar and concrete to create the foundation and walls for the new

elevator and staircase. Both the existing structure and the newly poured structures will be waterproofed before they are backfilled and SOE is removed. From this point, steel framing for the elevator can be installed, followed by the glass and glazing, and finally the installation of the elevator itself. Likewise, treads and handrails will be installed on the new staircase during this time. Next, the existing flooring in the hallway will be repaired and terrazzo matching that of the rest of the station will be installed. New electrical work, wayfinding signage, braille, HVAC, and fire suppression will also be installed in this area, which includes two new MBTA office between the elevator and staircase. While this work is occurring, there will be activity at the track level as well. The construction of the new platform will begin, moving west to east. The new platform begins with the installation of drilled micropiles, followed by reinforced concrete pile caps and piers. Note that where the tracks cross Grafton Street, precast piers and steel will be utilized rather than micropiles. From there, the FRP decking, which is the walking surface of the platform, can be installed. The canopy and drainage downspout installation follows closely behind the FRP. From this point, the installation of platform plumbing, electrical and wayfinding can all begin. The electrical scope includes new fixtures, a PA system, emergency telephones, a fire alarm system, digital message boards, and CCTV cameras. To bring power to these elements, a new service must be installed in the Greenspace area (the parking lot on the east end of the job). National Grid will install a trench which connects the new service to a medium voltage (MV) manhole, which will house their new switchgear. From there, conduits will connect the switchgear to the new transformer. Conduits will then connect the transformer into the electrical and communications rooms to distribute power to the system through switchboards and panelboards. National Grid is responsible for providing and installing both the switchgear and transformer, as well as all work associated with the primary trench bringing power into the MV manhole. Judlau will provide and install the MV manhole at National Grid's direction, as well as the concrete pad for the transformer and conduits connecting the switchgear and transformer. This entire sequence will be completed and the new service will be energized during Phase 2. A critical piece of that sequence is the emergency generator. The conduits connecting the generator to the electrical room will be installed after the retaining wall is poured. Then, the pad will be constructed so the generator can be placed and connected. A louver fence will surround the generator and transformer. The Greenspace area is also where Elevator #3 and Stair #3 will be located. Although contractually they are due at substantial completion, Judlau plans to perform a portion of the work during Phase 2 to keep the schedule manageable. During this phase, the work to lay the foundation and walls of these structures will be completed. SOE will be first be installed, followed by micropiles, a reinforced pile cap, the mud slab for both the elevator and stairs, waterproofing, and then the reinforced foundation for each structure will be poured. The walls for Elevator #3 will be poured during this phase, once the foundation has cured. Since the electrical and communications rooms are located adjacent to and under what will be Stair #3, the walls, roof, and floors for these rooms will be poured during this phase (including all required curing between steps). In order to complete this phase, both tracks need to

be fully removed and replaced up the phase line in the 12-month period. Since Station Track will be out of service, that will be completed during regular workdays, moving west to east. Track 1, on the other hand, will remain in service for the duration of this project. Although all commuter rail trains will be stopping to the east of the work zone (loading at the temporary platform), there are two Amtrak trains which pass through Track 1 each day. Therefore, weekend shutdowns will be utilized to perform the full depth replacement in pieces. An example schedule for a weekend shutdown would be as follows: once the tracks are dead, a section would be demolished, existing ballast would be excavated, new ballast would be placed, new ties and rail laid and welded, and then that portion returned to service by Monday morning. This would follow for future weekend closures. The end of Phase 2 occurs when Elevator and Stair 1 are fully operational, the hallway connecting the station to the platform is open, and the western portion of the platform has been built and energized. To fully transition into Phase 3, all passengers will now board the trains using the completed western half of the platform (and Elevator/Stair #1).

Phase 3 has work in two areas: the eastern half of the platform and the Greenspace. Work at the platform area will continue identical to how it progressed in Phase 2: micropiles, pile caps, FRP, canopy, drainage, then electrical and wayfinding finishes. As a mirror to Elevator #1 on the western end of the platform, Elevator #2 is located at the eastern end of the platform. The micropiles in this area will support both the elevator and stairs, so the pile cap is larger than the typical caps that have been installed to this point at the platform level. It will be very similar to the piles installed in the Greenspace area in Phase 2. To begin, Judlau will install SOE, excavate, then micropiles will be drilled, the reinforced cap and piers will be poured, then the installation sequence resumes with FRP decking. Additionally, the walls for Stair #2 and Elevator #2 will be poured once the foundation has cured. Steel framing for each can then be set once the walls have cured, followed by glass and glazing, and finally the installation of Elevator #2. In the Greenspace area, which is directly across the tracks from the Elevator/Stair #2 location, work will continue to finish constructing Elevator #3 and Stair #3. Since the walls for Elevator #3 were poured previously, the steel will be set, glass and glazing will be placed, and then elevator installation can begin. Stair #3 is primarily constructed of concrete, so it will be built up from the foundation laid in the last phase. There is a large amount of glass and glazing for this staircase, which will be installed prior to the handrails and stair treads. An elevated pedestrian bridge will be the second means of egress, connecting passengers from the east end of the platform to the adjacent parking lot (thereby connecting Elevator/Stair #2 with Elevator/Stair #3). The framing for this bridge will be constructed on the ground, and then it will be set during a weekend shutdown while the Track #1 replacement is occurring in the Phase 3 space. The framing for both stairs and elevators (#2 and #3) are required to be completed prior to this step. Once it is set, the topping slab can be poured and the glass can be installed. The pedestrian bridge has lights, CCTV cameras, VMS boards, and a PA system, much like the platform. Once the pedestrian bridge is set, the parking lot improvements will commence. These have been separated into Upper Parking Lot and Lower Parking Lot. This includes milling and paving, the creation of a sedimentation pond, a new drainage system, sewer work, light bollards and a hydrant. The track

work in Phase 3 will progress identically to Phase 2: Station Track will be removed and replaced during regular day shifts, as it is out of service. Track 1 will be removed and replaced during weekend shutdowns. The final step before substantial completion is to disassemble and remove the temporary platform. At this time, the eastern half of the platform will be opened, resulting in full access to the new platform, all three elevators, staircases, and entrances.

Milestone Information

The following milestones have been determined and shown on the project schedule:

<i>Milestone</i>	<i>Milestone Description</i>	<i>Contractual Finish Date</i>
MS01	Temporary Platform Certificate of Occupancy	March 12, 2022
MS02	Delivery of Elevator Assembly to within 50 Miles of Jobsite	September 26, 2022
MS03	Western Platform Certificate of Occupancy	February 7, 2023
MS04	Substantial Completion	October 24, 2023
MS05	Final Completion	December 23, 2023

Use of Construction Equipment & Crew Make Up

The Baseline Schedule has been fully resource loaded by crew hours for construction activities. The make-up of each crew has been provided as **Attachment 1**.

Costs

The Baseline Schedule has been fully cost loaded to reflect the bid value of \$44,421,176.00.

Every construction activity has been assigned a cost based on crew size, materials, overhead, markup, insurance, construction expenses, etc. The allowance items have also been added to the schedule and are loaded with their respective costs.

There are a number of activities that have been assigned a budgeted cost of over \$50,000.00 due to the high cost of materials, and/or due to the work within a confined area in a relatively short period of time. Every effort was made to limit these occurrences without further diluting the schedule by breaking that activity up into unnecessary items.

Judlau requests that the activities that are over \$50,000.00 be accepted as shown on the schedule.

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A list and explanation of all activities with costs over \$50,000.00 has been provided as **Attachment 2**.

Adverse Weather

Adverse weather has been incorporated into a level-of-effort activity as discussed with the project team (Activity WUS-PCT-8009 *Weather Day Allowance Activity*). This activity spans the duration of the project from the first weather sensitive activity to the last.

Calendars Used

Three (3) calendars have been used on the Baseline Schedule. The following calendars have been utilized:

- **X72CN01 - 5D - 5 Day w/H (Revenue)** – Five (5) day work week with Holidays during revenue hours
- **X72CN01 - 7D - Procurement** – Procurement Seven (7) days
- **X72CN01 - WKND** – Weekend work from 11:00 PM Friday to 4:00 AM Monday
- **X72CN01 – NIGHT** – 9:00 PM Sunday to 5:00 AM Friday
- **X72CN01 – PAVE** – Five (5) day work week with Holidays during revenue hours; work is not permitted after November 15th or before April 15th.
- **X72CN01 – LNDSCP** – Five (5) day work week with Holidays during revenue hours; work; work is only permitted from April 15th through May 31st and August 15th through October 31st.

Critical Path

The critical path of the project has been identified as follows:

<i>Activity ID</i>	<i>Activity Name</i>	<i>Early Start</i>	<i>Early Finish</i>	<i>Late Start</i>	<i>Late Finish</i>	<i>Total Float</i>
WUS-MS-NTP	Notice to Proceed - November 29, 2021	29-Nov-21		29-Nov-21		0
WUS-SUB-1049	Prepare & Submit Temp. Pedestrian Facilities	29-Nov-21	17-Jan-22	10-Dec-21	28-Jan-22	11
WUS-SUB-1142	Prepare & Submit FRP Subcontractor	29-Nov-21	27-Jan-22	29-Nov-21	27-Jan-22	0
WUS-SUB-1148	Prepare & Submit Elevator Shopdrawings	29-Nov-21	13-Feb-22	29-Nov-21	13-Feb-22	0
WUS-SUB-1199	Review & Approve Temp. Pedestrian Facilities	18-Jan-22	16-Feb-22	29-Jan-22	27-Feb-22	11
WUS-SUB-1319	Review & Approve FRP Subcontractor	28-Jan-22	26-Feb-22	28-Jan-22	26-Feb-22	0

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Activity ID	Activity Name	Early Start	Early Finish	Late Start	Late Finish	Total Float
WUS-SUB-1352	Review & Approve Elevator Shopdrawings	14-Feb-22	15-Mar-22	14-Feb-22	15-Mar-22	0
WUS-PH1-3004	Repair Pedestrian Walkway	17-Feb-22	3-Mar-22	28-Feb-22	11-Mar-22	6
WUS-SUB-1388	Prepare & Submit FRP Shopdrawings	27-Feb-22	28-Mar-22	27-Feb-22	28-Mar-22	0
WUS-PH1-3007	Install Temp. Fence at Pedestrian Walkway	11-Mar-22	12-Mar-22	11-Mar-22	12-Mar-22	0
WUS-MS-MS01	MS01 - Temporary Platform Certificate of Occupancy (103 Days from NTP) - March 12, 2022	-	12-Mar-22*	-	12-Mar-22	0
WUS-PH2-1219	Erosion Control Setup and Clearing/Grubbing - Phase 2 Greenspace	14-Mar-22	23-Mar-22	15-Mar-22	24-Mar-22	1
WUS-SUB-1421	Fabricate & Deliver Elevators	16-Mar-22	5-Sep-22	16-Mar-22	5-Sep-22	0
WUS-PH2-1225	Install SOE for Headhouse - Phase 2 Greenspace HH	24-Mar-22	13-Apr-22	25-Mar-22	14-Apr-22	1
WUS-SUB-1436	Review & Approve FRP Shopdrawings	29-Mar-22	27-Apr-22	29-Mar-22	27-Apr-22	0
WUS-PH2-1228	Excavate for Headhouse and Retaining Wall - Phase 2 Greenspace HH	14-Apr-22	4-May-22	15-Apr-22	5-May-22	1
WUS-SUB-1490	Fabricate & Deliver FRP	28-Apr-22	23-Aug-22	28-Apr-22	23-Aug-22	0
WUS-PH2-1231	Install Micropiles for Headhouse (BN-2) - Phase 2 Greenspace HH	5-May-22	20-May-22	6-May-22	23-May-22	1
WUS-PH2-3037	Install Micropiles for Headhouse (BN-1) - Phase 2 Greenspace HH	23-May-22	17-Jun-22	24-May-22	20-Jun-22	1
WUS-PH2-1234	Install Rebar for Headhouse Pilecaps - Phase 2 Greenspace HH	20-Jun-22	1-Jul-22	21-Jun-22	5-Jul-22	1
WUS-PH2-1237	Form Concrete Pilecaps for Headhouse - Phase 2 Greenspace HH	5-Jul-22	13-Jul-22	6-Jul-22	14-Jul-22	1
WUS-PH2-1240	Pour Concrete Pilecaps for Headhouse - Phase 2 Greenspace HH	14-Jul-22	27-Jul-22	15-Jul-22	28-Jul-22	1
WUS-PH2-1243	Dampproof Concrete Pilecaps for Headhouse - Phase 2 Greenspace HH	28-Jul-22	2-Aug-22	29-Jul-22	3-Aug-22	1
WUS-PH2-1675	Pour Mudslab for HH Rooms/Stair 3 - Phase 2 Greenspace HH	3-Aug-22	9-Aug-22	4-Aug-22	10-Aug-22	1
WUS-PH2-1678	Waterproof Mudslab for HH Rooms/Stair 3 - Phase 2 Greenspace HH	10-Aug-22	16-Aug-22	11-Aug-22	17-Aug-22	1
WUS-PH2-1681	Install Rebar for Foundation of HH Rooms/Stair 3 - Phase 2 Greenspace HH	17-Aug-22	30-Aug-22	18-Aug-22	31-Aug-22	1
WUS-PH2-1054	Install FRP - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	24-Aug-22	25-Aug-22	24-Aug-22	25-Aug-22	0
WUS-PH2-3097	Install FRP - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)	26-Aug-22	30-Aug-22	26-Aug-22	30-Aug-22	0
WUS-PH2-1684	F&P Foundation of HH Rooms/Stair 3 - Phase 2 Greenspace HH	31-Aug-22	14-Sep-22	1-Sep-22	15-Sep-22	1
WUS-PH2-3100	Install FRP - Phase 2 Platform (STA 2338+81.25 to 2337+81.25)	31-Aug-22	2-Sep-22	31-Aug-22	2-Sep-22	0
WUS-MS-MS02	MS02 - Delivery of Elevator Assembly to within 50 Miles of Jobsite (301 Days from NTP) - September 26, 2022	-	05-Sep-22*	-	5-Sep-22	0
WUS-PH2-1123	Survey Hoistway & Set Pit Equipment - Elevator 1 - Phase 2 Platform	6-Sep-22	15-Sep-22	6-Sep-22	15-Sep-22	0
WUS-PH2-3103	Install FRP - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)	6-Sep-22	7-Sep-22	6-Sep-22	7-Sep-22	0
WUS-PH2-3106	Install FRP - Phase 2 Platform (STA 2336+81.25 to 2335+81.25)	8-Sep-22	9-Sep-22	8-Sep-22	9-Sep-22	0

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Activity ID	Activity Name	Early Start	Early Finish	Late Start	Late Finish	Total Float
WUS-PH2-1063	Install Canopy Framing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	12-Sep-22	16-Sep-22	12-Sep-22	16-Sep-22	0
WUS-PH2-1687	Cure HH Rooms/Stair 3 Foundation - Phase 2 Greenspace HH	15-Sep-22	24-Sep-22	16-Sep-22	25-Sep-22	1
WUS-PH2-1724	Install Rail Brackets & Guide Rails - Elevator 1 - Phase 2 Platform	16-Sep-22	13-Oct-22	16-Sep-22	13-Oct-22	0
WUS-PH2-3109	Install Canopy Framing - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)	19-Sep-22	23-Sep-22	19-Sep-22	23-Sep-22	0
WUS-PH2-1249	Install Rebar for Comm and Electrical Room Walls - Phase 2 Greenspace HH	26-Sep-22	11-Oct-22	26-Sep-22	11-Oct-22	0
WUS-PH2-3112	Install Canopy Framing - Phase 2 Platform (STA 2338+81.25 to 2337+81.25)	26-Sep-22	30-Sep-22	26-Sep-22	30-Sep-22	0
WUS-PH2-3115	Install Canopy Framing - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)	3-Oct-22	11-Oct-22	3-Oct-22	11-Oct-22	0
WUS-PH2-1246	Form & Pour Comm and Electrical Room Walls - Phase 2 Greenspace HH	12-Oct-22	25-Oct-22	12-Oct-22	25-Oct-22	0
WUS-PH2-3118	Install Canopy Framing - Phase 2 Platform (STA 2336+81.25 to 2335+81.25)	12-Oct-22	14-Oct-22	12-Oct-22	14-Oct-22	0
WUS-PH2-1727	Rough-in Elevator Machine Room - Elevator 1 - Phase 2 Platform	14-Oct-22	21-Oct-22	14-Oct-22	21-Oct-22	0
WUS-PH2-1757	Install Canopy Drainage Gutters - Phase 2 Platform	17-Oct-22	28-Oct-22	17-Oct-22	28-Oct-22	0
WUS-PH2-1730	Install Elevator Platform & Hoistway Equipment - Elevator 1 - Phase 2 Platform	24-Oct-22	15-Nov-22	24-Oct-22	15-Nov-22	0
WUS-PH2-1693	Backfill at HH Rooms - Phase 2 Greenspace HH	26-Oct-22	1-Nov-22	26-Oct-22	1-Nov-22	0
WUS-PH2-1069	Install Canopy Column Downspouts - Phase 2 Platform	31-Oct-22	14-Nov-22	31-Oct-22	14-Nov-22	0
WUS-PH2-1696	Pour Slab on Grade for HH Rooms - Phase 2 Greenspace HH	2-Nov-22	7-Nov-22	2-Nov-22	7-Nov-22	0
WUS-PH2-1252	Install Comm Room Cabinets and Conduit - Phase 2 Greenspace	8-Nov-22	22-Nov-22	8-Nov-22	22-Nov-22	0
WUS-PH2-1066	Install Canopy Roof - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	15-Nov-22	18-Nov-22	15-Nov-22	18-Nov-22	0
WUS-PH2-1733	Install Elevator Entrance Frames/Doors - Elevator 1 - Phase 2 Platform	16-Nov-22	2-Dec-22	16-Nov-22	2-Dec-22	0
WUS-PH2-3133	Install Canopy Roof - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)	21-Nov-22	25-Nov-22	21-Nov-22	25-Nov-22	0
WUS-PH2-1255	Install Comm Room Fixtures & Fitout - Phase 2 Greenspace	23-Nov-22	6-Dec-22	23-Nov-22	6-Dec-22	0
WUS-PH2-3136	Install Canopy Roof - Phase 2 Platform (STA 2338+81.25 to 2337+81.25)	28-Nov-22	1-Dec-22	28-Nov-22	1-Dec-22	0
WUS-PH2-3139	Install Canopy Roof - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)	2-Dec-22	7-Dec-22	2-Dec-22	7-Dec-22	0
WUS-PH2-1736	Install Hoistway Wiring and Fixtures - Elevator 1 - Phase 2 Platform	5-Dec-22	19-Dec-22	5-Dec-22	19-Dec-22	0
WUS-PH2-3040	Install Comm Room Wiring and Boxes - Phase 2 Greenspace	7-Dec-22	13-Dec-22	7-Dec-22	13-Dec-22	0
WUS-PH2-3142	Install Canopy Roof - Phase 2 Platform (STA 2336+81.25 to 2335+81.25)	8-Dec-22	13-Dec-22	8-Dec-22	13-Dec-22	0
WUS-PH2-1126	Install CCTV Cameras - Phase 2 Platform	14-Dec-22	28-Dec-22	14-Dec-22	28-Dec-22	0
WUS-PH2-3043	Comm Room Systems Testing - Phase 2 Greenspace	14-Dec-22	20-Dec-22	14-Dec-22	20-Dec-22	0

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Activity ID	Activity Name	Early Start	Early Finish	Late Start	Late Finish	Total Float
WUS-PH2-1739	Build and Wire Elevator Cab - Elevator 1 - Phase 2 Platform	20-Dec-22	12-Jan-23	20-Dec-22	12-Jan-23	0
WUS-PH2-1258	Install Electrical Room Cabinets & conduit - Phase 2 Greenspace	21-Dec-22	5-Jan-23	21-Dec-22	5-Jan-23	0
WUS-PH2-1129	Install PA System - Phase 2 Platform	29-Dec-22	12-Jan-23	29-Dec-22	12-Jan-23	0
WUS-PH2-3046	Install Electrical Room Fixtures & Fitout - Phase 2 Greenspace	6-Jan-23	23-Jan-23	6-Jan-23	23-Jan-23	0
WUS-PH2-1132	Install Emergency Phones - Phase 2 Platform	13-Jan-23	24-Jan-23	13-Jan-23	24-Jan-23	0
WUS-PH2-1742	Adjust Elevator - Elevator 1 - Phase 2 Platform	13-Jan-23	24-Jan-23	13-Jan-23	24-Jan-23	0
WUS-PH2-3049	Install Electrical Room Wiring and boxes - Phase 2 Greenspace	24-Jan-23	30-Jan-23	24-Jan-23	30-Jan-23	0
WUS-PH2-1135	Install VMS - Phase 2 Platform	25-Jan-23	7-Feb-23	25-Jan-23	7-Feb-23	0
WUS-PH2-1745	Elevator Pre-Test - Elevator 1 - Phase 2 Platform	25-Jan-23	25-Jan-23	25-Jan-23	25-Jan-23	0
WUS-PH2-1748	State Inspections & Corrections - Elevator 1 - Phase 2 Platform	26-Jan-23	1-Feb-23	26-Jan-23	1-Feb-23	0
WUS-PH2-3052	Electrical Room Systems Testing	31-Jan-23	6-Feb-23	31-Jan-23	6-Feb-23	0
WUS-PH2-1751	72-Hour Test - Elevator 1 - Phase 2 Platform	2-Feb-23	6-Feb-23	2-Feb-23	6-Feb-23	0
WUS-PH2-1754	Commission Elevator 1 - Phase 2 Platform	7-Feb-23	7-Feb-23	7-Feb-23	7-Feb-23	0
WUS-MS-MS03	MS03 - Western Platform Certificate of Occupancy (435 Days from NTP) - February 7, 2023	-	07-Feb-23*	-	7-Feb-23	0
WUS-PH3-1357	Excavate for Elevator 2 - Phase 3 Platform	8-Feb-23	22-Feb-23	15-Feb-23	28-Feb-23	4
WUS-PH3-1426	Install Rebar for Elevator 2 Footing - Phase 3 Platform	23-Feb-23	6-Mar-23	1-Mar-23	10-Mar-23	4
WUS-PH3-1429	F&P Elevator 2 Pile Cap - Phase 3 Platform	7-Mar-23	13-Mar-23	13-Mar-23	17-Mar-23	4
WUS-PH3-1663	Cure Elevator 2 Pile Cap - Phase 3 Platform	13-Mar-23	23-Mar-23	18-Mar-23	27-Mar-23	4
WUS-PH3-1666	Install Rebar for Elevator 2 & Machine Room Walls - Phase 3 Platform	23-Mar-23	6-Apr-23	28-Mar-23	10-Apr-23	2
WUS-PH3-1669	F&P Concrete for Elevator 2 & Machine Room Walls - Phase 3 Platform	6-Apr-23	18-Apr-23	11-Apr-23	20-Apr-23	2
WUS-PH3-1672	Cure Elevator 2 and Machine Room Walls - Phase 3 Platform	18-Apr-23	28-Apr-23	21-Apr-23	30-Apr-23	2
WUS-PH3-1360	Install Elevator 2 Framing - Phase 3 Platform	28-Apr-23	5-May-23	1-May-23	5-May-23	0
WUS-PH3-1363	Install Elevator 2 Glass/Glazing - Phase 3 Platform	5-May-23	5-Jun-23	8-May-23	5-Jun-23	0
WUS-PH3-1366	Survey Hoistway & Set Pit Equipment - Elevator 2 - Phase 3 Platform	5-Jun-23	15-Jun-23	6-Jun-23	15-Jun-23	0
WUS-PH3-1726	Install Rail Brackets & Guide Rails - Elevator 2 - Phase 3 Platform	15-Jun-23	12-Jul-23	16-Jun-23	12-Jul-23	0
WUS-PH3-1729	Rough-in Elevator Machine Room - Elevator 2 - Phase 3 Platform	12-Jul-23	19-Jul-23	13-Jul-23	19-Jul-23	0
WUS-PH3-1732	Install Elevator Platform & Hoistway Equipment - Elevator 2 - Phase 3 Platform	19-Jul-23	9-Aug-23	20-Jul-23	9-Aug-23	0
WUS-PH3-1735	Install Elevator Entrance Frames/Doors - Elevator 2 - Phase 3 Platform	9-Aug-23	24-Aug-23	10-Aug-23	24-Aug-23	0
WUS-PH3-1738	Install Hoistway Wiring and Fixtures - Elevator 2 - Phase 3 Platform	24-Aug-23	8-Sep-23	25-Aug-23	8-Sep-23	0
WUS-PH3-1741	Build and Wire Elevator Cab - Elevator 2 - Phase 3 Platform	8-Sep-23	2-Oct-23	11-Sep-23	2-Oct-23	0

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Activity ID	Activity Name	Early Start	Early Finish	Late Start	Late Finish	Total Float
WUS-PH3-1744	Adjust Elevator - Elevator 2 - Phase 3 Platform	2-Oct-23	12-Oct-23	3-Oct-23	12-Oct-23	0
WUS-PH3-1747	Elevator Pre-Test - Elevator 2 - Phase 3 Platform	12-Oct-23	13-Oct-23	13-Oct-23	13-Oct-23	0
WUS-PH3-1750	State Inspections & Corrections - Elevator 2 - Phase 3 Platform	13-Oct-23	17-Oct-23	16-Oct-23	17-Oct-23	0
WUS-PH3-1753	72-Hour Test - Elevator 2 - Phase 3 Platform	17-Oct-23	23-Oct-23	18-Oct-23	23-Oct-23	0
WUS-PH3-1756	Commission Elevator 2 - Phase 3 Platform	23-Oct-23	24-Oct-23	24-Oct-23	24-Oct-23	0
WUS-PCT-8000	Project Closeout & As-Built	24-Oct-23	23-Dec-23	25-Oct-23	23-Dec-23	0
WUS-PCT-8003	Punch List	24-Oct-23	23-Dec-23	25-Oct-23	23-Dec-23	0
WUS-PCT-8006	Final Finishes and Cleanup	24-Oct-23	23-Dec-23	25-Oct-23	23-Dec-23	0
WUS-MS-MS04	MS04 - Substantial Completion (694 Days from NTP) - October 24, 2023	-	24-Oct-23*	-	24-Oct-23	0
WUS-MS-MS05	MS05 - Final Completion (754 Days from NTP) - December 23, 2023	-	23-Dec-23*	-	23-Dec-23	0

Critical Submittals (total float less than thirty (30) days)

The following critical submittals and procurements have been identified with the Baseline Schedule (total float less than thirty (30) days):

- Electrical Subcontractor
- Signage Subcontractor
- Temporary Platform Erection Subcontractor
- Micropile Subcontractor
- Glass / Glazing Subcontractor
- FRP Subcontractor
- Work Submittals
- Safety Supervisor
- SWPPP & CGP
- Temporary Pedestrian Facilities
- Phasing Plan & Traffic Management
- Temporary Platform
- Temporary Platform Shopdrawings
- Temporary Platform Signage Shopdrawings
- Temporary Platform Signage Shopdrawings-1
- Signs
- Sign Samples
- Sign Shopdrawings
- Elevator
- Micropile Submittals
- FRP Shopdrawings

- Glass / Glazing Shopdrawings
- Generator Shop Drawings & Catalog Cuts

Lags

There have been no lags utilized within the schedule network at this time.

Durations Exceeding Twenty-Two (22) Working Days or Thirty (30) Calendar Days

A list and explanation of all construction activities with durations over thirty (30) days has been provided as **Attachment 3**.

Schedule Coding

The project schedule submission has been coded as required by MBTA project specifications:

- Activity User Defined Fields:
 - MBTA: Area
 - MBTA: Bid Item Code
 - MBTA: Bid Item Description
 - MBTA: Milestones
- Global Activity Codes:
 - MBTA: Const Stage-Phase
 - MBTA: CSI Level
 - MBTA: DBE
 - MBTA: Milestones
 - MBTA: Ops Support Req'd
 - MBTA: Responsibility
 - MBTA: Transit Line-Dir
 - MBTA: Type of Space
 - MBTA: Work Type

Abbreviations

There are no abbreviations or acronyms used within the schedule network other than common industry standard abbreviations.

Response to Owner's Comments

In response to comments received from the Owner regarding the Baseline Schedule Rev. 0, the following responses and/or changes have been made:

5 – Schedule Review Comments

5.1 – Missing Scope

5.1.1 – A new activity has been added for *Fabricate & Deliver Drainage Structures* (Activity WUS-SUB-1601) as well as for *Fabricate & Fabricate Sewer PVC Pipes & Structures* (Activity WUS-SUB-1613).

5.1.2 – A new activity has been added for *Fabricate & Deliver Guardrail* (Activity WUS-SUB-1604).

5.1.3 – New activities have been added for the elevator *State Inspections & Corrections* (Activities WUS-PH2-1748, WUS-PH3-1750 and WUS-PH3-1783).

5.1.4 – New activities have been added for the elevator *State Inspections & Corrections* (Activities WUS-PH2-1748, WUS-PH3-1750 and WUS-PH3-1783).

5.1.5 – New activities have been added for *Commission Elevator* (Activities WUS-PH2-1754, WUS-PH3-1756, and WUS-PH3-1789).

5.1.6 – New activities have been added for the elevator *72-Hour Test* (Activities WUS-PH2-1751, WUS-PH3-1753, and WUS-PH3-1786).

5.1.7 – A new activity has been added for *MBTA Training (Maintenance & Equipment)* (Activity WUS-PCT-8012).

5.1.8 – Activity description has been modified (Activity WUS-SUB-1535).

5.1.9 – New activities have been added for the submission and approval of *Roofing Materials/Data Sheets/Samples* (Activities WUS-SUB-1595 and WUS-SUB-1598).

5.1.10 – Activity WUS-PH2-1069 has been modified to read *Install Canopy Column Downspouts - Phase 2 Platform* and a new activity has been added for *Install Canopy Drainage Gutters - Phase 2 Platform* (Activity WUS-PH2-1756).

5.1.11 – This work is included within existing activities (Activity WUS-PH3-1330, WUS-PH3-1936 and WUS-PH3-1939).

5.1.12 – New activities have been added for the submission, approval and fabrication of the *Sewer PVC Pipes & Structures* (Activities WUS-SUB-1607, WUS-SUB-1610 and WUS-SUB-1607).

A number of additional activities have been added to break out Activity WUS-PH3-1585 (including but not limited to Activities WUS-PH3-1795, WUS-PH3-1798, WUS-PH3-1801, WUS-PH3-1804, WUS-PH3-1807, WUS-PH3-1810, WUS-PH3-1813, WUS-PH3-1816, WUS-PH3-1825, WUS-PH3-1825 and WUS-PH3-1834).

Note that the Station Track is out of service for the duration of Phase 2 and 3 (in its entirety) so there are no live tracks for this work.

5.1.13 – A new activity has been added for *Install Concrete Headwalls - Phase 3 Sed Pond* (Activity WUS-PH3-1837).

5.1.14 – A new activity has been added for *Install Riprap Swale - Phase 3 Sed Pond* (Activity WUS-PH3-1840).

5.1.15 – A new activity has been added for *Adjust Castings - Phase 3 Upper Parking Lot* (Activity WUS-PH3-1822).

5.1.16 – A new activity has been added for *Fabricate & Deliver Stormwater Treatment Device* (Activity WUS-SUB-1616). A new activity has been added for *Install Stormwater Treatment Device - Phase 3 Sed Pond* (Activity WUS-PH3-1831).

5.1.17 – A new activity has been added for *Install Detention Basin - Phase 3 Sed Pond* (Activity WUS-PH3-1843).

5.1.18 – This work shown Activities WUS-PH3-1582, WUS-PH3-1846 and WUS-PH3-1849. This is a stocked item and does not have a separate procurement item.

5.1.19 – This work is included within an existing activity (Activity WUS-PH3-1795 *Install DMH - Phase 3 Upper Parking Lot*); this is a descriptor for the type of DMH but does not have separate or special procurement or installation.

5.1.20 – A new activity has been added (Activity WUS-PH3-1879 *Install Duplex Fire Valve - Phase 3 Lower Parking Lot*).

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5.1.21 – A new activity for *Install PVC Perforated Drainage Pipe - Phase 3 Upper Parking Lot* has been added (Activity WUS-PH3-1819).

5.1.22 – Unable to add this with appropriate ties and durations, as we do not know if or when we would be asked to relocate power lines.

Construction Phase Review

5.1.23 – Judlau to submit phasing plan for original baseline work separately.

5.1.24 – This work is incidental to Activities WUS-PH2-1198 *Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing Lighting Conduits/boxes - Platform Access Corridor - Phase 2 Station*.

5.1.25 – This work is incidental to Activity WUS-PH2-1162 *Demolish Existing Walls - Platform Access Corridor - Phase 2 Station*.

5.1.26 – This work is incidental to Activity WUS-PH2-1165 *Build New Walls - Platform Access Corridor - Phase 2 Station*.

5.1.27 – This work is incidental to Activity WUS-PH2-1165 *Build New Walls - Platform Access Corridor - Phase 2 Station*.

5.1.28 – This work is incidental to Activities WUS-PH2-1198 *Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing Lighting Conduits/boxes - Platform Access Corridor - Phase 2 Station*.

5.1.29 – This work is incidental to Activities WUS-PH2-1198 *Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing Lighting Conduits/boxes - Platform Access Corridor - Phase 2 Station*.

5.1.30 – This work is incidental to Activities WUS-PH2-1198 *Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing Lighting Conduits/boxes - Platform Access Corridor - Phase 2 Station*.

5.1.31 – This work is incidental to Activities WUS-PH2-1198 *Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing Lighting Conduits/boxes - Platform Access Corridor - Phase 2 Station*.

5.1.32 – This work is incidental to Activities WUS-PH2-1198 *Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing*

Lighting Conduits/boxes - Platform Access Corridor - Phase 2 Station.

5.1.33 – This work is incidental to Activities WUS-PH2-1183 *Demolish Existing HVAC AHU - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing Lighting Conduits/Boxes - Platform Access Corridor - Phase 2 Station.*

5.1.34 – This work is incidental to Activities WUS-PH2-1198 *Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1760 *Demolish Existing Lighting Conduits/boxes - Platform Access Corridor - Phase 2 Station.*

5.1.35 – Contract Phasing drawings are a suggestion and Judlau is able to do the temporary repair work (WUS-PH1-3004 *Repair Pedestrian Walkway*) during days. WUS-PH1-3007 *Install Temp. Fence at Pedestrian Walkway* has been moved to a weekend calendar.

5.1.36 – Construction Phasing drawings were suggestions and indicated Contractor could adjust the sequence as they desired or structured. Judlau will be doing the SOE for the Greenspace in Phase 2.

5.1.37 – WUS-PH1-3001 *Install Pad for Temp. Platform Footing* was approved to be performed during days due to winter temperatures, so that will remain on the day calendar. Lighting and signage on the temporary platform is approved for days since it's on a protected structure, so those will also remain on days. For WUS-PH1-3010 *Install Temp Platform Structure* and WUS-PH1-3013 *Install Temp Platform Walking Surface*, Judlau was able to do one of them during the daytime and had to finish the other at night. Therefore WUS-PH1-3010 will remain on days and WUS-PH1-3013 will be on a night calendar (which includes the non-revenue service hours).

5.1.38 – This work is incidental to Activity WUS-PH1-3022 *Install Stairs/Ramp to Temp. Platform.*

5.1.39 – Construction Phasing drawings were suggestions. Judlau plans to remove this track portion in a later phase as part of the Phase 3 work. It is not required to install the temporary platform stairs/ramp.

5.1.40 – This work is incidental to Activity WUS-PH1-3022 *Install Stairs/Ramp to Temp. Platform.*

5.1.41 – Sequence has been modified to reflect the Contractor's Means & Methods including adding new activities (Activities WUS-PH1-3028 *Install Temp Platform Rubbing Board* and WUS-PH1-3031 *Install Temp Platform Roof*).

5.1.42 – There is a misunderstanding regarding the Station Track. The Station Track will be taken completely out of service (from start to end stationing) from Milestone 1 through

Substantial Completion. The activities in the schedule of replacing the track do not mean the track is put back in service when the new rail is laid. Additionally, The Track 1 activities happen on two weekends. They are a full remove and replace of a section of track on that weekend, and the entire track will be returned to service Monday morning after each weekend.

5.1.43 – This work is incidental to Activity WUS-PH2-1021 *Install Ballast - Station Track - Phase 2 Track*.

5.1.44 – The Station WBS has been expanded on and additional activities added as needed.

5.1.45 – The SOE for Elevator 1 and Stair 1 are closer together than is shown on the snippet provided with this comment (which shows the top of the stairs; the bottom of the stairs are adjacent to the existing tunnel structure, as is Elevator 1). Additionally, we have already separated Elevator 1 and Stair 1 activities when they start to differentiate (after Activity WUS-PH2-1105 *Pour Elevator 1/Stair 1 Walls - Phase 2 Platform*).

5.1.46 – The SOE for Elevator 2 and Stair 2 is the same pit (the piles/foundation being poured here will support both). Again, the stair and elevator activities have been separated after WUS-PH3-1672 *Cure Elevator 2 and Machine Room Walls - Phase 3 Platform* when they start to have individual paths.

5.1.47 – The snippet shown with this comment does not match. The activities snipped in the screenshot have been further broken down into more specific areas for Phase 3 (Upper Parking Lot, Lower Parking Lot, Sedimentation Pond, etc). None of those are activities related to the bullet points, which are referencing Phase 2. To address the items desired in the bulleted list, the electrical and communications room have been separated into their own WBS, as well as Elevator 3, in Phase 2. Please note that the foundation work for this headhouse area (stairs, rooms, elevator, lobby) is all the same area and is being built together. Therefore, those activities will share the Greenspace WBS until they start to diverge (starting with the mudslabs- Activities WUS-PH2-1675 *Pour Mudslab for HH Rooms/Stair 3 - Phase 2 Greenspace HH* and WUS-PH2-1699 *Pour Mudslab for Elevator 3 - Phase 2 Greenspace HH*).

5.1.48 – New WBS and activities have been added to better define this work.

5.1.49 – A new activity has been added (Activity WUS-PH2-3034 *Set Temporary Stairs on East End of Phase 2 Platform*).

5.1.50 – This work is shown as Activities WUS-PH2-1063 *Install Canopy Framing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)*, WUS-PH2-3109 *Install Canopy Framing - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)*, WUS-PH2-3112 *Install Canopy Framing - Phase 2 Platform (STA 2338+81.25 to 2337+81.25)*, WUS-PH2-3115 *Install Canopy Framing - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)* and WUS-PH2-3118 *Install Canopy Framing -*

Phase 2 Platform (STA 2336+81.25 to 2335+81.25).

5.1.51 – The Station Track is out of service for the duration of Phase 2 and Phase 3, so that comment does not apply. The other activities can be done on days with the introduction of our vertical shield activity (cleared at project startup).

5.1.52 – Additional activities have been added divide the Platform work into stationing.

5.1.53 – The following has been noted:

New activities have been added (WUS-PH3-1873 and WUS-PH3-1876).

- Procurement costs of the glass/glazing costs was separated out to make this section more accurate.
- Steel will be assembled on the ground and the set on a weekend – therefore only the setting is on a weekend calendar.
- Incidental to Activity WUS-PH3-1519 *Construct Pedestrian Bridge Framing*
- New activities have been added (WUS-PH3-1873 *Install Pedestrian Bridge Roofing System* and WUS-PH3-1876 *Install Pedestrian Bridge Drainage & Gutter System*).
- Pedestrian bridge submittals are incidental to steel shops

5.1.54 – Construction Phasing drawings were suggestions. Judlau plans to perform Elevator 2 work in Phase 3, along with the western half of the platform.

5.1.55 – The construction of the elevators will overlap in the schedule. Phase 2 and Phase 3 transitions do not require Elevator 2 or 3 to be built at a certain time (they both tie to Substantial Completion).

5.1.56 –

- This work is incidental to Activity WUS-PH2-1186 *Install New HVAC AHU - Mechanical Room - Phase 2 Station*
- A new activity has been added (Activity WUS-PH2-1793 *Install DSS HVAC - Elevator 1 Machine Room - Phase 2 Station*)
- A new activity has been added (Activity WUS-PH2-1775 *Install Return Air Fan (RAF) - Mechanical Room - Phase 2 Station*)
- New activities have been added (Activities WUS-PH2-1790 *Install Elevator 1 Sump Pump - Elevator 1 Pit - Phase 2 Station* and WUS-PH2-1772 *Install New HVAC AHU Condensate Pump - Mechanical Room - Phase 2 Station*).
- A new activity has been added (Activity WUS-PH2-1787 *Install Electric Unit Heaters - Platform Access Corridor - Phase 2 Station*)

- New activities have been added (Activities WUS-PH2-1778 *Install Return Air Diffusers - Platform Access Corridor - Phase 2 Station*, WUS-PH2-1781 *Install Supply Air Diffusers - Platform Access Corridor - Phase 2 Station* and WUS-PH2-1784 *Install Supply Air Diffuser - Mechanical Room - Phase 2 Station*).

5.1.57 – Some activities have a significant procurement duration prior to fabrication (signage and steel), while another has only a procurement and not a fabrication (terrazzo). All other instances of ‘procure’ have been corrected and renamed.

5.1.58 – Monies have been reallocated related to the generator (Activity WUS-SUB-1589 *Fabricate & Deliver Generator*) as well as the glass & glazing (Activity WUS-SUB-1460 *Field Verify Glass/Glazing Dims & Fabricate*). Micropile costs should remain in the installation activities.

5.2 – Activity Durations

5.2.1 – Activity WUS-PH2-1636 *Excavate & Install Conduits (New Service to Switchgear) - Phase 2 Greenspace* is a National Grid activity. Judlau is holding their duration so this cannot be changed.

5.2.2 – The elevator sequence has been broken down so all activities are under twenty-two (22) days each.

5.2.3 – Confirmed.

5.3 – Logic Review

5.3.1 – Additional logic has been added.

5.3.2 – The O&M submittal is prepared by the subcontractor installing elevators, so it should remain a successor of WUS-SUB-1214 *Review & Approve Elevator Subcontractor*. The shop drawings for the elevator and cut sheets are submitted before the subcontractor is approved; the sub just needs to be approved before they begin on site. Elevators are a major component and shop drawings had to begin immediately to meet the project schedule (prior to approval). Judlau selected a subcontractor doing elevator work on other MBTA projects to expedite approvals.

5.3.3 – Additional logic has been added.

5.3.4 – Additional logic has been added.

5.3.5 – Additional logic has been added.

5.3.6 – The steel supplier and steel installer are different subcontractors. Therefore, Activity WUS-SUB-1301 *Review & Approve Structural Steel and FRP Installation Subcontractor* will not be tied to Activity WUS-SUB-1064 *Prepare & Submit Steel Shopdrawings*. Erection procedure (Activity WUS-SUB-1043 *Prepare & Submit Erection Procedure*) has been tied as requested.

5.3.7 – Activity descriptions modified for clarification that the Steel Subcontractor will also be installing the FRP.

5.3.8 – The temporary platform is being fabricated and designed by a third party, not the installer. Their approval is not a required precondition to the shop drawings being approved.

5.3.9 – O&M Manuals have their own WBS and begin before Substantial Completion. Judlau has updated the closeout activity to include As-Built. The written request for, and approval of, Substantial Completion is incidental to the milestone and is not usually required. The last bullet is incidental to Activity WUS-PCT-8003 *Punch List*. Any testing or balancing records are incidental to commissioning or start-up activities. For activities after Substantial Completion, a training activity has been added (Activity WUS-PCT-8012 *MBTA Training (Maintenance & Equipment)*). Final cleanup and demobilization are part of Activity WUS-PCT-8006 *Final Finishes and Cleanup*. Warranty and closeout documents are part of Activity WUS-PCT-8003 *Punch List*.

5.3.10 – Additional logic has been added.

5.4 – Cost Loading Review

5.4.1 – The DBE requirement is 20% of the contract value, which is \$8,884,235.20. DBE amounts and subcontractors have been reviewed and adjusted.

The remaining balance of DBE money is located in subcontractors whose work is incidental to many of the construction activities on this list, such as survey, engineering, trucking, and soil testing of spoils. These are not construction activities in their own right and would not be found in a traditional schedule. Judlau plans to update the MBTA Statement of Payment to Subcontractors each month to show progress towards the DBE goal.

5.4.2 – Addressed as a result of addressing Comment 5.4.3.

5.4.3 – The Bid Item Description has been added to Activity WUS-SUB-1490 *Fabricate & Deliver FRP*.

5.4.4 – The supporting documentation referenced in 01322 1.6 F4 is required when invoicing against procurement/fabrication line items. Proper invoices, documents and title transfers must

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be presented to bill that money ahead of the scheduled install. Subcontractor verification is not required during schedule construction.

5.4.5 – This project is not structured in such a way where a typical S-curve would apply. The way the tracks are phased is not equal - Phase 2 is 66% of the work and Phase 3 is 33% of the work. Additionally, with the fabrication costs being added to the generator and glass/glazing, it will shift to be even more front loaded in this revision.

5.4.6 – Activities have been broken out into additional detail where feasible and explanations for remaining activities with budgeted costs of \$50K have been included within this report.

5.5 Resource Loading Review

5.5.1 – The “Default Units/Time” and the “Budgeted Labor Units” are correct and may be an import issue on the reviewer’s end (Resource Dictionary will not overwrite on import).

▼ Display: Current Project's Resources		
Resource ID /	Resource Name	Default Units / Time
X72CN01	Bid Item Value	8/d
R-9	Crew 9 - Excav/Encase/ BF Conduits (Electrical)	40/d
R-8	Crew 8 - Exc/ Install Drainage & Water at Greensp	40/d
R-7	Crew 7 - Subbase at Elev/Stair 1 Install	48/d
R-6	Crew 6 - Install SOE for Elev/Stairs	40/d
R-5	Crew 5 - Slope Protection & Soil Stockpile & Clear/	32/d
R-45	Crew 45 - Install Temp Platform	16/d
R-44	Crew 44 - Landscaping	16/d
R-43	Crew 43 - Vibration Monitoring	16/d
R-42	Crew 42 - Fencing	40/d
R-41	Crew 41 - Tracks	64/d
R-40	Crew 40 - FRP Install	56/d
R-4	Crew 4 - Fix Temp Ped Walkway	32/d

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5.5.2 – The resources shown do not appear to be from the project. There are no resources with “Auto Compute Actuals” or “Calculate costs from units” checked off in the Resource Dictionary.

5.5.3 – The following is noted:

- Activity WUS-PH2-1633 – Work by others (National Grid)
- Activity WUS-PH2-1636 – Work by others (National Grid)
- Activity WUS-PH2-1630 – Work by others (National Grid)
- Activity WUS-PCT-8003 – Closeout activity and not typically resource/cost loaded
- Activity WUS-PCT-8006 – Closeout activity and not typically resource/cost loaded

5.6 Adverse Weather Days

5.6.1 – A new Activity WUS-PCT-8009 *Weather Day Allowance Activity*) has been added as discussed with the Project Team. This activity spans the duration of the project from the first weather sensitive activity to the last.

5.7 Calendar Review

5.7.1 – Judlau chose to allocate the three weekends differently than what was shown and received approval. The State inspectors for the temporary platform requested a weekend to be able to conduct their inspections, so that has been added separately.

5.7.2 – No action required.

5.7.3 – A new calendar has been added.

5.7.4 – A new calendar has been added.

5.7.5 – The “Time Periods” for each calendar have been modified.

5.7.6 – A new calendar has been added.

P6 Settings / Miscellaneous Comments

5.8 – Activity descriptions modified.

5.9 – The WBS has been modified.

5.10 – It is unclear what this comment is suggesting.

5.11 – The setting has been modified as suggested.

5.12 – This comment is acknowledged.

5.13 – The setting has been modified as suggested.

5.14 Schedule Narrative and Printouts Review

5.14.1 – The narrative report has been modified above.

5.14.2 – The critical path has been identified within the narrative above and any non-critical paths to completion have been discussed within the Executive Summary above.

5.14.3 – The Activity Report has been modified.

5.14.4 – The Bid Item Report has been modified.

5.14.5 – The Schedule of Values report has been included with this resubmission.

-Attachment No. 1-

- Crew 1 - Demo @ Station
 - 1 Laborer FM
 - 3 Laborers
- Crew 2 - Demo/Excavate @ Greenspace HH
 - 1 Laborer FM
 - 3 Laborers
 - 2 Operators
- Crew 3 - Demo/Excavate Stair & Elevator SOE
 - 1 Laborer FM
 - 4 Laborers
 - 2 Operators
- Crew 4 - Fix Temporary Pedestrian Walkway
 - 1 Laborer FM
 - 3 Laborers
- Crew 5 - Slope Protection & Soil Stockpile & Clear/Grub/Tree Removal
 - 1 Laborer FM
 - 2 Laborers
 - 1 Operator
- Crew 6 - Install SOE for Elevator/Stairs
 - 1 Piledriver FM
 - 3 Piledrivers
 - 1 Operator
- Crew 7 - Subbase at Elevator/Stair 1 Install
 - 1 Laborer FM
 - 3 Laborers
 - 2 Operators
- Crew 8 - Excavate/Install Drainage & Water at Greenspace
 - 1 Laborer FM
 - 3 Laborers
 - 1 Operator
- Crew 9 - Excavate/Encase/ BF Conduits (Electrical)
 - 1 Laborer FM
 - 3 Laborers
 - 1 Operator
- Crew 10 - Remove Temporary Platform
 - 1 Laborer FM
 - 3 Laborers

- 1 Operator
- Crew 11 - Temporary Platform Foundation Prep Work
 - 1 Laborer FM
 - 2 Laborers
 - 1 Operator
- Crew 12 - Install Station Barricades
 - 1 Carpenter FM
 - 3 Carpenters
- Crew 13 - Install Stair Treads/Nosing
 - 1 Laborer FM
 - 2 Laborers
- Crew 14 - Water Repellant/Seal Concrete
 - 1 Laborer FM
 - 2 Laborers
- Crew 15 - Install Precast Panels (Platform)
 - 1 Ironworker FM
 - 4 Ironworkers
 - 1 Operator
 - 1 Laborer (Support)
- Crew 16 - Install Doors
 - 1 Carpenter FM
 - 1 Carpenter JM
- Crew 17 - Install Benches/Trash Cans/LP Bases
 - 1 Laborer FM
 - 3 Laborers
 - 1 Operator
- Crew 18 - Excavate Ballast
 - 1 Laborer FM
 - 1 Laborer
 - 1 Operator
- Crew 19 - Install Ballast
 - 1 Laborer FM
 - 2 Laborers
 - 1 Operator
- Crew 20 - Excavate & Install Ballast Weekend
 - 1 Laborer FM

- 4 Laborers
 - 4 Operators
- Crew 21 - Construct New Walls (Station) CMU
 - 1 Carpenter FM
 - 2 Carpenter JM
- Crew 22 - Install/Grind Terrazzo
 - 1 Laborer FM
 - 2 Terrazzo Mech
 - 2 Terrazzo Finishers
- Crew 23 - Paint
 - 1 Painter FM
 - 2 Painter JM
- Crew 24 - Fire Protection
 - 1 Sprinkler Fitter FM
 - 1 Sprinkler Fitter JM
- Crew 25 - HVAC
 - 1 Plumber FM
 - 2 Plumber JM
- Crew 26 - Lighting/ Comm/FA
 - 1 Electrician FM
 - 3 Electricians
- Crew 27 - Structural Steel
 - 1 Ironworker FM
 - 5 Ironworkers
 - 2 Laborers (Support)
- Crew 28 - Glass/Glazing
 - 1 Glazing FM
 - 3 Glazing JM
- Crew 29 - New Signs/Frames
 - 1 Sign FM
 - 3 Sign JM
 - 2 Laborers (Support)
- Crew 30 - SS Wire Mesh Screen
 - 1 Ironworker FM
 - 2 Ironworker JM

- Crew 31 - Elevator
 - 1 Elevator Mech FM
 - 1 Elevator Mech
- Crew 32 - Minipiles
 - 1 Laborer FM
 - 3 Laborers
 - 1 Rig Operator
 - 2 Laborers (Support)
 - 1 Operator (Support)
- Crew 33 - Misc Metals
 - 1 Ironworker FM
 - 2 Ironworker JM
- Crew 34 - Mill/Pave
 - 1 Laborer FM
 - 3 Laborer JM
 - 2 Operators
 - 1 Teamster
- Crew 35 - Curb & Sidewalk
 - 1 Laborer FM
 - 3 Laborer JM
- Crew 36 - F&P Concrete
 - 1 Carpenter FM
 - 5 Carpenters
- Crew 37 - Rebar
 - 1 Rebar FM
 - 3 Rebar JM
 - 1 Operator (Support)
- Crew 38 - Platform Plumbing
 - 1 Plumber FM
 - 3 Plumber JM
- Crew 39 - Canopy Roof
 - 1 Roofer FM
 - 3 Roofer JM
- Crew 40 - FRP Install
 - 1 Ironworker FM
 - 4 Ironworkers
 - 1 Operator

- 1 Laborer (Support)
- Crew 41 - Tracks
 - 1 Track FM
 - 6 Track JM
 - 1 Operator
- Crew 42 - Fencing
 - 1 Laborer FM
 - 2 Laborer JM
- Crew 43 - Vibration Monitoring
 - 2 Engineers
- Crew 44 - Landscaping
 - 1 Laborer FM
 - 2 Laborer JM
- Crew 45 - Install Temporary Platform
 - 1 Carpenter FM
 - 3 Carpenter JM

-Attachment No. 2-

Activity ID	Activity Name	Budgeted Cost	Explanation of Cost
WUS-PH2-1742	Adjust Elevator - Elevator 1 - Phase 2 Platform	\$78,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1744	Adjust Elevator - Elevator 2 - Phase 3 Platform	\$78,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1777	Adjust Elevator - Elevator 3 - Phase 3 Headhouse	\$78,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-CST-9018	Allowance - Disposal of Qualifying Soils	\$800,000.00	Allowance Item. N/A
WUS-CST-9000	Allowance - Integration Support for PTC	\$150,000.00	Allowance Item. N/A
WUS-CST-9021	Allowance - Risk Allowance	\$3,849,000.00	Allowance Item. N/A
WUS-CST-9009	Allowance - Traffic Officers Services	\$525,000.00	Allowance Item. N/A
WUS-CST-9006	Allowance - Weekend Substitute Transportation	\$535,000.00	Allowance Item. N/A
WUS-PH2-1739	Build and Wire Elevator Cab - Elevator 1 - Phase 2 Platform	\$145,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1741	Build and Wire Elevator Cab - Elevator 2 - Phase 3 Platform	\$145,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1774	Build and Wire Elevator Cab - Elevator 3 - Phase 3 Headhouse	\$145,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH2-1165	Build New Walls - Platform Access Corridor - Phase 2 Station	\$70,000.00	This activity was separated out into walls and ceiling, so they each had their own activity. The walls for this corridor will be built linearly, with availability dependent on some work areas. Due to the shortened duration, this activity should remain singular.
WUS-PH3-1519	Construct Pedestrian Bridge Framing	\$235,000.00	This activity has been split to better show the roof/drainage system as well as the structural steel. This structural steel construction will happen off site or on the ground, prior to setting it on the weekend. It is the only structure that is fully comprised of steel supports, therefore is the most expensive. The cost to procure this steel has already been separated out.
WUS-PH2-1087	Demo into Existing Structure for Elevator 1/Stair 1 - Phase 2 Platform	\$459,106.70	This is an extremely large operation occurring over a very short duration. Connections/knock-ins will be made to the existing MBTA structure below the tracks, to make room for the new platform entrances.
WUS-PH2-1033	Excavate and Install Ballast - Track 1 - Phase 2 Track - Weekend 1	\$122,724.80	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH2-1648	Excavate and Install Ballast - Track 1 - Phase 2 Track - Weekend 2	\$122,724.80	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced

Activity ID	Activity Name	Budgeted Cost	Explanation of Cost
			in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH3-1294	Excavate and Install Ballast - Track 1 - Phase 3 Track	\$102,313.20	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH2-1018	Excavate Ballast - Station Track - Phase 2 Track	\$129,544.02	Phase 2 track work is roughly 900' long. This excavation is on the dead track, so there is no time requirement to restore it to service before trains are scheduled to run. We looked into breaking this up by station, but it did not serve the schedule. Progressing this based on % complete would best drive.
WUS-PH3-1291	Excavate Ballast - Station Track - Phase 3 Track	\$154,069.30	Phase 3 track work is roughly 500' long. As this work is scheduled to be completed in under 3 weeks, further breaking this down does not assist the schedule. This work will not be broken up or partially completed & revisited later: in the 12 day period, it will be complete.
WUS-PH2-1003	Excavate for Central Conduits - Phase 2 West Tracks	\$54,000.00	This activity is occurring between tracks (one live, one dead) and requires specialized excavation equipment for this sensitive area.
WUS-PH2-1084	Excavate for Elevator 1/Stair 1 - Phase 2 Platform	\$142,338.30	This is around the existing structure, to make space for the new elevator and stairs. Given the duration and large amount of excavation/earth removal/disposal, there is no reason to further break this down.
WUS-PH3-1357	Excavate for Elevator 2 - Phase 3 Platform	\$177,000.00	Excavation work after SOE for Elevator 2. Cannot further breakup this activity (all excavate activities for different areas were already separated out, so to further divide within a region would not be practical).
WUS-PH2-1228	Excavate for Headhouse and Retaining Wall - Phase 2 Greenspace HH	\$481,892.60	The entire existing greenspace/parking lot area needs to be excavated down to grade. There is no subdivision, as the work zone is all in one concentrated area at the border of the upper/lower lots and overlaps both.
WUS-PH2-3085	F&P Concrete Pile Caps - Phase 2 Platform (P-11 to P-15)	\$93,750.00	The pile caps have been broken out into their column lines for this phase (resulting in 6 activities instead of 1). It is not practical to further break down, especially given the very short duration for each of these.
WUS-PH2-3088	F&P Concrete Pile Caps - Phase 2 Platform (P-20 to P-23)	\$75,000.00	The pile caps have been broken out into their column lines for this phase (resulting in 6 activities instead of 1). It is not practical to further break down, especially given the very short duration for each of these.
WUS-PH2-3091	F&P Concrete Pile Caps - Phase 2 Platform (P-24 to P-27)	\$75,000.00	The pile caps have been broken out into their column lines for this phase (resulting in 6 activities instead of 1). It is not practical to further break down, especially given the very short duration for each of these.
WUS-PH2-3094	F&P Concrete Pile Caps - Phase 2 Platform (P-28 to P-30)	\$56,250.00	The pile caps have been broken out into their column lines for this phase (resulting in 6 activities instead of 1). It is not practical to further break down, especially given the very short duration for each of these.

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
WUS-PH3-1927	F&P Concrete Pile Caps - Phase 2 Platform (P-43 to P-48)	\$75,000.00	The pile caps have been broken out into their column lines for this phase (resulting in 6 activities instead of 1). It is not practical to further break down, especially given the very short duration for each of these.
WUS-PH2-1048	F&P Concrete Pile Caps - Phase 2 Platform (P-7 to P-10)	\$75,000.00	The pile caps have been broken out into their column lines for this phase (resulting in 6 activities instead of 1). It is not practical to further break down, especially given the very short duration for each of these.
WUS-PH2-1717	F&P Elevator 3 & Machine Room Walls - Phase 3 Greenspace	\$83,000.00	These walls are 20' + in height, but are explicitly for the elevator (all concrete work in this area has already been broken out into both reinforcement and concrete for the mudslab, foundation and walls).
WUS-PH3-1495	F&P Stair 3 Walls - Phase 3 Headhouse	\$937,867.60	This is the tallest of the three staircases, with the most extensive concrete work. It has already been broken down into mudslab, foundation, supporting walls, and structural walls. The elevator has been separated, as have the Comm and Electrical rooms in this area. Additionally, the landings have been separated into their own activities as well, so this breakdown is sufficient given the sheet volume of concrete here.
WUS-SUB-1490	Fabricate & Deliver FRP	\$2,406,176.00	Fabricate/Procure activity. N/A
WUS-SUB-1589	Fabricate & Deliver Generator	\$125,000.00	Fabricate/Procure activity. N/A
WUS-SUB-1361	Fabricate & Deliver Rebar	\$181,892.00	Fabricate/Procure activity. N/A
WUS-SUB-1496	Fabricate & Deliver Sign Frames	\$100,000.00	Fabricate/Procure activity. N/A
WUS-SUB-1508	Fabricate Signs	\$145,000.00	Fabricate/Procure activity. N/A
WUS-SUB-1478	Fabricate Steel	\$1,650,616.00	Fabricate/Procure activity. N/A
WUS-SUB-1460	Field Verify Glass/Glazing Dims & Fabricate	\$780,000.00	Fabricate/Procure activity. N/A
WUS-PH2-1246	Form & Pour Comm and Electrical Room Walls - Phase 2 Greenspace HH	\$184,871.83	The Comm room and Elec room share a perimeter and dividing wall, and this will be done as single activity in reality, therefore this activity should not be broken down. The F&P activities are high because they carry subcontractor placement costs (including pump trucks, hoppers, etc) as well as the cost of the concrete itself.
WUS-PH2-1093	Form Elevator 1/Stair 1 Foundation - Phase 2 Platform	\$187,500.00	This has a very short duration and will be done by a specialty placement subcontractor. This activity is already broken down into Form, pour, rebar, and further differentiates the foundation from the walls. This is the first major pour of the project.
WUS-PH2-1102	Form Elevator 1/Stair 1 Walls - Phase 2 Platform	\$165,000.00	This has a very short duration and will be done by a specialty placement subcontractor. This activity is already broken down into Form, pour, rebar, and further differentiates the foundation from the walls. This is the first major pour of the project.
WUS-PH2-1021	Install Ballast - Station Track - Phase 2 Track	\$91,314.30	Phase 2 track work is roughly 900' long. This excavation is on the dead track, so there is no time requirement to restore it to service before

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
			trains are scheduled to run. We looked into breaking this up by station, but it did not serve the schedule. Progressing this based on % complete would best drive.
WUS-PH3-1306	Install Ballast - Station Track - Phase 3 Track	\$247,690.30	Phase 3 track work is roughly 500' long. As this work is scheduled to be completed in under 3 weeks, further breaking this down does not assist the schedule. This work will not be broken up or partially completed & revisited later: in the 12 day period, it will be complete.
WUS-PH2-1063	Install Canopy Framing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	\$80,000.00	Canopy framing has been broken down into the stations for this phase. All other canopy framing activities are under \$50k for this phase, but this is the exception as this area has the stairs/elevator and specialty steel.
WUS-PH3-1945	Install Canopy Framing - Phase 3 Platform (STA 2333+81.25 to 2332+81.25)	\$116,700.00	Canopy framing has been broken down into stations for this phase. Given the short duration of each activity now (one week), It is not practical to further break this activity down.
WUS-PH3-1942	Install Canopy Framing - Phase 3 Platform (STA 2334+81.25 to 2333+81.25)	\$116,650.00	Canopy framing has been broken down into stations for this phase. Given the short duration of each activity now (one week), It is not practical to further break this activity down.
WUS-PH3-1336	Install Canopy Framing - Phase 3 Platform (STA 2335+81.25 to 2334+81.25)	\$116,650.00	Canopy framing has been broken down into stations for this phase. Given the short duration of each activity now (one week), It is not practical to further break this activity down.
WUS-PH3-1951	Install Canopy Roof - Phase 3 Platform (STA 2333+81.25 to 2332+81.25)	\$58,605.90	Canopy Roof has been broken down into stations for this phase. We cannot further break down this activity, given the extremely short duration.
WUS-PH3-1948	Install Canopy Roof - Phase 3 Platform (STA 2334+81.25 to 2333+81.25)	\$58,604.50	Canopy Roof has been broken down into stations for this phase. We cannot further break down this activity, given the extremely short duration.
WUS-PH3-1528	Install CCTV Cameras - Pedestrian Bridge	\$99,103.90	CCTV cameras are an expensive activity, due to security concerns as well as integration. Due to the very short duration, we feel this cost loading is acceptable.
WUS-PH2-1126	Install CCTV Cameras - Phase 2 Platform	\$165,000.00	CCTV cameras are an expensive activity, due to security concerns as well as integration. Due to the very short duration, we feel this cost loading is acceptable.
WUS-PH3-1399	Install CCTV Cameras - Phase 3 Platform	\$106,770.40	CCTV cameras are an expensive activity, due to security concerns as well as integration. Due to the very short duration, we feel this cost loading is acceptable.
WUS-PH2-1006	Install Central Conduits - Phase 2 West Tracks	\$69,707.25	This activity is occurring between tracks (one live, one dead) and requires specialized equipment for this sensitive area.
WUS-PH2-1252	Install Comm Room Cabinets and Conduit - Phase 2 Greenspace	\$100,000.00	The Comm room in the east parking lot area has been broken down into its building components, its outfitting/fixture components, and its testing components. This breakdown should be sufficient, especially given the durations.
WUS-PH2-1255	Install Comm Room Fixtures & Fitout - Phase 2 Greenspace	\$100,000.00	The Comm room in the east parking lot area has been broken down into its building components, its outfitting/fixture components, and its testing

Activity ID	Activity Name	Budgeted Cost	Explanation of Cost
			components. This breakdown should be sufficient, especially given the durations.
WUS-PH2-3040	Install Comm Room Wiring and Boxes - Phase 2 Greenspace	\$100,000.00	The Comm room in the east parking lot area has been broken down into its building components, its outfitting/fixture components, and its testing components. This breakdown should be sufficient, especially given the durations.
WUS-PH2-1549	Install Doors - Phase 2 Headhouse	\$52,140.20	Due to the short duration and specific location, we did not see fit to further divide this activity.
WUS-PH2-1258	Install Electrical Room Cabinets & conduit - Phase 2 Greenspace	\$100,000.00	The Electrical room in the east parking lot area has been broken down into its building components, its outfitting/fixture components, and its testing components. This breakdown should be sufficient, especially given the durations.
WUS-PH2-3046	Install Electrical Room Fixtures & Fitout - Phase 2 Greenspace	\$100,000.00	The Electrical room in the east parking lot area has been broken down into its building components, its outfitting/fixture components, and its testing components. This breakdown should be sufficient, especially given the durations.
WUS-PH2-3049	Install Electrical Room Wiring and boxes - Phase 2 Greenspace	\$95,950.80	The Electrical room in the east parking lot area has been broken down into its building components, its outfitting/fixture components, and its testing components. This breakdown should be sufficient, especially given the durations.
WUS-PH2-1114	Install Elevator 1 Framing - Phase 2 Platform	\$560,000.00	There is an extensive amount of steel for the elevators, and no logical way to further break it down given the duration.
WUS-PH2-1117	Install Elevator 1 Glass/Glazing - Phase 2 Platform	\$215,000.00	The cost of glass/glazing procurement has been extracted from this activity and put under the procurement section. The remaining monies to install cannot further be broken down in a helpful way, especially given the duration.
WUS-PH3-1360	Install Elevator 2 Framing - Phase 3 Platform	\$210,000.00	There is an extensive amount of steel for the elevators, and no logical way to further break it down given the duration.
WUS-PH3-1363	Install Elevator 2 Glass/Glazing - Phase 3 Platform	\$205,000.00	The cost of glass/glazing procurement has been extracted from this activity and put under the procurement section. The remaining monies to install cannot further be broken down in a helpful way, especially given the duration.
WUS-PH3-1510	Install Elevator 3 Framing - Phase 3 Headhouse	\$140,000.00	There is an extensive amount of steel for the elevators, and no logical way to further break it down given the duration.
WUS-PH3-1513	Install Elevator 3 Glass/Glazing - Phase 3 Headhouse	\$120,000.00	The cost of glass/glazing procurement has been extracted from this activity and put under the procurement section. The remaining monies to install cannot further be broken down in a helpful way, especially given the duration.
WUS-PH2-1733	Install Elevator Entrance Frames/Doors - Elevator 1 - Phase 2 Platform	\$100,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1735	Install Elevator Entrance Frames/Doors - Elevator 2 - Phase 3 Platform	\$100,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.

Activity ID	Activity Name	Budgeted Cost	Explanation of Cost
WUS-PH3-1768	Install Elevator Entrance Frames/Doors - Elevator 3 - Phase 3 Headhouse	\$100,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH2-1730	Install Elevator Platform & Hoistway Equipment - Elevator 1 - Phase 2 Platform	\$115,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1732	Install Elevator Platform & Hoistway Equipment - Elevator 2 - Phase 3 Platform	\$115,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1765	Install Elevator Platform & Hoistway Equipment - Elevator 3 - Phase 3 Headhouse	\$115,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1534	Install Emergency Phones - Pedestrian Bridge	\$107,800.00	Looking at the drawings, there is no way to break up this work on the pedestrian bridge due to the quantity.
WUS-PH2-1132	Install Emergency Phones - Phase 2 Platform	\$106,700.00	Looking at the drawings, there is no way to break up this work due to the very low quantity.
WUS-PH3-1405	Install Emergency Phones - Phase 3 Platform	\$87,780.00	Looking at the drawings, there is no way to break up this work due to the very low quantity.
WUS-PH2-1144	Install Fire Alarm System - Phase 2 Platform	\$392,776.80	This is a delegated design activity, whose full installation requirements and components will not be known until the design is finalized and installed. Once the design is available, we will consider revisiting this activity to further break it out.
WUS-PH3-1417	Install Fire Alarm System - Phase 3 Platform	\$392,776.80	This is a delegated design activity, whose full installation requirements and components will not be known until the design is finalized and installed. Once the design is available, we will consider revisiting this activity to further break it out.
WUS-PH2-1267	Install Generator - Phase 2 Greenspace	\$102,500.00	The cost to fabricate this generator have already been extracted and placed in the procurement section. This cost that remains is to construct the generator on site.
WUS-PH2-1736	Install Hoistway Wiring and Fixtures - Elevator 1 - Phase 2 Platform	\$88,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1738	Install Hoistway Wiring and Fixtures - Elevator 2 - Phase 3 Platform	\$88,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1771	Install Hoistway Wiring and Fixtures - Elevator 3 - Phase 3 Headhouse	\$88,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH2-1270	Install Louver Fence - Phase 2 Greenspace	\$150,683.00	This is a specialty item being installed by our fencing subcontractor. Their subcontract is being executed, but this is worth \$120k.
WUS-PH2-3064	Install Micropiles (Platform Pier) - Phase 2 Platform (P-11 o P-15)	\$71,784.00	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This results in a very short duration. There is no way

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
			to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH3-1900	Install Micropiles (Platform Pier) - Phase 3 Platform (P-31 to P-34)	\$70,000.00	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This results in a very short duration. There is no way to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH3-1906	Install Micropiles (Platform Pier) - Phase 3 Platform (P-35 to P-38)	\$70,000.00	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This results in a very short duration. There is no way to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH3-1912	Install Micropiles (Platform Pier) - Phase 3 Platform (P-39 to P-42)	\$70,000.00	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This results in a very short duration. There is no way to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH3-1918	Install Micropiles (Platform Pier) - Phase 3 Platform (P-43 to P-48)	\$88,927.60	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This results in a very short duration. There is no way to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH3-1423	Install Micropiles for Elevator 2 Footing - Phase 3 Platform	\$360,000.00	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This results in a very short duration. There is no way to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH2-3037	Install Micropiles for Headhouse (BN-1) - Phase 2 Greenspace HH	\$264,533.40	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
			results in a very short duration. There is no way to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH2-1231	Install Micropiles for Headhouse (BN-2) - Phase 2 Greenspace HH	\$171,969.00	Micropile installation for this phase has been broken out by column line, including no more than 4 in a column line (except where the spacing isn't typical, or at platform ends). This results in a very short duration. There is no way to further break this down, as testing has already been allocated its own money, and this is not a procurement item that would be eligible for things like stored material or fabrication costs.
WUS-PH2-1027	Install New Station Track Rails - Phase 2 Track	\$280,621.00	All track work in the schedule is worth \$2.35M (does not include ballast, as that is not being performed by the track sub). The track subcontractors' value is \$2.15M (still in execution, to be submitted). This cost loading is acceptable.
WUS-PH3-1300	Install New Station Track Rails - Phase 3 Track	\$157,329.59	All track work in the schedule is worth \$2.35M (does not include ballast, as that is not being performed by the track sub). The track subcontractors' value is \$2.15M (still in execution, to be submitted). This cost loading is acceptable.
WUS-PH2-1024	Install New Station Track Ties - Phase 2 Track	\$106,700.00	All track work in the schedule is worth \$2.35M (does not include ballast, as that is not being performed by the track sub). The track subcontractors' value is \$2.15M (still in execution, to be submitted). This cost loading is acceptable.
WUS-PH3-1297	Install New Station Track Ties - Phase 3 Track	\$80,250.00	All track work in the schedule is worth \$2.35M (does not include ballast, as that is not being performed by the track sub). The track subcontractors' value is \$2.15M (still in execution, to be submitted). This cost loading is acceptable.
WUS-PH2-1036	Install New Track 1 Ties and Rails - Phase 2 Track - Weekend 1	\$193,660.50	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH2-1651	Install New Track 1 Ties and Rails - Phase 2 Track - Weekend 2	\$193,660.50	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH3-1309	Install New Track 1 Ties and Rails - Phase 3 Track	\$214,000.00	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH2-1129	Install PA System - Phase 2 Platform	\$137,500.00	Communications equipment installation requires a high level of coordination among itself (CCTV, PA, emergency phones, pulls,

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
			fire alarm, etc). Integrating this into the platform network
WUS-PH3-1402	Install PA System - Phase 3 Platform	\$55,000.00	Communications equipment installation requires a high level of coordination among itself (CCTV, PA, emergency phones, pulls, fire alarm, etc). Integrating this into the platform network
WUS-PH1-3001	Install Pad for Temp. Platform Footing	\$97,500.00	The Temporary platform has been further broken down in this revision, to show the structure, walking surface, rubbing board and roof. Due to the extremely short durations, this work cannot be further broken down just to meet the \$50k limit. Additionally, at this time, this work is 90% complete.
WUS-PH3-1522	Install Pedestrian Bridge Glass/Glazing	\$732,550.00	The cost of glass/glazing procurement has been extracted from this activity and put under the procurement section. The remaining monies to install cannot further be broken down in a helpful way, especially given the duration.
WUS-PH3-1273	Install Permanent Picket Fence - Phase 3 Tracks	\$251,396.60	Specialty subcontractor that will be installing the fence linearly down the track. We do not see this work as taking longer than 2 updates to complete.
WUS-PH3-1411	Install Platform Lighting Conduits/Boxes/Wire - Phase 3 Platform	\$197,776.80	Electrical work on the platform is critical, and is comprised of both above and below mounted equipment. This will be mounted to the canopy, and is an extensive network of both rigid and flexible conduit and boxes.
WUS-PH3-1414	Install Platform Lighting Fixtures - Phase 3 Platform	\$130,000.00	The lighting plan for the platform has a large amount of fixtures to be installed in Phase 3. As there is no divisions within the platform (other than the phase line, which we have adhered to), there is no need to further divide this in a productive manner.
WUS-PH3-1333	Install Precast Platform Panels - Phase 3 Platform (BW to P-53)	\$64,482.00	Setting these panels next to the elevator will occur over a very short duration. They are a specialty platform item and there is no need to break this up solely for the \$50k requirement.
WUS-PH2-1724	Install Rail Brackets & Guide Rails - Elevator 1 - Phase 2 Platform	\$175,008.40	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1726	Install Rail Brackets & Guide Rails - Elevator 2 - Phase 3 Platform	\$175,008.40	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1759	Install Rail Brackets & Guide Rails - Elevator 3 - Phase 3 Headhouse	\$175,008.40	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH2-1090	Install Rebar for Elevator 1/Stair 1 Foundation - Phase 2 Platform	\$60,000.00	This area has already been broken down into its simplest forms (rebar, form, pour, cure). Given the duration, this activity makes the most sense staying at its current level of description.
WUS-PH2-1099	Install Rebar for Elevator 1/Stair 1 Walls - Phase 2 Platform	\$60,000.00	This area has already been broken down into its simplest forms (rebar, form, pour, cure). Given the duration, this activity makes the most sense staying at its current level of description.

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
WUS-PH3-1492	Install Rebar for Stair 3 Walls - Phase 3 Headhouse	\$85,510.10	This is the tallest of the three staircases, with the most extensive concrete reinforcement work. It has already been broken down into mudslab, foundation, supporting walls, and structural walls.
WUS-PH1-3019	Install Signage for Temp. Platform	\$75,000.00	This is a very short duration for a very small quantity of temporary signs. There is no need to further break this down.
WUS-PH2-1081	Install SOE for Elevator 1/Stair 1 - Phase 2 Platform	\$546,000.00	This is the most involved of all 3 SOE areas. This is not an activity that has a procurement/fabrication item, as the specialty driving subcontract will be bringing all material with them on the day the activity is set to begin. This is highly sensitive given the proximity to the existing station structure, as well as live track.
WUS-PH3-1354	Install SOE for Elevator 2 - Phase 3 Platform	\$182,702.80	SOE for Elevator 2 and the Headhouse have different designs (hence the different durations), but are roughly similar in scope and size. This is being installed by a specialty subcontractor, with specialized equipment.
WUS-PH2-1225	Install SOE for Headhouse - Phase 2 Greenspace HH	\$182,000.00	SOE for Elevator 2 and the Headhouse have different designs (hence the different durations), but are roughly similar in scope and size. This is being installed by a specialty subcontractor, with specialized equipment.
WUS-PH3-1546	Install SS Screen - Stair 2 - Phase 3 Platform	\$75,000.00	These screens are installed prior to the glass/glazing system, and must integrate seamlessly despite having separate fabrication. There is not an opportunity to further remove cost for fabrication purposes, as they will be fabricated & installed linearly.
WUS-PH3-1723	Install SS Screen - Stair 3 - Phase 3 Headhouse	\$75,000.00	These screens are installed prior to the glass/glazing system, and must integrate seamlessly despite having separate fabrication. There is not an opportunity to further remove cost for fabrication purposes, as they will be fabricated & installed linearly.
WUS-PH2-1120	Install Stair 1 Glass/Glazing - Phase 2 Platform	\$75,000.00	The cost of glass/glazing procurement has been extracted from this activity and put under the procurement section. The remaining monies to install cannot further be broken down in a helpful way, especially given the duration.
WUS-PH2-1111	Install Stair 1 Railings - Phase 2 Platform	\$269,712.40	Assembly of the rails & installation of the system is more complicated than a simple handrail system (which is why they cost reflects that). Given the short duration, even if you were to subdivide into 5 activities that were all 1 day long, they would all be over the \$50k limit.
WUS-PH2-1108	Install Stair 1 Treads/Nosing - Phase 2 Platform	\$50,543.95	This is the shortest of the 3 staircases, hence the difference in cost loading. Installing the treads and nosings progresses through the staircase - there is no further way to break this down.
WUS-PH3-1369	Install Stair 2 Framing - Phase 3 Platform	\$350,000.00	The stairs have a considerable amount of framing in this area, as it connects the parking lot to the platform (must go up high enough so the ped bridge clears the tracks). We assessed this for options to further break it down, and could not arrive at a solution that would make

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
			sense in the schedule. This is already separated from the concrete portion of the stairs in this location, as well as the pedestrian bridge.
WUS-PH3-1372	Install Stair 2 Glass/Glazing - Phase 3 Platform	\$245,000.00	The cost of glass/glazing procurement has been extracted from this activity and put under the procurement section. The remaining monies to install cannot further be broken down in a helpful way, especially given the duration. Stair 2 and 3 have significantly more glass than Stair 1, hence the unbalanced loading.
WUS-PH3-1384	Install Stair 2 Railings - Phase 3 Platform	\$140,000.00	Assembly of the rails & installation of the system is more complicated than a simple handrail system (which is why they cost reflects that).
WUS-PH3-1375	Install Stair 2 Treads/Nosing - Phase 3 Platform	\$140,103.60	This is the second tallest of the staircases, hence the difference in cost loading. Installing the treads and nosings progresses through the staircase - there is no further way to break this down.
WUS-PH3-1501	Install Stair 3 Glass/Glazing - Phase 3 Headhouse	\$270,000.00	The cost of glass/glazing procurement has been extracted from this activity and put under the procurement section. The remaining monies to install cannot further be broken down in a helpful way, especially given the duration. Stair 2 and 3 have significantly more glass than Stair 1, hence the unbalanced loading.
WUS-PH3-1507	Install Stair 3 Railings - Phase 3 Headhouse	\$133,000.00	Assembly of the rails & installation of the system is more complicated than a simple handrail system (which is why they cost reflects that).
WUS-PH3-1504	Install Stair 3 Treads/Nosings - Phase 3 Headhouse	\$147,103.60	This is the tallest of the staircases, hence the difference in cost loading. Installing the treads and nosings progresses through the staircase - there is no further way to break this down.
WUS-PH3-1498	Install Stair 3/HH Framing - Phase 3 Headhouse	\$420,000.00	The stairs have a considerable amount of framing in this area, as it connects the parking lot to the platform (the tallest framing on the job). We assessed this for options to further break it down, and could not arrive at a solution that would make sense in the schedule. This is already separated from the concrete portion of the stairs in this location, as well as the rooms and the pedestrian bridge.
WUS-PH1-3031	Install Temp Platform Roof	\$68,750.00	The Temporary platform has been further broken down in this revision, to show the structure, walking surface, rubbing board and roof. Due to the extremely short durations, this work cannot be further broken down just to meet the \$50k limit. Additionally, at this time, this work is 90% complete.
WUS-PH1-3028	Install Temp Platform Rubbing Board	\$463,750.00	The Temporary platform has been further broken down in this revision, to show the structure, walking surface, rubbing board and roof. Due to the extremely short durations, this work cannot be further broken down just to meet the \$50k limit. Additionally, at this time, this work is done.
WUS-PH1-3010	Install Temp Platform Structure	\$450,000.00	The Temporary platform has been further broken down in this revision, to show the

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
			structure, walking surface, rubbing board and roof. Due to the extremelt short durations, this work cannot be further broken down just to meet the \$50k limit. Additionally, at this time, this work is done.
WUS-PH1-3013	Install Temp Platform Walking Surface	\$150,000.00	The Temporary platform has been further broken down in this revision, to show the structure, walking surface, rubbing board and roof. Due to the extremelt short durations, this work cannot be further broken down just to meet the \$50k limit. Additionally, at this time, this work is done.
WUS-PH2-1012	Install Track Deformation Monitoring - Phase 2 Track	\$81,474.00	This is a specialty item for engineering monitoring. This must be installed around trains on a live track.
WUS-PH3-1285	Install Track Deformation Monitoring - Phase 3 Track	\$81,474.00	This is a specialty item for engineering monitoring. This must be installed around trains on a live track.
WUS-PH2-1000	Install Vertical Shield Along Track 1 - Phase 2 Track	\$96,933.60	This shield runs the length of the tracks and is being installed to facilitate day shift work along the tracks. Due to the sequencing and cost of this fence, the schedule would benefit from keeping this as a single activity. This requires work in a very specific window, which makes the duration and costs more extensive than if this were located in a place not fouling the tracks. Posts will be driven with fabric to shield the live track from the work area.
WUS-PH2-1135	Install VMS - Phase 2 Platform	\$197,561.10	VMS interfacing and installation on the platform is an expensive aspect of the work - considering the secure data and tech involved in each one.
WUS-PH3-1408	Install VMS - Phase 3 Platform	\$110,000.00	VMS interfacing and installation on the platform is an expensive aspect of the work - considering the secure data and tech involved in each one.
WUS-CST-9024	Mobilization - Payment 1	\$384,371.76	Mob Payment. N/A
WUS-CST-9027	Mobilization - Payment 2	\$384,371.76	Mob Payment. N/A
WUS-CST-9030	Mobilization - Payment 3	\$384,371.76	Mob Payment. N/A
WUS-PH2-1096	Pour Elevator 1/Stair 1 Foundation - Phase 2 Platform	\$150,000.00	The construction of the foundation for elevator/stair #1 has been broken down into its most basic parts (rebar, form, pour, also separated into foundation and walls). This area of the jobsite is the first major pour on the job, and we so no way to further break this down in a way that makes sense (espically given the duration)
WUS-PH2-1105	Pour Elevator 1/Stair 1 Walls - Phase 2 Platform	\$241,722.00	The construction of the foundation for elevator/stair #1 has been broken down into its most basic parts (rebar, form, pour, also separated into foundation and walls). This area of the jobsite is the first major pour on the job, and we so no way to further break this down in a way that makes sense (espically given the duration)
WUS-SUB-1499	Procure Sign Materials	\$100,000.00	Procurement activity. N/A
WUS-SUB-1358	Procure Steel	\$1,659,000.00	Procurement activity. N/A

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
WUS-PH2-1015	Remove Existing Station Track - Phase 2 Track	\$320,100.00	All track work in the schedule is worth \$2.35M (does not include ballast, as that is not being performed by the track sub). The track subcontractors' value is \$2.15M (still in execution, to be submitted). This cost loading is acceptable.
WUS-PH3-1288	Remove Existing Station Track - Phase 3 Track	\$133,750.00	All track work in the schedule is worth \$2.35M (does not include ballast, as that is not being performed by the track sub). The track subcontractors' value is \$2.15M (still in execution, to be submitted). This cost loading is acceptable.
WUS-PH2-1030	Remove Existing Track 1 - Phase 2 Track - Weekend 1	\$213,516.50	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH2-1645	Remove Existing Track 1 - Phase 2 Track - Weekend 2	\$213,516.50	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH3-1303	Remove Existing Track 1 - Phase 3 Track	\$206,655.52	This is weekend work - an entire stretch of Track 1 needs to be fully removed & replaced in the 2-day window. Costs for this work are more expensive due the short window and large amount of work.
WUS-PH2-1276	Remove SOE for Elevator 1/Stair 1 and Backfill - Phase 2 Platform	\$130,000.00	Specialty subcontractor to remove SOE, requiring special equipment (machine, flat bed, etc). Given the duration, there is no way to break this up that benefits schedule logic.
WUS-PH3-1420	Remove Temporary Platform - Phase 3 Platform	\$234,000.00	The removal of this platform in Phase 3 does not drive any other activities. We are not sure at this time if it will be dissassembled in bays, or top-down. Given that the duration is less than a month, it makes more sense to not break this up further and progress it as a % complete.
WUS-PH2-1727	Rough-in Elevator Machine Room - Elevator 1 - Phase 2 Platform	\$75,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1729	Rough-in Elevator Machine Room - Elevator 2 - Phase 3 Platform	\$75,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1762	Rough-in Elevator Machine Room - Elevator 3 - Phase 3 Headhouse	\$75,000.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1639	Set Pedestrian Bridge	\$98,000.00	This will be completed on a weekend shift, and requires a crane to pick the bridge and set it. We then have to fully anchor the bridge and complete steel before service is restored on Monday.
WUS-PH2-1123	Survey Hoistway & Set Pit Equipment - Elevator 1 - Phase 2 Platform	\$54,660.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.

<i>Activity ID</i>	<i>Activity Name</i>	<i>Budgeted Cost</i>	<i>Explanation of Cost</i>
WUS-PH3-1366	Survey Hoistway & Set Pit Equipment - Elevator 2 - Phase 3 Platform	\$54,660.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH3-1516	Survey Hoistway & Set Pit Equipment - Elevator 3	\$54,660.00	The elevator work has been broken up into 14 activities to better describe each step. We reviewed this with the elevator subcontractor and this is the greatest level of detail we can do.
WUS-PH2-1150	Waterproof at Grafton St. Bridge - Phase 2 Platform	\$180,075.00	This is weekend work and is a specialty subcontractor (waterproofing). This requires an outage of Track 2, excavation and waterproofing to be completed before service is restored on Monday.
WUS-PH2-1147	Waterproof Passenger Structure Below - Phase 2 Platform	\$180,075.00	This is weekend work and is a specialty subcontractor (waterproofing). This requires an outage of Track 2, excavation and waterproofing to be completed before service is restored on Monday.

-Attachment No. 3-

<i>Activity ID</i>	<i>Activity Name</i>	<i>Original Duration</i>	<i>Explanation of Duration</i>
WUS-PH2-1636	Excavate & Install Conduits (New Service to Switchgear) - Phase 2 Greenspace	30	This is work to be performed by a utility contractor, National Grid, outside of the control of Judlau. This duration must remain.
WUS-PH3-1492	Install Rebar for Stair 3 Walls - Phase 3 Headhouse	30	Stair 3 at the Head House is the largest staircase of the project. The foundation and support work is already separated out. There is no way to break this out that makes sense, either for project tracking or distribution.
WUS-PH3-1495	F&P Stair 3 Walls - Phase 3 Headhouse	30	Stair 3 at the Head House is the largest staircase of the project. The foundation and support work is already separated out. There is no way to break this out that makes sense, either for project tracking or distribution.
WUS-PH3-1498	Install Stair 3/HH Framing - Phase 3 Headhouse	25	Stair 3 at the Head House is the largest staircase of the project. The foundation and support work is already separated out. There is no way to break this out that makes sense, either for project tracking or distribution.
WUS-PH3-1513	Install Elevator 3 Glass/Glazing - Phase 3 Headhouse	25	Elevator 3 is the largest elevator (3 stop), so the glass and glazing required is more extensive than the other two. It will all be performed in one mobilization by the glass subcontractor, so we do not feel breaking this down would do anything to aid the schedule.
WUS-PH3-1522	Install Pedestrian Bridge Glass/Glazing	30	The pedestrian bridge is a singular location with glass/glazing, with no distinguishing stations. It will be performed in one mobilization by the glass subcontractor, so we do not feel breaking this down would do anything to aid the schedule.

			Baseline Schedule																																												
Activity ID	Activity Name	OD	Start	Finish	Late Start	Late Finish	Total Float	2022														2023														2024											
								N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F												
MBTA Worcester Union Station Improvements			515	29-Nov-21	23-Dec-23	29-Nov-21	23-Dec-23	0	23-Dec-23																																						
Milestones			755	29-Nov-21	23-Dec-23	29-Nov-21	23-Dec-23	0	23-Dec-23																																						
WUS-MS-NTP	Notice to Proceed - November 29, 2021	0	29-Nov-21		29-Nov-21		0	◆ Notice to Proceed - November 29, 2021																																							
WUS-MS-MS01	MS01 - Temporary Platform Certificate of Occupancy (103 Days from NTP) - March 12, 2022	0		12-Mar-22*		12-Mar-22	0	◆ MS01 - Temporary Platform Certificate of Occupancy (103 Days from NTP) - March 12, 2022																																							
WUS-MS-MS02	MS02 - Delivery of Elevator Assembly to within 50 Miles of Jobsite (301 Days from NTP) - September 26, 2022	0		05-Sep-22*		05-Sep-22	0	◆ MS02 - Delivery of Elevator Assembly to within 50 Miles of Jobsite (301 Days from NTP) - September 26, 2022																																							
WUS-MS-MS03	MS03 - Western Platform Certificate of Occupancy (435 Days from NTP) - February 7, 2023	0		07-Feb-23*		07-Feb-23	0	◆ MS03 - Western Platform Certificate of Occupancy (435 Days from NTP) - February 7, 2023																																							
WUS-MS-MS04	MS04 - Substantial Completion (694 Days from NTP) - October 24, 2023	0		24-Oct-23*		24-Oct-23	0	◆ MS04 - Substantial Completion (694 Days from NTP) - October 24, 2023																																							
WUS-MS-MS05	MS05 - Final Completion (754 Days from NTP) - December 23, 2023	0		23-Dec-23*		23-Dec-23	0	◆ MS05 - Final Completion (754 Days from NTP) - December 23, 2023																																							
Shopdrawings/Submittals/Material Procurement			405	29-Nov-21	07-Jan-23	29-Nov-21	24-Oct-23	290	07-Jan-23, Shopdrawings/Submittals/Material Procurement																																						
Subcontractors			90	29-Nov-21	26-Feb-22	29-Nov-21	24-Oct-23	605	26-Feb-22, Subcontractors																																						
Scheduling Subcontractor			60	29-Nov-21	27-Jan-22	26-Aug-23	24-Oct-23	635	27-Jan-22, Scheduling Subcontractor																																						
WUS-SUB-1076	Prepare & Submit Scheduling Subcontractor	30	29-Nov-21	28-Dec-21	26-Aug-23	24-Sep-23	635	▲▲ Prepare & Submit Scheduling Subcontractor																																							
WUS-SUB-1202	Review & Approve Scheduling Subcontractor	30	29-Dec-21	27-Jan-22	25-Sep-23	24-Oct-23	635	▲▲ Review & Approve Scheduling Subcontractor																																							
Electrical Subcontractor			60	29-Nov-21	27-Jan-22	01-Dec-21	29-Jan-22	2	27-Jan-22, Electrical Subcontractor																																						
WUS-SUB-1079	Prepare & Submit Electrical Subcontractor	30	29-Nov-21	28-Dec-21	01-Dec-21	30-Dec-21	2	▲▲ Prepare & Submit Electrical Subcontractor																																							
WUS-SUB-1205	Review & Approve Electrical Subcontractor	30	29-Dec-21	27-Jan-22	31-Dec-21	29-Jan-22	2	▲▲ Review & Approve Electrical Subcontractor																																							
Environmental / LSP Subcontractor			60	29-Nov-21	27-Jan-22	26-Aug-23	24-Oct-23	635	27-Jan-22, Environmental / LSP Subcontractor																																						
WUS-SUB-1082	Prepare & Submit Environmental / LSP Subcontractor	30	29-Nov-21	28-Dec-21	26-Aug-23	24-Sep-23	635	▲▲ Prepare & Submit Environmental / LSP Subcontractor																																							
WUS-SUB-1208	Review & Approve Environmental / LSP Subcontractor	30	29-Dec-21	27-Jan-22	25-Sep-23	24-Oct-23	635	▲▲ Review & Approve Environmental / LSP Subcontractor																																							
Concrete Subcontractor			60	29-Nov-21	27-Jan-22	19-May-22	17-Jul-22	171	27-Jan-22, Concrete Subcontractor																																						
WUS-SUB-1085	Prepare & Submit Concrete Subcontractor	30	29-Nov-21	28-Dec-21	19-May-22	17-Jun-22	171	▲▲ Prepare & Submit Concrete Subcontractor																																							
WUS-SUB-1211	Review & Approve Concrete Subcontractor	30	29-Dec-21	27-Jan-22	18-Jun-22	17-Jul-22	171	▲▲ Review & Approve Concrete Subcontractor																																							
Elevator Subcontractor			60	29-Nov-21	27-Jan-22	28-Apr-23	26-Jun-23	515	27-Jan-22, Elevator Subcontractor																																						
WUS-SUB-1088	Prepare & Submit Elevator Subcontractor	30	29-Nov-21	28-Dec-21	28-Apr-23	27-May-23	515	▲▲ Prepare & Submit Elevator Subcontractor																																							
WUS-SUB-1214	Review & Approve Elevator Subcontractor	30	29-Dec-21	27-Jan-22	28-May-23	26-Jun-23	515	▲▲ Review & Approve Elevator Subcontractor																																							
Rebar Installation Subcontractor			90	29-Nov-21	26-Feb-22	09-Feb-22	09-May-22	72	26-Feb-22, Rebar Installation Subcontractor																																						
Start Date: 29-Nov-21		▲ Actual Work		Worcester Union Station Accessibility and Infrastructure Improvements MBTA Contract No. X72CN01 Judlau Contracting, Inc. -Baseline Schedule-																								Arnold Engineering Co., Inc.																			
Finish Date: 23-Dec-23		▲ Remaining Work																										Date				Revision								Checked				Approved			
Data Date: 29-Nov-21		▲ Critical Remaining Work																																													
Page 1 of 30		◆ Milestone																																													
WUS BL-R1 X72CN01		▬ Summary																																													

Activity ID			Activity Name	OD	Start	Finish	Late Start	Late Finish	Total Float	2022														2023														2024			
										N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F				
			WUS-SUB-1091	Prepare & Submit Rebar Installation Subcontractor	60	29-Nov-21	27-Jan-22	09-Feb-22	09-Apr-22	72	Prepare & Submit Rebar Installation Subcontractor																														
			WUS-SUB-1283	Review & Approve Rebar Installation Subcontractor	30	28-Jan-22	26-Feb-22	10-Apr-22	09-May-22	72	Review & Approve Rebar Installation Subcontractor																														
			Fencing Subcontractor			90	29-Nov-21	26-Feb-22	13-Jan-23	12-Apr-23	410	26-Feb-22, Fencing Subcontractor																													
			WUS-SUB-1094	Prepare & Submit Fencing Subcontractor	60	29-Nov-21	27-Jan-22	13-Jan-23	13-Mar-23	410	Prepare & Submit Fencing Subcontractor																														
			WUS-SUB-1286	Review & Approve Fencing Subcontractor	30	28-Jan-22	26-Feb-22	14-Mar-23	12-Apr-23	410	Review & Approve Fencing Subcontractor																														
			Signage Subcontractor			60	29-Nov-21	27-Jan-22	17-Dec-21	14-Feb-22	18	27-Jan-22, Signage Subcontractor																													
			WUS-SUB-1097	Prepare & Submit Signage Subcontractor	30	29-Nov-21	28-Dec-21	17-Dec-21	15-Jan-22	18	Prepare & Submit Signage Subcontractor																														
			WUS-SUB-1217	Review & Approve Signage Subcontractor	30	29-Dec-21	27-Jan-22	16-Jan-22	14-Feb-22	18	Review & Approve Signage Subcontractor																														
			Soil Disposal Subcontractor			90	29-Nov-21	26-Feb-22	25-May-22	22-Aug-22	177	26-Feb-22, Soil Disposal Subcontractor																													
			WUS-SUB-1100	Prepare & Submit Soil Disposal Subcontractor	60	29-Nov-21	27-Jan-22	25-May-22	23-Jul-22	177	Prepare & Submit Soil Disposal Subcontractor																														
			WUS-SUB-1289	Review & Approve Soil Disposal Subcontractor	30	28-Jan-22	26-Feb-22	24-Jul-22	22-Aug-22	177	Review & Approve Soil Disposal Subcontractor																														
			Temporary Platform Erection Subcontractor			60	29-Nov-21	27-Jan-22	06-Dec-21	03-Feb-22	7	27-Jan-22, Temporary Platform Erection Subcontractor																													
			WUS-SUB-1103	Prepare & Submit Temporary Platform Erection Subcontractor	30	29-Nov-21	28-Dec-21	06-Dec-21	04-Jan-22	7	Prepare & Submit Temporary Platform Erection Subcontractor																														
			WUS-SUB-1220	Review & Approve Temporary Platform Erection Subcontractor	30	29-Dec-21	27-Jan-22	05-Jan-22	03-Feb-22	7	Review & Approve Temporary Platform Erection Subcontractor																														
			HVAC Subcontractor			90	29-Nov-21	26-Feb-22	11-Jun-22	08-Sep-22	194	26-Feb-22, HVAC Subcontractor																													
			WUS-SUB-1106	Prepare & Submit HVAC Subcontractor	60	29-Nov-21	27-Jan-22	11-Jun-22	09-Aug-22	194	Prepare & Submit HVAC Subcontractor																														
			WUS-SUB-1292	Review & Approve HVAC Subcontractor	30	28-Jan-22	26-Feb-22	10-Aug-22	08-Sep-22	194	Review & Approve HVAC Subcontractor																														
			Track Subcontractor			60	29-Nov-21	27-Jan-22	28-Apr-22	26-Jun-22	150	27-Jan-22, Track Subcontractor																													
			WUS-SUB-1109	Prepare & Submit Track Subcontractor	30	29-Nov-21	28-Dec-21	28-Apr-22	27-May-22	150	Prepare & Submit Track Subcontractor																														
			WUS-SUB-1223	Review & Approve Track Subcontractor	30	29-Dec-21	27-Jan-22	28-May-22	26-Jun-22	150	Review & Approve Track Subcontractor																														
			Terrazzo Subcontractor			90	29-Nov-21	26-Feb-22	01-May-22	29-Jul-22	153	26-Feb-22, Terrazzo Subcontractor																													
			WUS-SUB-1112	Prepare & Submit Terrazzo Subcontractor	60	29-Nov-21	27-Jan-22	01-May-22	29-Jun-22	153	Prepare & Submit Terrazzo Subcontractor																														
			WUS-SUB-1295	Review & Approve Terrazzo Subcontractor	30	28-Jan-22	26-Feb-22	30-Jun-22	29-Jul-22	153	Review & Approve Terrazzo Subcontractor																														
			Mill / Pave Subcontractor			90	29-Nov-21	26-Feb-22	24-Jun-23	21-Sep-23	572	26-Feb-22, Mill / Pave Subcontractor																													
WUS-SUB-1115	Prepare & Submit Mill / Pave Subcontractor	60	29-Nov-21	27-Jan-22	24-Jun-23	22-Aug-23	572	Prepare & Submit Mill / Pave Subcontractor																																	
WUS-SUB-1298	Review & Approve Mill / Pave Subcontractor	30	28-Jan-22	26-Feb-22	23-Aug-23	21-Sep-23	572	Review & Approve Mill / Pave Subcontractor																																	

Activity ID		Activity Name	OD	Start	Finish	Late Start	Late Finish	Total Float	2022														2023														2024		
									N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F			
		Structural Steel Subcontractor		90	29-Nov-21	26-Feb-22	09-Feb-22	09-May-22	72	26-Feb-22, Structural Steel Subcontractor																													
		WUS-SUB-1118	Prepare & Submit Structural Steel and FRP Installation Subcontractor	60	29-Nov-21	27-Jan-22	09-Feb-22	09-Apr-22	72	Prepare & Submit Structural Steel and FRP Installation Subcontractor																													
		WUS-SUB-1301	Review & Approve Structural Steel and FRP Installation Subcontractor	30	28-Jan-22	26-Feb-22	10-Apr-22	09-May-22	72	Review & Approve Structural Steel and FRP Installation Subcontractor																													
		Micropile Subcontractor		60	29-Nov-21	27-Jan-22	07-Dec-21	04-Feb-22	8	27-Jan-22, Micropile Subcontractor																													
		WUS-SUB-1121	Prepare & Submit Micropile Subcontractor	30	29-Nov-21	28-Dec-21	07-Dec-21	05-Jan-22	8	Prepare & Submit Micropile Subcontractor																													
		WUS-SUB-1226	Review & Approve Micropile Subcontractor	30	29-Dec-21	27-Jan-22	06-Jan-22	04-Feb-22	8	Review & Approve Micropile Subcontractor																													
		Glass / Glazing Subcontractor		75	29-Nov-21	11-Feb-22	25-Dec-21	09-Mar-22	26	11-Feb-22, Glass / Glazing Subcontractor																													
		WUS-SUB-1124	Prepare & Submit Glass / Glazing Subcontractor	45	29-Nov-21	12-Jan-22	25-Dec-21	07-Feb-22	26	Prepare & Submit Glass / Glazing Subcontractor																													
		WUS-SUB-1238	Review & Approve Glass / Glazing Subcontractor	30	13-Jan-22	11-Feb-22	08-Feb-22	09-Mar-22	26	Review & Approve Glass / Glazing Subcontractor																													
		Painting Subcontractor		90	29-Nov-21	26-Feb-22	02-Sep-22	30-Nov-22	277	26-Feb-22, Painting Subcontractor																													
		WUS-SUB-1127	Prepare & Submit Painting Subcontractor	60	29-Nov-21	27-Jan-22	02-Sep-22	31-Oct-22	277	Prepare & Submit Painting Subcontractor																													
		WUS-SUB-1304	Review & Approve Painting Subcontractor	30	28-Jan-22	26-Feb-22	01-Nov-22	30-Nov-22	277	Review & Approve Painting Subcontractor																													
		Landscaping Subcontractor		90	29-Nov-21	26-Feb-22	15-Jul-23	12-Oct-23	593	26-Feb-22, Landscaping Subcontractor																													
		WUS-SUB-1130	Prepare & Submit Landscaping Subcontractor	60	29-Nov-21	27-Jan-22	15-Jul-23	12-Sep-23	593	Prepare & Submit Landscaping Subcontractor																													
		WUS-SUB-1307	Review & Approve Landscaping Subcontractor	30	28-Jan-22	26-Feb-22	13-Sep-23	12-Oct-23	593	Review & Approve Landscaping Subcontractor																													
		Curb / Sidewak Subcontractor		90	29-Nov-21	26-Feb-22	27-Mar-23	24-Jun-23	483	26-Feb-22, Curb / Sidewak Subcontractor																													
		WUS-SUB-1133	Prepare & Submit Curb / Sidewak Subcontractor	60	29-Nov-21	27-Jan-22	27-Mar-23	25-May-23	483	Prepare & Submit Curb / Sidewak Subcontractor																													
		WUS-SUB-1310	Review & Approve Curb / Sidewak Subcontractor	30	28-Jan-22	26-Feb-22	26-May-23	24-Jun-23	483	Review & Approve Curb / Sidewak Subcontractor																													
		Waterproofing Subcontractor		90	29-Nov-21	26-Feb-22	15-Feb-22	15-May-22	78	26-Feb-22, Waterproofing Subcontractor																													
		WUS-SUB-1136	Prepare & Submit Waterproofing Subcontractor	60	29-Nov-21	27-Jan-22	15-Feb-22	15-Apr-22	78	Prepare & Submit Waterproofing Subcontractor																													
WUS-SUB-1313	Review & Approve Waterproofing Subcontractor	30	28-Jan-22	26-Feb-22	16-Apr-22	15-May-22	78	Review & Approve Waterproofing Subcontractor																															
CMU Subcontractor		90	29-Nov-21	26-Feb-22	13-Jun-22	10-Sep-22	196	26-Feb-22, CMU Subcontractor																															
WUS-SUB-1139	Prepare & Submit CMU Subcontractor	60	29-Nov-21	27-Jan-22	13-Jun-22	11-Aug-22	196	Prepare & Submit CMU Subcontractor																															
WUS-SUB-1316	Review & Approve CMU Subcontractor	30	28-Jan-22	26-Feb-22	12-Aug-22	10-Sep-22	196	Review & Approve CMU Subcontractor																															
FRP Subcontractor		90	29-Nov-21	26-Feb-22	29-Nov-21	26-Feb-22	0	26-Feb-22, FRP Subcontractor																															
WUS-SUB-1142	Prepare & Submit FRP Subcontractor	60	29-Nov-21	27-Jan-22	29-Nov-21	27-Jan-22	0	Prepare & Submit FRP Subcontractor																															

Activity ID			Activity Name	OD	Start	Finish	Late Start	Late Finish	Total Float	2022														2023														2024	
										N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F	M	A	M	J	Jul	A	S	O	N	D	J	F		
		Submittal Log		45	29-Nov-21	12-Jan-22	10-Sep-23	24-Oct-23	650	12-Jan-22, Submittal Log																													
		WUS-SUB-1058	Prepare & Submit Submittal Log	15	29-Nov-21	13-Dec-21	10-Sep-23	24-Sep-23	650	Prepare & Submit Submittal Log																													
		WUS-SUB-1172	Review & Approve Submittal Log	30	14-Dec-21	12-Jan-22	25-Sep-23	24-Oct-23	650	Review & Approve Submittal Log																													
		Baseline Schedule		75	29-Nov-21	11-Feb-22	10-Aug-23	23-Oct-23	619	11-Feb-22, Baseline Schedule																													
		WUS-SUB-1016	Prepare & Submit Baseline Schedule	45	29-Nov-21	12-Jan-22	10-Aug-23	23-Sep-23	619	Prepare & Submit Baseline Schedule																													
		WUS-SUB-1229	Review & Approve Baseline Schedule	30	13-Jan-22	11-Feb-22	24-Sep-23	23-Oct-23	619	Review & Approve Baseline Schedule																													
		Building Permits		90	29-Nov-21	26-Feb-22	27-Jul-22	24-Oct-22	240	26-Feb-22, Building Permits																													
		WUS-SUB-1013	Prepare & Submit Building Permits	60	29-Nov-21	27-Jan-22	27-Jul-22	24-Sep-22	240	Prepare & Submit Building Permits																													
		WUS-SUB-1187	Review & Approve Building Permits	30	28-Jan-22	26-Feb-22	25-Sep-22	24-Oct-22	240	Review & Approve Building Permits																													
		EMMP		44	29-Nov-21	11-Jan-22	10-Jul-22	22-Aug-22	223	11-Jan-22, EMMP																													
		WUS-SUB-1022	Prepare & Submit EMMP	14	29-Nov-21	12-Dec-21	10-Jul-22	23-Jul-22	223	Prepare & Submit EMMP																													
		WUS-SUB-1169	Review & Approve EMMP	30	13-Dec-21	11-Jan-22	24-Jul-22	22-Aug-22	223	Review & Approve EMMP																													
		Dust/Vapor/Odor		60	29-Nov-21	27-Jan-22	24-Jun-22	22-Aug-22	207	27-Jan-22, Dust/Vapor/Odor																													
		WUS-SUB-1019	Prepare & Submit Dust/Vapor/Odor	30	29-Nov-21	28-Dec-21	24-Jun-22	23-Jul-22	207	Prepare & Submit Dust/Vapor/Odor																													
		WUS-SUB-1190	Review & Approve Dust/Vapor/Odor	30	29-Dec-21	27-Jan-22	24-Jul-22	22-Aug-22	207	Review & Approve Dust/Vapor/Odor																													
		Air/Noise Control Monitoring Plan		90	29-Nov-21	26-Feb-22	25-May-22	22-Aug-22	177	26-Feb-22, Air/Noise Control Monitoring Plan																													
		WUS-SUB-1025	Prepare & Submit Air/Noise Control Monitoring Plan	60	29-Nov-21	27-Jan-22	25-May-22	23-Jul-22	177	Prepare & Submit Air/Noise Control Monitoring Plan																													
		WUS-SUB-1244	Review & Approve Air/Noise Control Monitoring Plan	30	28-Jan-22	26-Feb-22	24-Jul-22	22-Aug-22	177	Review & Approve Air/Noise Control Monitoring Plan																													
		SWPPP & CGP		50	29-Nov-21	17-Jan-22	29-Nov-21	17-Jan-22	0	17-Jan-22, SWPPP & CGP																													
		WUS-SUB-1004	Prepare & Submit SWPPP & CGP / NPDES Permit	20	29-Nov-21	18-Dec-21	29-Nov-21	18-Dec-21	0	Prepare & Submit SWPPP & CGP / NPDES Permit																													
		WUS-SUB-1178	Review & Approve SWPPP & CGP / NPDES Permit	30	19-Dec-21	17-Jan-22	19-Dec-21	17-Jan-22	0	Review & Approve SWPPP & CGP / NPDES Permit																													
		Temporary Pedestrian Facilities		80	29-Nov-21	16-Feb-22	10-Dec-21	27-Feb-22	11	16-Feb-22, Temporary Pedestrian Facilities																													
		WUS-SUB-1049	Prepare & Submit Temp. Pedestrian Facilities	50	29-Nov-21	17-Jan-22	10-Dec-21	28-Jan-22	11	Prepare & Submit Temp. Pedestrian Facilities																													
		WUS-SUB-1199	Review & Approve Temp. Pedestrian Facilities	30	18-Jan-22	16-Feb-22	29-Jan-22	27-Feb-22	11	Review & Approve Temp. Pedestrian Facilities																													
		Deformation & Vibration Monitoring Plan		60	29-Nov-21	27-Jan-22	16-Jan-22	16-Mar-22	48	27-Jan-22, Deformation & Vibration Monitoring Plan																													
WUS-SUB-1046	Prepare & Submit Deformation & Vibration Monitoring Plan	30	29-Nov-21	28-Dec-21	16-Jan-22	14-Feb-22	48	Prepare & Submit Deformation & Vibration Monitoring Plan																															

Activity ID		Activity Name	OD	Start	Finish	Late Start	Late Finish	Total Float	2022														2023														2024																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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			WUS-SUB-1196	Review & Approve Deformation & Vibration Monitoring Plan	30	29-Dec-21	27-Jan-22	15-Feb-22	16-Mar-22	48																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</

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Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
0120.101 - Integration Support for Positive Train Control System				
WUS-CST-9000	Allowance - Integration Support for PTC	0	0	\$150,000.00
Subtotal		0	0	\$150,000.00
0130.062 - Weekend Substitute Transportation				
WUS-CST-9006	Allowance - Weekend Substitute Transportation	0	0	\$535,000.00
Subtotal		0	0	\$535,000.00
0130.130 - Construct Passenger Station Facilities				
WUS-CST-9024	Mobilization - Payment 1	1	0	\$384,371.76
WUS-CST-9027	Mobilization - Payment 2	1	0	\$384,371.76
WUS-PH1-3001	Install Pad for Temp. Platform Footing	1	0	\$97,500.00
WUS-PH1-3010	Install Temp Platform Structure	1	0	\$450,000.00
WUS-PH1-3013	Install Temp Platform Walking Surface	1	0	\$150,000.00
WUS-PH1-3016	Install Lighting for Temp. Platform	1	0	\$37,500.00
WUS-PH1-3019	Install Signage for Temp. Platform	1	0	\$75,000.00
WUS-PH1-3022	Install Stairs/Ramp to Temp. Platform	1	0	\$45,000.00
WUS-PH1-3028	Install Temp Platform Rubbing Board	1	0	\$463,750.00
WUS-PH1-3031	Install Temp Platform Roof	1	0	\$68,750.00
WUS-PH2-1000	Install Vertical Shield Along Track 1 - Phase 2 Track	1	0	\$96,933.60
WUS-PH2-1003	Excavate for Central Conduits - Phase 2 West Tracks	1	0	\$54,000.00
WUS-PH2-1006	Install Central Conduits - Phase 2 West Tracks	1	0	\$69,707.25
WUS-PH2-1009	Encase/Backfill Central Conduits - Phase 2 West Tracks	1	0	\$47,250.00
WUS-PH2-1045	Install Rebar for Pile Caps - Phase 2 Platform (P-7 to P-30)	1	0	\$24,000.00
WUS-PH2-1048	F&P Concrete Pile Caps - Phase 2 Platform (P-7 to P-10)	1	0	\$75,000.00
WUS-PH2-1051	Dampproof Concrete Pile Caps - Phase 2 Platform (P-7 to P-30)	1	0	\$49,390.50
WUS-PH2-1054	Install FRP - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$41,312.10
WUS-PH2-1057	Install Precast Platform Panels - Phase 2 Platform (P1 to P2)	1	0	\$34,482.00
WUS-PH2-1060	Install Platform Plumbing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$33,210.58
WUS-PH2-1063	Install Canopy Framing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$80,000.00
WUS-PH2-1066	Install Canopy Roof - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$50,000.00
WUS-PH2-1069	Install Canopy Column Downspouts - Phase 2 Platform	1	0	\$40,000.00
WUS-PH2-1072	Install Sign Frames - Phase 2 Platform	1	0	\$30,067.80
WUS-PH2-1075	Install Signs and Cases - Phase 2 Platform	1	0	\$50,000.00
WUS-PH2-1078	Install Braille - Phase 2 Platform	1	0	\$10,440.80
WUS-PH2-1090	Install Rebar for Elevator 1/Stair 1 Foundation - Phase 2 Platform	1	0	\$60,000.00
WUS-PH2-1093	Form Elevator 1/Stair 1 Foundation - Phase 2 Platform	1	0	\$187,500.00
WUS-PH2-1096	Pour Elevator 1/Stair 1 Foundation - Phase 2 Platform	1	0	\$150,000.00
WUS-PH2-1099	Install Rebar for Elevator 1/Stair 1 Walls - Phase 2 Platform	1	0	\$60,000.00
WUS-PH2-1102	Form Elevator 1/Stair 1 Walls - Phase 2 Platform	1	0	\$165,000.00
WUS-PH2-1105	Pour Elevator 1/Stair 1 Walls - Phase 2 Platform	1	0	\$241,722.00
WUS-PH2-1108	Install Stair 1 Treads/Nosing - Phase 2 Platform	1	0	\$50,543.95
WUS-PH2-1111	Install Stair 1 Railings - Phase 2 Platform	1	0	\$269,712.40
WUS-PH2-1114	Install Elevator 1 Framing - Phase 2 Platform	1	0	\$560,000.00
WUS-PH2-1117	Install Elevator 1 Glass/Glazing - Phase 2 Platform	1	0	\$215,000.00
WUS-PH2-1120	Install Stair 1 Glass/Glazing - Phase 2 Platform	1	0	\$75,000.00
WUS-PH2-1123	Survey Hoistway & Set Pit Equipment - Elevator 1 - Phase 2 Platform	1	0	\$54,660.00
WUS-PH2-1138	Install Platform Conduits/Wire - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$48,100.00

Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH2-1141	Install Platform Light Fixtures - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$30,000.00
WUS-PH2-1144	Install Fire Alarm System - Phase 2 Platform	1	0	\$392,776.80
WUS-PH2-1147	Waterproof Passenger Structure Below - Phase 2 Platform	1	0	\$180,075.00
WUS-PH2-1150	Waterproof at Grafton St. Bridge - Phase 2 Platform	1	0	\$180,075.00
WUS-PH2-1153	Install Steel at Grafton St. Bridge - Phase 2 Platform	1	0	\$31,960.60
WUS-PH2-1156	Install Precast Piers at Grafton St. Bridge - Phase 2 Platform	1	0	\$30,000.00
WUS-PH2-1159	Install Barricades - Platform Access Corridor - Phase 2 Station	1	0	\$21,673.80
WUS-PH2-1165	Build New Walls - Platform Access Corridor - Phase 2 Station	1	0	\$70,000.00
WUS-PH2-1168	Paint New Walls - Platform Access Corridor - Phase 2 Station	1	0	\$30,000.00
WUS-PH2-1171	Install Doors - MBTA Offices - Phase 2 Station	1	0	\$45,000.00
WUS-PH2-1174	Repair Floors - Platform Access Corridor - Phase 2 Station	1	0	\$25,000.00
WUS-PH2-1177	Install Terrazzo - Platform Access Corridor - Phase 2 Station	1	0	\$50,000.00
WUS-PH2-1180	Grind/Finish Terrazzo - Platform Access Corridor - Phase 2 Station	1	0	\$50,000.00
WUS-PH2-1183	Demolish Existing HVAC AHU - Platform Access Corridor - Phase 2 Station	1	0	\$30,000.00
WUS-PH2-1186	Install New HVAC AHU - Mechanical Room - Phase 2 Station	1	0	\$49,400.00
WUS-PH2-1189	Install New HVAC Ductwork - Platform Access Corridor - Phase 2 Station	1	0	\$35,000.00
WUS-PH2-1192	Demolish Existing Fire Protection Piping - Platform Access Corridor - Phase 2 Station	1	0	\$13,000.00
WUS-PH2-1195	Install New Fire Protection Piping - Platform Access Corridor - Phase 2 Station	1	0	\$34,500.00
WUS-PH2-1198	Demolish Existing Lighting Fixtures - Platform Access Corridor - Phase 2 Station	1	0	\$20,000.00
WUS-PH2-1201	Install New Conduit & Wire - Mechanical Room - Phase 2 Station	1	0	\$25,000.00
WUS-PH2-1204	Install New Fixtures - Mechanical Room - Phase 2 Station	1	0	\$10,400.00
WUS-PH2-1207	Install EMR 1 Conduits - Phase 2 Station	1	0	\$47,500.00
WUS-PH2-1210	Install EMR 1 Fixtures - Phase 2 Station	1	0	\$50,000.00
WUS-PH2-1213	Install Signs & Frames - Platform Access Corridor - Phase 2 Station	1	0	\$10,000.00
WUS-PH2-1216	Install Braille - Platform Access Corridor - Phase 2 Station	1	0	\$7,438.90
WUS-PH2-1234	Install Rebar for Headhouse Pilecaps - Phase 2 Greenspace HH	1	0	\$30,000.00
WUS-PH2-1237	Form Concrete Pilecaps for Headhouse - Phase 2 Greenspace HH	1	0	\$20,000.00
WUS-PH2-1240	Pour Concrete Pilecaps for Headhouse - Phase 2 Greenspace HH	1	0	\$20,000.00
WUS-PH2-1243	Dampproof Concrete Pilecaps for Headhouse - Phase 2 Greenspace HH	1	0	\$49,392.00
WUS-PH2-1246	Form & Pour Comm and Electrical Room Walls - Phase 2 Greenspace HH	1	0	\$184,871.83
WUS-PH2-1249	Install Rebar for Comm and Electrical Room Walls - Phase 2 Greenspace HH	1	0	\$27,000.00
WUS-PH2-1261	F&P Generator Pad - Phase 2 Greenspace	1	0	\$45,500.00
WUS-PH2-1267	Install Generator - Phase 2 Greenspace	1	0	\$102,500.00
WUS-PH2-1270	Install Louver Fence - Phase 2 Greenspace	1	0	\$150,683.00
WUS-PH2-1549	Install Doors - Phase 2 Headhouse	1	0	\$52,140.20
WUS-PH2-1606	Form and Pour Retaining Wall Footing - Phase 2 Greenspace HH	1	0	\$37,500.00
WUS-PH2-1609	Install Conduits (Generator to Electrical Room) - Phase 2 Greenspace	1	0	\$33,976.00
WUS-PH2-1612	Install Conduits (Switchgear to Transformer) - Phase 2	1	0	\$36,400.00

Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH2-1615	Greenspace Install Conduits (Transformer to Electrical Room) - Phase 2 Greenspace	1	0	\$49,400.00
WUS-PH2-1618	Install MV MH - Phase 2 Greenspace	1	0	\$22,000.00
WUS-PH2-1621	F&P Retaining Wall - Phase 2 Greenspace	1	0	\$45,000.00
WUS-PH2-1627	F&P Transformer Pad - Phase 2 Greenspace	1	0	\$22,500.00
WUS-PH2-1675	Pour Mudslab for HH Rooms/Stair 3 - Phase 2 Greenspace HH	1	0	\$28,000.00
WUS-PH2-1678	Waterproof Mudslab for HH Rooms/Stair 3 - Phase 2 Greenspace HH	1	0	\$17,000.00
WUS-PH2-1681	Install Rebar for Foundation of HH Rooms/Stair 3 - Phase 2 Greenspace HH	1	0	\$20,000.00
WUS-PH2-1684	F&P Foundation of HH Rooms/Stair 3 - Phase 2 Greenspace HH	1	0	\$35,000.00
WUS-PH2-1693	Backfill at HH Rooms - Phase 2 Greenspace HH	1	0	\$28,000.00
WUS-PH2-1696	Pour Slab on Grade for HH Rooms - Phase 2 Greenspace HH	1	0	\$21,000.00
WUS-PH2-1699	Pour Mudslab for Elevator 3 - Phase 2 Greenspace HH	1	0	\$20,000.00
WUS-PH2-1702	Waterproof Mudslab for Elevator 3 - Phase 2 Greenspace HH	1	0	\$12,000.00
WUS-PH2-1705	Install Rebar for Elevator 3 Foundation - Phase 2 Greenspace HH	1	0	\$15,000.00
WUS-PH2-1708	F&P Elevator 3 Foundation - Phase 2 Greenspace HH	1	0	\$25,000.00
WUS-PH2-1714	Install Rebar for Elevator 3 and Machine Room Walls - Phase 3 Greenspace	1	0	\$45,000.00
WUS-PH2-1717	F&P Elevator 3 & Machine Room Walls - Phase 3 Greenspace	1	0	\$83,000.00
WUS-PH2-1724	Install Rail Brackets & Guide Rails - Elevator 1 - Phase 2 Platform	1	0	\$175,008.40
WUS-PH2-1727	Rough-in Elevator Machine Room - Elevator 1 - Phase 2 Platform	1	0	\$75,000.00
WUS-PH2-1730	Install Elevator Platform & Hoistway Equipment - Elevator 1 - Phase 2 Platform	1	0	\$115,000.00
WUS-PH2-1733	Install Elevator Entrance Frames/Doors - Elevator 1 - Phase 2 Platform	1	0	\$100,000.00
WUS-PH2-1736	Install Hoistway Wiring and Fixtures - Elevator 1 - Phase 2 Platform	1	0	\$88,000.00
WUS-PH2-1739	Build and Wire Elevator Cab - Elevator 1 - Phase 2 Platform	1	0	\$145,000.00
WUS-PH2-1742	Adjust Elevator - Elevator 1 - Phase 2 Platform	1	0	\$78,000.00
WUS-PH2-1745	Elevator Pre-Test - Elevator 1 - Phase 2 Platform	1	0	\$25,000.00
WUS-PH2-1751	72-Hour Test - Elevator 1 - Phase 2 Platform	1	0	\$25,000.00
WUS-PH2-1754	Commission Elevator 1 - Phase 2 Platform	1	0	\$25,000.00
WUS-PH2-1757	Install Canopy Drainage Gutters - Phase 2 Platform	1	0	\$30,000.00
WUS-PH2-1760	Demolish Existing Lighting Conduits/Boxes - Platform Access Corridor - Phase 2 Station	1	0	\$45,000.00
WUS-PH2-1763	Build New Walls - MBTA Offices - Phase 2 Station	1	0	\$50,000.00
WUS-PH2-1766	Install New Metal Ceiling - Platform Access Corridor - Phase 2 Station	1	0	\$46,480.50
WUS-PH2-1769	Demolish Existing HVAC Duct and Piping - Platform Access Corridor - Phase 2 Station	1	0	\$30,000.00
WUS-PH2-1772	Install New HVAC AHU Condensate Pump - Mechanical Room - Phase 2 Station	1	0	\$17,000.00
WUS-PH2-1775	Install Return Air Fan (RAF) - Mechanical Room - Phase 2 Station	1	0	\$12,000.00
WUS-PH2-1778	Install Return Air Diffusers - Platform Access Corridor - Phase 2 Station	1	0	\$15,000.00
WUS-PH2-1781	Install Supply Air Diffusers - Platform Access Corridor - Phase 2 Station	1	0	\$15,000.00
WUS-PH2-1784	Install Supply Air Diffuser - Mechanical Room - Phase 2 Station	1	0	\$15,000.00
WUS-PH2-1787	Install Electric Unit Heaters - Platform Access Corridor - Phase 2 Station	1	0	\$20,000.00
WUS-PH2-1790	Install Elevator 1 Sump Pump - Elevator 1 Pit - Phase 2 Station	1	0	\$12,500.00

Schedule of Values

Cost Accounts				
Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH2-1793	Install DSS HVAC - Elevator 1 Machine Room - Phase 2 Station	1	0	\$27,500.00
WUS-PH2-1796	Install New Fixtures - Platform Access Corridor - Phase 2 Station	1	0	\$44,200.00
WUS-PH2-1799	Install New Fixtures - MBTA Offices - Phase 2 Station	1	0	\$10,400.00
WUS-PH2-1802	Install New Conduit & Wire - Platform Access Corridor - Phase 2 Station	1	0	\$50,000.00
WUS-PH2-1805	Install New Conduit & Wire - MBTA Offices - Phase 2 Station	1	0	\$22,500.00
WUS-PH2-1808	Paint New Walls - MBTA Offices - Phase 2 Station	1	0	\$18,606.60
WUS-PH2-1811	Paint Walls - Station Office - Phase 2 Station	1	0	\$10,000.00
WUS-PH2-1814	Install Door - Station Office - Phase 2 Station	1	0	\$10,864.50
WUS-PH2-1817	Repair Floors - MBTA Offices - Phase 2 Station	1	0	\$5,494.00
WUS-PH2-1820	Install Epoxy Floor - MBTA Offices - Phase 2 Station	1	0	\$10,083.10
WUS-PH2-1823	Install Signs & Frames - Station - Phase 2 Station	1	0	\$37,763.80
WUS-PH2-1826	Install EMR 1 Boxes/Cabinets - Phase 2 Station	1	0	\$25,000.00
WUS-PH2-1829	Install EMR 1 Conduits - Phase 2 Station	1	0	\$42,775.50
WUS-PH2-1867	Install Benches and Trash Cans - Phase 2 Platform	1	0	\$11,356.60
WUS-PH2-3085	F&P Concrete Pile Caps - Phase 2 Platform (P-11 to P-15)	1	0	\$93,750.00
WUS-PH2-3088	F&P Concrete Pile Caps - Phase 2 Platform (P-20 to P-23)	1	0	\$75,000.00
WUS-PH2-3091	F&P Concrete Pile Caps - Phase 2 Platform (P-24 to P-27)	1	0	\$75,000.00
WUS-PH2-3094	F&P Concrete Pile Caps - Phase 2 Platform (P-28 to P-30)	1	0	\$56,250.00
WUS-PH2-3097	Install FRP - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)	1	0	\$41,312.10
WUS-PH2-3100	Install FRP - Phase 2 Platform (STA 2338+81.25 to 2337+81.25)	1	0	\$41,312.10
WUS-PH2-3103	Install FRP - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)	1	0	\$41,312.10
WUS-PH2-3106	Install FRP - Phase 2 Platform (STA 2336+81.25 to 2335+81.25)	1	0	\$41,312.10
WUS-PH2-3109	Install Canopy Framing - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)	1	0	\$50,000.00
WUS-PH2-3112	Install Canopy Framing - Phase 2 Platform (STA 2338+81.25 to 2337+81.25)	1	0	\$50,000.00
WUS-PH2-3115	Install Canopy Framing - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)	1	0	\$50,000.00
WUS-PH2-3118	Install Canopy Framing - Phase 2 Platform (STA 2336+81.25 to 2335+81.25)	1	0	\$50,000.00
WUS-PH2-3121	Install Platform Plumbing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$33,210.58
WUS-PH2-3124	Install Platform Plumbing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$33,210.58
WUS-PH2-3127	Install Platform Plumbing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$33,210.58
WUS-PH2-3130	Install Platform Plumbing - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$33,210.58
WUS-PH2-3133	Install Canopy Roof - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)	1	0	\$50,000.00
WUS-PH2-3136	Install Canopy Roof - Phase 2 Platform (STA 2338+81.25 to 2337+81.25)	1	0	\$50,000.00
WUS-PH2-3139	Install Canopy Roof - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)	1	0	\$50,000.00
WUS-PH2-3142	Install Canopy Roof - Phase 2 Platform (STA 2336+81.25 to 2335+81.25)	1	0	\$50,000.00
WUS-PH2-3145	Install Platform Conduits/Wire - Phase 2 Platform (STA 2339+81.25 to 2338+81.25)	1	0	\$48,100.00
WUS-PH2-3148	Install Platform Conduits/Wire- Phase 2 Platform (STA 2338+81.25 to 2337+81.25)	1	0	\$48,100.00
WUS-PH2-3151	Install Platform Conduits/Wire - Phase 2 Platform (STA 2337+81.25 to 2336+81.25)	1	0	\$48,100.00
WUS-PH2-3154	Install Platform Conduits/Wire - Phase 2 Platform (STA	1	0	\$48,100.00

Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH2-3157	2336+81.25 to 2335+81.25) Install Platform Light Fixtures - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$30,000.00
WUS-PH2-3160	Install Platform Light Fixtures - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$30,000.00
WUS-PH2-3163	Install Platform Light Fixtures - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$30,000.00
WUS-PH2-3166	Install Platform Light Fixtures - Phase 2 Platform (STA 2340+81.25 to 2339+81.25)	1	0	\$32,276.80
WUS-PH3-1318	Install Rebar for Pie Caps - Phase 3 Platform (P-31 to P-48)	1	0	\$13,000.00
WUS-PH3-1321	F&P Concrete Pile Caps - Phase 2 Platform (P-31 to P-34)	1	0	\$50,000.00
WUS-PH3-1324	Dampproof Concrete Pile Caps - Phase 3 Platform (P-31 to P-48)	1	0	\$49,390.50
WUS-PH3-1327	Install FRP - Phase 3 Platform (STA 2335+81.25 to 2334+81.25)	1	0	\$32,676.00
WUS-PH3-1330	Install Platform Plumbing - Phase 3 Platform (STA 2335+81.25 to 2334+81.25)	1	0	\$27,675.70
WUS-PH3-1333	Install Precast Platform Panels - Phase 3 Platform (BW to P-53)	1	0	\$64,482.00
WUS-PH3-1336	Install Canopy Framing - Phase 3 Platform (STA 2335+81.25 to 2334+81.25)	1	0	\$116,650.00
WUS-PH3-1339	Install Canopy Roof - Phase 3 Platform (STA 2335+81.25 to 2334+81.25)	1	0	\$50,000.00
WUS-PH3-1342	Install Canopy Drainage Gutters - Phase 3 Platform	1	0	\$40,000.00
WUS-PH3-1345	Install Sign Frames - Phase 3 Platform	1	0	\$15,033.20
WUS-PH3-1348	Install Signs and Cases - Phase 3 Platform	1	0	\$26,500.60
WUS-PH3-1351	Install Braille - Phase 3 Platform	1	0	\$7,438.20
WUS-PH3-1352	Install Specialty Signage - Phase 3 Platform	1	0	\$43,754.20
WUS-PH3-1360	Install Elevator 2 Framing - Phase 3 Platform	1	0	\$210,000.00
WUS-PH3-1363	Install Elevator 2 Glass/Glazing - Phase 3 Platform	1	0	\$205,000.00
WUS-PH3-1366	Survey Hoistway & Set Pit Equipment - Elevator 2 - Phase 3 Platform	1	0	\$54,660.00
WUS-PH3-1369	Install Stair 2 Framing - Phase 3 Platform	1	0	\$350,000.00
WUS-PH3-1372	Install Stair 2 Glass/Glazing - Phase 3 Platform	1	0	\$245,000.00
WUS-PH3-1375	Install Stair 2 Treads/Nosing - Phase 3 Platform	1	0	\$140,103.60
WUS-PH3-1384	Install Stair 2 Railings - Phase 3 Platform	1	0	\$140,000.00
WUS-PH3-1411	Install Platform Lighting Conduits/Boxes/Wire - Phase 3 Platform	1	0	\$197,776.80
WUS-PH3-1414	Install Platform Lighting Fixtures - Phase 3 Platform	1	0	\$130,000.00
WUS-PH3-1417	Install Fire Alarm System - Phase 3 Platform	1	0	\$392,776.80
WUS-PH3-1420	Remove Temporary Platform - Phase 3 Platform	1	0	\$234,000.00
WUS-PH3-1426	Install Rebar for Elevator 2 Footing - Phase 3 Platform	1	0	\$6,500.00
WUS-PH3-1429	F&P Elevator 2 Pile Cap - Phase 3 Platform	1	0	\$50,000.00
WUS-PH3-1492	Install Rebar for Stair 3 Walls - Phase 3 Headhouse	1	0	\$85,510.10
WUS-PH3-1495	F&P Stair 3 Walls - Phase 3 Headhouse	1	0	\$937,867.60
WUS-PH3-1498	Install Stair 3/HH Framing - Phase 3 Headhouse	1	0	\$420,000.00
WUS-PH3-1501	Install Stair 3 Glass/Glazing - Phase 3 Headhouse	1	0	\$270,000.00
WUS-PH3-1504	Install Stair 3 Treads/Nosings - Phase 3 Headhouse	1	0	\$147,103.60
WUS-PH3-1507	Install Stair 3 Railings - Phase 3 Headhouse	1	0	\$133,000.00
WUS-PH3-1510	Install Elevator 3 Framing - Phase 3 Headhouse	1	0	\$140,000.00
WUS-PH3-1513	Install Elevator 3 Glass/Glazing - Phase 3 Headhouse	1	0	\$120,000.00
WUS-PH3-1516	Survey Hoistway & Set Pit Equipment - Elevator 3	1	0	\$54,660.00
WUS-PH3-1519	Construct Pedestrian Bridge Framing	1	0	\$235,000.00
WUS-PH3-1522	Install Pedestrian Bridge Glass/Glazing	1	0	\$732,550.00
WUS-PH3-1525	Pour Topping Slab - Pedestrian Bridge	1	0	\$42,000.00
WUS-PH3-1540	Install Lighting Conduits/Wiring - Pedestrian Bridge	1	0	\$48,500.00
WUS-PH3-1543	Install Light Fixtures - Pedestrian	1	0	\$16,500.00

Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH3-1546	Install SS Screen - Stair 2 - Phase 3 Platform	1	0	\$75,000.00
WUS-PH3-1552	Install Sign Frames - Phase 3 Headhouse	1	0	\$15,033.20
WUS-PH3-1555	Install Signs and Cases - Phase 3 Headhouse	1	0	\$12,500.60
WUS-PH3-1558	Install Braille - Phase 3 Headhouse	1	0	\$7,439.60
WUS-PH3-1561	Install Lollipop - Phase 3 Headhouse	1	0	\$22,472.80
WUS-PH3-1564	Install Specialty Signage - Phase 3 Headhouse	1	0	\$43,754.20
WUS-PH3-1567	Install Light Bollards - Phase 3 Upper Parking Lot	1	0	\$40,000.00
WUS-PH3-1570	Install Benches and Trash Cans - Phase 3 Platform	1	0	\$11,000.00
WUS-PH3-1600	Repair Handrail at Existing Stair - Phase 3 Upper Parking Lot	1	0	\$10,125.00
WUS-PH3-1603	Install Removable Bollards - Phase 3 Lower Parking Lot	1	0	\$48,860.00
WUS-PH3-1639	Set Pedestrian Bridge	1	0	\$98,000.00
WUS-PH3-1666	Install Rebar for Elevator 2 & Machine Room Walls - Phase 3 Platform	1	0	\$20,000.00
WUS-PH3-1669	F&P Concrete for Elevator 2 & Machine Room Walls - Phase 3 Platform	1	0	\$40,000.00
WUS-PH3-1723	Install SS Screen - Stair 3 - Phase 3 Headhouse	1	0	\$75,000.00
WUS-PH3-1726	Install Rail Brackets & Guide Rails - Elevator 2 - Phase 3 Platform	1	0	\$175,008.40
WUS-PH3-1729	Rough-in Elevator Machine Room - Elevator 2 - Phase 3 Platform	1	0	\$75,000.00
WUS-PH3-1732	Install Elevator Platform & Hoistway Equipment - Elevator 2 - Phase 3 Platform	1	0	\$115,000.00
WUS-PH3-1735	Install Elevator Entrance Frames/Doors - Elevator 2 - Phase 3 Platform	1	0	\$100,000.00
WUS-PH3-1738	Install Hoistway Wiring and Fixtures - Elevator 2 - Phase 3 Platform	1	0	\$88,000.00
WUS-PH3-1741	Build and Wire Elevator Cab - Elevator 2 - Phase 3 Platform	1	0	\$145,000.00
WUS-PH3-1744	Adjust Elevator - Elevator 2 - Phase 3 Platform	1	0	\$78,000.00
WUS-PH3-1747	Elevator Pre-Test - Elevator 2 - Phase 3 Platform	1	0	\$25,000.00
WUS-PH3-1753	72-Hour Test - Elevator 2 - Phase 3 Platform	8	0	\$25,000.00
WUS-PH3-1756	Commission Elevator 2 - Phase 3 Platform	1	0	\$25,000.00
WUS-PH3-1759	Install Rail Brackets & Guide Rails - Elevator 3 - Phase 3 Headhouse	1	0	\$175,008.40
WUS-PH3-1762	Rough-in Elevator Machine Room - Elevator 3 - Phase 3 Headhouse	1	0	\$75,000.00
WUS-PH3-1765	Install Elevator Platform & Hoistway Equipment - Elevator 3 - Phase 3 Headhouse	1	0	\$115,000.00
WUS-PH3-1768	Install Elevator Entrance Frames/Doors - Elevator 3 - Phase 3 Headhouse	1	0	\$100,000.00
WUS-PH3-1771	Install Hoistway Wiring and Fixtures - Elevator 3 - Phase 3 Headhouse	1	0	\$88,000.00
WUS-PH3-1774	Build and Wire Elevator Cab - Elevator 3 - Phase 3 Headhouse	1	0	\$145,000.00
WUS-PH3-1777	Adjust Elevator - Elevator 3 - Phase 3 Headhouse	1	0	\$78,000.00
WUS-PH3-1780	Elevator Pre-Test - Elevator 3 - Phase 3 Headhouse	1	0	\$25,000.00
WUS-PH3-1786	72-Hour Test - Elevator 3 - Phase 3 Headhouse	1	0	\$25,000.00
WUS-PH3-1789	Commission Elevator 3 - Phase 3 Headhouse	1	0	\$25,000.00
WUS-PH3-1855	Install Light Bollards Fixtures and Wiring - Phase 3 Upper Parking Lot	1	0	\$22,175.40
WUS-PH3-1870	Install Canopy Column Downspouts - Phase 3 Platform	1	0	\$30,000.00
WUS-PH3-1873	Install Pedestrian Bridge Roofing System	1	0	\$46,800.00
WUS-PH3-1876	Install Pedestrian Bridge Drainage & Gutter System	1	0	\$15,000.00
WUS-PH3-1882	F&P Upper Level Landing - Phase 3 Headhouse	1	0	\$50,000.00
WUS-PH3-1885	F&P Lower Level Landing/Plaza - Phase 3 Headhouse	1	0	\$50,000.00
WUS-PH3-1888	F&P CIP Slab for Stair 2 - Phase 3 Platform	1	0	\$20,000.00
WUS-PH3-1894	F&P Bridge Piers - Phase 3 Platform	1	0	\$20,000.00
WUS-PH3-1921	F&P Concrete Pile Caps - Phase 2 Platform (P-35 to P-38)	1	0	\$50,000.00

Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH3-1924	F&P Concrete Pile Caps - Phase 2 Platform (P-39 to P-42)	1	0	\$50,000.00
WUS-PH3-1927	F&P Concrete Pile Caps - Phase 2 Platform (P-43 to P-48)	1	0	\$75,000.00
WUS-PH3-1930	Install FRP - Phase 3 Platform (STA 2334+81.25 to 2333+81.25)	1	0	\$32,676.00
WUS-PH3-1933	Install FRP - Phase 3 Platform (STA 2333+81.25 to 2332+81.25)	1	0	\$32,677.40
WUS-PH3-1936	Install Platform Plumbing - Phase 3 Platform (STA 2334+81.25 to 2333+81.25)	1	0	\$27,675.70
WUS-PH3-1939	Install Platform Plumbing - Phase 3 Platform (STA 2333+81.25 to 2332+81.25)	1	0	\$27,675.70
WUS-PH3-1942	Install Canopy Framing - Phase 3 Platform (STA 2334+81.25 to 2333+81.25)	1	0	\$116,650.00
WUS-PH3-1945	Install Canopy Framing - Phase 3 Platform (STA 2333+81.25 to 2332+81.25)	1	0	\$116,700.00
WUS-PH3-1948	Install Canopy Roof - Phase 3 Platform (STA 2334+81.25 to 2333+81.25)	1	0	\$58,604.50
WUS-PH3-1951	Install Canopy Roof - Phase 3 Platform (STA 2333+81.25 to 2332+81.25)	1	0	\$58,605.90
WUS-PH3-1954	Install Stair 2 Roof - Phase 3 Platform	1	0	\$50,000.00
WUS-PH3-1957	Install Stair 3 Roof - Phase 3 Greenspace	1	0	\$50,000.00
WUS-SUB-1241	Fabricate & Deliver Temp. Platform	1	0	\$47,067.00
WUS-SUB-1358	Procure Steel	1	0	\$1,659,000.00
WUS-SUB-1361	Fabricate & Deliver Rebar	1	0	\$181,892.00
WUS-SUB-1460	Field Verify Glass/Glazing Dims & Fabricate	1	0	\$780,000.00
WUS-SUB-1478	Fabricate Steel	1	0	\$1,650,616.00
WUS-SUB-1490	Fabricate & Deliver FRP	1	0	\$2,406,176.00
WUS-SUB-1496	Fabricate & Deliver Sign Frames	1	0	\$100,000.00
WUS-SUB-1499	Procure Sign Materials	1	0	\$100,000.00
WUS-SUB-1508	Fabricate Signs	1	0	\$145,000.00
WUS-SUB-1589	Fabricate & Deliver Generator	2360	0	\$125,000.00
Subtotal		2628	0	\$27,315,542.85
0130.429 - Traffic Officers Services				
WUS-CST-9009	Allowance - Traffic Officers Services	0	0	\$525,000.00
Subtotal		0	0	\$525,000.00
0211.495 - Site Utilities				
WUS-CST-9012	Allowance - Site Utilities	0	0	\$50,000.00
Subtotal		0	0	\$50,000.00
0213.212 - Integrated Pest Management				
WUS-CST-9015	Allowance - Integrated Pest Management	0	0	\$25,000.00
Subtotal		0	0	\$25,000.00
0221.331 - Disposal of Qualifying Soils				
WUS-CST-9018	Allowance - Disposal of Qualifying Soils	0	0	\$800,000.00
Subtotal		0	0	\$800,000.00
0221.990 - Site Work				
WUS-CST-9030	Mobilization - Payment 3	1	0	\$384,371.76
WUS-PH1-3004	Repair Pedestrian Walkway	1	0	\$30,549.00
WUS-PH1-3007	Install Temp. Fence at Pedestrian Walkway	1	0	\$47,880.00
WUS-PH2-1012	Install Track Deformation Monitoring - Phase 2 Track	1	0	\$81,474.00
WUS-PH2-1042	Install Micropiles (Canopy) - Phase 2 Platform (P-7 to P-10)	1	0	\$44,467.60
WUS-PH2-1081	Install SOE for Elevator 1/Stair 1 - Phase 2 Platform	1	0	\$546,000.00
WUS-PH2-1084	Excavate for Elevator 1/Stair 1 - Phase 2 Platform	1	0	\$142,338.30
WUS-PH2-1087	Demo into Existing Structure for Elevator 1/Stair 1 - Phase 2 Platform	1	0	\$459,106.70

Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH2-1162	Demolish Existing Walls - Platform Access Corridor - Phase 2 Station	1	0	\$44,203.86
WUS-PH2-1219	Erosion Control Setup and Clearing/Grubbing - Phase 2 Greenspace	1	0	\$44,524.20
WUS-PH2-1222	Slope Protection - Phase 2 Greenspace HH	1	0	\$36,487.40
WUS-PH2-1225	Install SOE for Headhouse - Phase 2 Greenspace HH	1	0	\$182,000.00
WUS-PH2-1228	Excavate for Headhouse and Retaining Wall - Phase 2 Greenspace HH	1	0	\$481,892.60
WUS-PH2-1231	Install Micropiles for Headhouse (BN-2) - Phase 2 Greenspace HH	1	0	\$171,969.00
WUS-PH2-1276	Remove SOE for Elevator 1/Stair 1 and Backfill - Phase 2 Platform	1	0	\$130,000.00
WUS-PH2-1660	Micropile Sacrificial Load Testing - 30kip - Phase 2 Platform	1	0	\$50,000.00
WUS-PH2-3037	Install Micropiles for Headhouse (BN-1) - Phase 2 Greenspace HH	1	0	\$264,533.40
WUS-PH2-3055	Micropile Sacrificial Load Testing - 90kip - Phase 2 Platform	1	0	\$50,000.00
WUS-PH2-3058	Install Micropiles (Platform Pier) - Phase 2 Platform (P-7 to P-10)	1	0	\$47,856.00
WUS-PH2-3061	Install Micropiles (Canopy) - Phase 2 Platform (P-11 to P-15)	1	0	\$44,444.00
WUS-PH2-3064	Install Micropiles (Platform Pier) - Phase 2 Platform (P-11 o P-15)	1	0	\$71,784.00
WUS-PH2-3067	Install Micropiles (Canopy) - Phase 2 Platform (P-20 to P-23)	1	0	\$44,444.00
WUS-PH2-3070	Install Micropiles (Platform Pier) - Phase 2 Platform (P-20 to P-23)	1	0	\$47,856.00
WUS-PH2-3073	Install Micropiles (Canopy) - Phase 2 Platform (P-24 to P-27)	1	0	\$44,444.00
WUS-PH2-3076	Install Micropiles (Platform Pier) - Phase 2 Platform (P-24 to P-27)	1	0	\$47,856.00
WUS-PH2-3079	Install Micropiles (Canopy) - Phase 2 Platform (P-28 to P-30)	1	0	\$22,222.00
WUS-PH2-3082	Install Micropiles (Platform Pier) - Phase 2 Platform (P-28 to P-30)	1	0	\$47,856.00
WUS-PH3-1273	Install Permanent Picket Fence - Phase 3 Tracks	1	0	\$251,396.60
WUS-PH3-1285	Install Track Deformation Monitoring - Phase 3 Track	1	0	\$81,474.00
WUS-PH3-1315	Install Micropiles (Canopy) - Phase 3 Platform (P-31 to P-34)	1	0	\$50,000.00
WUS-PH3-1354	Install SOE for Elevator 2 - Phase 3 Platform	1	0	\$182,702.80
WUS-PH3-1357	Excavate for Elevator 2 - Phase 3 Platform	1	0	\$177,000.00
WUS-PH3-1423	Install Micropiles for Elevator 2 Footing - Phase 3 Platform	1	0	\$360,000.00
WUS-PH3-1573	Demo Asphalt & Concrete - Phase 3 Upper Parking Lot	1	0	\$50,000.00
WUS-PH3-1576	Install Curb/Sidewalk - Phase 3 Upper Parking Lot	1	0	\$38,000.00
WUS-PH3-1579	Install Guardrail - Phase 3 Upper Parking Lot	1	0	\$27,454.80
WUS-PH3-1582	Install 6" DIP Water - Phase 3 Lower Parking Lot	1	0	\$15,000.00
WUS-PH3-1585	Install RCP Drainage Pipe (DS-25 to DS-49) - Phase 3 Upper Parking Lot	1	0	\$14,912.00
WUS-PH3-1588	Demo/Remove Existing Catch Basins - Phase 3 Upper Parking Lot	1	0	\$20,000.00
WUS-PH3-1591	Install New Catch Basin Structure & RCP - Phase 3 Sed Pond	1	0	\$15,000.00
WUS-PH3-1594	Full Depth Paving - Phase 3 Upper Parking Lot	1	0	\$50,000.00
WUS-PH3-1597	Landscaping - Phase 3 Upper Parking Lot	1	0	\$9,000.00
WUS-PH3-1657	Pave Permanent Pedestrian Walkway	1	0	\$48,000.00
WUS-PH3-1795	Install DMH - Phase 3 Upper Parking Lot	1	0	\$17,500.00
WUS-PH3-1798	Install RCP Drainage Pipe (DS-49 to DS-36) - Phase 3 Upper Parking Lot	1	0	\$30,000.00
WUS-PH3-1801	Install New Catch basin structures & RCP - Phase 3 Upper Parking Lot	1	0	\$30,000.00
WUS-PH3-1804	Install DMH (Platform East) - Phase 3 Platform	1	0	\$7,500.00
WUS-PH3-1807	Install Sewer Manhole - Phase 3 Lower Parking Lot	1	0	\$15,000.00
WUS-PH3-1810	Install 8" PVC Sewer Pipe - Phase 3 Lower Parking Lot	1	0	\$17,500.00
WUS-PH3-1813	Install Sewer Manholes - Phase 3 Upper Parking Lot	1	0	\$33,000.00
WUS-PH3-1816	Install 8" PVC Sewer Pipe - Phase 3 Upper Parking Lot	1	0	\$25,000.00

Schedule of Values

Cost Accounts		Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
Activity ID					
WUS-PH3-1819		Install PVC Perforated Drainage Pipe - Phase 3 Upper Parking Lot	1	0	\$35,000.00
WUS-PH3-1822		Adjust Castings - Phase 3 Upper Parking Lot	1	0	\$7,000.00
WUS-PH3-1825		Remodel Existing Catch basin & Abandon existing CI - Phase 3 Upper Parking Lot Swale	1	0	\$8,500.00
WUS-PH3-1828		Remodel Existing Sewer MH - Phase 3 Upper Parking Lot Swale	1	0	\$8,500.00
WUS-PH3-1831		Install Stormwater Treatment Device - Phase 3 Sed Pond	1	0	\$5,000.00
WUS-PH3-1834		Install New Catch Basin Outlet Control Structure & RCP - Phase 3 Sed Pond	1	0	\$10,000.00
WUS-PH3-1837		Install Concrete Headwalls - Phase 3 Sed Pond	1	0	\$10,000.00
WUS-PH3-1840		Install Riprap Swale - Phase 3 Sed Pond	1	0	\$20,000.00
WUS-PH3-1843		Install Detention Basin - Phase 3 Sed Pond	1	0	\$35,000.00
WUS-PH3-1846		Install Hydrant - Phase 3 Lower Parking Lot	1	0	\$13,628.00
WUS-PH3-1849		Connect to Existing Water & Test - Phase 3 Lower Parking Lot	1	0	\$5,000.00
WUS-PH3-1852		Demo Asphalt & Concrete - Phase 3 Lower Parking Lot	1	0	\$30,679.00
WUS-PH3-1858		Mill - Phase 3 Lower Parking Lot	1	0	\$30,000.00
WUS-PH3-1861		Pave - Phase 3 Lower Parking Lot	1	0	\$46,016.80
WUS-PH3-1864		Install Curb/Sidewalk - Phase 3 Lower Parking Lot	1	0	\$18,940.00
WUS-PH3-1879		Install Duplex Fire Valve - Phase 3 Lower Parking Lot	1	0	\$5,000.00
WUS-PH3-1900		Install Micropiles (Platform Pier) - Phase 3 Platform (P-31 to P-34)	1	0	\$70,000.00
WUS-PH3-1903		Install Micropiles (Canopy) - Phase 3 Platform (P-35 to P-38)	1	0	\$50,000.00
WUS-PH3-1906		Install Micropiles (Platform Pier) - Phase 3 Platform (P-35 to P-38)	1	0	\$70,000.00
WUS-PH3-1909		Install Micropiles (Canopy) - Phase 3 Platform (P-39 to P-42)	1	0	\$50,000.00
WUS-PH3-1912		Install Micropiles (Platform Pier) - Phase 3 Platform (P-39 to P-42)	1	0	\$70,000.00
WUS-PH3-1915		Install Micropiles (Canopy) - Phase 3 Platform (P-43 to P-48)	1	0	\$50,000.00
WUS-PH3-1918		Install Micropiles (Platform Pier) - Phase 3 Platform (P-43 to P-48)	1	0	\$88,927.60
Subtotal			74	0	\$5,913,191.42
0290.000 - Railroad Work					
WUS-PH2-1015		Remove Existing Station Track - Phase 2 Track	1	0	\$320,100.00
WUS-PH2-1018		Excavate Ballast - Station Track - Phase 2 Track	1	0	\$129,544.02
WUS-PH2-1021		Install Ballast - Station Track - Phase 2 Track	1	0	\$91,314.30
WUS-PH2-1024		Install New Station Track Ties - Phase 2 Track	1	0	\$106,700.00
WUS-PH2-1027		Install New Station Track Rails - Phase 2 Track	1	0	\$280,621.00
WUS-PH2-1030		Remove Existing Track 1 - Phase 2 Track - Weekend 1	1	0	\$213,516.50
WUS-PH2-1033		Excavate and Install Ballast - Track 1 - Phase 2 Track - Weekend 1	1	0	\$122,724.80
WUS-PH2-1036		Install New Track 1 Ties and Rails - Phase 2 Track - Weekend 1	1	0	\$193,660.50
WUS-PH2-1642		Excavate for Grafton St Waterproofing & Footings -Phase 2 Platform	1	0	\$22,000.00
WUS-PH2-1645		Remove Existing Track 1 - Phase 2 Track - Weekend 2	1	0	\$213,516.50
WUS-PH2-1648		Excavate and Install Ballast - Track 1 - Phase 2 Track - Weekend 2	1	0	\$122,724.80
WUS-PH2-1651		Install New Track 1 Ties and Rails - Phase 2 Track - Weekend 2	1	0	\$193,660.50
WUS-PH3-1288		Remove Existing Station Track - Phase 3 Track	1	0	\$133,750.00
WUS-PH3-1291		Excavate Ballast - Station Track - Phase 3 Track	1	0	\$154,069.30
WUS-PH3-1294		Excavate and Install Ballast - Track 1 - Phase 3 Track	1	0	\$102,313.20
WUS-PH3-1297		Install New Station Track Ties - Phase 3 Track	1	0	\$80,250.00
WUS-PH3-1300		Install New Station Track Rails - Phase 3 Track	1	0	\$157,329.59
WUS-PH3-1303		Remove Existing Track 1 - Phase 3 Track	1	0	\$206,655.52
WUS-PH3-1306		Install Ballast - Station Track - Phase 3 Track	1	0	\$247,690.30

Schedule of Values

Cost Accounts

Activity ID	Activity Name	Budgeted Nonlabor Units	Actual Nonlabor Units	Budgeted Total Cost
WUS-PH3-1309	Install New Track 1 Ties and Rails - Phase 3 Track	1	0	\$214,000.00
Subtotal		20	0	\$3,306,140.83
0310.054 - Concrete Cleaning & Restoration				
WUS-CST-9003	Allowance - Concrete Cleaning & Restoration	0	0	\$50,000.00
Subtotal		0	0	\$50,000.00
1649.991 - Signaling and Communications				
WUS-PH2-1126	Install CCTV Cameras - Phase 2 Platform	1	0	\$165,000.00
WUS-PH2-1129	Install PA System - Phase 2 Platform	1	0	\$137,500.00
WUS-PH2-1132	Install Emergency Phones - Phase 2 Platform	1	0	\$106,700.00
WUS-PH2-1135	Install VMS - Phase 2 Platform	1	0	\$197,561.10
WUS-PH2-1252	Install Comm Room Cabinets and Conduit - Phase 2	1	0	\$100,000.00
WUS-PH2-1255	Install Comm Room Fixtures & Fitout - Phase 2 Greenspace	1	0	\$100,000.00
WUS-PH2-1258	Install Electrical Room Cabinets & conduit - Phase 2 Greenspace	1	0	\$100,000.00
WUS-PH2-3040	Install Comm Room Wiring and Boxes - Phase 2 Greenspace	1	0	\$100,000.00
WUS-PH2-3043	Comm Room Systems Testing - Phase 2 Greenspace	1	0	\$25,000.00
WUS-PH2-3046	Install Electrical Room Fixtures & Fitout - Phase 2 Greenspace	1	0	\$100,000.00
WUS-PH2-3049	Install Electrical Room Wiring and boxes - Phase 2 Greenspace	1	0	\$95,950.80
WUS-PH2-3052	Electrical Room Systems Testing	1	0	\$25,000.00
WUS-PH3-1399	Install CCTV Cameras - Phase 3 Platform	1	0	\$106,770.40
WUS-PH3-1402	Install PA System - Phase 3 Platform	1	0	\$55,000.00
WUS-PH3-1405	Install Emergency Phones - Phase 3 Platform	1	0	\$87,780.00
WUS-PH3-1408	Install VMS - Phase 3 Platform	1	0	\$110,000.00
WUS-PH3-1528	Install CCTV Cameras - Pedestrian Bridge	1	0	\$99,103.90
WUS-PH3-1531	Install PA System - Pedestrian Bridge	1	0	\$44,084.70
WUS-PH3-1534	Install Emergency Phones - Pedestrian Bridge	1	0	\$107,800.00
WUS-PH3-1537	Install VMS - Pedestrian Bridge	1	0	\$39,050.00
Subtotal		20	0	\$1,902,300.90
6500.000 - Risk Allowance				
WUS-CST-9021	Allowance - Risk Allowance	0	0	\$3,849,000.00
Subtotal		0	0	\$3,849,000.00
Total		2742	0	\$44,421,176.00

**Worcester Union Station
Accessibility Improvements Project**

**100% Design Estimate
Basis and Assumptions**

September 2, 2021



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Worcester Union Station Accessibility Improvements Project
MBTA Contract No. X72PS01

1. EXECUTIVE SUMMARY

Keville Enterprises, Inc. (Keville) has conducted an independent 100% Design construction cost estimate for MBTA's Worcester Union Station Accessibility Improvements project in the city of Worcester, MA. The following table is an estimate summary, including allowances and alternates.

Division	Description			Total Direct Cost	Total w/ M-Us
1A	General Conditions	1	LS	\$ 2,919,200	\$ 3,753,829
1B	General Requirements	1	LS	\$ 190,335	\$ 244,754
2	Existing Conditions - Demolition	1	LS	\$ 295,488	\$ 379,970
3	Concrete	1	LS	\$ 1,438,162	\$ 1,849,347
4	Masonry	1	LS	\$ -	\$ -
5	Metals	1	LS	\$ 4,509,552	\$ 5,798,878
6	Wood, Plastics & Composites	1	LS	\$ 2,508,534	\$ 3,225,749
7	Thermal & Moisture Protection	1	LS	\$ 391,726	\$ 503,724
8	Openings	1	LS	\$ 1,551,160	\$ 1,994,653
9	Finishes	1	LS	\$ 1,368,343	\$ 1,759,566
10	Specialties	1	LS	\$ 1,082,199	\$ 1,391,611
11	Equipment	1	LS	\$ 5,301	\$ 6,816
12	Furnishings	1	LS	\$ 16,759	\$ 21,551
13	Special Construction	1	LS	\$ 49,016	\$ 63,030
14	Conveying Equipment	1	LS	\$ 2,534,851	\$ 3,259,591
21	Fire Suppression	1	LS	\$ 8,876	\$ 11,414
22	Plumbing	1	LS	\$ 30,841	\$ 39,659
23	HVAC	1	LS	\$ 168,547	\$ 216,736
26	Electrical	1	LS	\$ 2,388,277	\$ 3,071,109
27	Communications	1	LS	\$ 98,217	\$ 126,298
28	Electronic Safety & Security	1	LS	\$ 213,108	\$ 274,038
31	Earthwork	1	LS	\$ 2,746,550	\$ 3,531,816
32	Exterior Improvements	1	LS	\$ 754,962	\$ 970,813
33	Utilities	1	LS	\$ 1,133,620	\$ 1,457,733
34	Transportation	1	LS	\$ 3,350,404	\$ 4,308,318
	Total Direct Construction Cost			\$ 29,754,028	\$ 38,261,000
5.0%	Overhead			\$ 1,487,701	included
	Escalation from estimate date to midpoint of Construction and an annual rate of 4%	4.2%		\$ 1,312,038	included
	Market Conditions	5%		\$ 1,562,086	included
5.0%	Profit			\$ 1,705,793	included
1.00%	Permits			\$ 358,216	included
0.65%	General Liability Insurance			\$ 235,169	included
1.00%	Railroad Protection Liability Insurance			\$ 364,150	included
1.00%	Bond			\$ 367,792	included
3.0%	Design Contingency			\$ 1,114,409	included
	Total Estimated Construction Cost			\$ 38,261,000	\$ 38,261,000
	ALLOWANCES				
	INTEGRATION SUPPORT FOR POSITIVE TRAIN CONTROL SYSTEM	1	AN	\$ 150,000	\$ 150,000
	TRAFFIC OFFICERS SERVICES	1	AN	\$ 525,000	\$ 525,000
	WEEKEND SUBSTITUTE TRANSPORTATION	1	AN	\$ 535,000	\$ 535,000
	EXISTING SITE UTILITIES	1	AN	\$ 50,000	\$ 50,000
	INTEGRATED PEST MANAGEMENT	1	AN	\$ 25,000	\$ 25,000
	DISPOSE OF QUALIFYING SOILS	1	AN	\$ 800,000	\$ 800,000
	CONCRETE CLEANING AND RESTORATION	1	AN	\$ 50,000	\$ 50,000
	RISK ALLOWANCE REALLOCATION	1	AN	\$ 3,826,000	\$ 3,826,000
	TOTAL ESTIMATED COST w/ ALLOWANCES			\$ 44,222,000	\$ 44,222,000

2. PURPOSE

At the request of HDR, Keville has prepared a construction cost estimate at the 100% design level for the accessibility improvements project of the Worcester Union Station in Worcester, Massachusetts to ensure compliance with current ADA standards and local building codes. The project includes the installation of three (3) new elevators, a new pedestrian bridge and trackwork.

This revised 100% submittal cost estimate was updated due to key construction materials experiencing price increases, shortages, and delivery delays brought on in most part by COVID-19 and pent-up demand. The August 2021 ENR's (Engineering News Record) Material Price Index was utilized to update material pricing. Volatile increases in current Commodity Costs (concrete, asphalt, fabricated structural metals, mill steel, lumber, etc.) have been included.

The estimate is a professional opinion of construction scope and cost from 100% design documents. It is not a prediction of final design scopes or bid pricing.

3. PROJECT DESCRIPTION

The accessibility improvements of the Worcester Union Station, including, but not limited to, new high-level passenger platforms, canopies, elevators, ramps, stairs, foundation systems, trackwork, signage, sidewalks, lighting systems, emergency power systems, communications systems, and landscaping.

- Elevators (3 each)
- New Pedestrian Bridge.
- Installation of new Stairways.
- Reconfigure existing storage room for access to (main lobby) the platform.
- Installation of new high level FRP center island passenger platform, walkways (ramps), and stairways.
- Track work - Full-depth track replacement.
- Mini-pile foundations.
- Green space remodeling.
- Incorporate accessibility improvements for the station's platforms.
- Complete other accessibility improvements throughout the station area. Site amenities including lighting, bike racks, benches, and landscaping.
- Modifications and improvements to the following Stations 's systems to comply with current accessibility and building codes:
 - Fire Alarm
 - Communications

- Power
- Emergency power
- Security
- Signage – Wayfinding and Tactile /Braille.
- Site Utilities – Electrical, sewer, water, gas, and storm.

4. ESTIMATE RECONCILIATION

This revised 100% submittal increased by \$5.219M, from the initial 100% submittal dated 05/24/2021 to compensate for the recent volatility in commodities. The current labor rates were used as of August 2021.

This revised 100% submittal decreased by \$5.096M from the previous 75% submittal due to the design development consisting of removal of CP44, removal of east side track drainage, phasing updates, developed architectural details, revision of allowances and the reduction of design estimate contingency due to 100% level of design documents. The Cost Growth report reflected the design refinement for steel, mini-piling, temporary platform, foundations, architectural details, and the associated markups on cost.

5. REFERENCES

- 100% Submittal design documents dated April 17, 2020, prepared by HDR received 03/15/2020.
- Various emails and phone conversations with HDR.

6. ESTIMATE METHODOLOGY

- Hourly labor rates developed from current published Prevailing Wages and Fringes, plus payroll taxes and insurance and trade-specific average Workers Comp rates. No overhead or profit is included in hourly rates.
- Estimate developed under the assumption that the Work performed by a general contractor with support by subcontractors (electrical, mechanical, Plumbing, fire sprinkler, track, pavement, masonry, elevator, and utility).
- All line items are present-day 2021 USD and escalated to mid-point of construction, using 4% escalation as the annual basis.

7. BASIS AND ASSUMPTIONS

- Massachusetts sales tax exempt.
- MGL Chapter 30 publicly bid contract.
- Installation costs based on difficult construction conditions and encompassed the prospective limitations encountered for railway activities and accessibility.
- The existing Station is to remain in-service.

- The railways will remain as active railways. A single track will remain in service during work hours; only the Station track will remain closed until the removal in proposed Construction Phase 3 of the constructed temporary platform and ramp. Tracks will be open for service when no work is being performed along the right-of-way.
- The work was allocated during revenue, anticipated night work and anticipated weekend outages work per the construction phasing. Final schedule subject to agreement with Authority and Contractor based on Contractor means and methods.
- A crane utilized at the storage and loading area to load and unload construction supplies, equipment, and material.
- Construction work performed on a continuous basis with no stoppages.
- Railroad Protection Liability insurance policy costs included.
- Escalation, Contractor General Conditions, and General Requirements, at a built-up rate, in correlation with the CTD parameters.
- Production rates based on various sources, including Estimating publications, historical data, and Estimators' experience.
- Material costs based on information from vendors/suppliers, online searches, as well as recent similar construction projects.
- Key construction materials are experiencing price increases, shortages, and delivery delays brought on for the most part by COVID-19 and pent-up demand. Estimated costs of the unpredictable increase in Commodity Costs (concrete, asphalt, fabricated structural metals, mill steel, lumber, etc.) are included based on the August 2021 ENR's (Engineering News Record) Material Price Index.
- Adequate skilled labor is locally available.
- Work area cleaned and returned to original condition at the completion of work shift such that there is no impact to the public or Owner personnel.
- No rock removal or significant dewatering is anticipated or required.
- Design Estimate contingency of 3% was included based on the 100% level of design.
- Allowances included:
 - Integration Support for Positive Train Control System
 - Traffic Officers Services
 - Weekend Substitute Transportation
 - Existing Site Utilities
 - Integrated Pest Management
 - Dispose of Qualifying Soils
 - Concrete Cleaning and Restoration
 - Risk Allowance Reallocation

Estimate Exclusions

- No Owner costs, e.g., Force Accounts, program management & construction management.
- No Massachusetts or local sales tax.
- No Pollution Prevention Liability insurance coverage.
- No third-party contract interferences.
- No MBTA imposed delays to the proposed and agreed to work schedule.
- No A/E design costs.
- No rock removal or dewatering costs.
- No environmental assessment fees.
- No procurement or furnishing of Ticket Vending Machines (TVM) and AFC Fare Validators – furnished by MBTA. Estimated material value of \$57,000 per TVM and \$10,000 per Fare Validator.
- Apart from MBTA standards for elevators no products to be sole-sourced.
- No maintenance and protection of Railroad property including Flaggers – furnished by MBTA.
- No MBTA safety training of construction craft personnel allocated hourly costs prior to the start of Work.
- No Abatement, handling, or disposal of any hazardous, contaminated, or regulated materials.
- No Construction Contingency.
- No weather delays.

8. ATTACHMENTS

- Executive Summary
- Estimate
 - Work Item Summary (Major Item Breakdown)
 - Cost Summary (CSI Breakdown)
 - Direct Cost Estimate (Details)
 - Cost Growth Report (@ 75% to 100% Submittal Design Levels)

Cost Summary (Major Item Breakdown)

Work Item	Description	QTY	UNIT	Total Direct Cost	TOTAL w/ M-Us
1	0170.000 GENERAL CONDITIONS	1	LS	\$ 2,919,200	\$ 3,776,296
2	0170.001 GENERAL REQUIREMENTS	1	LS	\$ 190,335	\$ 246,219
3	0130.130 CONSTRUCT PASSNGER STATION FACILITIES			\$ 20,508,843	\$ 26,530,370
3a	PLATFORM	1	LS	\$ 8,632,209	\$ 11,166,681
3b	WEST PLATFORM	1	LS	\$ 2,153,740	\$ 2,786,092
3c	EAST PLATFORM	1	LS	\$ 2,785,372	\$ 3,603,174
3d	NORTH HEADHOUSE	1	LS	\$ 4,549,246	\$ 5,884,933
3e	ELECTRICAL	1	LS	\$ 2,388,277	\$ 3,089,490
4	0221.990 SITE WORK	1	LS	\$ 2,284,039	\$ 2,954,647
5	0290.000 TRACKWORK	1	LS	\$ 3,709,087	\$ 4,798,098
6	1649.991 SIGNALING AND COMMUNICATIONS	1	LS	\$ 142,523	\$ 184,369
	Total Direct Construction Cost			\$ 29,754,028	\$ 38,490,000
5.0%	Overhead			\$ 1,487,701	included
	Escalation to midpoint of Construction (4.9%) & Market Conditions (5%)			\$ 3,078,330	included
5.0%	Profit			\$ 1,716,003	included
1.00%	Permits			\$ 360,361	included
0.65%	General Liability Insurance			\$ 236,577	included
1.00%	Railroad Protection Liability Insurance			\$ 366,330	included
1.00%	Bond			\$ 369,993	included
3.0%	Design Contingency			\$ 1,121,080	included
	Total Estimated Construction Cost			\$ 38,490,000	\$ 38,490,000
	ALLOWANCES				
0120.101	INTEGRATION SUPPORT FOR POSITIVE TRAIN CONTROL SYSTEM	1	AN	\$ 150,000	\$ 150,000
0130.429	TRAFFIC OFFICERS SERVICES	1	AN	\$ 525,000	\$ 525,000
0130.062	WEEKEND SUBSTITUTE TRANSPORTATION	1	AN	\$ 535,000	\$ 535,000
0211.495	EXISTING SITE UTILITIES	1	AN	\$ 50,000	\$ 50,000
0213.212	INTEGRATED PEST MANAGEMENT	1	AN	\$ 25,000	\$ 25,000
0221.331	DISPOSE OF QUALIFYING SOILS	1	AN	\$ 800,000	\$ 800,000
0310.054	CONCRETE CLEANING AND RESTORATION	1	AN	\$ 50,000	\$ 50,000
6500.000	RISK ALLOWANCE REALLOCATION	1	AN	\$ 3,849,000	\$ 3,849,000
	TOTAL PROJECT COST			\$ 44,474,000	\$ 44,474,000

Cost Summary (CSI Breakdown)

Division	Description						Total Direct Cost	Total w/ M-Us
1A	General Conditions	1				LS	\$ 2,919,200	\$ 3,776,296
1B	General Requirements	1				LS	\$ 190,335	\$ 246,219
2	Existing Conditions - Demolition	1				LS	\$ 295,488	\$ 382,245
3	Concrete	1				LS	\$ 1,438,162	\$ 1,860,416
4	Masonry	1				LS	\$ -	\$ -
5	Metals	1				LS	\$ 4,509,552	\$ 5,833,585
6	Wood, Plastics & Composites	1				LS	\$ 2,508,534	\$ 3,245,056
7	Thermal & Moisture Protection	1				LS	\$ 391,726	\$ 506,739
8	Openings	1				LS	\$ 1,551,160	\$ 2,006,591
9	Finishes	1				LS	\$ 1,368,343	\$ 1,770,097
10	Specialties	1				LS	\$ 1,082,199	\$ 1,399,940
11	Equipment	1				LS	\$ 5,301	\$ 6,857
12	Furnishings	1				LS	\$ 16,759	\$ 21,679
13	Special Construction	1				LS	\$ 49,016	\$ 63,407
14	Conveying Equipment	1				LS	\$ 2,534,851	\$ 3,279,100
21	Fire Suppression	1				LS	\$ 8,876	\$ 11,482
22	Plumbing	1				LS	\$ 30,841	\$ 39,896
23	HVAC	1				LS	\$ 168,547	\$ 218,033
26	Electrical	1				LS	\$ 2,388,277	\$ 3,089,490
27	Communications	1				LS	\$ 98,217	\$ 127,054
28	Electronic Safety & Security	1				LS	\$ 213,108	\$ 275,678
31	Earthwork	1				LS	\$ 2,746,550	\$ 3,552,955
32	Exterior Improvememts	1				LS	\$ 754,962	\$ 976,623
33	Utilities	1				LS	\$ 1,133,620	\$ 1,466,458
34	Transportation	1				LS	\$ 3,350,404	\$ 4,334,104
	Total Direct Construction Cost						\$ 29,754,028	\$ 38,490,000
5.0%	Overhead						\$ 1,487,701	included
	Escalation from estimate date to midpoint of Construction and an annual rate of 4%	4.9%					\$ 1,516,243	included
	Market Conditions	5%					\$ 1,562,086	included
5.0%	Profit						\$ 1,716,003	included
1.00%	Permits						\$ 360,361	included
0.65%	General Liability Insurance						\$ 236,577	included
1.00%	Railroad Protection Liability Insurance						\$ 366,330	included
1.00%	Bond						\$ 369,993	included
3.0%	Design Contingency						\$ 1,121,080	included
	Total Estimated Construction Cost						\$ 38,490,000	\$ 38,490,000
ALLOWANCES								
	INTEGRATION SUPPORT FOR POSITIVE TRAIN CONTROL SYSTEM	1				AN	\$ 150,000	\$ 150,000
	TRAFFIC OFFICERS SERVICES	1				AN	\$ 525,000	\$ 525,000
	WEEKEND SUBSTITUTE TRANSPORTATION	1				AN	\$ 535,000	\$ 535,000
	EXISTING SITE UTILITIES	1				AN	\$ 50,000	\$ 50,000
	INTEGRATED PEST MANAGEMENT	1				AN	\$ 25,000	\$ 25,000
	DISPOSE OF QUALIFYING SOILS	1				AN	\$ 800,000	\$ 800,000
	CONCRETE CLEANING AND RESTORATION	1				AN	\$ 50,000	\$ 50,000
	RISK ALLOWANCE REALLOCATION	1				AN	\$ 3,849,000	\$ 3,849,000
TOTAL ESTIMATED COST w/ ALLOWANCES							\$ 44,474,000	\$ 44,474,000

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
5	GENERAL CONDITIONS				
6	Site Superintendent	25	mo	\$ 17,480	\$ 437,000
7	Assistant Site Superintendent (Weekend & night work)	2	mo	\$ 17,480	\$ 34,960
8	Admin. Assistant (1/2 time)	13.5	mo	\$ 17,480	\$ 235,980
9	Project Manager	11	mo	\$ 17,480	\$ 196,650
10	QA/QC Field Engineer	25	mo	\$ 14,100	\$ 352,500
11	Scheduler PT	10.8	mo	\$ 14,992	\$ 161,164
12	Site safety Manager (construction duration)	25	mo	\$ 14,481	\$ 362,025
13	Field engineer	25	mo	\$ 12,800	\$ 320,000
14	Field engineer (Weekend & night work)	2	mo	\$ 12,800	\$ 25,600
15	Survey crew (2 person crew)	2150	hr	\$ 92.58	\$ 199,054
16	Mobilization & Demobilization	256	hr	\$ 150	\$ 38,400
17	Job site trailer	25	mo	\$ 1,700	\$ 42,500
18	Stairs for job site trailer	2	ea	\$ 1,240	\$ 2,480
19	Laborer-clean-up etc. (5 HR per week for project duration)	538	hr	\$ 88.37	\$ 47,498
20	Storage units-2 each for project duration	25	mo	\$ 800	\$ 20,000
21	Temporary water costs	25	mo	\$ 200	\$ 5,000
22	Temporary electric service	1	ls	\$ 1,500	\$ 1,500
23	Temporary electric usage	25	mo	\$ 1,000	\$ 25,000
24	Portable toilets-2 each	25	mo	\$ 400	\$ 10,000
25	Sanitary supplies	25	mo	\$ 80	\$ 2,000
26	Copier/scanner/fax	1	ea	\$ 350	\$ 350
27	Computer (including software)	2	ea	\$ 1,500	\$ 3,000
28	Cell phones-4 each	25	mo	\$ 760	\$ 19,000
29	Water cooler & water	25	mo	\$ 74	\$ 1,850
30	Office furniture and equipment	1	ls	\$ 5,000	\$ 5,000
31	Office supplies	25	mo	\$ 200	\$ 5,000
32	Project signs	1	ea	\$ 6,000	\$ 6,000
33	Bullgang (4 Laborers) - Unloading, loading, staging for workday & clear right-of-way for pedestrian traffic.	25	mo	\$ 5,656	\$ 141,389
34	Snow removal	10	ea	\$ 4,000	\$ 40,000
35	Job safety supplies	25	mo	\$ 1,000	\$ 25,000
36	Construction Progress Documentation - progress photos record drawings, reprographics	25	mo	\$ 2,500	\$ 62,500
37	O&M manuals, etc.	1	ls	\$ 2,000	\$ 2,000
38	Superintendent job site pick-up	25	mo	\$ 1,500	\$ 37,500
39	Sub, street sweeping at main roads	1	mo	\$ 3,000	\$ 1,500
40	Generator , 50% use	13	mo	\$ 1,584	\$ 19,800
41	Dumpster-2 per month	25	mo	\$ 1,200	\$ 30,000
42					
43	GENERAL REQUIREMENTS				
44	Modular office trailer (construction duration + 2 mos)	27	mo	\$ 1,500	\$ 40,500
45	Stairs for trailers	2	ea	\$ 1,240	\$ 2,480
46	Mobilization & Demobilization	256	hr	\$ 150	\$ 38,400
47	Water cooler & water	27	mo	\$ 75	\$ 2,025
48	Portable toilets-2 each	27	mo	\$ 400	\$ 10,800
49	Sanitary supplies	27	mo	\$ 80	\$ 2,160
50	1 phone line, 1 fax line, 3 computer lines	27	mo	\$ 300	\$ 8,100
51	Electric service connection	1	ls	\$ 1,000	\$ 1,000
52	Electric usage	27	mo	\$ 500	\$ 13,500
53	Office furniture & equipment	4	set	\$ 1,200	\$ 4,800
54	Drafting table, stool and lamp	1	ea	\$ 1,800	\$ 1,800
55	Utility table	6	ea	\$ 300	\$ 1,800
56	Folding type chair	6	ea	\$ 50	\$ 300
57	Drawer type safe	1	ea	\$ 450	\$ 450
58	Legal size filing cabinet	2	ea	\$ 250	\$ 500
59	Electric pencil sharpeners	3	ea	\$ 30	\$ 90
60	Electric calculators w/ tape	2	ea	\$ 40	\$ 80
61	Copier/Printer/Scanner	27	mo	\$ 350	\$ 9,450
62	Fax	27	mo	\$ 60	\$ 1,620
63	Cell phones-2 each	27	mo	\$ 380	\$ 10,260
64	Plan rack	1	ea	\$ 1,000	\$ 1,000
65	Misc. office equipment	1	ls	\$ 500	\$ 500
66	Office supplies	27	mo	\$ 200	\$ 5,400
67	Locker	3	ea	\$ 350	\$ 1,050
68	Desk top computer-includes software	3	ea	\$ 1,700	\$ 5,100
69	Champ Management System Software	27	mo	\$ 500	\$ 13,500
70	Concrete air meter	1	ea	\$ 650	\$ 650
71	50' fiberglass engineer's tape	2	ea	\$ 25	\$ 50
72	100' fiberglass engineer's tape	2	ea	\$ 30	\$ 60
73	Industrial first aid kit	2	ea	\$ 75	\$ 150
74	Fire extinguisher	2	ea	\$ 80	\$ 160

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
75	Fencing & gates incl. setup & removal	1	ls	\$ 4,500	\$ 4,500
76	Insurance on engineer's property	27	mo	\$ 300	\$ 8,100
77	<u>Parking Areas and Overall Sitework</u>				
78	Site Prep				
79	Dust control entry (Wheel wash area)	500	cy	\$ 75	\$ 37,576
80	Disposal of excess materials	500	cy	\$ 26.43	\$ 13,214
81	Traffic / Pedestrian Management Plan	1	ls	\$ 2,500	\$ 2,500
82	Erosion Control	600	lf	\$ 9.09	\$ 5,454
83	Site Grading	4,383	sy	\$ 4.64	\$ 20,324
84	RipRap Swale	123	tn	\$ 46.77	\$ 5,737
85	Head walls	31	sf	\$ 17.04	\$ 525
86	Water quality outlet structure	1	ea	\$ 13,123	\$ 13,123
87	Demolition				
88	Remove existing sign	1	ea	\$ 152	\$ 152
89	Remove existing Bollards	6	ea	\$ 48.22	\$ 289
90	Remove Shelter & Fdn	2	ea	\$ 10,888	\$ 21,776
91	Remove & reset site bench	1	ea	\$ 272	\$ 272
92	Remove guardrail	238	lf	\$ 4.82	\$ 1,146
93	Remove Sidewalk	1,227	sf	\$ 6.30	\$ 7,736
94	Remove granite curb	151	lf	\$ 9.64	\$ 1,456
95	Remove Parking Pay Machine	1	ea	\$ 1,235	\$ 1,235
96	Remove Jersey Barrier	3	ea	\$ 592	\$ 1,775
97	Remove Tactile Strip	912	sf	\$ 13.78	\$ 12,566
98	Remove existing tree	3	ea	\$ 2,934	\$ 8,801
99	Remove existing 8" dia CIP	60	lf	\$ 79	\$ 4,734
100	Demo Electrical @Ex. Storage Room	1	ls	\$ 21,315	\$ 21,315
101	Remove existing Catch Basin	1	ea	\$ 2,699	\$ 2,699
102	Site Improvements				
103	Sawcut existing pavement	569	lf	\$ 3.85	\$ 2,190
104	Parking -HMA	22,995	sf	\$ 10.79	\$ 248,206
105	Rehab Existing Stairs w/ AL treads	188	sf	\$ 164	\$ 30,901
106	Stair Entrance -concrete slab	980	sf	\$ 15.34	\$ 15,039
107	New CLF for Generator	60	lf	\$ 136	\$ 8,181
108	Replace Sidewalk	1,681	sf	\$ 13.76	\$ 23,120
109	Curbing - Granite	435	lf	\$ 85	\$ 37,095
110	Retaining Wall- Concrete	47	cy	\$ 233	\$ 10,986
111	Retaining Wall - Forms	198	sf	\$ 17.03	\$ 3,372
112	Retaining Wall -Rebar	6,130	lb	\$ 1.05	\$ 6,415
113	Retaining wall - finish	1,698	sf	\$ 24.56	\$ 41,689
114	Retaining Wall footing- Concrete	30	cy	\$ 236	\$ 7,002
115	Retaining Wall footing- Forms	179	sf	\$ 14.25	\$ 2,544
116	Retaining Wall Footing -Rebar	3,408	lb	\$ 1.05	\$ 3,567
117	Retaining wall Footing - finish	534	sf	\$ 2.15	\$ 1,146
118	Loam & Seed	10,442	sf	\$ 6.70	\$ 70,001
119	Rain Garden	2,049	sf	\$ 45.45	\$ 93,135
120	New guardrail , W-Beam	730	lf	\$ 136	\$ 99,571
121	New fence for pedestrian walk way	429	lf	\$ 85.22	\$ 36,575
122	Portable Changeable Message Signs (PCMS) rental (2 ea)	125	day	\$ 954	\$ 119,234
123	Set & remove work zone(s) warnings	125	day	\$ 7.00	\$ 875
124	Parking Pay Machine	1	ea	\$ 5,301	\$ 5,301
125	Parking Pay Machine Signage	1	ea	\$ 1,204	\$ 1,204
126	Special MBTA Space Sign	1	ea	\$ 1,914	\$ 1,914
127	Temp Paving	2,480	sf	\$ 6.59	\$ 16,343
128	Parking striping	1,400	lf	\$ 3.41	\$ 4,772
129	HC Parking striping	8	ea	\$ 187	\$ 1,500
130	HC Parking signage	16	ea	\$ 85.22	\$ 1,363
131	Gore area -Misc striping	3	ea	\$ 341	\$ 1,023
132	Pay Machine Signage	1	ea	\$ 664	\$ 664
133	Concrete Pad	565	sf	\$ 17.04	\$ 9,626
134	Exterior slab on grade	1,718	sf	\$ 17.04	\$ 29,280
135	Landscaping	1	ls	\$ 28,405	\$ 28,405
136	Parking Lot Lighting Replace Poles and Base	2	ea	\$ 20,452	\$ 40,903
137	Covered Overhead Ped Structure				
138	1" dia Anchor bolts	80	ea	\$ 109.48	\$ 8,758
139	Grout Col Base Plates 1.5x1.5x.17	20	ea	\$ 44.76	\$ 895
140	Covered Stairs				
141	1" dia Anchor bolts	64	ea	\$ 109.48	\$ 7,007
142	Grout Col Base Plates 1.5x1.5x.17	16	ea	\$ 44.76	\$ 716
143	Canopy Structural Steel	178	tn	\$ 10,633	\$ 1,892,714
144	<u>Utilities</u>				

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
145	Domestic/Fire Water Service				
146	Water service, manhole and meter	1	ea	\$ 76,125	\$ 76,125
147	8" Water Supply main	240	lf	\$ 142	\$ 34,086
148	2" water service	240	lf	\$ 74	\$ 17,725
149	6"Tee	1	ea	\$ 2,236	\$ 2,236
150	6" Valve	1	ea	\$ 4,440	\$ 4,440
151	Connection charges	1	ls	\$ 7,150	\$ 7,150
152	Proposed Duplex Fire Valve	1	ea	\$ 14,070	\$ 14,070
153	Site Drainage				
154	Catch basins	4	ea	\$ 2,544	\$ 10,175
155	Drainage (12" Roof drain)	741	lf	\$ 140.96	\$ 104,511
156	3" Insulation for Drainage (12" Roof drain)	741	lf	\$ 133	\$ 98,600
157	Deep Sump DMH	6	ea	\$ 8,870	\$ 53,220
158	4" Roof Drains	50	ea	\$ 841	\$ 42,043
159	18" Perforated PVC Pipe	310	lf	\$ 70.37	\$ 21,814
160	18" CPP	15	lf	\$ 53.38	\$ 801
161	18" RCP	202	lf	\$ 75.21	\$ 15,192
162	12" RCP	117	lf	\$ 57.61	\$ 6,741
163	Core drill Manhole for 8" dia pipe	1	ea	\$ 512	\$ 512
164	Core drill Manhole for 18" dia pipe	1	ea	\$ 801	\$ 801
165	Adj Manholes Frame & cover	5	ea	\$ 1,032	\$ 5,160
166	5" Communication Conduits RGS Ductbank	240	lf	\$ 252	\$ 60,397
167	Ductbank Excavation	49	cy	\$ 33.47	\$ 1,637
168	Ductbank Backfill	57	cy	\$ 112	\$ 6,412
169	Ductbank Concrete	8	cy	\$ 271	\$ 2,110
170	Ductbank Forms	240	sf	\$ 13.86	\$ 3,327
171	Ductbank Reinforcing Steel	720	lb	\$ 1.05	\$ 754
172	Duct Spacers	96	ea	\$ 189	\$ 18,153
173	Pull String	240	lf	\$ 2.85	\$ 684
174	Excavation (piping)	507	cy	\$ 33.47	\$ 16,958
175	Backfill 3/4" Crushed stone	301	cy	\$ 112	\$ 33,762
176	Backfill - select (Compacted)	206	cy	\$ 102.27	\$ 21,037
177	Geotextile Fabric	213	sy	\$ 5.91	\$ 1,256
178	Electrical				
179	Raise OH Electrical Wires for Contractor Access	610	LF	\$ 12.67	\$ 7,722
180	Furnish outdoor diesel genset 400kw, (400A/480v) daytank, sound enclosure	1	ea	\$ 172,251	\$ 172,251
181	Generator Foundation Concrete	12	cy	\$ 205	\$ 2,465
182	Fdn Forms	90	sf	\$ 12.39	\$ 1,115
183	Fdn Reinforcing steel	1500	lb	\$ 1.05	\$ 1,570
184	Fdn Finish	216	sf	\$ 2.95	\$ 638
185	Rub Finish	90	sf	\$ 21.40	\$ 1,926
186	Set genset- truck crane and electricians	1	ea	\$ 2,520	\$ 2,520
187	Connect genset, test and commission(250kva, 480/277V,3Ph,4w)	1	ea	\$ 62,126	\$ 62,126
188	ATS 480/277v, 400A	1	ea	\$ 5,864	\$ 5,864
189	Generator Interlock C/B 400A	1	ea	\$ 6,954	\$ 6,954
190	Main Utility Circuit Breaker 480/277V 3 Phase-600A	1	ea	\$ 11,476	\$ 11,476
191	Fused PT& CT Compartment	1	ea	\$ 8,764	\$ 8,764
192	Utility Meter by Utility company	1	ea	\$ 4,497	\$ 4,497
193	Utility company charges	1	ls	\$ 49,500	\$ 49,500
194	Power Monitor	1	ea	\$ 10,847	\$ 10,847
195	Distribution Panel 480/277V, 3Ph, 4w	1	ea	\$ 22,068	\$ 22,068
196	UPS unit 75kva	1	ea	\$ 111,333	\$ 111,333
197	General Panel 208/120V,3Ph,4w	1	ea	\$ 4,646	\$ 4,646
198	Main Ground Fault Protector	1	ea	\$ 7,011	\$ 7,011
199	Electrical Service PVC conduit	515	lf	\$ 37.03	\$ 19,085
200	Electrical Service PVC-RGS conduit	400	lf	\$ 80.77	\$ 32,310
201	Telecommunications Service PVC Conduit	610	lf	\$ 37.03	\$ 22,589
202	Telecommunications Service PVC-RGS Conduit	400	lf	\$ 80.77	\$ 32,310
203	Ductbank Excavation	271	cy	\$ 45.65	\$ 12,374
204	Ductbank Backfill	341	cy	\$ 37.19	\$ 12,667
205	Ductbank Concrete	26	cy	\$ 199	\$ 5,181
206	Ductbank Forms	1,126	sf	\$ 18.60	\$ 20,940
207	Ductbank Reinforcing Steel	3,378	lb	\$ 1.05	\$ 3,535
208	Duct Spacers	385	ea	\$ 28.78	\$ 11,082
209	Pull String	1,925	lf	\$ 1.55	\$ 2,987
210	Ground Cable- w/ trenching	725	lf	\$ 9.77	\$ 7,083
211	Cadwelds	8	ea	\$ 363	\$ 2,906
212	Ground Rods	4	ea	\$ 885	\$ 3,539
213	Electrical Manhole	1	ea	\$ 18,753	\$ 18,753
214	Electrical Junction boxes (N-4)	4	ea	\$ 4,099	\$ 16,398

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
215	Utility Transformer -250 kva	1	ea	\$ 7,304	\$ 7,304
216	XFMR Foundation Concrete	1	cy	\$ 205	\$ 171
217	Fdn Forms	24	sf	\$ 12.39	\$ 297
218	Fdn Reinforcing steel	104	lb	\$ 1.05	\$ 109
219	Fdn Finish	15	sf	\$ 2.95	\$ 44
220	Rub Finish	24	sf	\$ 21.40	\$ 514
221	Elevator 1 Panel (480V/277V,3 PH, 4 w)	1	ea	\$ 15,789	\$ 15,789
222	Elevator 1 - 480V-208V XFMR 3Ph,4w, 15KVA	1	ea	\$ 5,972	\$ 5,972
223	Elevator 2 - 480V-208/120V XFMR 3Ph,4w, 45KVA	1	ea	\$ 7,593	\$ 7,593
224	480V-208/120V XFMR 1Ph,4w, 50KVA -Ex Keolis Bldg	1	ea	\$ 6,805	\$ 6,805
225	(240V/120V,3 PH, 4 w Panelboard in EX Keolis Bldg	1	ea	\$ 13,645	\$ 13,645
226	Elevator 1,2 & 3 Equipment Panel (208V/120V,3 PH, 4 w)	3	ea	\$ 11,396	\$ 34,189
227	Communications Transformer -30 kva, 3 PH,480-208/120V	1	ea	\$ 6,749	\$ 6,749
228	Communication Panel (208V/120V,3 PH, 4 w) 100A	1	ea	\$ 12,838	\$ 12,838
229	Lighting Panel (480V/277V,3 PH, 4 w)	1	ea	\$ 15,228	\$ 15,228
230	Gas				
231	Trench Excavation & Backfill	200	lf	\$ 27.97	\$ 5,589
232	Gas Line connection to Existing Line Tee & valve	1	ea	\$ 2,366	\$ 2,366
233	Gas Line connection to Generator - Valve & Flex connection	1	ea	\$ 2,500	\$ 2,500
234	Gas Line 4" Steel	200	lf	\$ 34.56	\$ 6,906
235	Test	1	ls	\$ 1,100	\$ 1,100
236	Sewer				
237	Trench Excavation & Backfill	150	lf	\$ 27.97	\$ 4,195
238	Connection to Existing Sewer Manhole	1	ea	\$ 136	\$ 136
239	Sewer Manholes	3	ea	\$ 5,556	\$ 16,667
240	Sewer line 8" SS	150	lf	\$ 23.24	\$ 3,486
241	Platform				
242	Earthwork				
243	Platform Foundation Excav & BF	486	cy	\$ 73.85	\$ 35,887
244	Mobilization (pile driving and drilling eq)	1	ls	\$ 44,000	\$ 44,000
245	Mini-piles-7x.408 (avg. total length is 40 feet)	880	vlf	\$ 99.79	\$ 87,812
246	Casing-9-5/8" with .545 wall 21'	8,847	lbs	\$ 1.76	\$ 15,604
247	Rebar-dywidag bars	656	lf	\$ 44.23	\$ 29,013
248	Grout	588	cf	\$ 21.83	\$ 12,834
249	Mini-piles-9-5/8" (avg. total length is 55 feet)	5,500	vlf	\$ 99.79	\$ 548,824
250	Casing-9-5/8" with .545 wall 21'	71,400	lbs	\$ 1.76	\$ 125,936
251	Rebar-dywidag bars	5,600	lf	\$ 44.23	\$ 247,674
252	Grout	3072	cf	\$ 21.83	\$ 67,059
253	Dispose of spoil from mini-piles	191	tn	\$ 27.60	\$ 5,272
254	Piling impact Test	1	ls	\$ 2,200	\$ 2,200
255	Concrete				
256	Platform Pile Cap concrete	51	cy	\$ 205	\$ 10,477
257	Platform Pile Cap forms	1,539	sf	\$ 12.81	\$ 19,719
258	Platform Pile Cap reinforcing steel	6,120	lb	\$ 1.05	\$ 6,405
259	Platform Pile Cap finish	459	sf	\$ 12.88	\$ 5,912
260	Canopy Pile Cap concrete -Pile Cap	18	cy	\$ 205	\$ 3,680
261	Canopy Pedestal concrete	10	cy	\$ 209	\$ 2,063
262	Canopy Pile Cap forms - Pile cap	339	sf	\$ 17.17	\$ 5,815
263	Canopy Pedestal forms	267	sf	\$ 33.36	\$ 8,896
264	Canopy Pile Cap reinforcing steel	3,135	lb	\$ 1.05	\$ 3,281
265	Canopy Pedestal reinforcing steel	1,729	lb	\$ 1.05	\$ 1,809
266	Canopy Pile Cap finish	160	sf	\$ 12.88	\$ 2,061
267	Canopy Pedestal Finish	160	sf	\$ 12.88	\$ 2,061
268	Canopy Pedestal Rub Finish	533	sf	\$ 12.94	\$ 6,902
269	Canopy Col base Concrete	3	cy	\$ 205	\$ 714
270	Canopy Col base forms	225	sf	\$ 20.76	\$ 4,669
271	Canopy Col base reinforcing steel	695	lb	\$ 2.45	\$ 1,705
272	Canopy Col base finish	225	sf	\$ 21.40	\$ 4,813
273	Grout Col Base Plates	39	ea	\$ 44.76	\$ 1,745
274	P-2 Platform Col Footing Concrete	13	cy	\$ 205	\$ 2,692
275	P-2 Platform Col Footing forms	107	sf	\$ 12.81	\$ 1,367
276	P-2 Platform Col Footing reinforcing steel	1,966	lb	\$ 1.05	\$ 2,057
277	P-2 Platform Col Footing finish	177	sf	\$ 1.87	\$ 330
278	P-2 Platform Pile Cap concrete -Pile Cap	0.6	cy	\$ 205	\$ 127
279	P-2 Platform Pile Cap forms - Pile cap	33	sf	\$ 12.81	\$ 427
280	P-2 Platform Pile Cap reinforcing steel	108	lb	\$ 1.05	\$ 113
281	P-2 Platform Pedestal Finish	4	sf	\$ 12.88	\$ 52
282	P-2 Platform Pedestal Rub Finish	33	sf	\$ 12.94	\$ 432
283	P-3 Canopy Col Footing Concrete	5	cy	\$ 205	\$ 1,065
284	P-3 Canopy Col Footing forms	68	sf	\$ 12.81	\$ 871
285	P-3 Canopy Col Footing reinforcing steel	778	lb	\$ 1.05	\$ 814

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
286	P-3 Canopy Col Footing finish	70	sf	\$ 1.87	\$ 131
287	P-3 Canopy Pedestal concrete	0.6	cy	\$ 205	\$ 127
288	P-3 Canopy Pedestal forms	33	sf	\$ 12.81	\$ 427
289	P-3 Canopy Pedestal reinforcing steel	108	lb	\$ 1.05	\$ 113
290	P-3 Canopy Pedestal Finish	4	sf	\$ 12.88	\$ 52
291	P-3 Canopy Pedestal Rub Finish	33	sf	\$ 12.94	\$ 432
292	P-4 Platform Col Footing Concrete	9	cy	\$ 205	\$ 1,851
293	P-4 Platform Col Footing forms	178	sf	\$ 12.81	\$ 2,279
294	P-4 Platform Col Footing reinforcing steel	1,351	lb	\$ 1.05	\$ 1,414
295	P-4 Platform Col Footing finish	88	sf	\$ 1.87	\$ 164
296	P-4 Platform Pedestal concrete -Pile Cap	0.6	cy	\$ 205	\$ 127
297	P-4 Platform Pedestal forms - Pile cap	33	sf	\$ 12.81	\$ 427
298	P-4 Platform Pedestal reinforcing steel	108	lb	\$ 1.05	\$ 113
299	P-4 Platform Pedestal Finish	4	sf	\$ 12.88	\$ 52
300	P-4 Platform Pedestal Rub Finish	33	sf	\$ 12.94	\$ 432
301	P-5 Canopy Col Footing Concrete	1	cy	\$ 205	\$ 190
302	P-5 Canopy Col Footing forms	108	sf	\$ 12.81	\$ 1,384
303	P-5 Canopy Col Footing reinforcing steel	139	lb	\$ 1.05	\$ 145
304	P-5 Canopy Col Footing finish	25	sf	\$ 1.87	\$ 47
305	P-5 Canopy Pedestal concrete -Pile Cap	1.9	cy	\$ 205	\$ 398
306	P-5 Canopy Pedestal forms - Pile cap	105	sf	\$ 12.81	\$ 1,340
307	P-5 Canopy Pedestal reinforcing steel	339	lb	\$ 1.05	\$ 355
308	P-5 Canopy Pedestal Finish	4	sf	\$ 12.88	\$ 52
309	P-5 Canopy Pedestal Rub Finish	105	sf	\$ 12.94	\$ 1,353
310	P-6 Platform Col Footing Concrete	3	cy	\$ 205	\$ 700
311	P-6 Platform Col Footing forms	56	sf	\$ 12.81	\$ 722
312	P-6 Platform Col Footing reinforcing steel	511	lb	\$ 1.05	\$ 535
313	P-6 Platform Col Footing finish	25	sf	\$ 1.87	\$ 47
314	P-6 Platform wall concrete -Pile Cap	2.8	cy	\$ 205	\$ 570
315	P-6 Platform wall forms - Pile cap	170	sf	\$ 12.81	\$ 2,183
316	P-6 Platform wall reinforcing steel	486	lb	\$ 1.05	\$ 508
317	P-6 Platform wall Finish	74	sf	\$ 12.88	\$ 948
318	P-6 Platform wall Rub Finish	170	sf	\$ 12.94	\$ 2,205
319	P-16 & P-19 Footing - Precast concrete	154	sf	\$ 103.35	\$ 15,916
320	P-16 & P-19 Pier -Concrete	10	cy	\$ 205	\$ 2,064
321	P-16 & P-19 Pier -Forms	252	sf	\$ 12.81	\$ 3,229
322	P-16 & P-19 Pedestal -Concrete	2	cy	\$ 205	\$ 348
323	P-16 & P-19 Pedestal -Forms	91	sf	\$ 12.81	\$ 1,171
324	P-16 & P-19 Pier -Reinforcing Steel	1,206	lb	\$ 1.05	\$ 1,262
325	P-16 & P-19 Pedestal -Reinforcing Steel	254	lb	\$ 1.05	\$ 266
326	P-16 & P-19 Pedestal & Pier -Rub Finish	343	sf	\$ 12.94	\$ 4,444
327	P17,P17A, P18 & P18A Pedestal -Concrete	2	cy	\$ 209	\$ 450
328	P17,P17A, P18 & P18A Pedestal - -Forms	133	sf	\$ 14.18	\$ 1,885
329	P17,P17A, P18 & P18A Pedestal - -Reinforcing Steel	323	lb	\$ 1.05	\$ 338
330	P17,P17A, P18 & P18A Pedestal -- Finish	133	sf	\$ 21.40	\$ 2,847
331	1" dia Anchor bolts	24	ea	\$ 138	\$ 3,305
332	Grout Col Base Plates 1.5x1.5x.17	6	ea	\$ 44.76	\$ 269
333	14" ID Pipe -Galv (2.5' L)	2	ea	\$ 3,875	\$ 7,750
334	Concrete encased W Beam	4	cy	\$ 809	\$ 3,217
335	Roof Drain Scuppers	45	ea	\$ 588	\$ 26,447
336	1" dia Anchor bolts	176	ea	\$ 109.48	\$ 19,268
337	New Membrane WP	6,081	sf	\$ 9.88	\$ 60,056
338	Platform (FRP composite platform deck construction)				
339	FRP Platform Deck w/ connecting hardware	11,200	sf	\$ 169	\$ 1,887,819
340	Connection Hardware supplied	1	ls	\$ 68,221	\$ 68,221
341	Delivered to the site	1	ls	\$ 90,203	\$ 90,203
342	FRP Platform Erection	52	ea	\$ 2,406	\$ 125,129
343	24" Tactile Warning Strip	4,100	sf	\$ 38.51	\$ 157,909
344	Rub Rail (Platform Level) 2-1/2" wood	1,640	lf	\$ 18.18	\$ 29,814
345	FRP Deck Joints Sealing	1,500	lf	\$ 15.25	\$ 22,882
346	Galv. Steel platform guard rail - w/ vertical pickets @ Accessible Walkway	395	lf	\$ 358	\$ 141,419
347	Roofing				
348	Metal roofing over platform canopy (1-1/2")	4,755	sf	\$ 34.82	\$ 165,577
349	Gutters and downspouts	440	lf	\$ 30.21	\$ 13,291
350	Specialties				
351	Way Finding Signage	1	ls	\$ 552,867	\$ 552,867
352	Temporary Signage	1	ls	\$ 2,841	\$ 2,841
353	Tactile/Braille signage	1	ls	\$ 101,363	\$ 101,363
354	Furnishings				
355	Benches -on Platform	3	ea	\$ 2,841	\$ 8,522
356	Benches -on Accessible Walkway	2	ea	\$ 2,841	\$ 5,681

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
357	Waste receptacles	5	ea	\$ 511	\$ 2,556
358	Lighting @ platform				
359	Light Fixtures 4"x4' Linear LED	457	ea	\$ 1,020.64	\$ 466,432
360	Lumium N2 2.5"x4' Linear LED	117	ea	\$ 1,656	\$ 193,789
361	Light Fixture 40" Bollard	19	ea	\$ 2,085	\$ 39,615
362	Conduit	12,360	lf	\$ 31.16	\$ 385,080
363	Duplex GFCI outlets	15	ea	\$ 276	\$ 4,138
364	Double GFCI outlets	10	ea	\$ 591	\$ 5,911
365	#10 Awg Cable	37,080	lf	\$ 4.64	\$ 172,064
366	Communications @ Platform Level				
367	Ambient Noise Sensor	7	ea	\$ 227	\$ 1,591
368	PA Speakers	31	ea	\$ 799	\$ 24,761
369	Emergency Phone	1	ea	\$ 557	\$ 557
370	Dual sided VMS (Variable Message Sign)	8	ea	\$ 3,739	\$ 29,914
371	Patch Panel in Comm House	3	ea	\$ 1,103	\$ 3,308
372	New communications feed	2	ea	\$ 16,202	\$ 32,404
373	Security Systems @ Platform				
374	Security Monitoring hardware (CCTV)	12	ea	\$ 3,181	\$ 38,176
375	Access Control (new elevator and headhouse)	1	loc	\$ 4,382	\$ 4,382
376	West Platform Elevator & Grade Access to Station Building				
377	Demolition				
378	Create Clean transition btwn rotunda & Platform access corridor	4	ea	\$ 9,094	\$ 36,375
379	Cut Openings in EX Retaining Wall	4	ea	\$ 609	\$ 2,435
380	Partial demolition for stair & elevator connection	200	sf	\$ 497	\$ 99,314
381	Disposal of excess debris	18	cy	\$ 140	\$ 2,488
382	Modifications to new storage room access points	2	loc	\$ 14,203	\$ 28,405
383	Structurally Shore opening	1	ls	\$ 11,362	\$ 11,362
384	Sitework - West End				
385	Excav & BF	580	cy	\$ 60.22	\$ 34,904
386	Mud slab	262	cy	\$ 259	\$ 67,880
387	Disposal of excess materials	343	cy	\$ 48.80	\$ 16,727
388	SOE (sheet pile - Drive , Extract & salvage)	4,131	sf	\$ 66.70	\$ 275,510
389	Backfill gravel for CIP concrete stairs				
390	Compactable crushed gravel	185	cy	\$ 143	\$ 26,449
391	Concrete				
392	Platform elevator foundation @ West end platform	33	cy	\$ 205	\$ 6,863
393	Platform elevator foundation walls @ West end platform	43	cy	\$ 203	\$ 8,767
394	Elevator Footing forms	88	sf	\$ 12.81	\$ 1,131
395	Elevator Footing reinforcing steel	4,009	lb	\$ 1.05	\$ 4,196
396	Elevator Footing finish	451	sf	\$ 1.87	\$ 842
397	Elevator Wall forms	260	sf	\$ 12.81	\$ 3,332
398	Elevator Wall reinforcing steel	6,491	lb	\$ 1.05	\$ 6,793
399	Elevator Wall finish	999	sf	\$ 21.40	\$ 21,373
400	Platform stairway foundation @ West end platform	20	cy	\$ 205	\$ 4,148
401	Platform stairway foundation @ West end platform	24	cy	\$ 205	\$ 4,884
402	Stairs to tunnel	28	cy	\$ 653	\$ 18,586
403	Curb @ stair opening	2	cy	\$ 1,666	\$ 3,100
404	Structural Steel (Galv.) Elevator @ West end platform				
405	Structural Steel (Galv.) for new Elevator Shaft & Machine room roof	20,576	lb	\$ 8.34	\$ 171,573
406	Column anchors to existing base slab	48	ea	\$ 240	\$ 11,543
407	Elevator Hoisting Beam (Galv.)	1	ls	\$ 3,951	\$ 3,951
408	Galvanized Steel Sump pit grating w/ Galv. steel angle embeds	1	ls	\$ 409	\$ 409
409	Elevator Sill Angles (Galv.)	2	ea	\$ 1,411	\$ 2,822
410	Galvanized Steel Ladders @ Elevator Pit	6	vlf	\$ 250	\$ 1,500
411	SS Wire mesh 4@ 8'-0" x 1'-0" SS wire on frame	32	sf	\$ 62.49	\$ 2,000
412	Stair Rails				
413	Stairway Side Wall Type Railing (SS vertical picket type railing)	280	lf	\$ 165	\$ 46,130
414	Galv. Steel platform guard rail - w/ vertical pickets	16	lf	\$ 358	\$ 5,726
415	Paint Galv. Platform railing	16	lf	\$ 17.04	\$ 273
416	Waterproofing				
417	West & Stairway waterproofing	4,291	sf	\$ 2.45	\$ 10,532
418	West & Stairway Protection board	4,291	sf	\$ 1.00	\$ 4,287
419	Roofing				
420	Metal roofing over platform canopy (1-1/2")	150	sf	\$ 34.82	\$ 5,223
421	Gutters and downspouts	48	lf	\$ 30.21	\$ 1,450
422	Openings				
423	Stainless Steel framing for glass at enclosures platform	2,873	sf	\$ 161	\$ 462,712
424	3/8" Clear Laminated glass/spandrel glass	2,873	sf	\$ 59.18	\$ 170,013
425	Stainless Steel framing for Sloped Glazing	2,543	sf	\$ 161	\$ 409,563
426	3/8" Clear Laminated glass/spandrel glass	2,543	sf	\$ 59.18	\$ 150,485

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
427	Screen Enclosure	728	sf	\$ 63.64	\$ 46,338
428	Doors				
429	Elevator Machine Room door @ West end platform(3' x 7' SS HM door & Frame w/ hardware)	1	ea	\$ 2,760	\$ 2,760
430	Curtainwall				
431	Stainless Steel framing for glass at new elevator shaft @ West end platform	1,286	sf	\$ 161	\$ 207,117
432	3/8" Clear Laminated glass/spandrel glass	1,286	sf	\$ 59.18	\$ 76,101
433	Finishes				
434	Misc painting	1	ls	\$ 2,275	\$ 2,275
435	Specialties				
436	Way Finding Signage	1	ls	\$ 18,179	\$ 18,179
437	Temporary Signage	1	ls	\$ 1,363	\$ 1,363
438	Tactile/Braille signage	1	ls	\$ 1,363	\$ 1,363
439	"T" logo signage	2	ea	\$ 5,113	\$ 10,226
440	Fire extinguishers	1	ea	\$ 273	\$ 273
441	Elevators				
442	Elevator @ West end of platform				
443	New MBTA standard Traction elevator ass'y (Approx. 16' travel - platform to grade) 5250#, 200fpm	1	ea	\$ 801,476	\$ 801,476
444	Elevator Sump Pump	1	ea	\$ 1,073	\$ 1,073
445	HVAC				
446	Ductless Unit 18.5 MBH	1	ea	\$ 7,251	\$ 7,251
447	Electric Baseboard Heater w/ T-stat & Dbl Pole Disconnect	1	ea	\$ 265	\$ 265
448	Electric Unit Heaters 5KW, ceiling mntd.	1	ea	\$ 2,354	\$ 2,354
449	T-Stats	3	ea	\$ 423	\$ 1,270
450	Design, integration, and testing	1	day	\$ 1,619	\$ 1,619
451	New mechanical exhaust system atop the new headhouse	1	ea	\$ 12,012	\$ 12,012
452	Electrical @ West end platform access				
453	New main feed from remote location	1	ea	\$ 207,571	\$ 207,571
454	Power supply, feeds, panels and disconnects	1	ea	\$ 41,812	\$ 41,812
455	Duplex GFCI outlet @ pit	1	ea	\$ 699	\$ 699
456	Connection for Sump Pump	1	ea	\$ 1,201	\$ 1,201
457	New feed & disconnect	1	ea	\$ 3,476	\$ 3,476
458	New feed for HVAC unit @ machine room	1	ea	\$ 1,539	\$ 1,539
459	New feed & disconnect for mechanical exhaust system	1	ea	\$ 5,057	\$ 5,057
460	Elevator Pit lighting	2	ea	\$ 824	\$ 1,648
461	Exterior Elevator Lighting	2	ea	\$ 3,678	\$ 7,356
462	New fire alarm and security connection feed	1	ls	\$ 16,333	\$ 16,333
463	Smoke Detection (new elevator and stairway)	3	ls	\$ 1,799	\$ 5,397
464	Access Control (new elevator and headhouse)	2	loc	\$ 5,040	\$ 10,079
465	East Platform Elevator & Overhead Pedestrian Crossover				
466	Sitework - East End				
467	Platform stairway foundation excav & BF East end of platform	484	cy	\$ 259	\$ 125,438
468	Disposal of excess materials	284	cy	\$ 56.12	\$ 15,964
469	SOE (sheet pile - Drive , Extract & salvage)	1,883	sf	\$ 66.70	\$ 125,621
470	Handling of spoils	45	cy	\$ 185	\$ 8,276
471	Disposal of excess spoils	45	cy	\$ 106	\$ 4,743
472	Concrete				
473	P-45&46 Stair wall Footing Concrete	10	cy	\$ 205	\$ 2,054
474	P-45&46 Stair wall Footing forms	216	sf	\$ 12.81	\$ 2,768
475	P-45&46 Stair wall Footing reinforcing steel	1,500	lb	\$ 1.05	\$ 1,570
476	P-45&46 Stair wall Footing finish	90	sf	\$ 1.87	\$ 168
477	P-45&46 Stair wall concrete	33.5	cy	\$ 205	\$ 6,886
478	P-45&46 stair wall forms	1,810	sf	\$ 12.81	\$ 23,191
479	P-45&46 Stair wall reinforcing steel	5,866	lb	\$ 1.05	\$ 6,139
480	P-45&46 Stair wall Finish	49	sf	\$ 1.87	\$ 91
481	P-45&46 stair wall Finish	1,810	sf	\$ 21.40	\$ 38,742
482	P-45 & 46 Structural Slab	11.6	cy	\$ 205	\$ 2,376
483	P-45&46 slab forms	98	sf	\$ 12.81	\$ 1,256
484	P-45&46 Stair wall Finish	178	sf	\$ 1.87	\$ 333
485	P-47 Stair Twr Footing Concrete	2	cy	\$ 205	\$ 342
486	P-47 Stair Twr Footing forms	48	sf	\$ 12.81	\$ 615
487	P-47 Stair Twr Footing reinforcing steel	250	lb	\$ 1.05	\$ 262
488	P-47 Stair Twr Footing finish	15	sf	\$ 1.87	\$ 28
489	P-47 Stair Twr Col Concrete	1	cy	\$ 205	\$ 127
490	P-47 Stair Twr Col forms	33	sf	\$ 12.81	\$ 427
491	P-47 Stair Twr Col reinforcing steel	124	lb	\$ 1.05	\$ 129
492	P-47 Stair Twr Col finish	33	sf	\$ 21.40	\$ 714
493	P-48 Stair Twr Footing Concrete	5	cy	\$ 205	\$ 1,027
494	P-48 Stair Twr Footing forms	108	sf	\$ 12.81	\$ 1,384
495	P-48 Stair Twr Footing reinforcing steel	750	lb	\$ 1.05	\$ 785
496	P-48 Stair Twr Footing finish	45	sf	\$ 1.87	\$ 84

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
497	P-48 Stair Twr Col Concrete	1	cy	\$ 205	\$ 254
498	P-48 Stair Twr Col forms	67	sf	\$ 12.81	\$ 855
499	P-48 Stair Twr Col reinforcing steel	247	lb	\$ 1.05	\$ 259
500	P-48 Stair Twr Col finish	33	sf	\$ 21.40	\$ 714
501	Bridge / Elevator Foundation Pile cap - Concrete	71	cy	\$ 205	\$ 14,542
502	Bridge / Elevator Foundation Pile cap - Forms	85	sf	\$ 12.81	\$ 1,086
503	Bridge / Elevator Foundation Pile cap - Reinforcing Steel	10,618	lb	\$ 1.05	\$ 11,113
504	Bridge / Elevator Foundation Pile cap - Finish	637	sf	\$ 1.87	\$ 1,190
505	Bridge Pier - Concrete	17	cy	\$ 205	\$ 3,437
506	Bridge Pier - Form	365	sf	\$ 12.81	\$ 4,678
507	Bridge Pier - Reinforcing Steel	2,510	lb	\$ 1.05	\$ 2,626
508	Bridge Pier - Finish	365	sf	\$ 21.40	\$ 7,815
509	Bridge Pedestal - Concrete	1	cy	\$ 205	\$ 254
510	Bridge Pedestal - Form	67	sf	\$ 12.81	\$ 855
511	Bridge Pedestal - Reinforcing Steel	247	lb	\$ 1.05	\$ 259
512	Bridge Pedestal - Finish	67	sf	\$ 21.40	\$ 1,428
513	Elevator Pit & Machine room walls - Concrete	32	cy	\$ 205	\$ 6,484
514	Elevator Pit & Machine room walls - Forms	1,726	sf	\$ 12.81	\$ 22,114
515	Elevator Pit & Machine room walls - Reinforcing Steel	4,735	lb	\$ 1.05	\$ 4,955
516	Elevator Pit & Machine room walls - Finish	1,726	sf	\$ 21.40	\$ 36,943
517	Machine Rm Grade Slab - Concrete	5	cy	\$ 205	\$ 1,098
518	Machine Rm Grade Slab - Reinforcing Steel	802	lb	\$ 1.05	\$ 839
519	Machine Rm Grade Slab - Finish	19	sf	\$ 1.87	\$ 35
520	Machine Rm SOC - Concrete	7	cy	\$ 205	\$ 1,518
521	Machine Rm SOC - Forms	43	sf	\$ 12.81	\$ 551
522	Machine Rm SOC - Reinforcing Steel	1,108	lb	\$ 1.05	\$ 1,160
523	Machine Rm SOC - Finish	19	sf	\$ 1.87	\$ 35
524	Exterior Grade Slab - Concrete	3	cy	\$ 205	\$ 708
525	Exterior Grade Slab - Forms	41	sf	\$ 184	\$ 7,466
526	Exterior Grade Slab - Reinforcing Steel	517	lb	\$ 1.05	\$ 541
527	Exterior Grade Slab - Finish	187	sf	\$ 1.87	\$ 349
528	Rub Finish	22	sf	\$ 1.87	\$ 40
529	Structural Steel (Galv.) for new Elevator Shaft & Machine room roof & Ped	206,643	lb	\$ 4.88	\$ 1,008,557
530	Steel Handrail	231	lf	\$ 125	\$ 28,871
531	Column anchors to existing base slab	48	ea	\$ 240	\$ 11,543
532	Elevator Hoisting Beam (Galv.)	1	ls	\$ 3,659	\$ 3,659
533	Galvanized Steel Sump pit grating w/ Galv. steel angle embeds	1	ls	\$ 409	\$ 409
534	Galvanized Steel Ladders @ Elevator Pit	12	vlf	\$ 250	\$ 3,000
535	SS Wire mesh 4@ 8'-0" x 1'-0" SS wire on frame	32	sf	\$ 62.49	\$ 2,000
536	Elevator Metal Roof Decking (Galv.)	150	sf	\$ 40.70	\$ 6,105
537	Stairs to Crossover level	64	rsr	\$ 1,088	\$ 69,651
538	Intermediate stair landing & decking	96	sf	\$ 84.61	\$ 8,123
539	Galv. Steel platform guard rail - w/ vertical pickets	80	lf	\$ 324	\$ 25,905
540	Prefabricated Ramp	721	sf	\$ 31.36	\$ 22,623
541	Prefabricated Canopy	721	sf	\$ 36.59	\$ 26,393
542	Sonotube - Concrete Fdns	22	ea	\$ 107.98	\$ 2,375
543	Sonotube - Concrete Fdns	8	ea	\$ 20.86	\$ 167
544	Rebar	405	lbs	\$ 1.05	\$ 424
545	Concrete	27	cy	\$ 209	\$ 5,592
546	Remove Prefabricated Ramp	1	ls	\$ 22,000	\$ 22,000
547	Temporary Platform				
548	Foundation Concrete	93	cy	\$ 205	\$ 19,125
549	Foundation Forms	2,100	sf	\$ 12.81	\$ 26,908
550	Foundation Reinforcing Steel	9,310	lb	\$ 1.05	\$ 9,744
551	Foundation Concrete Finish	599	sf	\$ 1.87	\$ 1,118
552	N-S Grout Col Base Plates	21	ea	\$ 44.76	\$ 940
553	Compacted Crushed Stone - Temp Plat & East end	137	cy	\$ 151	\$ 20,616
554	1-1/2" Metal Roof Deck	1,944	sf	\$ 13.64	\$ 26,519
555	FRP Platform Deck w/ connecting hardware	1,700	sf	\$ 141	\$ 238,920
556	Connection Hardware supplied	1	ls	\$ 8,313	\$ 8,313
557	Delivered to the site	1	ls	\$ 11,078	\$ 11,078
558	FRP Platform Erection	7	ea	\$ 2,689	\$ 18,823
559	24" Tactile Warning Strip	1,000	sf	\$ 38.51	\$ 38,514
560	Rub Rail (Platform Level)	400	lf	\$ 18.34	\$ 7,334
561	FRP Deck Joints Sealing	330	lf	\$ 15.25	\$ 5,034
562	Remove Temporary Platform	1	ls	\$ 2,613	\$ 2,613
563	Paint Galv. Platform railing	80	lf	\$ 19.60	\$ 1,568
564	Waterproofing				
565	East & Stairway waterproofing	768	sf	\$ 2.45	\$ 1,885
566	East & Stairway Protection board	768	sf	\$ 1.00	\$ 767
567	Roofing				

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
568	Crossover Roof (Corrugated Metal Roofing)	1,559	sf	\$ 38.69	\$ 60,325
569	Gutters and downspouts (Crossover)	316	lf	\$ 30.21	\$ 9,553
570	Gutters and downspouts (Elevator)	72	lf	\$ 30.21	\$ 2,175
571					
572	Doors				
573	Elevator Machine Room door @ East end platform(3' x 7' SS HM door & Frame w/ hardware)	1	ea	\$ 2,400	\$ 2,400
574	Louvers	383	sf	\$ 43.55	\$ 16,698
575	Finishes				
576	Misc painting	1	ls	\$ 2,616	\$ 2,616
577	Specialties				
578	Way Finding Signage	1	ls	\$ 9,090	\$ 9,090
579	Temporary Signage	1	ls	\$ 1,704	\$ 1,704
580	Tactile/Braille signage	1	ls	\$ 1,363	\$ 1,363
581	"T" logo signage	2	ea	\$ 5,113	\$ 10,226
582	Fire extinguishers	1	ea	\$ 273	\$ 273
583	Elevators				
584	Elevator @ East end of platform				
585	New MBTA standard Traction elevator ass'y (Approx. 24' travel - platform to grade) 5250#, 200fpm	1	ea	\$ 843,494	\$ 843,494
586	Elevator Sump Pump	1	ea	\$ 1,073	\$ 1,073
587	HVAC				
588	Ductless Unit 18.5 MBH	2	ea	\$ 7,251	\$ 14,503
589	Electric Baseboard Heater w/ T-stat & Dbl Pole Disconnect	1	ea	\$ 265	\$ 265
590	Electric Unit Heaters 5KW, ceiling mntd.	1	ea	\$ 2,354	\$ 2,354
591	T-Stats	4	ea	\$ 423	\$ 1,693
592	Design, integration, and testing	1	day	\$ 1,619	\$ 1,619
593	New mechanical exhaust system atop the new headhouse	1	ea	\$ 12,012	\$ 12,012
594	Electrical @ East end platform access w/ Crossover				
595	New main feed from remote location	1	ea	\$ 45,732	\$ 45,732
596	Power supply, feeds, panels and disconnects	1	ea	\$ 15,680	\$ 15,680
597	Duplex GFCI outlet @ pit	1	ea	\$ 699	\$ 699
598	Connection to Sump Pump	1	ea	\$ 1,201	\$ 1,201
599	New feed & disconnect	1	ea	\$ 3,476	\$ 3,476
600	New feed for HVAC unit @ machine room	1	ea	\$ 1,539	\$ 1,539
601	New feed & disconnect for mechanical exhaust system	1	ea	\$ 5,057	\$ 5,057
602	Elevator Pit lighting	2	ea	\$ 824	\$ 1,648
603	Exterior Elevator Lighting	2	ea	\$ 2,855	\$ 5,710
604	Machine Room Lighting	2	ea	\$ 2,033	\$ 4,066
605	Exterior Lighting at Pedestrian Crossover	54	ea	\$ 1,810	\$ 97,723
606	Security Systems @ East end of Platform				
607	New Fire Alarm (new elevator & lobby and cross over)	1	ls	\$ 16,006	\$ 16,006
608	Smoke Detection (new elevators, lobbies and cross over)	1	ls	\$ 1,799	\$ 1,799
609	Access Control (new elevators, lobbies and cross over)	2	loc	\$ 5,040	\$ 10,079
610	Main Lobby & Elevator #3				
611	Demolition				
612	Demolish Exist BOH walls	113	sf	\$ 1.65	\$ 187
613	Remove Existing Door & Frame	4	sf	\$ 165	\$ 660
614	Remove Existing Counter	17	sf	\$ 16.50	\$ 283
615	Remove Existing AHU	1	sf	\$ 880	\$ 880
616	Remove Existing Drop Ceilings	2,302	sf	\$ 1.10	\$ 2,532
617	Paint existing Walls	3,960	sf	\$ 2.18	\$ 8,641
618	New Floor (terrazzo)	2,302	sf	\$ 49.55	\$ 114,068
619	New Ceiling	2,302	sf	\$ 3.27	\$ 7,520
620	Metal Slat Panel Ceiling	490	sf	\$ 21.46	\$ 10,514
621	Architectural Metal Screen	5,293	sf	\$ 225	\$ 1,189,516
622	Wall Tile	1,655	sf	\$ 12.65	\$ 20,934
623	Replace Gyp Ceiling	261	sf	\$ 4.24	\$ 1,105
624	Clean Exposed Concrete Ceiling	856	sf	\$ 2.33	\$ 1,993
625	New Doors	2	ea	\$ 2,287	\$ 4,573
627	Sitework @ Main Lobby & Elevator				
628	Platform stairway foundation excav & BF Main Lobby Foundation	711	cy	\$ 259	\$ 184,467
629	Disposal of excess materials	264	cy	\$ 56.1	\$ 14,817
630	Unclassified Excavation	49	cy	\$ 65.3	\$ 3,213
631	Disposal of excess spoils	49	cy	\$ 106	\$ 5,224
632	N Headhouse - Concrete	91	cy	\$ 205	\$ 18,662
633	N Headhouse - Forms	242	sf	\$ 12.81	\$ 3,097
634	N Headhouse - Reinforcing Steel	13,626	lb	\$ 1.05	\$ 14,261

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
635	N Headhouse - Finish	1,226	sf	\$ 1.87	\$ 2,290
636	BW/BN2 Footing Concrete	33	cy	\$ 205	\$ 6,848
637	BW/BN2 Footing forms	460	sf	\$ 12.81	\$ 5,894
638	BW/BN2 Footing reinforcing steel	5,000	lb	\$ 1.05	\$ 5,233
639	BW/BN2 Footing finish	180	sf	\$ 1.87	\$ 336
640	Elevator 3 - Concrete	23	cy	\$ 205	\$ 4,775
641	Elevator 3- Forms	158	sf	\$ 12.81	\$ 2,024
642	Elevator 3 - Reinforcing Steel	3,486	lb	\$ 1.05	\$ 3,649
643	Elevator 3 - Finish	314	sf	\$ 1.87	\$ 586
644	N Headhouse SOG - Concrete	28	cy	\$ 205	\$ 5,817
645	N Headhouse SOG - Forms	29	sf	\$ 12.81	\$ 378
646	N Headhouse SOG- Reinforcing Steel	4,248	lb	\$ 1.05	\$ 4,445
647	N Headhouse SOG - Finish	1,529	sf	\$ 1.87	\$ 2,856
648	N Headhouse walls - Concrete	89	cy	\$ 205	\$ 18,375
649	N Headhouse walls - Forms	4,858	sf	\$ 12.81	\$ 62,244
650	N Headhouse walls - Reinforcing Steel	13,417	lb	\$ 1.05	\$ 14,042
651	N Headhouse walls - Finish	4,858	sf	\$ 21.40	\$ 103,981
652	N Headhouse SOC - Concrete	57	cy	\$ 205	\$ 11,634
653	N Headhouse SOC - Forms	1,530	sf	\$ 12.81	\$ 19,606
654	N Headhouse SOC- Reinforcing Steel	8,495	lb	\$ 1.05	\$ 8,891
655	N Headhouse SOC - Finish	1,529	sf	\$ 1.87	\$ 2,856
656	N Headhouse SOC- Concrete	14	cy	\$ 205	\$ 2,783
657	N Headhouse SOC - Forms	547	sf	\$ 12.81	\$ 7,009
658	N Headhouse SOC- Reinforcing Steel	2,032	lb	\$ 1.05	\$ 2,127
659	N Headhouse SOC - Finish	546	sf	\$ 1.87	\$ 1,020
660	N Headhouse SOC - Concrete	11	cy	\$ 205	\$ 2,319
661	N Headhouse SOC - Forms	456	sf	\$ 12.81	\$ 5,843
662	N Headhouse SOC- Reinforcing Steel	1,694	lb	\$ 1.05	\$ 1,773
663	N Headhouse SOC - Finish	455	sf	\$ 1.87	\$ 850
664	N Headhouse Stairs - Concrete	4	cy	\$ 229	\$ 960
665	N Headhouse Stairs- Forms	170	sf	\$ 12.81	\$ 2,178
666	N Headhouse Stairs- Reinforcing Steel	629	lb	\$ 1.05	\$ 658
667	N Headhouse Stairs - Finish	169	sf	\$ 1.87	\$ 316
668	N Headhouse Stair walls - Concrete	94	cy	\$ 205	\$ 19,361
669	N Headhouse Stair walls - Forms	5,124	sf	\$ 12.81	\$ 65,658
670	N Headhouse Stair walls - Reinforcing Steel	14,137	lb	\$ 1.05	\$ 14,795
671	N Headhouse Stair walls - Finish	2,562	sf	\$ 21.40	\$ 54,842
672	N Headhouse Stairs - Concrete	4	cy	\$ 229	\$ 960
673	N Headhouse Stairs- Forms	170	sf	\$ 12.81	\$ 2,178
674	N Headhouse Stairs- Reinforcing Steel	629	lb	\$ 1.05	\$ 658
675	N Headhouse Stairs - Finish	169	sf	\$ 1.87	\$ 316
676	N Headhouse Stairs - Concrete	4	cy	\$ 229	\$ 960
677	N Headhouse Stairs- Forms	170	sf	\$ 12.81	\$ 2,178
678	N Headhouse Stairs- Reinforcing Steel	629	lb	\$ 1.05	\$ 658
679	N Headhouse Stairs - Finish	169	sf	\$ 1.87	\$ 316
680	N Headhouse Stair walls - Concrete	79	cy	\$ 205	\$ 16,263
681	N Headhouse Stair walls - Forms	4,304	sf	\$ 13	\$ 55,152
682	N Headhouse Stair walls - Reinforcing Steel	11,875	lb	\$ 1	\$ 12,428
683	N Headhouse Stair walls - Finish	2,152	sf	\$ 21	\$ 46,067
684	N Headhouse Stairs - Concrete	4	cy	\$ 229	\$ 960
685	N Headhouse Stairs- Forms	170	sf	\$ 13	\$ 2,178
686	N Headhouse Stairs- Reinforcing Steel	629	lb	\$ 1	\$ 658
687	N Headhouse Stairs - Finish	169	sf	\$ 2	\$ 316
688	N Headhouse Retaining Wall Ftng - Concrete	30	cy	\$ 205	\$ 6,089
689	N Headhouse Retaining Wall - Forms	180	sf	\$ 13	\$ 2,306
690	N Headhouse Retaining Wall - Reinforcing Steel	4,446	lb	\$ 1	\$ 4,653
691	N Headhouse Retaining Wall - Finish	534	sf	\$ 2	\$ 996
692	N Headhouse Retaining Wall walls - Concrete	31	cy	\$ 205	\$ 6,458
693	N Headhouse Retaining Wall walls - Forms	1,733	sf	\$ 13	\$ 22,199

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
694	N Headhouse Retaining Wall walls - Reinforcing Steel	4,715	lb	\$ 1	\$ 4,935
695	N Headhouse Retaining Wall walls - Finish	1,733	sf	\$ 21	\$ 37,084
696	Platform elevator foundation walls @ Elevator #3	35	cy	\$ 203	\$ 7,154
697	Elevated Concrete Slabs @ Elevator #3	422	sf	\$ 14	\$ 5,759
698	Pedestrian Bridge SOS - Concrete	33	cy	\$ 205	\$ 6,689
699	Pedestrian Bridge SOSD - Forms	1,759	sf	\$ 9	\$ 16,029
700	Pedestrian Bridge SOC- Reinforcing Steel	3,907	lb	\$ 1	\$ 4,089
701	Pedestrian Bridge SOC - Finish	1,758	sf	\$ 2	\$ 3,284
702	Pedestrian Bridge Truss Expansion Bearing	2	ea	\$ 886	\$ 1,771
703	Pedestrian Bridge Truss Fixed Bearing	2	ea	\$ 886	\$ 1,771
721	Structural Steel (Galv.) for new Elevator Shaft & Machine room roof	127,327	lb	\$ 5.31	\$ 676,320
722	Metal floor form decking	842	sf	\$ 25.58	\$ 21,552
723	Metal Roof Decking	150	sf	\$ 15.22	\$ 2,283
724	Column anchors to existing base slab	48	ea	\$ 240	\$ 11,543
725	Elevator Hoisting Beam (Galv.)	1	ls	\$ 3,659	\$ 3,659
726	Galvanized Steel Sump pit grating w/ Galv. steel angle embeds	1	ls	\$ 409	\$ 409
727	Galvanized Steel Ladders @ Elevator Pit	6	vlf	\$ 250	\$ 1,500
728	SS Wire mesh 4@ 8'-0" x 1'-0" SS wire on frame	32	sf	\$ 62.49	\$ 2,000
729	Elevator Metal Roof Decking (Galv.)	180	sf	\$ 40.70	\$ 7,326
730	Stairs to Platform Access corridor	96	rsr	\$ 621	\$ 59,601
731	Stairs from lower parking lot level	19	rsr	\$ 621	\$ 11,796
732	Stairs to Upper Parking Lot	34	rsr	\$ 621	\$ 21,109
733	Intermediate stair landing & decking	144	sf	\$ 135	\$ 19,428
735	SS Handrail	664	lf	\$ 73.85	\$ 49,074
736	Galv. Steel platform guard rail - w/ vertical pickets	240	lf	\$ 324	\$ 77,716
737	Paint Galv. Platform railing	240	lf	\$ 19.60	\$ 4,704
738	Waterproofing				
739	Main Lobby & Elevator waterproofing	1,728	sf	\$ 2.45	\$ 4,241
740	Replace WP @ Grafton Bridge	2,867	sf	\$ 2.64	\$ 7,562
742	Remove waterproofing @ Grafton Bridge	2,867	sf	\$ 0.91	\$ 2,603
743	Roof Drain	2	ea	\$ 588	\$ 1,175
744	Gutters and downspouts	172	lf	\$ 30	\$ 5,184
745	Openings				
746	Doors				
747	Elevator Machine Room door @ main lobby (3' x 7' SS HM door & Frame w/ hardware)	1	ea	\$ 2,400	\$ 2,400
748	Finishes				
749	Misc painting	1	ls	\$ 2,616	\$ 2,616
750	Specialties				
751	Way Finding Signage	1	ls	\$ 31,530	\$ 31,530
752	Temporary Signage	1	ls	\$ 1,363	\$ 1,363
753	Tactile/Braille signage	1	ls	\$ 5,454	\$ 5,454
754	"T" logo signage	2	ea	\$ 5,113	\$ 10,226
755	Fire extinguishers	3	ea	\$ 273	\$ 818
756	Elevators				
757	Elevator @ Main Lobby access				
758	New MBTA standard Traction elevator ass'y (Approx. 36' travel - platform to grade) 5250#, 200fpm	1	ea	\$ 889,881	\$ 889,881
759	Fire Suppression				
760	Demo Fire protection piping	42	lf	\$ 74.36	\$ 3,105
761	3/4" Black Steel Pipe	14	lf	\$ 78.80	\$ 1,139
762	1" Black Steel Pipe	8	lf	\$ 92.52	\$ 712
763	1-1/4" Black Steel Pipe	4	lf	\$ 60.44	\$ 259
764	1-1/2" Black Steel Pipe	3	lf	\$ 71.31	\$ 207
765	2" Black Steel Pipe	9	lf	\$ 85.75	\$ 737
766	Chrome Pendant Sprinkler head	9	ea	\$ 302	\$ 2,717
767	HVAC				
768	Ductless Unit 18.5 MBH	2	ea	\$ 7,251	\$ 14,503
769	Electric Baseboard Heater w/ T-stat & Dbl Pole Disconnect	1	ea	\$ 265	\$ 265
770	Electric Unit Heaters 5KW, ceiling mntd.	1	ea	\$ 2,354	\$ 2,354
771	T-Stats	4	ea	\$ 423	\$ 1,693

ESTIMATE DETAILS

Line Item	Description	Qty	Unit	Unit Cost	Direct Cost Subtotal
772	Design, integration, and testing	1	day	\$ 1,619	\$ 1,619
773	HVAC Demo -Main Lobby	1	ls	\$ 8,466	\$ 8,466
774	AHU -7	1	ea	\$ 19,337	\$ 19,337
775	HVAC Duct	701	lb	\$ 6.38	\$ 4,474
776	REF -1	1	ea	\$ 6,363	\$ 6,363
777	VFD	1	ea	\$ 7,940	\$ 7,940
778	BMS Network	1	ea	\$ 6,135	\$ 6,135
779	Refrigerant line set 25ft	1	ea	\$ 162	\$ 162
780	Cond. Drain 20ft	1	ea	\$ 35.28	\$ 35
781	Concrete core and sleeve for line set & condensate	2	ea	\$ 14.11	\$ 28
782	Condensate pump for AHU	1	ea	\$ 348	\$ 348
783	Diffuser	3	ea	\$ 438	\$ 1,315
784	T-Stats	1	ea	\$ 423	\$ 423
785	HVAC Controls	1	ea	\$ 23,860	\$ 23,860
786	New mechanical exhaust system atop the new headhouse	1	ea	\$ 12,012	\$ 12,012
787	Elevator Sump Pump	1	ea	\$ 1,073	\$ 1,073
799	Communications @ Main Lobby				
800	New communications feed	1	ea	\$ 2,841	\$ 2,841
801	New Intercom and notifications systems at new elevator	1	ea	\$ 2,841	\$ 2,841
802	Security Systems @ Main Lobby				
803	New fire alarm and security connection feed	1	ls	\$ 45,732	\$ 45,732
804	New fire alarm graphics annunciator panel	1	ls	\$ 37,239	\$ 37,239
805	New Fire Alarm (new elevator & main lobby)	1	ls	\$ 16,006	\$ 16,006
806	Smoke Detection (new elevator & main lobby)	1	ls	\$ 1,799	\$ 1,799
807	Access Control (new elevator & main lobby)	2	loc	\$ 5,040	\$ 10,079
808	Transportation Work				
809	Track Demolition	3,276	tf	\$ 98	\$ 321,014
810	Furnish & Install New Track 132# w/CWR	1,787	tf	\$ 425	\$ 758,756
811	Furnish & Install New Station Track 132# w/CWR	1,669	tf	\$ 425	\$ 708,689
812	Unclassified Excavation	4,540	cy	\$ 65.33	\$ 296,605
813	Gravel fill	225	cy	\$ 175	\$ 39,395
814	Dispose of rock /Ballast	10,282	cy	\$ 65.33	\$ 671,767
815	Geo Fabric	64,330	sf	\$ 2.57	\$ 165,207
816	Sub-ballast	2,866	tn	\$ 33.16	\$ 95,039
817	Ballast	11,019	tn	\$ 56.44	\$ 621,907
818	Grade Crossing Rubber Rail Seals (1'W)	200	lf	\$ 153	\$ 30,708
819	Track Signal and Communications				
820	Manholes	2	ea	\$ 5,928	\$ 11,855
821	Wayside Equipment Installation & wiring	2	ea	\$ 3,410	\$ 6,821
822	Signal Power Service Equipment Installation & wiring	1.00	ea	\$ 3,410	\$ 3,410
823	Conduit and Cables including Civil	1,600	lf	\$ 64.76	\$ 103,621
824	New Automatic Signals	1	ls	\$ 14,543	\$ 14,543
825	Testing and Tie-in Wiring at Signals	1	ls	\$ 2,272	\$ 2,272
826					
827	Total Direct Estimated Cost of Construction				\$ 29,754,028

Worcester Union Commuter Rail Station

WORCESTER, MASSACHUSETTS

COST GROWTH REPORT

WORK Breakdown	DESCRIPTION	75% Design Level Estimate	5/24/2021 100% Design Level Estimate	9/1/2021 100% Design Level Estimate	9/1/2021 Diff between 75% & 100%	% Diff	Remarks
3	PLATFORM	\$ 7,046,604	\$ 7,386,812	\$ 8,632,209	\$ 1,585,605	22.50%	Design Refinement.
3	WEST PLATFORM	\$ 2,771,659	\$ 1,856,189	\$ 2,153,740	\$ (617,919)	-22.29%	Design Refinement.
3	EAST PLATFORM	\$ 3,863,198	\$ 2,522,925	\$ 2,785,372	\$ (1,077,826)	-27.90%	Design Refinement.
3	MAIN LOBBY	\$ 5,379,891	\$ 3,931,327	\$ 4,549,246	\$ (830,645)	-15.44%	Design Refinement.
3	ELECTRICAL	\$ 2,005,708	\$ 2,114,645	\$ 2,388,277	\$ 382,569	19.07%	Design Refinement.
4	SITWORK	\$ 2,975,570	\$ 2,022,067	\$ 2,284,039	\$ (691,531)	-23.24%	East Side track Drainage removed. Phasing Updates.
5	TRACKWORK	\$ 4,564,197	\$ 3,206,459	\$ 3,709,087	\$ (855,110)	-18.74%	CP44 removal and design refinement. Phasing Updates
6	SIGNALING & COMMUNICATIONS	\$ -	\$ 126,282	\$ 142,523	\$ 142,523	100.00%	Previously combined with Trackwork
	Subtotal Direct Cost Construction	\$ 28,606,827	\$ 23,166,707	\$ 26,644,492	\$ (2,104,858)	-7.36%	
1 & 2	General Conditions / General Requirements	\$ 3,006,010	\$ 3,088,621	\$ 3,109,535	\$ 103,525	3.44%	Project duration
	Overhead & Profit	\$ 3,372,933	\$ 2,817,186	\$ 3,203,704	\$ (169,229)	-5.02%	Direct Cost
	General Liability / Bonds / Permits	\$ 1,392,533	\$ 1,168,869	\$ 1,333,261	\$ (59,272)	-4.26%	Direct Cost
	Escalation (TO MIDPOINT OF CONSTRUCTION) & Market conditions	\$ 2,652,341	\$ 2,520,291	\$ 3,078,330	\$ 425,989	16.06%	Project duration
	Design Contingency	\$ 3,903,065	\$ 982,850	\$ 1,121,080	\$ (2,781,985)	-71.28%	Design level - 7% Contingency reduction
	Allowances	\$ 6,636,000	\$ 5,510,000	\$ 5,984,000	\$ (652,000)	-9.83%	Project duration.
	TOTAL CONSTRUCTION COST	\$ 49,570,000	\$ 39,255,000	\$ 44,474,000	\$ (5,096,000)	-10.28%	



October 12, 2021

Mr. Anthony DeDominicis
Senior Director of Commuter Rail Programs
MBTA Capital Delivery
10 Park Plaza, Suite 5170
Boston, MA 02116

**Re: MBTA Contract No. X72CN01 Worcester Union Station Accessibility Improvements
Bid Award Recommendation**

Dear Mr. DeDominicis:

HDR has received and reviewed the results of the MBTA contract No. X72CN01 bids that were opened by the MBTA on October 7th, 2021. There were seven bids received by the MBTA ranging from a low of \$44,421,176.00 to a high of \$69,838,587.00.

The estimated cost for this contract as compiled by HDR and Keville Enterprises in the Engineer's estimate totaled \$44,474,000.00. The results, along with the Engineer's Estimate are summarized in the following table.

	Contract No. X72CN01 Bid Results	10-7-2021
Rank	Bidder Name	Bid Amount
1	Judlau Contracting, Inc.	\$44,421,176.00
ENG	HDR Engineering, Inc. (Engineer's Estimate)	\$44,474,000.00
2	J.F. White Contracting Co.	\$46,995,000.00
3	Skanska USA Civil Northeast, Inc.	\$49,312,150.00
4	SPS New England, Inc.	\$49,366,000.00
5	Manafort Brothers Incorporated	\$51,849,000.00
6	Union Station Builders	\$58,600,000.00
7	The Middlesex Corp.	\$69,838,587.00

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(617) 357-7700



The average of the seven bids was \$50,090,554.33, which is 12.6% higher than the Engineer's estimate. Excluding the two highest bids, which are 32% and 57% higher respectively, the average of the five remaining bids was \$48,388,665, which is 8.8% higher than the Engineer's estimate.

The average of the two lowest bids was \$45,708,088 which is 2.7% higher than the Engineer's estimate, while the two lowest bids were within 5.7% of each other. Based on HDR's review of all bid documents, we find that Judlau Contracting, Inc was the lowest responsible and eligible bidder with an estimated bid of \$44,421,176.00. This bid is 0.12% or \$52,824 lower than the Engineer's estimate and 5.7% or \$2,573,824 lower than the second lowest bidder.

The variances between the low bidder's prices and the Engineer's estimate are summarized below:

- Line Item 0130.130 Construct Passenger Station Facilities – Decrease of (\$2,311,044)
- Line Item 021.990 Site Work – Increase of \$2,613,723
- Line Item 0290.00 Railroad Work – Decrease of (\$2,051,918)
- Line Item 1649.991 Signaling and Communications – Increase of \$1,696,414

It is therefore HDR's recommendation that the MBTA accept the low bid for MBTA Contract No. X72CN01 and make an award to Judlau Contracting, Inc. for a total contract price of \$44,421,17.00 as bid. This recommendation is based upon the Contractor accepting and meeting all of the terms and conditions of the MBTA's Contract Documents.

Please advise if you require any further information on this matter.

Sincerely,

HDR Engineering, Inc.

A handwritten signature in blue ink, appearing to read 'Eric DiVirgilio', with a stylized flourish at the end.

Eric DiVirgilio, PE
Associate Vice President
New England Rail/Transit Department Manager



X72CNO1: Worcester Union Station Risk Assessment Report

JULY 10, 2020

Prepared by:
Patrick Engineering



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Appendices:

Appendix A – Risk Register

Appendix B – Risk Guide

Appendix C – Schedule Risk Ranking

Appendix D – Cost Risk Ranking

Appendix E – Risk Mapping

Appendix F – Base Cost Estimate

Appendix G – Estimate Uncertainty

Appendix H – Phasing Plan

Appendix I – P6 Schedule

Appendix J – Risk Workshop Attendees



Executive Summary

Project Description:

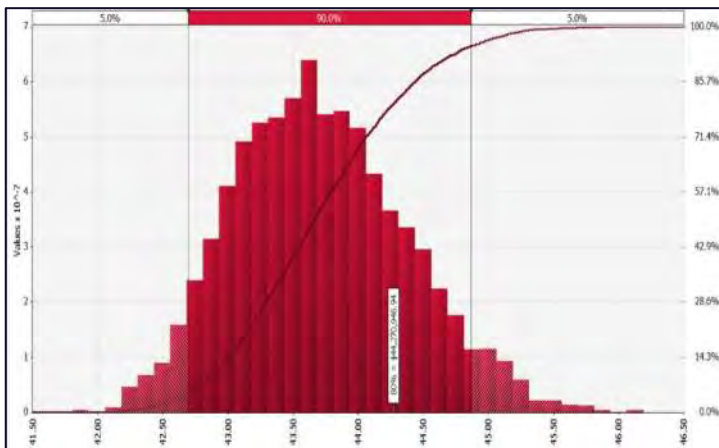
800ft long center island platform with a full length platform canopy; three elevators; a pedestrian bridge; two accessible plazas / landings; an accessible walkway with fencing; a retaining wall; a drainage system; parking lot / site improvements with a passenger drop off area; three elevator machine rooms; an electrical room with associated electrical equipment; a communications room with associated communications equipment; a backup generator; a mechanical room with an air-handling unit and associated ductwork and piping; an Access Corridor; a lighting system; a variable message system; signage; CCTV cameras; speakers; and other features and elements necessary to create a fully accessible and functional commuter rail station. In addition, 1450 track feet of Station Track full depth reconstruction and approximately 1850 track feet of Track 1 full depth reconstruction.

Deterministic Cost Estimate:

The Deterministic Cost Estimate is the estimate prior to uncertainty and risks being applied. This serves as the starting point of the cost risk analysis. The Deterministic cost estimate value was **\$43,705,000**. This number includes design contingency of \$1,840,341 and a risk allowance of \$3,865,000.

Cost Risk Results:

Risks were applied to the Deterministic Cost Estimate and a Monte Carlo simulation was performed to calculate a cost that the project is 80% likely not to exceed. This value is known as P80. The analysis results yielded a total cost of **\$44,270,946** at an 80% probability with a contingency of **\$4,406,409** or **11%** of Construction costs.



Work Constraints and Outages:

Due to the close proximity of the site to Worcester Union Station and required construction work in the ROW, there are a number of constraints and proposed outages designed to minimize the impact to MBTA Operations.

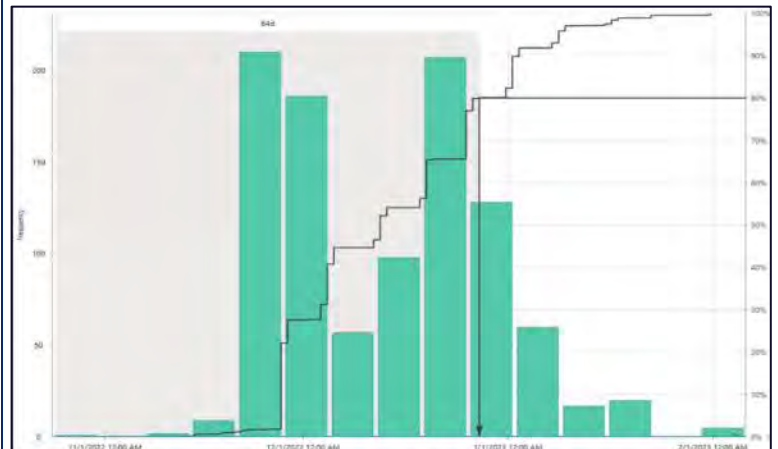
- Winter restriction for track construction, work is not allowed from December 1 to March 15
- Weekend outage work schedule from Saturdays, 1:30 AM to Mondays, 3:30 AM. The CTD requires four (4) weekend outages
- Night Work for construction on the tracks and ROW

Deterministic Contract Time Determination Schedule (CTD):

The Deterministic Schedule is the schedule prior to uncertainty and risks being applied. The Deterministic schedule is used to validate construction durations. The original CTD had a mobilization date of **10/15/2020** and a final completion date of **10/24/2022**. The construction duration of the project is **739** calendar days.

Schedule Risk Results:

Risks were applied to the Deterministic CTD Schedule and a Monte Carlo simulation was performed to calculate a schedule duration that the project is 80% likely not to exceed. This value is known as P80. The schedule analysis identified a completion date of **12/27/2022** which represents a contingency of **64** days based on the risk adjusted schedule.





1. Overview

Patrick Engineering performed a quantitative risk analysis on the Worcester Union Station Accessibility Project. The analysis reviewed cost and schedule risks based on the 100% Design. The analysis identified risks and the potential impacts should the risk occur. A quantitative risk analysis was performed to calculate the appropriate level of project cost and schedule contingency.

The purpose of this analysis was to:

- Analyze and document the potential range in both project cost and schedule due to risks or opportunities
- Review project phasing, milestones, budgets, and contingencies
- Review and validate the project's plans and estimates
- Maximize the likelihood of meeting on-time and on-budget goals by identifying potential risks
- Identify areas of risk that may require development of targeted mitigation strategies for anticipated threats
- Ensure transparency, integrity, and accountability throughout the life cycle of the project
- Encourage proactive risk planning

A comprehensive list of risks has been included in a Risk Register to serve as a guide for risks associated with this project (refer to the attached Risk Register in Appendix A as you review the report).

Project Description

The scope of the project consists of an 800ft long center island platform with a full length platform canopy; three elevators with lobby spaces at each level; three stairs with roofs and enclosures; a pedestrian bridge; two accessible plaza landings; an accessible walkway with fencing; a retaining wall; a drainage system; parking lot site improvements with a passenger drop off area; three elevator machine rooms; an electrical room with associated electrical equipment; a communications room with associated communications equipment; a backup generator; a mechanical room with an air-handling unit and associated ductwork and piping; an Access Corridor; a lighting system; a variable message system; signage; CCTV cameras; speakers; and other features and elements necessary to create a fully accessible and functional commuter rail station. In addition, 1450 track feet of Station Track full depth reconstruction and approximately 1850 track feet of Track 1 full depth reconstruction. These improvements will be made while existing MBTA operations continue to service Worcester Union Station.

The construction work is divided into three phases. A detailed phasing plan can be found in Appendix H.

Phase 1 Summary: Includes but is not limited to; start of demo in Union Station, east end elevator pit work, retaining wall, temporary mini high platform between station and track 1, bringing pedestrian walkway up to code, and installing a temporary fence.

Phase 2 Summary: Continue demo inside Union Station, modify existing storage room to make connection, construct machine room, construct elevator and west stair, install power feeds and run



power, install new subgrade under track 1, demo of station track, install foundation for western section of new platform, apply waterproofing to portion of storage room roof that is under the track, install precast platform footings at Grafton St. bridge, install western portion of center platform.

Phase 3 Summary: Complete civil work, install roof and screen enclosure, lights, signs, communication system, and perform elevator testing, install permanent fence and construct permanent accessible pedestrian walkway, install elevator and elevator machine room, install steel framing and overhead pedestrian bridge, install drainage upgrades during parking lot, shift boarding to newly opened portion of platform on track 1.

2. Procedure

A Risk Analysis Team was assembled that consisted of Key Stakeholders, Project Team Members, and Subject Matter Experts. The Risk Analysis Team was assembled to participate in the risk workshop. During the workshop, the team's responsibilities included:

- Utilizing the collective understanding of the project to identify the issues that may affect the status of the project.
- Using information obtained from project scope, cost, and schedule validation, to develop a list of risks and/or opportunities that are likely to affect the project under consideration
- Reviewing the project scope, cost estimate, schedule, and assessing the identified risks for their impact and likelihood of occurrence
- Preparing a list of risks ranked according to their effect on the project and recording them in a Risk Register.

The Risk Analysis Team utilized the following documents to develop the Risk Register and conduct the risk assessment:

- 100% Drawings
- 100% Contract Specifications
- 100% Deterministic CTD Schedule
- 100% Basis of schedule Assumptions
- 100% Deterministic Construction Cost Estimate
- 100% Basis of Estimate and Assumptions

These documents were used to assess the likelihood of occurrence and risk impacts captured in the Risk Register. The Risk Analysis Team used a five-point scale that ranged from Very Low to Very High to assess the likelihood of occurrence and impact of each risk. The Risk Register Guide in Appendix B provides the scale that was used to identify qualitative and quantitative values for each risk.

A Monte Carlo Simulation was performed to determine the most likely project outcome based on the state of the identified risks and most current project information. This included probabilistic estimates of project cost and schedule, which considers all risks and uncertainties. A probabilistic value is a range of possible values for project cost and duration rather than a single point estimate, which is known as deterministic.



3. Five Focus Areas of Risk

During the risk workshop, the Risk Analysis Team performed an initial assessment and ranked five focus areas within the project based on the perception of risk, cost, and schedule volatility. The assessment was done by comparing each of five focus areas to determine a hierarchical ranking for each. This exercise was created to get the group's initial perception of where potential risk is within the project and identify where the team should be focusing their attention. The results of the team's initial assessment can be seen in Figure 1. The 5 Focus Areas of Risk are identified below.

Five Focus Areas of Risk (5FA):

Schedule - Relates to calendar driven aspects of the project.

Technical - Includes all of the typical engineering requirements.

Context - Encompasses the external influences that have an impact on the project development and progress.

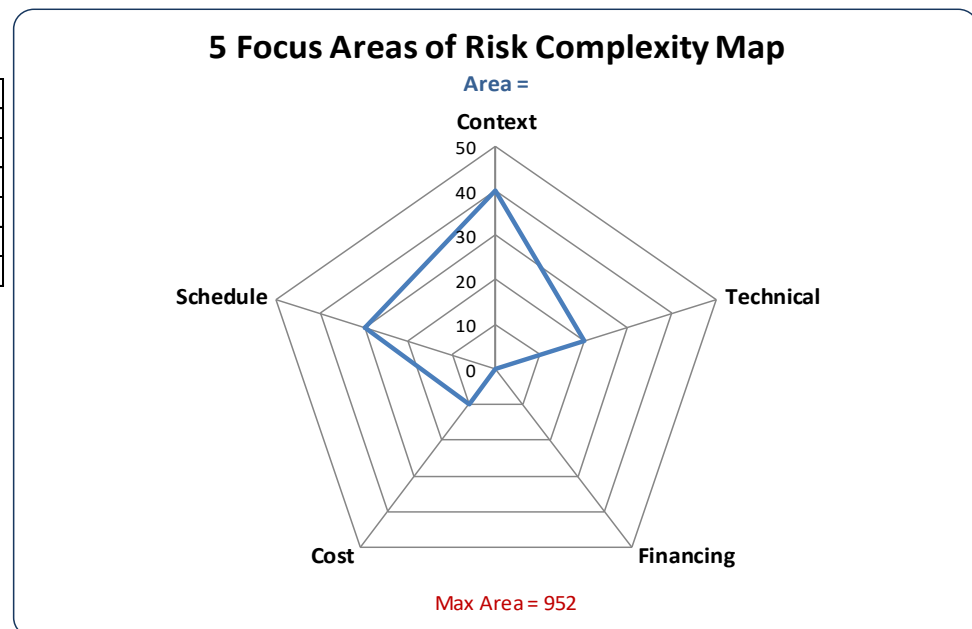
Cost - Involves quantifying the scope of work in dollar terms.

Financing - Relates to the need for understanding the fact that the manner in which the project is funded has an impact on the final scope of work.

Figure 1: 5 Focus Areas of Risk Complexity Map

Contract # X72CN01
Project Name: Worcester Union Station Accessibility

Context	40
Technical	20
Financing	0
Cost	10
Schedule	30
Area	713





The complexity ranking in Figure 1 identifies the Focus Areas in order from most complex to least based on the team's initial assessment. The 5 Focus areas are listed in descending order: Context, Schedule, Technical, Cost, and Financing.

Key risks to the project were identified and assigned to the 5 Focus Areas during the risk workshop. The discussions revolved around 38 risk items associated with the project and captured in the Risk Register. Figure 2 shows how each of the identified risks were assigned to the 5 Focus Areas versus the scores based on the team's initial assessment.

Figure 2: 5 Focus Area risk assignments

5 Focus Areas	Total Risk Identified	5FA Initial Score
Context	14	40
Schedule	15	30
Technical	7	20
Cost	2	10
Financing	0	0
Total	38	100

It is interesting to note, that while the initial ranking of the 5 focus Areas of Risk identified "Context" as having the most potential for risk, "Schedule", had the most risks assigned to it. The general consensus of the Risk Team was that "Context" is strongly correlated to "Schedule" due to the phasing and potential impacts to passengers and MBTA Operations.

4. Schedule Risk Analysis

4.1 Deterministic CTD Schedule

The deterministic CTD schedule serves as the starting point from which schedule risks and schedule uncertainty is assessed. Additionally, it plays a key role in risk modeling for time related costs and schedule impacts. The base schedule impacts are established from validated inputs gathered during the risk workshop and captured in the Risk Register. The Risk Analysis Team used the CTD schedule that was based on the 100% design to assess the overall critical path.

The first step in the schedule risk analysis process was to review the critical path and determine if it accurately reflected the critical activities necessary to achieve the calculated project completion dates in the deterministic schedule. The Risk Analysis Team's evaluation included but was not limited to reviewing activity durations, phasing, relationships, lags, calendars, and constraints to understand how they impacted the critical path.

4.2 Critical Path

To assess the quantitative impacts of the schedule risks, each risk needed to be assigned to the deterministic CTD schedule and a Monte Carlo simulation run to determine the most likely duration. Not all risks on the Risk Register were assigned to an activity in the deterministic schedule. Some risks were identified as duplicates or similar, while others were deemed best modeled using a schedule uncertainty factor. The full list of schedule risk assignments can be found in Appendix E.



As risks are applied to the Deterministic CTD schedule and a Monte Carlo simulation is executed, the critical path may change as the schedule goes through multiple iterations of calculation. The impact of a risk in a quantitative analysis is directly dependent on the impact the risk has to the critical path of the schedule. The critical path is running through subcontractor approval, temporary platform procurement and construction, micropiles procurement, construction of the temporary platform, elevator 1 construction, West platform construction along with certification of occupancy, and East platform construction with certification of occupancy. The critical path of the Deterministic CTD schedule is shown in Figure 3.

Figure 3: Deterministic Critical Path



4.3 Schedule Uncertainty Factor

It is recognized that there are several factors that may determine the level of efficiency during construction. Factors such as: site access, weather, environmental restrictions, and material deliveries, are all examples of issues that can influence productivity. The diversity of productivity rates is what drives uncertainty into a project. The Risk Analysis Team developed two groups to represent different levels of productivity uncertainty. These uncertainty rates were applied to specific activities where it was determined that productivity may deviate from what was estimated in the deterministic CTD schedule. The higher the uncertainty rate, the lower the assumed production. For example, if the uncertainty rate is 10% higher than planned or 110%, the task where this rate is applied will take 10% longer.

Each type of schedule uncertainty factor was applied where there appeared to be more variability in the production rate than what was assumed in the deterministic CTD schedule. Uncertainty rates were applied to activities related to night work, and weekend work. The uncertainty range is identified in Figure 4.



Figure 4: Productivity Uncertainty Rates

Uncertainty Code	Uncertainty Name	Uncertainty Range
U-Night	Night Work Inefficiency	-5% to +20%
U-WE	Weekend Work inefficiency	-5% to +10%

4.4 Qualitative Schedule Risk Analysis

The Risk Analysis Team was able to identify, classify, and rank schedule risk using qualitative methods. During the risk workshop the Risk Analysis Team performed a systematic evaluation of the uncertainty of the scope and duration of the potential schedule impacts. Based on this evaluation risks were ranked according to the designated risk score for each. The schedule risks ranked in descending order by the qualitative risk score can be found in Appendix C.

4.5 Risk Results (Schedule)

Following the risk workshop, a Monte Carlo Simulation was executed. Below are the risk-based schedule outputs of the risk analysis.

Top Schedule Risks

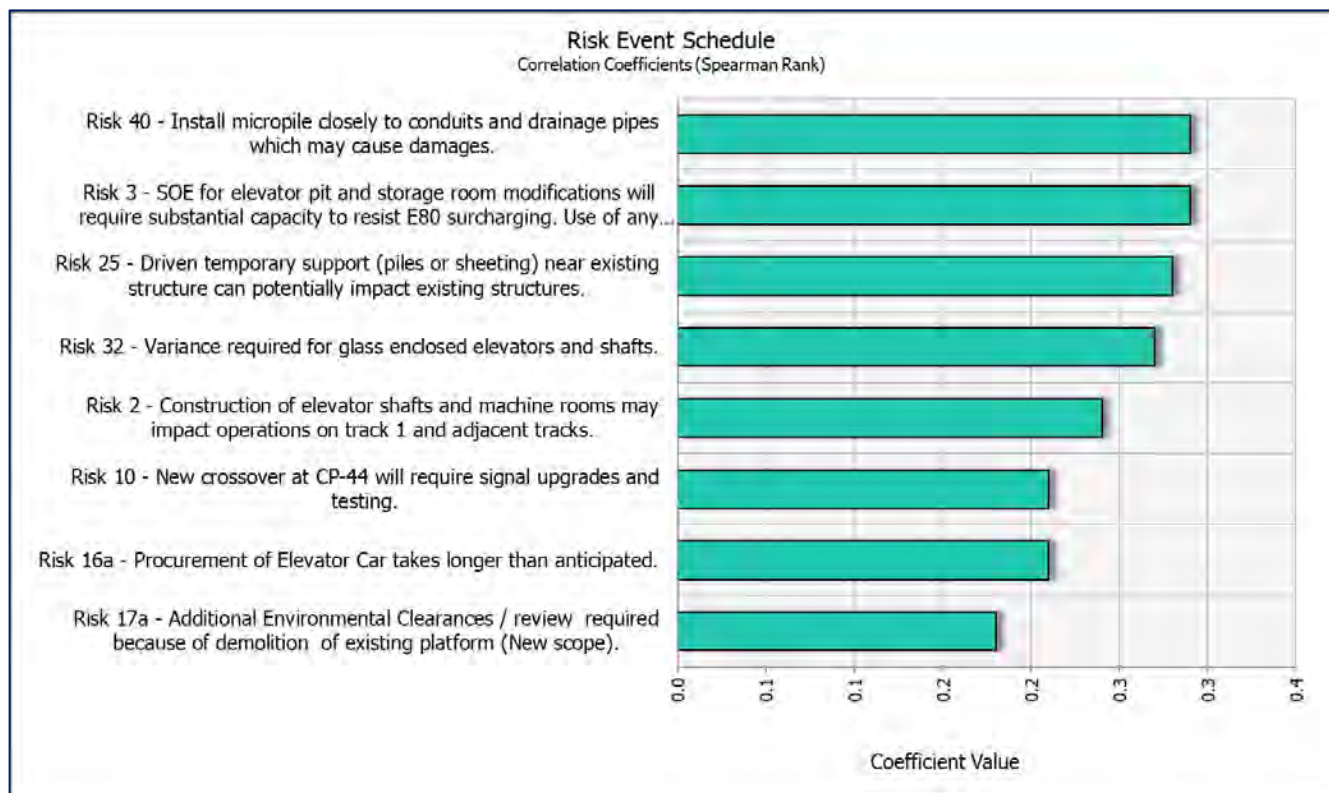
Once the schedule risks were identified using a qualitative approach the probability and impact of the risk occurrence was assessed using a Monte Carlo simulation. Each schedule related risk was added to the deterministic CTD schedule and assigned to a relevant activity. The Monte Carlo simulation was executed to determine the actual impact on critical activity durations in the deterministic construction schedule. Each risk was ranked in a tornado chart in descending order from top to bottom, where the top risk has the most influence on the simulated project completion date.

Based on the Monte Carlo simulation the top five schedule risks are:

1. **Risk No. 40** – Install micropile closely to conduits and drainage pipes which may cause damages.
2. **Risk No. 03** – SOE for elevator pit and storage room modifications will require substantial capacity to resist E80 surcharging. Use of any tiebacks will be limited due to track being retained, and possible interference with retaining wall.
3. **Risk No. 25** – Driven temporary support (piles or sheeting) near existing structure can potentially impact existing structures.
4. **Risk No. 32** – Variance required for glass enclosed elevators and shafts.
5. **Risk No. 02** – Construction of elevator shafts and machine rooms may impact operations on track 1 and adjacent tracks.



Figure 5: Simulated Schedule Risk Ranking



The top risks impacting the schedule completion date are representative of the expected critical path. The majority of the risks directly impacts the Right of Way (ROW) and has been assigned a specific night or weekend calendar. These activities are critical due to the fact that the station will be operational for the duration of construction. Maintaining MBTA operations requires close and constant coordination with stakeholders.

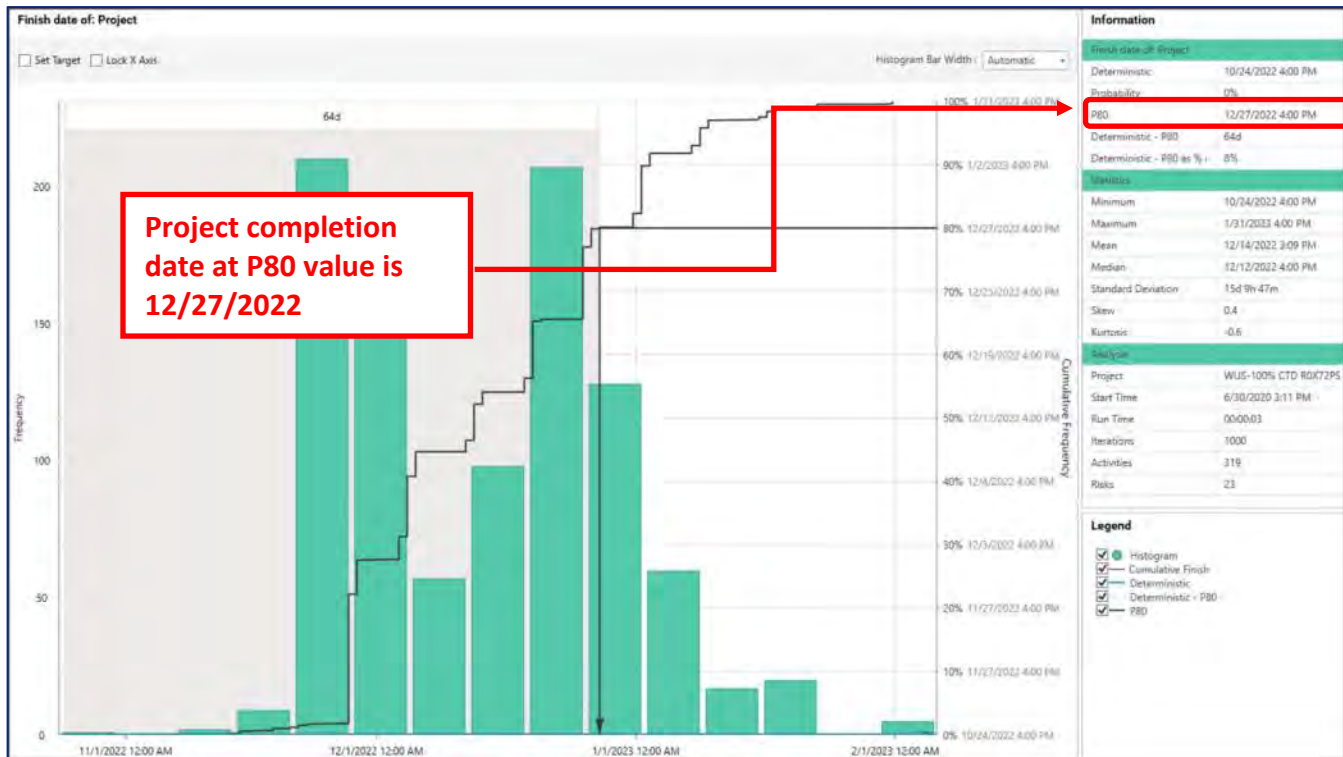
Risk-Based Schedule Results

The deterministic CTD schedule for the Worcester Union Station Accessibility Project had a final completion date of October 24, 2022 and a total construction duration of 739 calendar days. This schedule represents the ideal case for construction, without the addition of any risks or uncertainty factors.

At 80% probability (P80), the Monte Carlo Simulated schedule resulted in a project completion date of December 27, 2022 and a total duration of 803 calendar days. This was an increase of 64 calendar days. The results can be seen in Figure 6.



Figure 6: Project Schedule Impact Simulation – 80th Percentile



5. Cost Risk Analysis

5.1 Deterministic Base Cost Estimate

The cost risk analysis process is a “bottom-up” analysis of cost impacts at the estimate level. Once project risks are identified, their quantified impacts are added to the base costs to estimate a new risk-adjusted-final-cost through Monte Carlo simulation. The base cost estimate is also known as the deterministic cost estimate. The cost risk analysis process therefore requires a base cost estimate as a starting point for the assessment, as well as additional assumptions and supporting data for constructing a model to generate risk-adjusted outcomes. This section presents the base cost data and assumptions applied to the cost risk model. The Deterministic Base Cost Estimate can be found in Appendix F.



Figure 7: Deterministic Base Cost Estimate

Estimate Cost Summary	Value
General Conditions	\$ 2,662,441
General Requirements	\$ 190,335
Sitework	\$ 2,191,277
Platform	\$ 7,953,725
West Platform	\$ 2,119,458
East Platform	\$ 3,012,010
North Headhouse	\$ 5,113,859
Trackwork	\$ 3,806,728
Electrical	\$ 2,165,035
Total	\$ 29,214,868
Escalation to mid-point of construction escalation rate 5.2% per year	\$ 3,127,847
Bond, Insurance, Permitting	\$ 1,313,192
OH & Profit	\$ 3,150,916
Design Contingency	\$ 1,840,341
Total	\$ 9,432,296
Allowances	
TRAFFIC OFFICERS SERVICES**	\$ 283,000
WEEKEND SUBSTITUTE TRANSPORTATION	\$ 535,000
EXISTING SITE UTILITIES	\$ 50,000
PEST CONTROL	\$ 25,000
DISPOSAL OF ALLOWANCE QUALIFYING SOILS	\$ 250,000
CONCRETE and STRUCTURAL REPAIRS	\$ 50,000
RISK ALLOWANCE REALLOCATION	\$ 3,865,000
Total	\$ 5,058,000
Grand total	\$ 43,705,164

The base cost estimate serves as the basis against which risks and uncertainties are assessed. It is a starting point for the risk assessment. The estimate was reviewed during the risk analysis. The focus of the review was to look for any omissions or duplications, understand allowances, and identify a range of uncertainty to apply to the base cost estimate to account for variations in unit costs and quantities. Figure 7 shows the base cost estimate.



5.2 Base Cost Uncertainty

Estimating is not an exact science; a cost estimate is only an approximation of the probable costs and is made up of many elements that may not be completely defined at the time the estimate is prepared. As a result, there is uncertainty associated with any estimate. When applied to the project cost estimate this uncertainty establishes the cost range of a project or the elements within that project. A numerical value of uncertainty is in essence, an estimate of the error of tolerance within the quantity or unit price of an item. For any given project, the level of uncertainty is directly related to its position in the project life cycle, i.e. the earlier in the project development process, the greater the uncertainty; conversely, as the project progresses the estimate becomes more defined.

Uncertainty is typically expressed in terms of a percentage (of the quantity and/or unit cost) lower or higher than the base. Uncertainty was discussed during the analysis and a range of uncertainty was applied to specific work items. The overall construction cost was adjusted to show project cost ranges. Figure 8 shows the uncertainty factors that were applied to the base cost estimate.

Figure 8: Base Cost Uncertainty

Estimate Cost Summary	Min %	Most Likely %	Max %
General Conditions	0.95	1.00	1.15
General Requirements	0.95	1.00	1.05
Sitework	0.95	1.00	1.08
Platform	0.95	1.00	1.23
West Platform	0.95	1.00	1.08
East Platform	0.95	1.00	1.05
North Headhouse	0.95	1.00	1.20
Trackwork	0.95	1.00	1.10
Electrical	0.95	1.00	1.05
Escalation to mid-point of construction escalation rate 5.2% per year	0.95	1.00	1.20
Bond, Insurance, Permitting	0.95	1.00	1.20
OH & Profit	0.95	1.00	1.20
Design Contingency	0.00	0.00	0.00
Allowances			
TRAFFIC OFFICERS SERVICES**	0.95	1.00	1.05
WEEKEND SUBSTITUTE TRANSPORTATION	0.95	1.00	1.05
EXISTING SITE UTILITIES	0.95	1.00	1.05
PEST CONTROL	0.95	1.00	1.05
DISPOSAL OF ALLOWANCE QUALIFYING SOILS	0.95	1.00	1.05
CONCRETE and STRUCTURAL REPAIRS	0.95	1.00	1.05
RISK ALLOWANCE REALLOCATION	0.00	0.00	0.00



During the risk analysis, the team reviewed the summary level cost estimate. The review included identifying areas that had potential for variation from the base costs identified in the deterministic cost estimate. The standard uncertainty factor that was applied to the base cost estimate was established at + or – 5%. The areas within the base cost estimate that were determined to be more variable were assigned values of -5% to +8%, -5% to +10%, -5% to +20%, -5% to +23% respectively.

5.3 Escalation Cost

Typically, escalation is removed from the base cost estimate and then reapplied once the risk adjusted schedule impacts are calculated. The deterministic base cost escalation factor was identified in the base cost estimate as 5.2% was applied to the mid-point of construction in the risk adjusted schedule. An uncertainty factor was also applied due to the uncertainty of the markets due to COVID-19 and global tariffs.

5.4 Qualitative Cost Risk Analysis

The Risk Analysis Team was able to identify, classify, and rank cost risks using qualitative methods. During the Risk workshop the Risk Analysis Team performed a systematic evaluation of the uncertainty of the prices, and quantities in the base cost estimate. Based on this evaluation risks were ranked according to the designated risk score for each. The risk scores were calculated by assigning a value using a five-point scale (Very Low, Low, Moderate, High, Very High) and applying the five-point scale to the likelihood of occurrence and the anticipated cost impact. The cost risks ranked in descending order by the qualitative risk scores can be found in Appendix D.

5.5 Quantitative Cost Risk Analysis (Probabilistic Cost Risk Register)

The quantitative cost risk values were calculated by assigning a monetary value to each of the items in the five point scale used for the qualitative assessment. The monetary values assigned to the five point scale are captured in the Risk Workshop Guide in Appendix B. This monetary scale was used on all cost risks. The next step was assigning monetary values based on the five point scale to each risk in the Risk Register. The Risk Register was then converted from single point (deterministic) cost impacts to probabilistic (ranged values) cost impacts using a scale of Min, Most Likely, Max. An example of the probabilistic cost risk register is shown in Figure 9. The full Probabilistic Cost Risk Register for each construction alternative can be found in Appendix D.



Figure 9: Probabilistic Cost Risk Register

Risk ID	SFA	Category	Risk Description	Likelihood	Cost					Risk Score
				%	Min	ML	Max	expected value	risk sim cost	
17	Technical	Construction	Existing platform demolition and waterproofing coordination could have delays.	90%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$270,000	20
17a	Context	Environmental	Additional Environmental Clearances / review required because of demolition of existing platform (New scope).	90%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$270,000	20
15	Context	Real Estate	Utility coordination, construction permit and right of way access.	75%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$225,000	16
16	Schedule	Procurement	Procurement of Elevator components takes longer than anticipated.	50%	\$ 320,000	\$ 400,000	\$ 480,000	\$400,000	\$200,000	15
16a	Schedule	Procurement	Procurement of Elevator Car takes longer than anticipated.	50%	\$ 320,000	\$ 400,000	\$ 480,000	\$400,000	\$200,000	15
39	Context	3rd Party	The work by National Grid on transformer and meter need to get completed to mitigate potential impact on follow on phase.	50%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$150,000	12
36	Schedule	Permitting	Anticipate TCoO required for each of the temporary platforms plus Final.	50%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$150,000	12
7	Schedule	Resources	Keolis Flagging will be required.	50%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$150,000	12
13	Schedule	Resources	RFI Review Schedule.	50%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$150,000	12
12	Schedule	Schedule	Submittal Review Schedule.	50%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$150,000	12
14	Financing	Schedule	NTP Delay, Project is currently state funded but will be applying for federal funding.	50%	\$ 240,000	\$ 300,000	\$ 360,000	\$300,000	\$150,000	12
3	Technical	Construction	SOE for elevator pit and storage room modifications will require substantial capacity to resist E80 surcharging. Use of any tiebacks will be limited due to track being retained, and possible interference with retaining wall.	50%	\$ 160,000	\$ 200,000	\$ 240,000	\$200,000	\$100,000	9

5.6 Probabilistic Cost Estimate

The first step when modeling cost risk is converting the deterministic cost estimate (single point) to act as a probabilistic estimate using estimate ranges rather than static values. This range was based on the uncertainty factors that were developed during the risk analysis. The uncertainty factors captured in the probabilistic cost estimate is applied to the static cost identified in the deterministic cost estimate. A new estimate is created that captures a three-point range, Min, Most Likely, Max. When the Monte Carlo simulation is executed, the model selects a random sample based on the criteria establish by the identified uncertainty factors for each line in the estimate. Figure 10 provides an example of the probabilistic cost estimate.



Figure 10: Example – Probabilistic Cost Estimate

Estimate Cost Summary	Value	Min \$	Most Likely \$	Max \$	Shape Distribution
General Conditions	\$ 2,662,441	\$2,529,319	\$2,662,441	\$3,061,807	\$2,751,189
General Requirements	\$ 190,335	\$180,818	\$190,335	\$199,852	\$190,335
Sitework	\$ 2,191,277	\$2,081,713	\$2,191,277	\$2,366,579	\$2,213,190
Platform	\$ 7,953,725	\$7,556,039	\$7,953,725	\$9,783,082	\$8,430,948
West Platform	\$ 2,119,458	\$2,013,485	\$2,119,458	\$2,289,015	\$2,140,653
East Platform	\$ 3,012,010	\$2,861,409	\$3,012,010	\$3,162,610	\$3,012,010
North Headhouse	\$ 5,113,859	\$4,858,166	\$5,113,859	\$6,136,631	\$5,369,552
Trackwork	\$ 3,806,728	\$3,616,392	\$3,806,728	\$4,187,401	\$3,870,174
Electrical	\$ 2,165,035	\$2,056,783	\$2,165,035	\$2,273,287	\$2,165,035
Total	\$ 29,214,868	\$27,754,125	\$29,214,868	\$33,460,263	\$30,143,085
Escalation to mid-point of construction escalation rate 5.2% per year	\$ 3,127,847	\$2,971,454	\$3,127,847	\$3,753,416	\$3,284,239
Bond, Insurance, Permitting	\$ 1,313,192	\$1,247,532	\$1,313,192	\$1,575,830	\$1,378,852
OH & Profit	\$ 3,150,916	\$2,993,370	\$3,150,916	\$3,781,099	\$3,308,462
Design Contingency	\$ 1,840,341	\$0	\$0	\$0	\$0
Total	\$ 9,432,296	\$7,212,357	\$7,591,955	\$9,110,346	\$7,971,552
Allowances					
TRAFFIC OFFICERS SERVICES**	\$ 283,000	\$268,850	\$283,000	\$297,150	\$283,000
WEEKEND SUBSTITUTE TRANSPORTATION	\$ 535,000	\$508,250	\$535,000	\$561,750	\$535,000
EXISTING SITE UTILITIES	\$ 50,000	\$47,500	\$50,000	\$52,500	\$50,000
PEST CONTROL	\$ 25,000	\$23,750	\$25,000	\$26,250	\$25,000
DISPOSAL OF ALLOWANCE QUALIFYING SOILS	\$ 250,000	\$237,500	\$250,000	\$262,500	\$250,000
CONCRETE and STRUCTURAL REPAIRS	\$ 50,000	\$47,500	\$50,000	\$52,500	\$50,000
RISK ALLOWANCE REALLOCATION	\$ 3,865,000	\$0	\$0	\$0	\$0
Total	\$ 5,058,000	\$1,133,350	\$1,193,000	\$1,252,650	\$1,193,000
Grand total	\$ 43,705,164	\$44,445,538	\$46,784,777	\$54,186,255	
Base Estimate + Escalation + Allowances					\$39,307,638
Risk Events	\$4,151,559				\$4,151,559
Total Base Estimate + Esc + Risk Events					\$43,459,197
Overhead Due to Schedule Impact	\$ 247,060.46				\$247,060
Total Base Estimate & Risk Events w/overhead					\$43,706,257

The overall cost risk value is pulled from the Probabilistic Cost Risk Register and added to the estimate on the “Risk Events” Line. The “Risk Events” line in the probabilistic cost estimate represents the overall impact of cost risks to the estimate. The risk impact is then added to the uncertainty factors.

5.7 Time related Cost Impact

The final element of the probabilistic cost estimate is the cost associated with delay. This cost is often referred to as extended overhead and is listed in the probabilistic cost estimate as “Overhead Due to



Schedule Impact". A daily rate for General Conditions / Requirements is multiplied by the number of days a contract is impacted according to the output of the P80 value in the schedule risk analysis.

5.8 Risk Results (Cost)

Following the Risk Workshop, the Probabilistic Cost Risk Register and Probabilistic Cost Estimate were prepared, and a Monte Carlo Simulation was executed. Below are the risk-based cost outputs of the risk analysis.

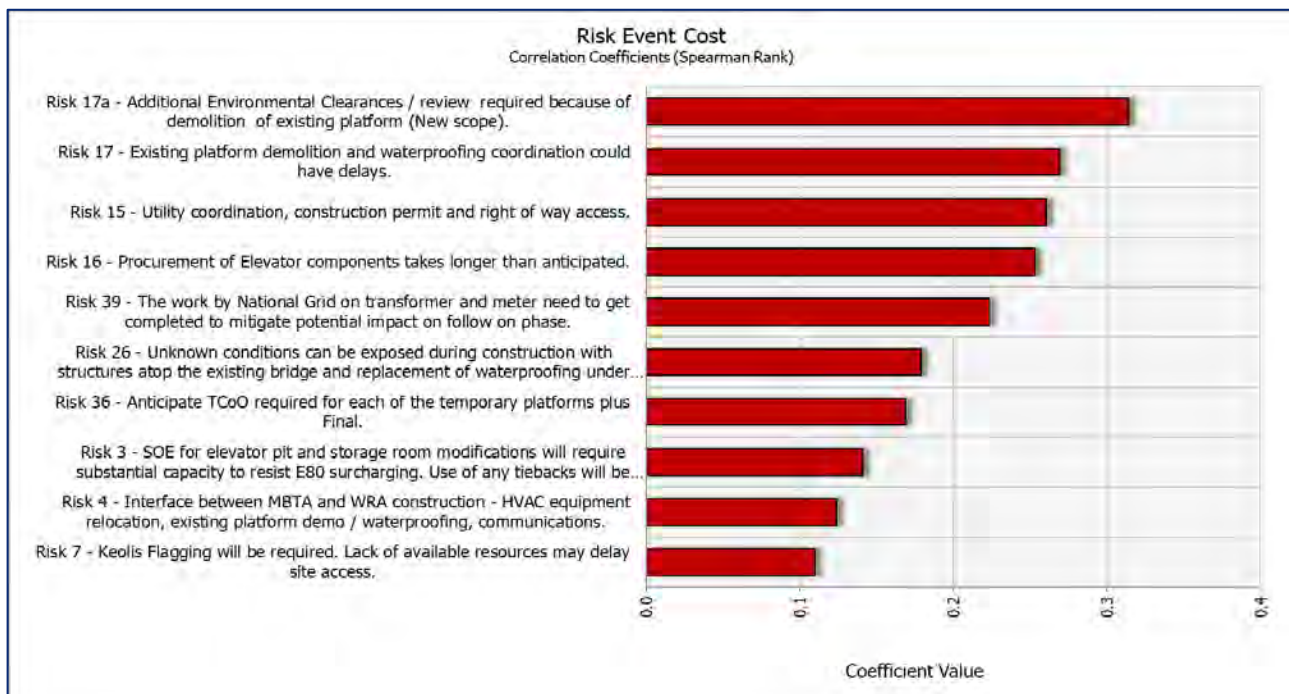
Top Cost Risk Factors

The Simulation Sensitivity "tornado" diagram shown in Figure 11 presents the top cost risk impacts. This tornado diagram provides the contribution of an individual risk factor to the cost outcome at the 80th percentile (P80). Risk names are listed along the vertical axis, and the impact of the risk is shown along the horizontal axis. Risks in the tornado diagram are ranked in descending order, with the largest risks at the top of the diagram. Risk factors that add to project cost are quantified with positive bars in the chart.

The top cost risks to the project have been identified as:

1. **Risk No. 17a** - Additional Environmental Clearances / review required because of demolition of existing platform (New scope)
2. **Risk No. 17** - Existing platform demolition and waterproofing coordination could have delays
3. **Risk No. 15** - Utility coordination, construction permit and right of way access
4. **Risk No. 16** - Procurement of Elevator components take longer than anticipated
5. **Risk No. 39** - The work by National Grid on transformer and meter need to get completed to mitigate potential impact on follow on phase

Figure 11: Simulated Cost Risk Ranking



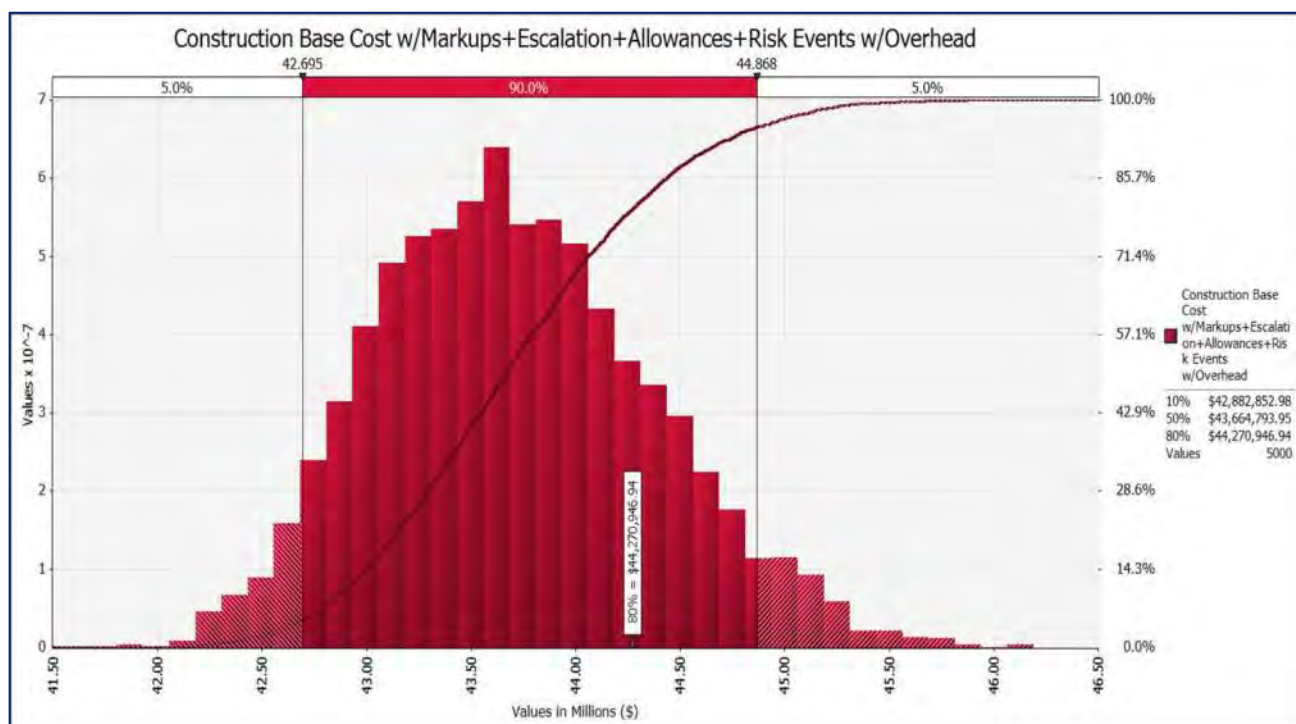


Understanding the top cost risks will help the project team identify and determine where to focus resources. As noted by the 5 Focus Areas of Risk activity, the top cost risks seem to fall under the category of “Context”. Meaning these risks are external influences that have an impact on the project development and progress. These risks are related to permitting, 3rd party agreements, and procurement.

Risk-Based Construction Cost Results

The risk-adjusted cost results are illustrated in histogram and S-curve. The chart in Figure 12, provides a cumulative probability distribution for the risk analysis results for project costs. The chart shows the probability of not exceeding a given cost on the vertical axis and the corresponding cost outcome on the horizontal axis. The S-curve represents the cumulative probability distribution for total construction costs. The analysis looks at the 80th percentile for total construction cost. This means it is 80% likely that the project costs will not exceed the identified value of \$44,270,946.

Figure 12: Construction Cost Risks – 80th Percentile

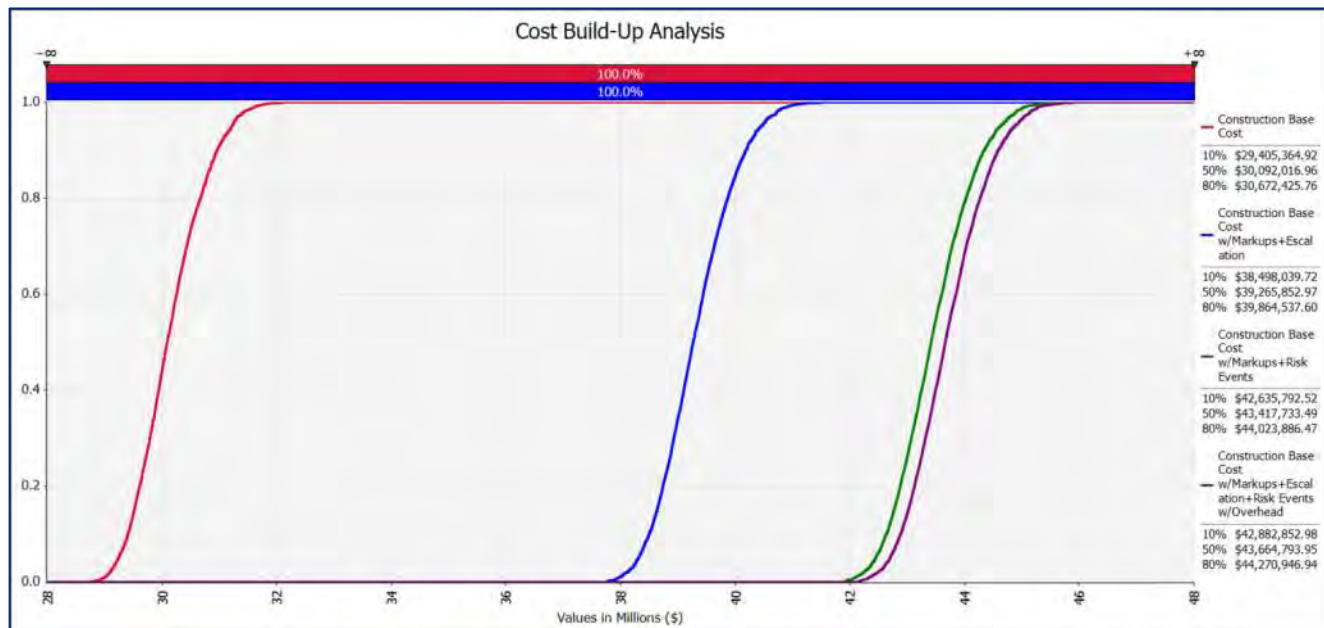


Cost Build Up analysis

The Cost Build Up Analysis identifies the makeup of the total construction costs. The total construction cost considers a series of factors including the base cost estimate and uncertainty (Red curve), escalation, markups, and allowances (Blue Curve), event risks (Green Curve), and project delay costs (Purple Curve). Figure 13 shows how much each factor impacts the total construction cost.



Figure 13: Cost Build Up Analysis



6. Risk Management Prospects

This Risk Analysis has led to the development of the project risk register, which is constructed to serve as the primary tool to document and facilitate risk response planning and is the key output for risk management. The risk response process leads to the development and determination of actions to reduce threats to the project and enhance opportunities.

6.1 Risk Management Approach

The intent of risk response planning is to identify a proactive response to key project risk factors in the hopes of minimizing project risk and uncertainty and potentially reducing project cost and schedule overruns. Risk response takes the form of several strategies specific to threats or opportunities. Risk response also entails focusing on the event risks that pose the greatest threat to the project. A project may contain a register of dozens of quantified event risks; however, typically, the bulk of the risk associated with a project will manifest in only a fraction of the total event risks for a project.

One good tool in establishing criteria managing risks is the Pareto Principle, also known as the 80-20 Rule. Usually, 80 percent of cost and schedule delays are found in 20 percent of the event risks identified. Concentrating on the top 20 percent provides the Project Team with a manageable number of risks. However, depending on time and budget constraints, a comprehensive Risk Analysis plan may require the Project Team to actively manage additional risks. Now that the initial assessment is completed, the event risks can be reviewed to determine the appropriate threshold for major risks to focus on in the risk response planning.

6.2 Risk Response Strategies

Following identification and analysis of project risks, it is recommended that the Project Team take action in response to the identified project risks, focusing on risks of most significance, in order to shift the odds in favor of project success.



Threats

For threats, risk response is a plan to seek answers to questions such as, what will one do if the event risk happens? Can a risk be avoided, and what plans can one put in place prior to the event risk to minimize the impact, if it occurs? Common risk response strategies for threats are:

- **Avoid** – To change the project scope to eliminate the impact of a risk. Some threats can be avoided entirely. This can be done by changing the way the project is performed or by de-scoping the portion of the project, which contains the risk element. This will often have a cost. Getting the job done in a risk-free environment is likely to cost more. Eliminating the risky scope might disappoint a critical stakeholder or degrade the business reason for performing the project.
- **Transfer** – To move a risk to another party who is more capable at handling the risk (such as the developer or insurance company). This involves moving the responsibility for a risk to another party usually by payment of a fee (outsourcing to a skilled expert or fixed price construction contract) or a premium (insurance). Transferring risk will almost always have an added cost. Some risk, such as schedule risk, cannot be transferred. Even though one can contract (transfer) the schedule responsibility to third parties, if they are late, the project is still late.
- **Mitigate** – The project team may seek to lessen the impact of a specific risk item, which may involve the consumption of additional time and/or money. Mitigation usually requires positive action and has a cost. These actions should be reflected as new work packages and controlled like any other part of the project. They will affect the project budget and schedule. Mitigation can be a very effective strategy and is often better than a “wait and see” approach.
- **Accept** – To decide not to take action to deal with a specific risk. After trying to avoid, transfer, or mitigate the threats to the project, the project will be left with residual risks, which are threats that cannot be reduced further. In active acceptance, the project team sets up a contingency reserve fund to account for the residual expected value of the remaining risks. The passive form of acceptance involves merely acknowledging the risk and moving forward on the project without reserves, which may seem sensible for risks with small expected values. The third form of risk acceptance is denial. Professional risk management seeks to reduce the use of denial as a strategy.
- **Share** – A self-insurance method of managing or reducing exposure to risk by spreading the burden of loss among several units or enterprises.

Opportunities

For opportunities, risk response is a plan of action designed to capitalize on the potential beneficial project cost and schedule opportunities. Typical risk response strategies for opportunities are:

- **Exploit** – To make a proactive decision to take action to ensure that an opportunity is realized.
- **Share** – To assign ownership of the opportunity to a third party who is best able to capture the benefit for the project. Examples of sharing actions include forming risk-sharing partnerships, teams, or joint ventures, which can be established with the express purpose of managing opportunities.
- **Enhance** – To take action to increase the probability and/or impact of the opportunity for the benefit of the project, seeking to facilitate or strengthen the cause of the opportunity, and proactively targeting and reinforcing its trigger conditions. Impact drivers can also be targeted, seeking to increase the project’s susceptibility to the opportunity.



- **Accept** – To take no action when opportunities are uncontrollable, and no practical action may be taken specifically to address it. At times, it is not possible or appropriate to take advantage of all opportunities, so the project team should document them and at least provide awareness that they exist and have been properly identified.

The potential risks associated with this project have been highlighted in an effort to create awareness of cost and schedule risk that may or may not have been evident to the project. The hope is that this risk analysis will be used to evaluate the project cost and schedule and increase the probability of a successful project for each construction alternative.

7. Conclusion

Patrick Engineering performed a Quantitative Risk Analysis on the Worcester Union Station Accessibility Project. The analysis reviewed cost and schedule risks based on 100% design documents. Many of the risks are related to performing construction activities while maintaining operation of Union Station. The Project Team should work closely with MBTA Operations to establish clear limitations of operations. The team should work on identifying key MBTA resources such as flagging support that can be designated to the project. The CTD schedule assumes some level of parallel construction activities. There should be sufficient laydown area to accommodate delivery and storage of materials for multiple crews performing on site. This work will need to be coordinated closely with state and local stakeholders.

Risk management should not end at the conclusion of this report. The Project Team should execute a risk management and review process during construction that will regularly review the risks identified in the Risk Register in Appendix A. This process should include taking active measures to reduce or eliminate negatives risks while promoting opportunities that improve project outcomes. The risk analysis produced an overall cost contingency of **11%** and a schedule contingency of **64** calendar days. These numbers should be considered when establishing a budget for construction of this project.



APPENDIX A:

Risk Register

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Cost Impact	Schedule Impact	Risk Notes	Strategy	Risk owner	Risk Score	
					VL,L,M,H,VH	VL,L,M,H,VH	VL,L,M,H,VH				Cost Score	Schedule Score
37	Context	3rd Party	Local Worcester building inspector to be responsible for work within WRA owned Terminal Building / State inspector responsible for new station facilities. Line between City /State to needs to be agreed upon.	Lack of coordination could delay inspection and approval.	L	VL	L	Requires understanding / agreement between City and State inspectors. Both parties are working together and have a verbal agreement.	Avoid	HDR/MBTA/WRA	2	4
39	Context	3rd Party	The work by National Grid on transformer and meter need to get completed to mitigate potential impact on follow on phase.	If utility is not complete on time construction could be delayed.	M	L	H	The spec. needs to call for contractor to have responsibility for coordinating with National Grid and require the timeline to do the work prior to start of phase. Needs to be complete before end of phase 2. Coordinating with NG on design.	Reduce	HDR	6	12
3	Technical	Construction	SOE for elevator pit and storage room modifications will require substantial capacity to resist E80 surcharging. Use of any tiebacks will be limited due to track being retained, and possible interference with retaining wall.		M	H	M	Design of SOE to be designed for E80 surcharge. The existing stairwells outside the storage room, if they still exist, can be used as a part of soil retaining system for construction of elevator pit and stair. Use test pits to determine the existence of the existing stairwells.	Avoid	HDR	12	9
5	Context	Construction	Temporary access for public runs through active construction zone and is ADA compliant.	Lack of agreement could delay permit.	L	VL	L	Providing barricades and wayfinding signage. Contract documents to identify contractor to provide safe access for public through work zone. Identify work restrictions and construction phasing. In process.	Transfer	HDR	2	4
17	Technical	Construction	Existing platform demolition and waterproofing coordination could have delays.	Change Order will incorporate platform demo work with WRA.	VH	VL	H	Coordinate with WRA on contract vehicle to complete this work. Still defining the agreement. This will be processed as a CO in the future. WRA will pay for CO.	Accept	MBTA	5	20
17a	Context	Environmental	Additional Environmental Clearances / review required because of demolition of existing platform (New scope).	May delay the opening of station track or impact the Contractor's ability to access area after track is reopened.	VH	L	H		Accept	MBTA/WRA	10	20
24	Schedule	Construction	Limited Access to room under tracks. Area is a confined space and could have increased cost/schedule impacts from typical production rates.	Lack of access could cause the Contractor to resequence work or reduce production.	VL	VL	VL	Access needs to be coordinated with WRA .	Avoid	HDR	1	1
25	Technical	Construction	Driven temporary support (piles or sheeting) near existing structure can potentially impact existing structures.	Significant impacts to structures could required structural reinforcements or repairs.	M	M	M	Site will be monitored during construction for any potential impacts. Captured in the estimate. Spec needs to be clear on monitoring building and track.	Transfer	HDR	9	9
26	Technical	Construction	Unknown conditions can be exposed during construction with structures atop the existing bridge and replacement of waterproofing under the proposed platform area.	There could potentially be more repairs than estimated, leading to additional time and costs.	M	M	M	Develop typical repair details for commonly occurring failures.	Accept	HDR	9	9
27	Technical	Construction	Unknown conditions can be exposed during excavation during tying into the existing station structure.	There could potentially be more repairs than estimated, leading to additional time and costs.	M	M	M	Develop typical repair details for commonly occurring failures.	Accept	HDR	9	9
34	Context	Construction	FTC levels required per MBTA current standards are reportedly under review. Requirements not clear. Current standard has risk of night sky pollution and/or light trespass issues.	This could impact the Contractor's ability to work at night.	VL	VL	VL	Considering utilization of LED light fixtures with variable light output capability. Light fixtures under canopy and facing down.	Avoid	HDR/MBTA	1	1
40	Technical	Construction	Install micropile closely to conduits and drainage pipes which may cause damages.	This may cause delays and added cost for repairs.	L	M	M	Expose the top of conduits and pipe during pile installation.	Reduce	HDR	6	6
23	Context	Engineering	Design exceptions need to be approved by MBTA.		VL	VL	VL	Work with MBTA Chief Engineer and Railroad Operations for approvals.		HDR	1	1
9	Cost	Environmental	Contaminated soils are found on site; reuse and disposal to be determined.	Identified contaminants may be different than what was assumed during estimate. This may add cost for disposal.	M	M	L	Will have an allowance for contamination items.	Avoid	HDR	9	6
18	Cost	Environmental	Unexpected hazardous materials (Lead) could be encountered.	If Haz Mat allowance is exceeded. The project will incur additional costs.	L	M	H	Carry allowance for hazardous materials.	Avoid	HDR	6	8
19	Schedule	Environmental	Unexpected asbestos could be encountered.	If asbestos allowance is exceeded. The project will incur additional costs.	L	M	H	Carry allowance for asbestos. Develop specification for asbestos. Pre-screening by consultant.	Avoid	HDR	6	8
20	Schedule	Environmental	Uncovering historic archeological items.		L	M	M	Coordinate with local historic commission to assess probability.	Accept	HDR	6	6
1	Schedule	Interface	Staging with regards to the pedestrian bridge, long span can be difficult to stage. May conflicting with other areas of staging needs in phase 3.	This may lead to resequencing construction activities causing delays.	L	L	L	Will need to review construction staging and phasing. The upper parking lot will be used as staging area for preassembly and erection of pedestrian bridge. Accessible parking will be moved to garage during phase 3.	Avoid	HDR	4	4

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Cost Impact	Schedule Impact	Risk Notes	Strategy	Risk owner	Risk Score	
					VL,L,M,H,VH	VL,L,M,H,VH	VL,L,M,H,VH				Cost Score	Schedule Score
4	Context	Interface	Interface between MBTA and WRA construction - HVAC equipment relocation, existing platform demo / waterproofing, communications.	If interface agreement is not reached, construction could be significantly delayed.	M	VL	M	MBTA and WRA to have a legal agreement. Agreement reportedly in process.	Avoid	MBTA	3	9
33	Schedule	Interface	The construction site and access are limited between two tracks. This will impact the construction duration and sequence since the construction likely will be done from west to east linearly. The work at the east end of platform cannot be advanced simultaneously with the west end in order to keep access for the work on the west end of platform.	Phasing and assumed production rates may be impacted.	L	L	L	Coordination with Keolis / MBTA for use of Station Track for construction access. Station Track being taken out of service during construction reduces potential risk.	Reduce	HDR/MBTA	4	4
2	Context	Operations	Construction of elevator shafts and machine rooms may impact operations on track 1 and adjacent tracks.	May required additional protection measures or work restrictions.	M	M	M	Need to determine time for construction. Will need to design SOE system (sheeting). Station Track being taken out of service during construction reduces potential risk. Spec should callout what can and can't be done. Length of sheeting may impact schedule. HDR to review impacts of sheeting lengths on schedule.	Reduce	HDR	9	9
8	Schedule	Operations	Weekend shutdowns will be required for various work activities such as waterproofing and installing the truss.	Amtrak may have an issue with allowing weekend shutdowns. This would impact when construction could occur causing delays.	L	L	L	Coordination will be required for Railroad Operations to obtain weekend outages. Design team will get MOU prior to bid.	Reduce	HDR/MBTA	4	4
29	Context	Operations	City of Worcester temporary loss of revenue from the current parking spaces.	This could impact laydown area and site access.	L	L	L	Limit parking space loss during construction. Managing lost of Rev will be captured in RE agreement MOU.	Avoid	HDR	4	4
30	Context	Operations	MBTA permanent loss of revenue parking spaces due to site improvements.	Lack of agreement could cause a redesign.	VL	VL	VL	Limit project parking space removals. Not reducing any parking.	Avoid	HDR	1	1
35	Schedule	Operations	Waterproofing of WRA below grade spaces needs to be coordinated with platform construction phasing. Waterproofing must be complete before Station Track can be returned to service.	If waterproofing is not complete on time returning the track to service may be delayed.	L	L	L	Coordination between WRA and MBTA re: agreement on who will be responsible for waterproofing and ensuring coordination. All Waterproofing scope done on MBTA contract as existing scope or CO.	Avoid	WRA/MBTA	4	4
38	Context	Operations	The interface for construction staging, available parking spaces during revenue service, and construction work in parking lot for duct bank, etc. need to be closely coordinated.		M	L	M	Requires proper planning of construction phasing and update of construction drawings/specifications to inform contractor of what are the requirements during construction.	Reduce	HDR/MBTA/WRA	6	9
21	Schedule	Permitting	FRP Variance approval needed.	If variance is not approved in time this could delay the project.	VL	VL	VL	Work with Ron Whitmore of FRP approval requirements. In process. No Variance required.	Avoid	HDR	1	1
32	Context	Permitting	Variance required for glass enclosed elevators and shafts.	If state board does not accept variance, a redesign may be required.	L	H	H	Prepare application for and attend hearing on behalf of MBTA to obtain variance from State Elevator Board. In process.	Avoid	HDR/MBTA	8	8
36	Schedule	Permitting	Anticipate TCoO required for each of the temporary platforms plus Final.	Delayed permits could significantly impact construction schedule and therefore cost.	M	VL	H		Reduce	HDR	3	12
11	Schedule	Procurement	Long lead track materials.	If NTP is delayed the MBTA may be required to procure material. Material may not be available when required.	VL	VL	VL	Either the Contractor will be required to procure material or HDR to develop procurement package for MBTA to procure. Contractor to procure materials. MBTA will not be purchasing any material.	Reduce	MBTA	1	1
16	Schedule	Procurement	Procurement of Elevator components takes longer than anticipated.		M	L	VH	Add milestones for completing construction of elevators. Milestones added to the CTD. Milestone for West End Elevator.	Reduce	HDR	6	15
16a	Schedule	Procurement	Procurement of Elevator Car takes longer than anticipated.		M	L	VH	Add milestones for completing construction of elevators. Milestones added to the CTD. Milestone for West End Elevator.	Reduce	HDR	6	15
15	Context	Real Estate	Utility coordination, construction permit and right of way access.		H	M	H	Confirm ownership of utilities and coordinate with necessary parties.	Reduce	HDR	12	16
28	Context	Real Estate	Resolution needed on the ownership in front of the station area. ROW from Grafton Street Bridge to CP 45 - actual limits. No plan found or legal description meters & bounds to define the land within the railroad corridor to be used to re-establish the ROW limits for MBTA ownership.	If this is not resolved this could limit the Contractor's ability to access certain areas of the site.	VL	VL	VL	Confirm ownership with real estate entities.	Avoid	HDR/MBTA	1	1
6	Context	Resources	Competing jurisdictions for the MBTA and City of Worcester on the work at Shrewsbury Street.	Lack of agreement could delay construction.	L	L	L	Coordinate police details. MBTA to have agreement with local police.	Reduce	MBTA	4	4
7	Schedule	Resources	Keolis Flagging will be required.	Lack of available resources may delay site access.	M	M	H	MBTA will sign a force account agreement with Keolis to provide flagging services.	Reduce	MBTA	9	12
13	Schedule	Resources	RFI Review Schedule.	Longer review cycles may delay the contractors ability to proceed with procurement or construction.	M	L	H	MBTA new contracts note 3 day review period. Timely reviews required.	Reduce	HDR	6	12

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Cost Impact	Schedule Impact	Risk Notes	Strategy	Risk owner	Risk Score	
					VL,L,M,H,VH	VL,L,M,H,VH	VL,L,M,H,VH				Cost Score	Schedule Score
10	Technical	Schedule	New crossover at CP-44 will require signal upgrades and testing.	Keolis resources may not be available when required.	L	L	M	Coordination with Keolis for cut-overs and testing of signal system. Transfer to Keolis, will have minimal impact on Ops. Not required to complete project.	Transfer	MBTA	4	6
12	Schedule	Schedule	Submittal Review Schedule.	Longer review cycles may delay the contractors ability to start procurement or construction.	M	L	H	MBTA new contracts note 21 day review period. Timely reviews required.	Reduce	HDR	6	12



APPENDIX B:

Risk Register Guide

Risk Register Guide

Contract # **X72CN01**

Project Name: **Worcester Union Station Accessibility**

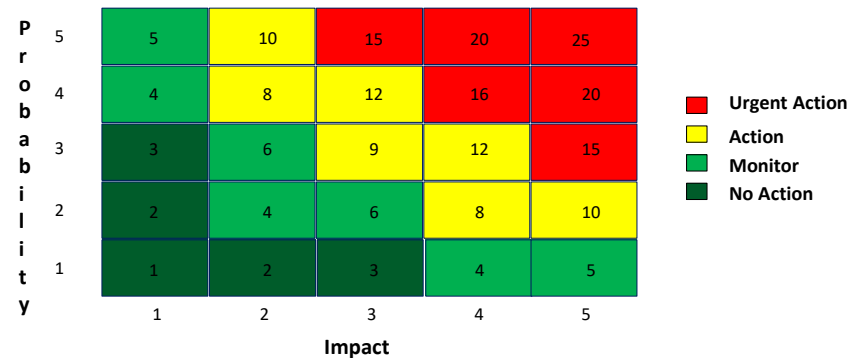
Qualitative Analysis

Probability = VL, L, M, H, VH - An assessment on the likelihood of occurrence

- 1 VL - Improbable, can assume occurrence will not happen
- 2 L - Unlikely, small, yet possible over the life of the project
- 3 M - Occasional, likely to occur over life of project
- 4 H - Probable, highly likely, will occur at least once over the life of the project
- 5 VH- Near certainty, frequent, likely to occur more than once over the life of the project

Impact to Time & Cost - An assessment on the severity of the effect of risk

	1	2	3	4	5
	VL	L	M	H	VH
Impact	Negligible	Acceptable	Marginal	Critical	Major
Time	No Impact	0 - 2 wk	2wk - 4wks	4wks - 8 wks	8 wks +
Cost to Project	\$0 - \$50,000	\$50,000 - \$100,000	\$100,000 - \$200,000	\$200,000 - \$400,000	\$400,000 +





APPENDIX C:

Schedule Risk Ranking

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Schedule Impact	Risk Notes	
					VL,L,M,H,VH	VL,L,M,H,VH		Schedule Score
17	Technical	Construction	Existing platform demolition and waterproofing coordination could have delays.	Change Order will incorporate platform demo work with WRA.	VH	H	Coordinate with WRA on contract vehicle to complete this work. Still defining the agreement. This will be processed as a CO in the future. WRA will pay for CO.	20
17a	Context	Environmental	Additional Environmental Clearances / review required because of demolition of existing platform (New scope).	May delay the opening of station track or impact the Contractor's ability to access area after track is reopened.	VH	H		20
15	Context	Real Estate	Utility coordination, construction permit and right of way access.		H	H	Confirm ownership of utilities and coordinate with necessary parties.	16
16	Schedule	Procurement	Procurement of Elevator components takes longer than anticipated.		M	VH	Add milestones for completing construction of elevators. Milestones added to the CTD. Milestone for West End Elevator.	15
16a	Schedule	Procurement	Procurement of Elevator Car takes longer than anticipated.		M	VH	Add milestones for completing construction of elevators. Milestones added to the CTD. Milestone for West End Elevator.	15
39	Context	3rd Party	The work by National Grid on transformer and meter need to get completed to mitigate potential impact on follow on phase.	If utility is not complete on time construction could be delayed.	M	H	The spec. needs to call for contractor to have responsibility for coordinating with National Grid and require the timeline to do the work prior to start of phase. Needs to be complete before end of phase 2. Coordinating with NG on design.	12
36	Schedule	Permitting	Anticipate TCoO required for each of the temporary platforms plus Final.	Delayed permits could significantly impact construction schedule and therefore cost.	M	H		12
7	Schedule	Resources	Keolis Flagging will be required.	Lack of available resources may delay site access.	M	H	MBTA will sign a force account agreement with Keolis to provide flagging services.	12
13	Schedule	Resources	RFI Review Schedule.	Longer review cycles may delay the contractors ability to proceed with procurement or construction.	M	H	MBTA new contracts note 3 day review period. Timely reviews required.	12
12	Schedule	Schedule	Submittal Review Schedule.	Longer review cycles may delay the contractors ability to start procurement or construction.	M	H	MBTA new contracts note 21 day review period. Timely reviews required.	12
14	Financing	Schedule	NTP Delay, Project is currently state funded but will be applying for federal funding.		M	H	\$200k-\$600k escalation costs for 6 month delay.	12
3	Technical	Construction	SOE for elevator pit and storage room modifications will require substantial capacity to resist E80 surcharging. Use of any tiebacks will be limited due to track being retained, and possible interference with retaining wall.		M	M	Design of SOE to be designed for E80 surcharge. The existing stairwells outside the storage room, if they still exist, can be used as a part of soil retaining system for construction of elevator pit and stair. Use test pits to determine the existence of the existing stairwells.	9
25	Technical	Construction	Driven temporary support (piles or sheeting) near existing structure can potentially impact existing structures.	Significant impacts to structures could required structural reinforcements or repairs.	M	M	Site will be monitored during construction for any potential impacts. Captured in the estimate. Spec needs to be clear on monitoring building and track.	9
26	Technical	Construction	Unknown conditions can be exposed during construction with structures atop the existing bridge and replacement of waterproofing under the proposed platform area.	There could potentially be more repairs than estimated, leading to additional time and costs.	M	M	Develop typical repair details for commonly occurring failures.	9
27	Technical	Construction	Unknown conditions can be exposed during excavation during tying into the existing station structure.	There could potentially be more repairs than estimated, leading to additional time and costs.	M	M	Develop typical repair details for commonly occurring failures.	9
4	Context	Interface	Interface between MBTA and WRA construction - HVAC equipment relocation, existing platform demo / waterproofing, communications.	If interface agreement is not reached, construction could be significantly delayed.	M	M	MBTA and WRA to have a legal agreement. Agreement reportedly in process.	9

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Schedule Impact	Risk Notes	Schedule Score
					VL,L,M,H,VH	VL,L,M,H,VH		
2	Context	Operations	Construction of elevator shafts and machine rooms may impact operations on track 1 and adjacent tracks.	May required additional protection measures or work restrictions.	M	M	Need to determine time for construction. Will need to design SOE system (sheeting). Station Track being taken out of service during construction reduces potential risk. Spec should callout what can and can't be done. Length of sheeting may impact schedule. HDR to review impacts of sheeting lengths on schedule.	9
38	Context	Operations	The interface for construction staging, available parking spaces during revenue service, and construction work in parking lot for duct bank, etc. need to be closely coordinated.		M	M	Requires proper planning of construction phasing and update of construction drawings/specifications to inform contractor of what are the requirements during construction.	9
18	Cost	Environmental	Unexpected hazardous materials (Lead) could be encountered.	If Haz Mat allowance is exceeded. The project will incur additional costs.	L	H	Carry allowance for hazardous materials.	8
19	Schedule	Environmental	Unexpected asbestos could be encountered.	If asbestos allowance is exceeded. The project will incur additional costs.	L	H	Carry allowance for asbestos. Develop specification for asbestos. Pre-screening by consultant.	8
31	Context	Operations	Coordination with Amtrak service / weekend shutdowns, work windows, operating needs.	Amtrak does not typically allow closures. This could result in resequencing work or modifying closure times.	L	H	Coordinate with Amtrak operations to develop work windows and operating needs to maintain Amtrak service and define scenarios to allow for busing over weekends Duplicate 8.	8
32	Context	Permitting	Variance required for glass enclosed elevators and shafts.	If state board does not accept variance, a redesign may be required.	L	H	Prepare application for and attend hearing on behalf of MBTA to obtain variance from State Elevator Board. In process.	8
40	Technical	Construction	Install micropile closely to conduits and drainage pipes which may cause damages.	This may cause delays and added cost for repairs.	L	M	Expose the top of conduits and pipe during pile installation.	6
9	Cost	Environmental	Contaminated soils are found on site; reuse and disposal to be determined.	Identified contaminates may be different than what was assumed during estimate. This may add cost for disposal.	M	L	Will have an allowance for contamination items.	6
20	Schedule	Environmental	Uncovering historic archeological items.		L	M	Coordinate with local historic commission to assess probability.	6
10	Technical	Schedule	New crossover at CP-44 will require signal upgrades and testing.	Keolis resources may not be available when required.	L	M	Coordination with Keolis for cut-overs and testing of signal system. Transfer to Keolis, will have minimal impact on Ops. Not required to complete project.	6
37	Context	3rd Party	Local Worcester building inspector to be responsible for work within WRA owned Terminal Building / State inspector responsible for new station facilities. Line between City /State to needs to be agreed upon.	Lack of coordination could delay inspection and approval.	L	L	Requires understanding / agreement between City and State inspectors. Both parties are working together and have a verbal agreement.	4
5	Context	Construction	Temporary access for public runs through active construction zone and is ADA compliant.	Lack of agreement could delay permit.	L	L	Providing barricades and wayfinding signage. Contract documents to identify contractor to provide safe access for public through work zone. Identify work restrictions and construction phasing. In process.	4
1	Schedule	Interface	Staging with regards to the pedestrian bridge, long span can be difficult to stage. May conflicting with other areas of staging needs in phase 3.	This may lead to resequencing construction activities causing delays.	L	L	Will need to review construction staging and phasing. The upper parking lot will be used as staging area for preassembly and erection of pedestrian bridge. Accessible parking will be moved to garage during phase 3.	4
33	Schedule	Interface	The construction site and access are limited between two tracks. This will impact the construction duration and sequence since the construction likely will be done from west to east linearly. The work at the east end of platform cannot be advanced simultaneously with the west end in order to keep access for the work on the west end of platform.	Phasing and assumed production rates may be impacted.	L	L	Coordination with Keolis / MBTA for use of Station Track for construction access. Station Track being taken out of service during construction reduces potential risk.	4

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Schedule Impact	Risk Notes	
					VL,L,M,H,VH	VL,L,M,H,VH		Schedule Score
8	Schedule	Operations	Weekend shutdowns will be required for various work activities such as waterproofing and installing the truss.	Amtrak may have an issue with allowing weekend shutdowns. This would impact when construction could occur causing delays.	L	L	Coordination will be required for Railroad Operations to obtain weekend outages. Design team will get MOU prior to bid.	4
29	Context	Operations	City of Worcester temporary loss of revenue from the current parking spaces.	This could impact laydown area and site access.	L	L	Limit parking space loss during construction. Managing lost of Rev will be captured in RE agreement MOU.	4
35	Schedule	Operations	Waterproofing of WRA below grade spaces needs to be coordinated with platform construction phasing. Waterproofing must be complete before Station Track can be returned to service.	If waterproofing is not complete on time returning the track to service may be delayed.	L	L	Coordination between WRA and MBTA re: agreement on who will be responsible for waterproofing and ensuring coordination. All Waterproofing scope done on MBTA contract as existing scope or CO.	4
22	Technical	Permitting	State Building inspector to work with City of Worcester inspector on permits required and demarcation lines.	Lack coordination with city could cause conflicts and delay project.	L	L	Coordinate between agencies on permitting needs.	4
6	Context	Resources	Competing jurisdictions for the MBTA and City of Worcester on the work at Shrewsbury Street.	Lack of agreement could delay construction.	L	L	Coordinate police details. MBTA to have agreement with local police.	4
24	Schedule	Construction	Limited Access to room under tracks. Area is a confined space and could have increased cost/schedule impacts from typical production rates.	Lack of access could cause the Contractor to resequence work or reduce production.	VL	VL	Access needs to be coordinated with WRA .	1
34	Context	Construction	FTC levels required per MBTA current standards are reportedly under review. Requirements not clear. Current standard has risk of night sky pollution and/or light trespass issues.	This could impact the Contractor's ability to work at night.	VL	VL	Considering utilization of LED light fixtures with variable light output capability. Light fixtures under canopy and facing down.	1
23	Context	Engineering	Design exceptions need to be approved by MBTA.		VL	VL	Work with MBTA Chief Engineer and Railroad Operations for approvals.	1
30	Context	Operations	MBTA permanent loss of revenue parking spaces due to site improvements.	Lack of agreement could cause a redesign.	VL	VL	Limit project parking space removals. Not reducing any parking.	1
21	Schedule	Permitting	FRP Variance approval needed.	If variance is not approved in time this could delay the project.	VL	VL	Work with Ron Whitmore of FRP approval requirements. In process. No Variance required.	1
11	Schedule	Procurement	Long lead track materials.	If NTP is delayed the MBTA may be required to procure material. Material may not be available when required.	VL	VL	Either the Contractor will be required to procure material or HDR to develop procurement package for MBTA to procure. Contractor to procure materials. MBTA will not be purchasing any material.	1
28	Context	Real Estate	Resolution needed on the ownership in front of the station area. ROW from Grafton Street Bridge to CP 45 - actual limits. No plan found or legal description meters & bounds to define the land within the railroad corridor to be used to re-establish the ROW limits for MBTA ownership.	If this is not resolved this could limit the Contractor's ability to access certain areas of the site.	VL	VL	Confirm ownership with real estate entities.	1



APPENDIX D:

Cost Risk Ranking

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Cost Impact	Risk Notes	Risk Score
					VL,L,M,H,VH	VL,L,M,H,VH		Cost Score
17	Technical	Construction	Existing platform demolition and waterproofing coordination could have delays.	Change Order will incorporate platform demo work with WRA.	VH	H	Coordinate with WRA on contract vehicle to complete this work. Still defining the agreement. This will be processed as a CO in the future. WRA will pay for CO.	20
17a	Context	Environmental	Additional Environmental Clearances / review required because of demolition of existing platform (New scope).	May delay the opening of station track or impact the Contractor's ability to access area after track is reopened.	VH	H		20
15	Context	Real Estate	Utility coordination, construction permit and right of way access.		H	H	Confirm ownership of utilities and coordinate with necessary parties.	16
16	Schedule	Procurement	Procurement of Elevator components takes longer than anticipated.		M	VH	Add milestones for completing construction of elevators. Milestones added to the CTD. Milestone for West End Elevator.	15
16a	Schedule	Procurement	Procurement of Elevator Car takes longer than anticipated.		M	VH	Add milestones for completing construction of elevators. Milestones added to the CTD. Milestone for West End Elevator.	15
39	Context	3rd Party	The work by National Grid on transformer and meter need to get completed to mitigate potential impact on follow on phase.	If utility is not complete on time construction could be delayed.	M	H	The spec. needs to call for contractor to have responsibility for coordinating with National Grid and require the timeline to do the work prior to start of phase. Needs to be complete before end of phase 2. Coordinating with NG on design.	12
36	Schedule	Permitting	Anticipate TCoO required for each of the temporary platforms plus Final.	Delayed permits could significantly impact construction schedule and therefore cost.	M	H		12
7	Schedule	Resources	Keolis Flagging will be required.	Lack of available resources may delay site access.	M	H	MBTA will sign a force account agreement with Keolis to provide flagging services.	12
13	Schedule	Resources	RFI Review Schedule.	Longer review cycles may delay the contractors ability to proceed with procurement or construction.	M	H	MBTA new contracts note 3 day review period. Timely reviews required.	12
12	Schedule	Schedule	Submittal Review Schedule.	Longer review cycles may delay the contractors ability to start procurement or construction.	M	H	MBTA new contracts note 21 day review period. Timely reviews required.	12
14	Financing	Schedule	NTP Delay, Project is currently state funded but will be applying for federal funding.		M	H	\$200k-\$600k escalation costs for 6 month delay.	12
3	Technical	Construction	SOE for elevator pit and storage room modifications will require substantial capacity to resist E80 surcharging. Use of any tiebacks will be limited due to track being retained, and possible interference with retaining wall.		M	M	Design of SOE to be designed for E80 surcharge. The existing stairwells outside the storage room, if they still exist, can be used as a part of soil retaining system for construction of elevator pit and stair. Use test pits to determine the existence of the existing stairwells.	9
25	Technical	Construction	Driven temporary support (piles or sheeting) near existing structure can potentially impact existing structures.	Significant impacts to structures could required structural reinforcements or repairs.	M	M	Site will be monitored during construction for any potential impacts. Captured in the estimate. Spec needs to be clear on monitoring building and track.	9
26	Technical	Construction	Unknown conditions can be exposed during construction with structures atop the existing bridge and replacement of waterproofing under the proposed platform area.	There could potentially be more repairs than estimated, leading to additional time and costs.	M	M	Develop typical repair details for commonly occurring failures.	9
27	Technical	Construction	Unknown conditions can be exposed during excavation during tying into the existing station structure.	There could potentially be more repairs than estimated, leading to additional time and costs.	M	M	Develop typical repair details for commonly occurring failures.	9
4	Context	Interface	Interface between MBTA and WRA construction - HVAC equipment relocation, existing platform demo / waterproofing, communications.	If interface agreement is not reached, construction could be significantly delayed.	M	M	MBTA and WRA to have a legal agreement. Agreement reportedly in process.	9
2	Context	Operations	Construction of elevator shafts and machine rooms may impact operations on track 1 and adjacent tracks.	May required additional protection measures or work restrictions.	M	M	Need to determine time for construction. Will need to design SOE system (sheeting). Station Track being taken out of service during construction reduces potential risk. Spec should callout what can and can't be done. Length of sheeting may impact schedule. HDR to review impacts of sheeting lengths on schedule.	9

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Cost Impact	Risk Notes	Risk Score
					VL,L,M,H,VH	VL,L,M,H,VH		Cost Score
38	Context	Operations	The interface for construction staging, available parking spaces during revenue service, and construction work in parking lot for duct bank, etc. need to be closely coordinated.		M	M	Requires proper planning of construction phasing and update of construction drawings/specifications to inform contractor of what are the requirements during construction.	9
18	Cost	Environmental	Unexpected hazardous materials (Lead) could be encountered.	If Haz Mat allowance is exceeded. The project will incur additional costs.	L	H	Carry allowance for hazardous materials.	8
19	Schedule	Environmental	Unexpected asbestos could be encountered.	If asbestos allowance is exceeded. The project will incur additional costs.	L	H	Carry allowance for asbestos. Develop specification for asbestos. Pre-screening by consultant.	8
31	Context	Operations	Coordination with Amtrak service / weekend shutdowns, work windows, operating needs.	Amtrak does not typically allow closures. This could result in resequencing work or modifying closure times.	L	H	Coordinate with Amtrak operations to develop work windows and operating needs to maintain Amtrak service and define scenarios to allow for busing over weekends Duplicate 8.	8
32	Context	Permitting	Variance required for glass enclosed elevators and shafts.	If state board does not accept variance, a redesign may be required.	L	H	Prepare application for and attend hearing on behalf of MBTA to obtain variance from State Elevator Board. In process.	8
40	Technical	Construction	Install micropile closely to conduits and drainage pipes which may cause damages.	This may cause delays and added cost for repairs.	L	M	Expose the top of conduits and pipe during pile installation.	6
9	Cost	Environmental	Contaminated soils are found on site; reuse and disposal to be determined.	Identified contaminants may be different than what was assumed during estimate. This may add cost for disposal.	M	L	Will have an allowance for contamination items.	6
20	Schedule	Environmental	Uncovering historic archeological items.		L	M	Coordinate with local historic commission to assess probability.	6
10	Technical	Schedule	New crossover at CP-44 will require signal upgrades and testing.	Keolis resources may not be available when required.	L	M	Coordination with Keolis for cut-overs and testing of signal system. Transfer to Keolis, will have minimal impact on Ops. Not required to complete project.	6
37	Context	3rd Party	Local Worcester building inspector to be responsible for work within WRA owned Terminal Building / State inspector responsible for new station facilities. Line between City /State to needs to be agreed upon.	Lack of coordination could delay inspection and approval.	L	L	Requires understanding / agreement between City and State inspectors. Both parties are working together and have a verbal agreement.	4
5	Context	Construction	Temporary access for public runs through active construction zone and is ADA compliant.	Lack of agreement could delay permit.	L	L	Providing barricades and wayfinding signage. Contract documents to identify contractor to provide safe access for public through work zone. Identify work restrictions and construction phasing. In process.	4
1	Schedule	Interface	Staging with regards to the pedestrian bridge, long span can be difficult to stage. May conflicting with other areas of staging needs in phase 3.	This may lead to resequencing construction activities causing delays.	L	L	Will need to review construction staging and phasing. The upper parking lot will be used as staging area for preassembly and erection of pedestrian bridge. Accessible parking will be moved to garage during phase 3.	4
33	Schedule	Interface	The construction site and access are limited between two tracks. This will impact the construction duration and sequence since the construction likely will be done from west to east linearly. The work at the east end of platform cannot be advanced simultaneously with the west end in order to keep access for the work on the west end of platform.	Phasing and assumed production rates may be impacted.	L	L	Coordination with Keolis / MBTA for use of Station Track for construction access. Station Track being taken out of service during construction reduces potential risk.	4
8	Schedule	Operations	Weekend shutdowns will be required for various work activities such as waterproofing and installing the truss.	Amtrak may have an issue with allowing weekend shutdowns. This would impact when construction could occur causing delays.	L	L	Coordination will be required for Railroad Operations to obtain weekend outages. Design team will get MOU prior to bid.	4
29	Context	Operations	City of Worcester temporary loss of revenue from the current parking spaces.	This could impact laydown area and site access.	L	L	Limit parking space loss during construction. Managing lost of Rev will be captured in RE agreement MOU.	4

Risk ID	5FA	Category	Risk	Risk Impact	Probability	Cost Impact	Risk Notes	Risk Score
					VL,L,M,H,VH	VL,L,M,H,VH		Cost Score
35	Schedule	Operations	Waterproofing of WRA below grade spaces needs to be coordinated with platform construction phasing. Waterproofing must be complete before Station Track can be returned to service.	If waterproofing is not complete on time returning the track to service may be delayed.	L	L	Coordination between WRA and MBTA re: agreement on who will be responsible for waterproofing and ensuring coordination. All Waterproofing scope done on MBTA contract as existing scope or CO.	4
22	Technical	Permitting	State Building inspector to work with City of Worcester inspector on permits required and demarcation lines.	Lack coordination with city could cause conflicts and delay project.	L	L	Coordinate between agencies on permitting needs.	4
6	Context	Resources	Competing jurisdictions for the MBTA and City of Worcester on the work at Shrewsbury Street.	Lack of agreement could delay construction.	L	L	Coordinate police details. MBTA to have agreement with local police.	4
24	Schedule	Construction	Limited Access to room under tracks. Area is a confined space and could have increased cost/schedule impacts from typical production rates.	Lack of access could cause the Contractor to resequence work or reduce production.	VL	VL	Access needs to be coordinated with WRA .	1
34	Context	Construction	FTC levels required per MBTA current standards are reportedly under review. Requirements not clear. Current standard has risk of night sky pollution and/or light trespass issues.	This could impact the Contractor's ability to work at night.	VL	VL	Considering utilization of LED light fixtures with variable light output capability. Light fixtures under canopy and facing down.	1
23	Context	Engineering	Design exceptions need to be approved by MBTA.		VL	VL	Work with MBTA Chief Engineer and Railroad Operations for approvals.	1
30	Context	Operations	MBTA permanent loss of revenue parking spaces due to site improvements.	Lack of agreement could cause a redesign.	VL	VL	Limit project parking space removals. Not reducing any parking.	1
21	Schedule	Permitting	FRP Variance approval needed.	If variance is not approved in time this could delay the project.	VL	VL	Work with Ron Whitmore of FRP approval requirements. In process. No Variance required.	1
11	Schedule	Procurement	Long lead track materials.	If NTP is delayed the MBTA may be required to procure material. Material may not be available when required.	VL	VL	Either the Contractor will be required to procure material or HDR to develop procurement package for MBTA to procure. Contractor to procure materials. MBTA will not be purchasing any material.	1
28	Context	Real Estate	Resolution needed on the ownership in front of the station area. ROW from Grafton Street Bridge to CP 45 - actual limits. No plan found or legal description meters & bounds to define the land within the railroad corridor to be used to re-establish the ROW limits for MBTA ownership.	If this is not resolved this could limit the Contractor's ability to access certain areas of the site.	VL	VL	Confirm ownership with real estate entities.	1



APPENDIX E:

Risk Mapping

Safran Risk Activity To Risk Mappings Import Template

Activity Id	Activity Description	Mapped Risks
MS.NTP	Notice to Proceed (NTP)	
MS.01	MS#1 - Temporary Platform Certificate of Occupancy	
MS.02	MS#2 - Delivery of Elevator Assembly to within 50 Miles of Jobsite	
MS.03	MS#3 - Western Platform Certificate of Occupancy	
MS.04	MS#4 - Substantial Completion	
MS.05	MS#5 - Final Completion	
A1210	Allowances	
A1030	General Conditions/General Requirements	
SUB.1060	Building Permit - Prepare and Submit	
SUB.1070	Building Permit - Review and Approve	
SUB.1000	Health and Safety Plans - Prepare and Submit	
SUB.1010	Health and Safety Plans - Review and Approve	
SUB.1290	SWPP Plan - Prepare and Submit	
SUB.1300	SWPP Plan - Review and Approve	
SUB.1470	Upper Parking Lot Relocation Plan - Prepare and Submit	
SUB.1480	Upper Parking Lot Relocation Plan - Review and Approve	
SUB.1350	Crane Lift Plan - Prepare and Submit	
SUB.1360	Crane Lift Plan - Review and Comments	
SUB.1690	Crane Lift Plan - Revise and Resubmit	
SUB.1700	Crane Lift Plan - Review and Approve	
SUB.1040	Demolition Plan - Prepare and Submit	
SUB.1050	Demolition Plan - Review and Comments	
SUB.1710	Demolition Plan - Revise and Resubmit	
SUB.1720	Demolition Plan - Review and Approve	
SUB.1210	Excavation Plan - Prepare and Submit	
SUB.1220	Excavation Plan - Review and Comments	
SUB.1330	Excavation Plan - Revise and Resubmit	
SUB.1340	Excavation Plan - Review and Approve	
A1000	Contractor to Notify Utility Companies for Relocation	
SUB.1020	Prep and Sub Subcontractor List	
SUB.1030	Review and Approve Subcontractor List	
SUB.2160	Canopy - Prepare and Submit	
SUB.2190	Canopy - Review and Approve	[Risk-36;Series]
SUB.2150	Canopy - Fabricate and Deliver	
SUB.2210	Footings - Prepare and Submit	
SUB.2220	Footings - Review and Approve	
SUB.2200	Footings - Fabricate and Deliver	
SUB.2260	Foundations - Prepare and Submit	
SUB.2270	Foundations - Review and Approve	[Risk-36;Series]
SUB.2250	Foundations - Fabricate and Deliver	
SUB.2290	FRP Temporary Platform - Prepare and Submit	
SUB.2300	FRP Temporary Platform - Review and Approve	
SUB.2280	FRP Temporary Platform - Fabricate and Deliver	
SUB.1990	Drainage - Prepare and Submit	
SUB.2000	Drainage - Review and Comments	
SUB.2020	Drainage - Fabricate & Deliver	
SUB.2370	Concrete - Prepare and Submit	
SUB.2400	Concrete - Review and Approve	
SUB.2360	Concretes - Fabricate and Deliver	
SUB.1390	Micropiles - Prepare and Submit	
SUB.1400	Micropiles - Review and Comments	
SUB.1510	Micropiles - Revise and Resubmit	
SUB.1520	Micropiles - Review and Approve	
SUB.1370	Micropiles - Fabricate and Deliver	
SUB.1260	FRP Deck - Prepare and Submit	
SUB.1270	FRP Deck - Review and Comments	
SUB.1490	FRP Deck - Revise and Resubmit	
SUB.1500	FRP Deck - Review and Approve	
SUB.1280	FRP Deck - Fabricate and Deliver	
SUB.1600	Steel Structure Elev - Prepare and Submit	
SUB.1610	Steel Structure Elev - Review and Comments	
SUB.1620	Steel Structure Elev - Revise and Resubmit	
SUB.1630	Steel Structure Elev - Review and Approve	
SUB.1590	Steel Structure Elev - Fabricate and Deliver	
SUB.1450	Canopy - Prepare and Submit	
SUB.1460	Canopy - Review and Comments	
SUB.1530	Canopy - Revise and Resubmit	
SUB.1540	Canopy - Review and Approve	
SUB.1380	Canopy - Fabricate and Deliver	
SUB.1650	Tower - Prepare and Submit	
SUB.1660	Tower - Review and Comments	
SUB.1670	Tower - Revise and Resubmit	
SUB.1680	Tower - Review and Approve	
SUB.1640	Tower - Fabricate and Deliver	

SUB.2410	Roofing - Prepare and Submit	
SUB.2420	Roofing - Review and Approve	
SUB.2430	Roofing - Fabrication and Deliver	
SUB.1080	Elevator - Prepare and Submit R0	
SUB.1090	Elevator - Review and Comments R0	
SUB.1100	Elevator - Revise and Resubmit R1	
SUB.1110	Elevator - Review and Comments R1	
SUB.1120	Elevator - Revise and Resubmit R2	
SUB.1130	Elevator - Review and Approve R2	[Risk-32;Series]
SUB.1160	Elevator - Fabricate and Deliver	[Risk-16a;Series]
SUB.2310	MEP - Prepare and Submit	
SUB.2320	MEP - Review and Comments	
SUB.2330	MEP - Revise and Resubmit	
SUB.2340	MEP - Review and Approve	
SUB.2350	MEP - Fabricate and Deliver	
SUB.2120	Generator - Prepare and Submit	
SUB.1950	Electrical - Prepare and Submit	
SUB.2130	Generator - Review and Comments	
SUB.1960	Electrical - Review and Comments	
SUB.1970	Electrical - Revise and Resubmit	
SUB.2140	Generator - Fabricate and Deliver	
SUB.1980	Electrical - Review and Approve	
SUB.2010	Electrical Equipment - Fabricate and Deliver	
SUB.2060	Glazing - Prepare and Submit	
SUB.2030	Finish Material - Prepare and Submit	
SUB.2070	Glazing - Review and Comments	
SUB.2040	Fisnih Material - Review and Comments	
SUB.2080	Glazing - Fabrication and Deliver	
SUB.2050	Finish Material - Fabrication and Deliver	
SUB.2090	Miscellaneous Metals - Prepare and Submit	
SUB.2100	Miscellaneous Metals - Review and Comments	
SUB.2110	Miscellaneous Metals - Fabrication and Deliver	
SUB.1190	Ped Bridge - Prepare and Submit	
SUB.1200	Ped Bridge - Review and Comments	
SUB.1310	Ped Bridge - Revise and Resubmit	
SUB.1320	Ped Bridge - Review and Approve	
SUB.1180	Ped Bridge - Fabricate and Deliver	
SUB.1890	Ped Bridge - Pre-Assembly at Site	
SUB.1900	Track - Prepare and Submit	
SUB.1910	Track - Review and Comments	
SUB.1930	Track - Revise and Resubmit	
SUB.1940	Track - Review and Approve	
SUB.1920	Track - Fabricate and Delivery	
SUB.1730	Sign Frames - Prepare and Submit	
SUB.1740	Sign Frames - Review and Comments	
SUB.1760	Sign Frames - Revise and Resubmit	
SUB.1770	Sign Frames - Review and Approve	
SUB.1750	Sign Frames - Fabrication and Deliver	
SUB.1840	Sign Frames - Field Measurement and Submit to MBTA for Approval	
SUB.1850	Signs - Prepare and Submit	
SUB.1860	Signs - Review and Comments	
SUB.1870	Signs - Revise and Resubmit	
SUB.1880	Signs - Review and Approve	
SUB.1830	Signs - MBTA to Provide Final Artwork	
SUB.1780	Signs - Prepare and Submit Digital Proofs To MBTA	
SUB.1820	Signs - MBTA Approve Digital Proofs	
SUB.1800	Signs - Fabrication and Deliver	
A1010	Test pits for existing Utilities	
A1020	Relocate Existing Utilities for Platform Construction	[Risk-39;Series]
CON.1000	Mobilization and Construct Field Office	
CON.2735	Install Erosion Control & Implement Pollution Prevention Plan	
CON.1385	Site Clearing/Temporary Signage, Prepare Upper Parking Lot Work Zone	
CON.3135	Relocate Parking Space Prior to Upper Parking lot Work	[Risk-04;Series]
CON.4445	Install Construction Barrier and Set up Work Area	[Risk-38;Series]
CON.3335	Demo Window, Door, Wall Partition, Ceiling, Prepare for New Finishes	[Risk-19;Series]
CON.3975	Demo Electrical & Plumbing System	[Risk-18;Series]
CON.3985	Demo HVAC System	
CON.3415	N Tower/Main Lobby and Elev 3 - Install SOE & Excavate	[Risk-09;Series]
CON.3405	N Tower/Main Lobby and Elev 3 - Install Micropiles	
CON.3425	N Tower/Main Lobby and Elev 3 - Construct Foundation and Pile Caps	
CON.3505	N Tower/Main Lobby and Elev 3 - Construct Retaining Wall	
CON.4455	N Tower/Main Lobby and Elev 3 - Enclose Electrical & Comm Room	
CON.4385	Install Footings for Temporary Platform	[U-Night;Series]
CON.4395	Construct Foundations for Temporary Ramps and Stairs	[U-Night;Series]
CON.2985	Install Temporary Mini High Platform, Canopy and Lighting	[U-Night;Series]
CON.4345	Convert Existing Platform into Code Compliant Accessible Walkway	[Risk-17;Series];[Risk-17a;Series];[U-Night;Series]
CON.4425	Install Modular Canopy Over Temporary Stairs and Ramp	[Risk-31;Series];[U-WE;Series]
CON.4405	Install Modular Stairs and Ramp for Temporary Platform	[Risk-31;Series];[U-WE;Series]
CON.4415	Install Track Crossing Between Temporary Platform and Stairs and Ramp	[Risk-31;Series];[U-WE;Series]

CON.4435	Connect Power from Existing Site Lighting to Temporary Platform	[Risk-31;Series];[U-WE;Series]
CON.4225	DPS Inspection and Issue TCO	[Risk-31;Series];[U-WE;Series]
CON.3345	Install Temporary Fence for Pedestrian Walkway	[U-WE;Series]
CON.2785	Install U/G Drainage System at the Parking Lot	[Risk-20;Series]
CON.2795	Install U/G Drainage System Under the Track to Parking Lot	
CON.4745	Construct Electric Pad	
CON.3955	Install U/G Elect/Comm Conduits from Transformer to Electrical Room	[U-Night;Series]
CON.3965	Install U/G Elect/Comm Conduits from Electrical Room to Platform	
CON.4685	Install U/G Elect/Comm Conduits under Platform	[Risk-15;Series]
CON.4195	Install U/G Sewer Line From Elevator 2 to Shrewsbury Street	
CON.4205	Install U/G Gas Line From Generator to Shrewsbury Street	[Risk-15;Series]
CON.4215	Install U/G Sewer Line Under the Track From Elevator 2 to Parking Lot	[Risk-15;Series]
CON.4725	Union Station Remaining Demo	
CON.4735	Union Station - Emergency Repairs	
CON.3075	Union Station - Construct Interior Walls	
CON.3995	Union Station - Install HVAC Duct and AHU	
CON.4005	Union Station - Install MEP System	
CON.4015	Union Station - Install Architectural Finishes	
CON.3545	Elev 1 - Install SOE for all West Side	[Risk-02;Series];[Risk-03;Series];[U-Night;Series]
CON.3555	Elev 1 - Excavation	
CON.4245	Elev 1 - Construct Concrete Elevator Foundation & Pit Wall	
CON.4115	Elev 1 - Elevator Lobby Wall and Roof	
CON.4575	Elev 1 - Cure Elevator Wall	
CON.3565	Elev 1 - Complete Concrete Elevator Hoistway Wall	
CON.4595	Elev 1 - Stainless Steel Framing & Glass	
CON.4125	Elev 1 - Install Protection Board and Waterproofing (Elev Hoistway/Lobby/Mach Rm)	
CON.3835	Elev 1 - Backfill and Remove SOE	[U-Night;Series]
CON.3265	Elev 1 - Erect Hoistway Steel Structure	
CON.4275	Elev 1 - Erect Hoistway Enclosure/Curtainwall, and Roof	
CON.1665	Elev 1 - Install Elevator	
CON.3525	Stair 1 - Install SOE for all West Side	[U-Night;Series]
CON.3535	Stair 1 - Excavate and Demolish Existing Wall at the Storage Room and Install New W Beam	[Risk-27;Series]
CON.1625	Stair 1 - Construct Foundation/Wall/Stairway	
CON.4085	Stair 1 - Construct Stair Roof	
CON.4095	Stair 1 - Cure Stair Roof	
CON.3855	Stair 1 - Install Protection Board and Waterproofing	
CON.4555	Stair 1 - Waterproofing under Track 1	
CON.4105	Stair 1 - Backfill and Remove SOE	[U-Night;Series]
CON.2635	Stair 1 - Install MEP System	
CON.3845	Stair 1 - Install Handrails and Finishing	
CON.1675	Mach Rm Elev 1- Construct Wall and Roof	
CON.2275	Mach Rm Elev 1 - Install MEP Systems	
CON.1715	Mach Elev 1 - Install Architectural Finishes	
CON.4185	Fdn above Grafton St - Install SOE and Excavate for Foundation Work at Grafton Street	
CON.4335	Fdn above Grafton St - Install Protection Board and Waterproofing	[Risk-26;Series]
CON.4155	Fdn above Grafton St - Construct Foundation and Beam (above Grafton Street)	[U-Night;Series]
CON.4165	Fdn above Grafton St - Cure Foundation and Beam (above Grafton Street)	
CON.4315	Fdn above Grafton St - Remove SOE and Backfill Foundation and Beam above Grafton Street	
CON.4485	Platform WS - Install Drainage	
CON.2165	Platform WS - Drill Test Micropiles	
CON.3005	Platform WS - Perform Pile Test Program & Modification if needed	
CON.2205	Platform WS - Install Micropiles	[Risk-40;Series];[Risk-25;Series];[U-Night;Series]
CON.4565	Platform WS - Install New Utilities Conduit	
CON.3205	Platform WS - FRP Pile Caps/Column Base	[U-Night;Series]
CON.3215	Platform WS - Cure Pile Caps	
CON.3355	Platform WS - Backfill for FRP Platform	
CON.3365	Platform WS - Place FRP Composite Panels w/ Tactile	
CON.3385	Platform WS - Erect Canopy Columns and Framing	
CON.3375	Platform WS - Install Canopy Roofing System	
CON.4495	Platform WS - Construct Temporary Stairs	
CON.3395	Platform WS - Install MEP System	
CON.1755	Platform WS - Install Architectural Finishes	
CON.3575	Platform WS - Install Signs	
CON.4465	N Tower - Install MEP & Equipment System in Electrical Room	
CON.4475	N Tower - Run Power from Electrical Room to Machine Room West	
CON.1375	Construct Emergency Generator Pad	
CON.4265	Cure Emergency Generator Pad	
CON.1405	Install Emergency Generator and Connection	
CON.3515	Emergency Generator Start up and Test	
CON.4375	Start of Station Track Out of Service	[Risk-10;Series]
CON.4365	Removal of Station Track	[U-Night;Series]
CON.4235	Remove and Replace Track #1 in 40' Western Segments	[U-Night;Series]
CON.3325	Station Track Full Depth Track Reconstruction Western Segment	[U-Night;Series]
CON.4075	Western Section - Test & Commission MEP Systems	

CON.1735	Western Section - Elev 1 Test, DPS Inspection and Issue Certificate	
CON.2295	Western Section - Elev 1 72 Hrs Performance Test	
CON.2305	Western Section - Elev 1 Rework and Retest	
CON.4055	Western Section - DPS Inspection and Issue TCO	
CON.4515	Platform ES - Remove Temporary Platform	[U-Night;Series]
CON.3605	Platform ES - Install Micropiles (Platform/Bridge/Elev 2/Mach Rm)	[U-Night;Series]
CON.4605	Platform ES - Stairway Foundation	
CON.3625	Platform ES - FRP Pile Caps (Platform/Bridge)	
CON.3635	Platform ES - Cure Pile Caps	
CON.3645	Platform ES - Backfill for FRP Platform	
CON.3655	Platform ES - Place FRP Composite Panels w/ Tactile	
CON.3675	Platform ES - Erect Canopy Columns and Framing	
CON.3665	Platform ES - Install Roofing System	
CON.4505	Elev 2 - SOE	[U-Night;Series]
CON.3715	Elev 2 - Construct Elevator Pit Slab and Pit Wall	[U-Night;Series]
CON.3905	Elev 2 - Cure Elevator Pit Slab and Pit Wall	
CON.3275	Elev 2 - Erect Hoistway Steel Structure	
CON.3815	Elev 2 - Erect Hoistway Enclosure/Curtainwall, and Roof	
CON.4635	Elev 2 - Waterproofing	
CON.2315	Elev 2 - Install Elevator	
CON.2325	Elev 2 Mach Rm - Construct SOG	
CON.2435	Elev 2 Mach Rm - Construct Perimeter Wall	
CON.2345	Elev 2 Mach Rm - Construct Roof Deck and Install Roofing System	
CON.2365	Elev 2 Mach Rm - Install MEP System	
CON.3765	Elev 2 Mach Rm - Install Architectural Finishes	
CON.1925	Stair 2 - Erect Structural Steel for Stair	[U-Night;Series]
CON.1955	Stair 2 - Construct Concret Landing/Deck	[U-Night;Series]
CON.4625	Stair 2 - Construct Wall	
CON.3805	Stair 2 - Install Roof System	
CON.1935	Stair 2 - Install Guardrail	
CON.3685	Platform ES - Install MEP Systems	
CON.3585	Platform ES - Install Architectural Finishes	
CON.4145	Platform ES - Install Signs	
CON.3465	Elev 3 - Install Elevator	
CON.4675	N Tower/Elev 3 - Foundation	
CON.4655	N Tower/Elev 3 - Pit Wall	
CON.1080	N Tower/Elev 3 - Erect Steel Structure Framing and Stairs	
CON.4325	N Tower/Elev 3 - Construct Elevated Concrete Floors	
CON.3825	N Tower/Elev 3 - Enclosure/Curtainwall, and Roof	
CON.3435	N Tower - Install Roofing System	
CON.3475	N Tower - Install MEP System	
CON.3495	N Tower - Install Architectural Finishes	
CON.4135	N Tower - Install Signs	
CON.3745	Bridge - Erect Columns and Framing for Bridge at the Platform	
CON.3725	Bridge - Lift and Set Pre-assembled Bridge	
CON.3735	Bridge - Construct Floor Deck	
CON.3755	Bridge - Install Enclosure/Curtain Wall and Roofing System	
CON.3775	Bridge - Install MEP System	
CON.4255	Bridge - Install Architectural Finishes	
CON.4695	Install Permanent Fence & Accessible Pedestrian Walkway	
CON.4765	Construct Permanent Pedestrian Walkway	[U-Night;Series]
CON.4815	Install Benches Pedestrian Walkway	
CON.4755	Install Fence for Pedestrian Walkway	[U-Night;Series]
CON.4785	Remove Temporary Stairs at Pedestrian Walkway	
CON.4545	Install Drainage Eastern Side	
CON.4535	Remove and Replace Track #1 in 40' Eastern Segments	
CON.4715	Track #1 Destressing	
CON.4525	Station Track Full Depth Track Reconstruction Eastern Segment	
CON.4705	Station Track Destressing	
CON.2715	Parking Lot - Saw Cut and Remove Existing Pavement	
CON.4805	Parking Lot - Perform Drainage Upgrades	
CON.2085	Parking Lot - Install Subbase and Install Granite Curb	
CON.2705	Parking Lot - Install HMA Binder Course	
CON.4775	Parking Lot - Construct Parking Plaza	
CON.2095	Parking Lot - Construct Concrete Sidewalk	
CON.3915	Parking Lot - Construct Rain Garden and Riprap Swale	
CON.2725	Parking Lot - Instal Guard Rail	
CON.3925	Parking Lot - Loam and Seed, and Planting	
CON.3935	Parking Lot - Install HMA Surface Course	
CON.3945	Parking Lot - Install Strippings, Markings, and Signs, Parking Lot Features	
CON.3885	Eastern Section - Test & Commission MEP Systems	
CON.4285	Eastern Section Elev 3 - Test, DPS Inspection and Issue Certificate	
CON.4295	Eastern Section Elev 3 - 72 Hrs Performance Test	
CON.4305	Eastern Section Elev 3 - Rework and Retest	
CON.2375	Eastern Section Elev 2 - Test, DPS Inspection and Issue Certificate	
CON.2455	Eastern Section Elev 2 - 72 Hrs Performance Test	
CON.3895	Eastern Section Elev 2 - Rework and Retest	
CON.2465	Eastern Section - DPS Inspection and Issue CO	
CLO.1000	Punch List and Inspections	

CLO.1120	Submittal and Procurement	
CLO.1020	Utility Relocation, Mobilization and General Site Preparation	
CLO.1050	Phase 2 - Parking Lot Underground Utilities	
CLO.1030	Phase 1 - Construction of Mini High Platform	
CLO.1160	Phase 1 - Demolition Work Inside Union Station	
CLO.1060	Phase 2 - Center Island Platform Western Section (E1 to P31)	
CLO.1070	Phase 2 - Access Corridor and Elevator Lobby Improvement	
CLO.1040	Phase 2/3 - Full Depth Track Reconstruction	
CLO.1130	Phase 2 - Elevator 1 Installation	
CLO.1090	Phase 3 - Center Island Platform Eastern Section (P31 to BE) and North Tower	
CLO.1150	Phase 3 - Elevator 3 Installation	
CLO.1110	Phase 3 - Parking Lot Improvement	
CLO.1140	Phase 3 - Elevator 2 Installation	



APPENDIX F:

Base Cost Estimate

Cost Summary (Major Item Breakdown)

Work Item	Description	QTY	UNIT	Total Direct Cost	TOTAL w/ M-Us
1	GENERAL CONDITIONS	1	LS	\$ 2,662,441	\$ 3,522,021
2	GENERAL REQUIREMENTS	1	LS	\$ 190,335	\$ 251,785
3	SITEWORK	1	LS	\$ 2,191,277	\$ 2,898,739
4	PLATFORM	1	LS	\$ 7,953,725	\$ 10,521,616
5	WEST PLATFORM	1	LS	\$ 2,119,458	\$ 2,803,733
6	EAST PLATFORM	1	LS	\$ 3,012,010	\$ 3,984,448
7	NORTH HEADHOUSE	1	LS	\$ 5,113,859	\$ 6,764,888
8	TRACKWORK	1	LS	\$ 3,806,728	\$ 5,035,745
9	ELECTRICAL	1	LS	\$ 2,165,035	\$ 2,864,025
Total Direct Construction Cost				\$ 29,214,868	\$ 38,647,000
5.0%	Overhead			\$ 1,460,743	included
	Escalation to midpoint of Construction & Market Conditions			\$ 3,127,847	included
5.0%	Profit			\$ 1,690,173	included
1.00%	Permits			\$ 354,936	included
0.65%	General Liability Insurance			\$ 233,016	included
1.00%	Railroad Protection Liability Insurance			\$ 360,816	included
1.00%	Bond			\$ 364,424	included
5.0%	Design Contingency			\$ 1,840,341	included
Total Estimated Construction Cost				\$ 38,647,000	\$ 38,647,000
10%	ALLOWANCES				
	MAINTENANCE and PROTECTION of RAILROAD PROPERTY			\$ -	\$0
	TRAFFIC OFFICERS SERVICES**			\$ 283,000	\$283,000
	WEEKEND SUBSTITUTE TRANSPORTATION			\$ 535,000	\$535,000
	EXISTING SITE UTILITIES			\$ 50,000	\$50,000
	PEST CONTROL			\$ 25,000	\$25,000
	DISPOSAL OF ALLOWANCE QUALIFYING SOILS			\$ 250,000	\$250,000
	CONCRETE and STRUCTURAL REPAIRS			\$ 50,000	\$50,000
	RISK ALLOWANCE REALLOCATION			\$ 3,865,000	\$3,865,000
TOTAL PROJECT COST				\$ 43,705,000	\$ 43,705,000



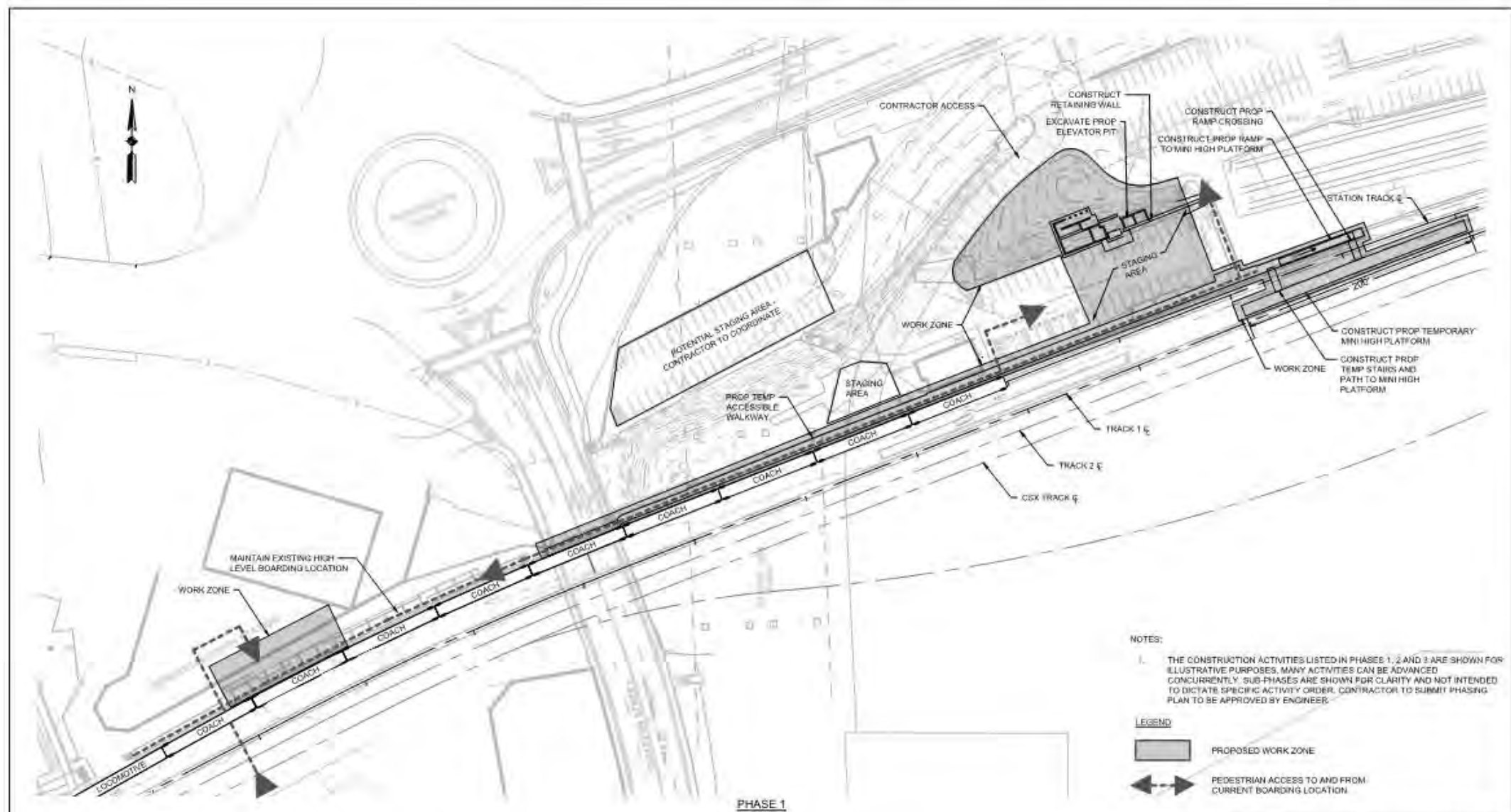
APPENDIX G:

Estimate Uncertainty



APPENDIX H:

Phasing Plan



PHASE 1

PHASE 1A NOTES - MAY BE COMPLETED DURING REVENUE HOURS

1. BEGIN DEMOLITION INSIDE UNION STATION (SEE SHEETS A-100, E-101, MD-101, and FXD-101 FOR DETAILS).
2. INSTALL SUPPORT OF EXCAVATION AND BEGIN PREPARATION AND EXCAVATION FOR ELEVATOR PIT IN GREENSPACE AREA.
3. CONSTRUCT RETAINING WALL FOR GREENSPACE AREA.
4. CONSTRUCT RAMP AND STAIRS FOR TEMPORARY MINI HIGH PLATFORM.
5. EXISTING STATION TRACK REMAINS IN SERVICE.

PHASE 1B NOTES - ANTICIPATED NIGHT WORK

1. CONSTRUCT TEMPORARY MINI HIGH PLATFORM BETWEEN THE STATION TRACK AND TRACK 1 DURING NON-REVENUE HOURS.
2. INSTALL ALL FOOTINGS FOR TEMPORARY MINI HIGH RAMP AND STAIRS EXCEPT FOR THOSE ADJACENT TO STATION TRACK DURING NON-REVENUE HOURS.
3. BRING ACCESSIBLE PEDESTRIAN WALKWAY UP TO CODE DURING NON-REVENUE HOURS.

PHASE 1C NOTES - ANTICIPATED TO REQUIRE A WEEKEND OUTAGE

1. INSTALL RAMP FOOTINGS ADJACENT TO STATION TRACK.
2. DEMO SECTION OF STATION TRACK THEN INSTALL TRACK CROSSINGS BETWEEN NEWLY CONSTRUCTED STAIRS/RAMP AND TEMPORARY MINI HIGH PLATFORM.
3. INSTALL TEMPORARY FENCE FOR ACCESSIBLE PEDESTRIAN WALKWAY.

NOTES:

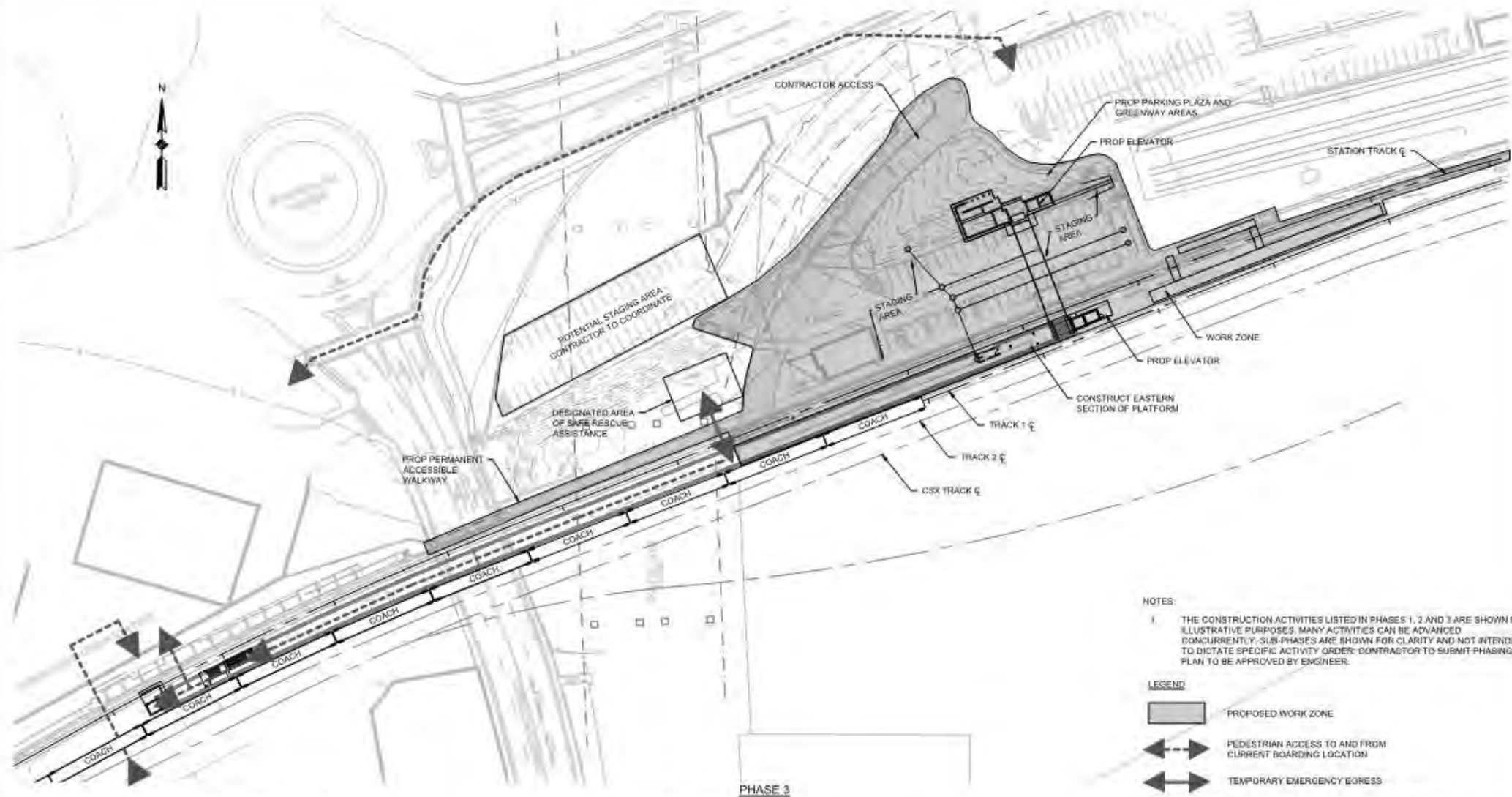
THE CONSTRUCTION ACTIVITIES LISTED IN PHASES 1, 2 AND 3 ARE SHOWN FOR ILLUSTRATIVE PURPOSES. MANY ACTIVITIES CAN BE ADVANCED CONCURRENTLY. SUB-PHASES ARE SHOWN FOR CLARITY AND NOT INTENDED TO DICTATE SPECIFIC ACTIVITY ORDER. CONTRACTOR TO SUBMIT PHASING PLAN TO BE APPROVED BY ENGINEER.

LEGEND

- PROPOSED WORK ZONE
- PEDESTRIAN ACCESS TO AND FROM CURRENT BOARDING LOCATION



T	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
	WORCESTER UNION STATION	
HR	ACCESSIBILITY IMPROVEMENTS (CONTRACT NO. 87252001)	
	CONSTRUCTION PHASING	
PHASE 1		
CONSTRUCT TEMP MINI HIGH PLATFORM		
20 HIGH STREET, SUITE 2000 BOSTON, MA 02110-2578		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
Project Manager:	DATE:	Project Manager:
HORIZ: AS SHOWN	DATE: 01-10-2018	DATE: 01-10-2018
VERT: AS SHOWN	DATE: 01-10-2018	DATE: 01-10-2018
DATE: 01-10-2018	DATE: 01-10-2018	DATE: 01-10-2018



NOTES:

- THE CONSTRUCTION ACTIVITIES LISTED IN PHASES 1, 2 AND 3 ARE SHOWN FOR ILLUSTRATIVE PURPOSES. MANY ACTIVITIES CAN BE ADVANCED CONCURRENTLY. SUB-PHASES ARE SHOWN FOR CLARITY AND NOT INTENDED TO DICTATE SPECIFIC ACTIVITY ORDER. CONTRACTOR TO SUBMIT PHASING PLAN TO BE APPROVED BY ENGINEER.

LEGEND

- PROPOSED WORK ZONE
- PEDESTRIAN ACCESS TO AND FROM CURRENT BOARDING LOCATION
- TEMPORARY EMERGENCY EGRESS

PHASE 3A NOTES - MAY BE COMPLETED DURING REVENUE HOURS

- SHIFT HANDICAP PARKING TO GARAGE.
- SHIFT BOARDING TO NEWLY OPENED PORTION OF PLATFORM ON TRACK 1.
- INSTALL EASTERN SECTION OF PLATFORM AND SET FRP PANELS.
- COMPLETE CIVIL WORK, INSTALL ROOF AND SCREEN ENCLOSURE, LIGHTS, SIGNS, COMMUNICATION SYSTEM, AND PERFORM ELEVATOR TESTING.
- INSTALL PERMANENT PENCE AND CONSTRUCT PERMANENT ACCESSIBLE PEDESTRIAN WALKWAY FROM STATION LIMITS TO EXTENTS OF HIGH LEVEL PLATFORM DURING NON-REVENUE HOURS.
- REMOVE TEMPORARY STAIRS FROM THE PEDESTRIAN WALKWAY TO THE NEWLY CONSTRUCTED PLATFORM AFTER CERTIFICATION OF OCCUPANCY IS RECEIVED.

PHASE 3B NOTES - ANTICIPATED NIGHT WORK

- INSTALL ELEVATOR AND ELEVATOR MACHINE ROOM DURING NON-REVENUE HOURS.
- INSTALL CONCRETE PILE CAPS AND FOUNDATIONS.
- INSTALL CONCRETE DECK AND STAIRS.

PHASE 3C NOTES - ANTICIPATED TO REQUIRE A WEEKEND OUTAGE

- REMOVE TEMPORARY MINI HIGH PLATFORM AND ASSOCIATED RAMP DURING WEEKEND OUTAGE.
- INSTALL STEEL FRAMING AND OVERHEAD PEDESTRIAN BRIDGE DURING WEEKEND OUTAGE.
- INSTALL DRAINAGE UPGRADES DURING PARKING LOT OUTAGE (SEE SHEETS C-401 THOUGH C-402 FOR DETAILS).

		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
		WORCESTER UNION STATION 425 COMMUNITY DRIVE, WILMINGTON CONTRACT NO. 9012005	
		CONSTRUCTION PHASING PHASE 3 COMPLETE PLATFORM AND GREENSPACE AREA	
		MASSACHUSETTS BAY TRANSPORTATION AUTHORITY	
Project Manager: _____ Date: _____	Date: _____ Date: _____	Project Manager: _____ Date: _____	Date: _____ Date: _____

SCALE 1" = 40'



APPENDIX I:

P6 Schedule

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	Budgeted Total Cost	2021												2022												2023								
							A	S	Oct	N	D	Jan	F	M	Apr	M	J	Jul	A	S	Oct	N	D	J	F	M	A	M	J	Jul	A	S	Oct	N	D	J			
MBTA Worcester Union Station and Associated Track Work 100% Final							MBTA Worcester Union Station and Associated Track Work 100% Final																																
MILESTONE							MILESTONE																																
CONTRACTUAL MILESTONE							CONTRACTUAL MILESTONE																																
MS.NTP	Notice to Proceed (NTP)	0	17-Aug-20*		0	\$0.00	◆ Notice to Proceed (NTP)																																
MS.01	MS#1 - Temporary Platform Certificate of Occupancy	0		20-Dec-20*	1	\$0.00	◆ MS#1 - Temporary Platform Certificate of Occupancy																																
MS.02	MS#2 - Delivery of Elevator Assembly to within 50 Miles of Jobsite	0		27-Jul-21*	0	\$0.00	◆ MS#2 - Delivery of Elevator Assembly to within 50 Miles of Jobsite																																
MS.03	MS#3 - Western Platform Certificate of Occupancy	0		03-Dec-21*	0	\$0.00	◆ MS#3 - Western Platform Certificate of Occupancy																																
MS.04	MS#4 - Substantial Completion	0		25-Aug-22*	0	\$0.00	◆ MS#4 - Substantial Completion																																
MS.05	MS#5 - Final Completion	0		24-Oct-22	0	\$0.00	◆ MS#5 - Final Completion																																
GENERAL							GENERAL																																
A1030	General Conditions/General Requirements	799	17-Aug-20	24-Oct-22	0	\$3,773,806.00	General Conditions/General Requirements																																
A1210	Allowances	799	17-Aug-20	24-Oct-22	0	\$5,058,000.00	Allowances																																
SUBMITTALS AND PROCUREMENT							SUBMITTALS AND PROCUREMENT																																
PLANS							PLANS																																
BUILDING PERMIT							BUILDING PERMIT																																
SUB.1060	Building Permit - Prepare and Submit	30	17-Aug-20	15-Sep-20	39	\$0.00	Building Permit - Prepare and Submit																																
SUB.1070	Building Permit - Review and Approve	30	16-Sep-20	15-Oct-20	39	\$0.00	Building Permit - Review and Approve																																
HEALTH & SAFETY PLANS							HEALTH & SAFETY PLANS																																
SUB.1000	Health and Safety Plans - Prepare and Submit	30	17-Aug-20	15-Sep-20	39	\$0.00	Health and Safety Plans - Prepare and Submit																																
SUB.1010	Health and Safety Plans - Review and Approve	30	16-Sep-20	15-Oct-20	39	\$0.00	Health and Safety Plans - Review and Approve																																
STORM WATER POLLUTION PREVENTION PLAN							STORM WATER POLLUTION PREVENTION PLAN																																
SUB.1290	SWPP Plan - Prepare and Submit	30	17-Aug-20	15-Sep-20	101	\$0.00	SWPP Plan - Prepare and Submit																																
SUB.1300	SWPP Plan - Review and Approve	30	16-Sep-20	15-Oct-20	101	\$0.00	SWPP Plan - Review and Approve																																
RELOCATION OF UPPER PARKING LOT PLAN							RELOCATION OF UPPER PARKING LOT PLAN																																
SUB.1470	Upper Parking Lot Relocation Plan - Prepare and Submit	30	17-Aug-20	15-Sep-20	154	\$0.00	Upper Parking Lot Relocation Plan - Prepare and Submit																																
SUB.1480	Upper Parking Lot Relocation Plan - Review and Approve	30	16-Sep-20	15-Oct-20	154	\$0.00	Upper Parking Lot Relocation Plan - Review and Approve																																
CRANE LIFT PLAN							CRANE LIFT PLAN																																
SUB.1350	Crane Lift Plan - Prepare and Submit	30	17-Aug-20	15-Sep-20	39	\$0.00	Crane Lift Plan - Prepare and Submit																																
SUB.1360	Crane Lift Plan - Review and Comments	30	16-Sep-20	15-Oct-20	39	\$0.00	Crane Lift Plan - Review and Comments																																
SUB.1690	Crane Lift Plan - Revise and Resubmit	21	16-Oct-20	05-Nov-20	39	\$0.00	Crane Lift Plan - Revise and Resubmit																																
SUB.1700	Crane Lift Plan - Review and Approve	30	06-Nov-20	05-Dec-20	39	\$0.00	Crane Lift Plan - Review and Approve																																
DEMOLITION PLAN							DEMOLITION PLAN																																
SUB.1040	Demolition Plan - Prepare and Submit	30	17-Aug-20	15-Sep-20	172	\$0.00	Demolition Plan - Prepare and Submit																																
SUB.1050	Demolition Plan - Review and Comments	30	16-Sep-20	15-Oct-20	172	\$0.00	Demolition Plan - Review and Comments																																
SUB.1710	Demolition Plan - Revise and Resubmit	21	16-Oct-20	05-Nov-20	172	\$0.00	Demolition Plan - Revise and Resubmit																																
SUB.1720	Demolition Plan - Review and Approve	30	06-Nov-20	05-Dec-20	172	\$0.00	Demolition Plan - Review and Approve																																
EXCAVATION PLAN							EXCAVATION PLAN																																
SUB.1210	Excavation Plan - Prepare and Submit	30	17-Aug-20	15-Sep-20	39	\$0.00	Excavation Plan - Prepare and Submit																																
SUB.1220	Excavation Plan - Review and Comments	30	16-Sep-20	15-Oct-20	39	\$0.00	Excavation Plan - Review and Comments																																
SUB.1330	Excavation Plan - Revise and Resubmit	21	16-Oct-20	05-Nov-20	39	\$0.00	Excavation Plan - Revise and Resubmit																																
SUB.1340	Excavation Plan - Review and Approve	30	06-Nov-20	05-Dec-20	39	\$0.00	Excavation Plan - Review and Approve																																
SCHEDULE							SCHEDULE																																
A1000	Contractor to Notify Utility Companies for Relocation	30	17-Aug-20	15-Sep-20	49	\$0.00	Contractor to Notify Utility Companies for Relocation																																
PROCUREMENT							PROCUREMENT																																
SUBCONTRACTORS LIST							SUBCONTRACTORS LIST																																
SUB.1020	Prep and Sub Subcontractor List	14	17-Aug-20	30-Aug-20	0	\$0.00	Prep and Sub Subcontractor List																																

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	Budgeted Total Cost	2021												2022														123					
							W	A	S	Oct	N	D	Jan	F	M	Apr	M	J	Jul	A	S	Oct	N	D	J	F	M	A	M	J	Jul	A	S	Oct	N	D	J	
SUB.1540	Canopy - Review and Approve	30	20-Dec-20	18-Jan-21	70	\$0.00																																
SUB.1380	Canopy - Fabricate and Deliver	120	19-Jan-21	18-May-21	70	\$790,000.00																																
STEEL STRUCTURE - NORTH TOWER																																						
SUB.1650	Tower - Prepare and Submit	30	30-Sep-20	29-Oct-20	246	\$0.00																																
SUB.1660	Tower - Review and Comments	30	30-Oct-20	28-Nov-20	246	\$0.00																																
SUB.1670	Tower - Revise and Resubmit	21	29-Nov-20	19-Dec-20	246	\$0.00																																
SUB.1680	Tower - Review and Approve	30	20-Dec-20	18-Jan-21	246	\$0.00																																
SUB.1640	Tower - Fabricate and Deliver	120	19-Jan-21	18-May-21	246	\$560,000.00																																
ROOFING																																						
SUB.2410	Roofing - Prepare and Submit	30	30-Sep-20	29-Oct-20	191	\$0.00																																
SUB.2420	Roofing - Review and Approve	30	30-Oct-20	28-Nov-20	191	\$0.00																																
SUB.2430	Roofing - Fabrication and Deliver	30	29-Nov-20	28-Dec-20	191	\$305,934.00																																
ELEVATORS																																						
SUB.1080	Elevator - Prepare and Submit R0	30	30-Sep-20	29-Oct-20	0	\$0.00																																
SUB.1090	Elevator - Review and Comments R0	30	30-Oct-20	28-Nov-20	0	\$0.00																																
SUB.1100	Elevator - Revise and Resubmit R1	14	29-Nov-20	12-Dec-20	0	\$0.00																																
SUB.1110	Elevator - Review and Comments R1	14	13-Dec-20	26-Dec-20	0	\$0.00																																
SUB.1120	Elevator - Revise and Resubmit R2	14	27-Dec-20	09-Jan-21	0	\$0.00																																
SUB.1130	Elevator - Review and Approve R2	14	10-Jan-21	23-Jan-21	0	\$0.00																																
SUB.1160	Elevator - Fabricate and Deliver	185	24-Jan-21	27-Jul-21	0	\$1,635,000.00																																
MEP																																						
SUB.2310	MEP - Prepare and Submit	30	17-Aug-20	15-Sep-20	203	\$0.00																																
SUB.2320	MEP - Review and Comments	30	16-Sep-20	15-Oct-20	203	\$0.00																																
SUB.2330	MEP - Revise and Resubmit	21	16-Oct-20	05-Nov-20	203	\$0.00																																
SUB.2340	MEP - Review and Approve	30	06-Nov-20	05-Dec-20	203	\$0.00																																
SUB.2350	MEP - Fabricate and Deliver	60	06-Dec-20	03-Feb-21	203	\$450,796.00																																
ELECTRICAL																																						
SUB.1950	Electrical - Prepare and Submit	30	30-Sep-20	29-Oct-20	159	\$0.00																																
SUB.2120	Generator - Prepare and Submit	30	30-Sep-20	29-Oct-20	224	\$0.00																																
SUB.1960	Electrical - Review and Comments	30	30-Oct-20	28-Nov-20	159	\$0.00																																
SUB.2130	Generator - Review and Comments	30	30-Oct-20	28-Nov-20	224	\$0.00																																
SUB.1970	Electrical - Revise and Resubmit	21	29-Nov-20	19-Dec-20	159	\$0.00																																
SUB.2140	Generator - Fabricate and Deliver	120	29-Nov-20	28-Mar-21	224	\$5,000.00																																
SUB.1980	Electrical - Review and Approve	30	20-Dec-20	18-Jan-21	159	\$0.00																																
SUB.2010	Electrical Equipment - Fabricate and Deliver	60	19-Jan-21	19-Mar-21	159	\$900,000.00																																
ARCHITECTURAL FINISHES																																						
SUB.2030	Finish Material - Prepare and Submit	30	30-Sep-20	29-Oct-20	262	\$0.00																																
SUB.2060	Glazing - Prepare and Submit	30	30-Sep-20	29-Oct-20	559	\$0.00																																
SUB.2040	Finish Material - Review and Comments	30	30-Oct-20	28-Nov-20	262	\$0.00																																
SUB.2070	Glazing - Review and Comments	30	30-Oct-20	28-Nov-20	559	\$0.00																																
SUB.2050	Finish Material - Fabrication and Deliver	30	29-Nov-20	28-Dec-20	262	\$375,000.00																																
SUB.2080	Glazing - Fabrication and Deliver	45	29-Nov-20	12-Jan-21	559	\$1,967,390.00																																
MISCELLANEOUS METALS																																						
SUB.2090	Miscellaneous Metals - Prepare and Submit	30	30-Sep-20	29-Oct-20	303	\$0.00																																
SUB.2100	Miscellaneous Metals - Review and Comments	30	30-Oct-20	28-Nov-20	303	\$0.00																																
SUB.2110	Miscellaneous Metals - Fabrication and Deliver	45	29-Nov-20	12-Jan-21	303	\$20,000.00																																
PEDESTRIAN BRIDGE																																						

■ Remaining Level of Effort ■ Critical Remaining Work
■ Actual Work ◆ Milestone
■ Remaining Work ⇨ Summary

100% CTD Schedule
 Page 3 of 9
 Date: 10-Apr-20





APPENDIX J:

Risk Workshop Attendees

X72CN01: Worcester Union Station Risk Workshop Attendees

#	Name:	Company:	Email:
1	Derrick Brantley	Patrick Engineering	dbrantley@patrickco.com
2	AJ Tanner	MBTA	atanner@MBTA.com
3	Anthony DeDominicis	MBTA	adedominicis@MBTA.com
4	Chris Smee	HDR	christopher.smee@hdrinc.com
5	Christopher Sullivan	MBTA	csullivan1@MBTA.com
6	Chris Hart	MBTA	chart@MBTA.com
7	Courtney Lackard	MBTA	clackard@MBTA.com
8	Dan Carroll	MBTA	dcarroll@MBTA.com
9	Debra Darby	MBTA	ddarby@MBTA.com
10	Adriana Echeverri	HDR	Adriana.Echeverri@hdrinc.com
11	Eric DiVirgilio	HDR	Eric.Divirgilio@hdrinc.com
12	Filipe Miranda	MBTA	fmiranda@MBTA.com
13	Hannah Lyons-Galant	MBTA	hlyonsgalante@MBTA.com
14	Maribel Kelly	MBTA	mkelly@mbta.com
15	Holly Palmgren	MBTA	HPalmgren@MBTA.com
16	John Murray	MBTA	jpmurray@MBTA.com
17	June Wu	HDR	June.Wu@hdrinc.com
18	Ben Losordo	MBTA	blosordo@MBTA.com
19	Megan Lott	Patrick Engineering	mlott@patrickco.com
20	Micheal Baskin	HDR	Michael.Baskin@hdrinc.com
21	Mike Gulya	Keolis	michael.gulya@keolis.com
22	Tess Paganelli	MBTA	tpaganelli@mbta.com
23	Regina Maguire	MBTA	rmaguire@MBTA.com
24	Seth Haffner	MBTA	shaffner@MBTA.com
25	Shahriyar (Roy) Mojahed	HDR	roy.mojahed@hdrinc.com
26	Sharon Cranston	MBTA	scranton@mbta.com
27	Kevin Slattery	HDR	kevin.slattery@hdrinc.com
28	Ted Banks	MBTA	tbanks@MBTA.com
29	William Tse	MBTA	wtse@MBTA.com
30	William Wolfgang	MBTA	wwolfgang@mbta.com
31	Marilou Krause	MBTA	mkrause@MBTA.com
32	Salina Martin	HDR	salina.martin@hdrinc.com
33			
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COMMENT DISPOSITION TRACKING FORM

Project:	MBTA South Elm Street Bridge Replacement				
Deliverable:	Final Design Plans				
Type of Review:	FD Review				
Comments Date:	10/20/2022				
Response: A - Change made; B - Change not made; C - Discussion needed; D - Will Address at Next Version					
Item No.	Reviewer Name	Sheet No.	Review Comment	Response Code	Author Response (or Explanation)
1	Khalid Salahuddin	General	Please provide a detailed and itemized cost estimate for this project.		
2	Khalid Salahuddin	3	On Sheet G-03 (.pdf page 3), Legend does not include R&D, possibly Remove and Dispose, but referred to on Sheet C-03 (.pdf Page 7), under Typical Section for the South Elm Street.		
3	Khalid Salahuddin	General	Who owns Elem Street? If owned by MassDOT, need to have an approval from them and also the approval for the MOT plans during reconstruction of the road and the railroad bridge as well. Vertical clearance is increased but not by much. MassDOT (or the roadway owner) needs to approve the sub-standard vertical clearance for the proposed bridge.		
4	Khalid Salahuddin	General	On this sheet, need to show dimension to the bottom of the tie-back encasement from the top of sidewalk to make sure adequate headroom available for the pedestrians		
5	Khalid Salahuddin	6	On Sheet C-02 (.pdf Page 6), it shows “Meet proposed Grade by Others’. Who is doing this project and what is the schedule for this project? If the schedule does not work out, then what is the plan?		
6	Khalid Salahuddin	23	On Sheet S-06 (.pdf Page 23), for some reason, CIP Concrete Encasement for Tiebacks is only shown at the North Abutment and not at the South Abutment. Please clarify why.		
7	Khalid Salahuddin	24	On Sheet S-08 (.pdf Page 24) some of the staging areas (shaded) shown are outside the railroad property limit. Who is going to acquire the easement needed if not already acquired (should not happen before the FRA NEPA)? Cost for any temporary or permanent easement needs to be included in the cost estimate.		

8	Khalid Salahuddin	26	On Sheet S-10 (.pdf Page 26), it is not clear whether the Inter-track fence is at the top of the existing Girder B. Provide details of attachment, if continues on the bridge, looks like only at the approaches. Clarify.		
9	Khalid Salahuddin	26	On this same sheet, in Construction Sequencing 2A, it is not clear how the micropiles can be installed without removing the superstructure and top two courses of the granite layers of the abutment wall. Please clarify.		



To: Greg DePietro
Railroad Safety Inspector (Track)
Federal Railroad Administration

From: Jennifer Tabakin
SCR Program Manager

Date: 6/7/2022

Project: MBTA South Coast Rail – Phase I

Subject: FRA Site Visit – 5/31/2022

The SCR Team received your email on 6/1/2022 outlining the recent visit to the SCR territory. During your visit, multiple reports were generated indicating areas that were out of compliance. The reports indicated that there were “No Violations Recommended”; however, the SCR team immediately took action and below is our response to your reports.

1. *“FRA inspectors conducted an unannounced unaccompanied inspection of RWP compliance on the Middleboro subdivision where multiple roadway work groups (RWG) were observed. A RWG (Middlesex Construction) was observed fouling the south leg of the WYE. FRA asked the RWG what their on-track safety was they stated that there was a derail protecting them. FRA inspectors located the RWIC (M. Abraham) and asked for a job briefing. He stated that he had exclusive track occupancy at the point of entry on the north end, and that at the other end he was giving permission to trains to traverse the south leg of the WYE from Cape main side. He stated that there was no derail applied, that the track was “Rule 98” territory, but admitted that he knew it was non-controlled track. The following line items lists exceptions taken.” (Report #65, non-violation)*
2. *“FAILURE TO MAKE TRACK(S) INACCESSIBLE AT EACH POSSIBLE POINT OF ENTRY IN ACCORDANCE WITH 214.327A. A roadway worker (Middlesex Construction RW) was observed fouling the South Leg of the Wye, believing that the track was made inaccessible by the RWIC. The track was made inaccessible from the north end but was left accessible from the Cape Main end.” (Report #65, non-violation)*
3. *“INCORRECT INFORMATION PROVIDED TO ROADWAY WORKERS REGARDING ON-TRACK SAFETY PROCEDURES IN EFFECT. The RWG stated to FRA that the south leg of Wye track was made inaccessible with a portable derail when in fact there was no derail applied and the track remained accessible from the Cape Main entrance.” (Report #65, non-violation)*

The South Coast Rail safety team upon notification of violation 1, 2 & 3 began an investigation into the above referenced incident. The team spoke to the contractor, SCRC, Mass Coastal Railroad (MCRR) and the FRA. Furthermore, we reviewed these specific reports with MCRR, the operator of the railroad within this territory, who is the provider of on-track protection for the contractor. MCRR acknowledged there was an error in the job briefing and the protection relayed to the

contractor in the field, specifically regarding the exclusive track occupancy of the area. MCRR incorrectly stated that there was a derail and admitted so upon discussion of the report with FRA, MBTA and the contractor. MCRR has implemented re-training for this individual and also instituted reminders to their staff regarding the shift job briefings be correct and thorough; both of which have already occurred. The SCR Safety team also spoke to the contractor, SCRC, to ensure they understand the job briefing given to their staff and also routinely verify the information provided by the EIC/Flagger is both accurate and correct for the work being performed.

4. *“The operator of the Premier Fence Company crane truck (hi-rail) No. 107 did not locate or have access to the operator's manual for the crane.” (Report #65, non-violation)*
5. *“FAILURE TO PROVIDE OR MAINTAIN FLAGGING KIT IN COMPLIANCE WITH OPERATING RULES OF THE RAILROAD WHEN EQUIPMENT IS ALONE OR LEADING/TRAILING IN A GROUP. (ALL ON-TRACK ROADWAY MAINTENANCE MACHINES AND HI-RAIL VEHICLES) The Premier Fence Co. hi-rail vehicle No. 109 had an incomplete flagging kit (it contained no fusees).” (Report #65, non-violation)*

The South Coast Rail safety team upon notification of violation 4 & 5 began an investigation into the above referenced incident and reviewed the observations with the contractor, SCRC, who is responsible for their subcontractor, Premier Fence.

SCRC reported that Premier Fence had misplaced the crane operator's manual. They attributed the misplacement to the recent service that the crane underwent. Premier Fence recognized its mistake and immediately ordered a new manual to replace the missing one. See attached PO for this manual for reference. SCRC; along with the SCR team, reminded Premier Fence of its obligation to have all proper material and tools within the vehicle and to verify items are present at the start of each shift.

Premier Fence acknowledged its inability to maintain a proper flagging kit to remain in compliance with the operating rules of the railroad. However, upon further inspection after the truck returned to the office after the recent shift, the fusees (flares) were discovered in the truck. Premier Fence has now confirmed that the flagging kit in Truck No. 109 has the following components: Six (6) fusees (flares), One (1) whistle, One (1) flag, One (1) first aid kit, One (1) flashlight, and One (1) Hi-rail inspection book. Also, please note that the foreman on site confirmed with the FRA Inspector that fusees are synonymous with flares.

In closing, the South Coast Rail team would like to thank the FRA for their observations and continued support of our project. We recognize the importance of safety on the right-of-way and on our construction sites and will remain vigilant to ensure a safe environment for our employees, the contractor and the public.

Attachments



Premier Fence, LLC.
1010 Turnpike St
Canton MA 02021
US
Phone: 781.821.5900

Purchase Order PO-0020416

Page 1

Date 6/2/2022

Buyer John Feerick

Ship Via FOB Canton, MA

FOB

Terms Net 30

V004370

V D.C. Bates Equipment Co. Inc.
E 10 Airport Drive
N Hopedale MA 01747
D Phone: (508) 473-0041
O
R

S Premier Fence, LLC.
H 1010 Turnpike St
I Canton MA 02021
P US
Phone: 781.821.5900
T
O

(508) 473-5531

R D.C. Bates Equipment Co. Inc.
E P.O. Box 11
M Hopedale MA 01747
I Phone: (508) 427-6524
T

T
O

Our Order Number Must Appear On Invoice, B/L Bundles, Cases, packing List and Correspondence

Line/Rel	Qty Ordered	UM	Item	Due Date	Tax	Unit Price	Net Total
1	1.000	EA	OPERATORSMANUALPK23002	6/8/2022	Yes	253.73	253.73
			PK23002 100119567 Operators Manual				

Replacement manual for Crane on Truck 107. Manual has been lost since last annual inspection.

Subtotal: 253.73
Freight: 0.00
Total: \$ 253.73
US Dollar

Accepted By

Date



U.S. Department
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REGION 1
Connecticut, Maine,
Massachusetts,
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Rhode Island, Vermont

Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093
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617-494-2865 (fax)

August 3, 2022

Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Kimberly Driscoll
Mayor
City of Salem
93 Washington Street
Salem, MA 01970

Re: Request to Transfer Funds – City of Salem 2022-CMPJ-041 – South Salem Commuter Rail Stop

Dear Mr. Poftak and Mayor Driscoll:

Thank you for your letter dated July 20, 2022, requesting to transfer \$372,000 in federal Community Project Funds for the South Salem Commuter Rail Stop Conceptual Design Phase from the City of Salem to the MBTA for grant administration.

The FTA approves this request, and we will work with the MBTA to obligate these funds in a subsequent grant award. We look forward to working with you on this project.

Sincerely,

Peter S. Butler
Regional Administrator



U.S. Department
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December 14, 2021

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

**RE: MBTA South Elm St. Bridge Project, Haverhill, MA
No Historic Properties Affected**

Dear Ms. Simon:

The Massachusetts Bay Transportation Authority (MBTA) is proposing to utilize Federal Transit Administration (FTA) financial assistance for the demolition and replacement of the South Elm St. Bridge in Haverhill, MA. The bridge, which carries two active tracks of the MBTA Haverhill Line over South Elm Street, has been identified for replacement because of severe/major deficiencies in the girders, floor beams, stringers, and bridge paint system. The proposed replacement bridge will be a steel through-plate girder structure that will look similar to the existing structure

The APE consists of the limit of work surrounded by a 100-foot buffer. The entirety of the MBTA right-of-way is within the APE.

The bridge has been identified in the Massachusetts Cultural Resource Information System (MACRIS) inventory (HVR.909) as not eligible for listing in the National Register of Historic Places (NRHP). The through-plate girder bridge, which was built in 1908 by the Boston Bridge Works, is a common example of its type and lacks distinction. No other historic resources have been identified in MACRIS in the APE or in the immediate vicinity of the bridge.

In accordance with 36 C.F.R. § 800.4(d)(1) of the Advisory Council on Historic Preservation's (ACHP) regulations, "Protection of Historic Properties", FTA has determined that there are no historic properties affected by the South Elm St. Bridge project. The FTA is requesting your concurrence with this determination. The following information is provided to support this determination:

- Consultant report on the South Elm St. Bridge Project: April 6, 2021, Technical Memorandum prepared by WSP
- MACRIS Scanned Record Cover Page for Bridge NVR.909

- Email – “Re: MBTA Proposed Replacement of South Elm Street Bridge Historic Review,” Concurrence from City of Haverhill Historical Commission

In accordance with 36 C.F.R. § 800.4(d)(1)(i), if a response from the Massachusetts Historical Commission is not received within 30 days, the FTA will consider its responsibilities under Section 106 fulfilled. If you have any questions regarding this matter, please contact Eric Papetti at 617-494-3494.

Sincerely,

Peter Butler
Regional Administrator

Attachment

cc: Tess Paganelli, Manager of Environmental Construction, MBTA

.



Gloucester Branch Qualification Process for DSLE/ SME

1. Establish course for physical characteristics qualification with the certification and training department.
 - Course code established April 28, 2022 for DSLE/ Qualifying Managers; T00086
 - Course code established April 29, 2022 for Qualifying Train and Engine Service Employees; T10016
 - Keolis will after it has qualified managers be qualifying approximately 74 locomotive engineers and 74 conductors under the course code T100016.
2. Review of Changes Gloucester Branch per course outline.
 - Section of track that the qualification process is for is 4.1 miles starts at Gloucester Draw and ends at Rockport Station.
 - All upgrades to territory and new signal apparatus have been documented both in Gloucester branch bulletin and physical characteristic test in section 3.
 - Meeting with North Side Manager of Locomotive Engineers Staff (formerly known as Road Foreman of Engines), Senior Route Manager, Gloucester Branch Route Manager and Transportation Safety to review operational changes, physical characteristic changes and proposed bulletin to change timetable to Gloucester branch. May 2, 2022 at 164 Canal St 10:30AM- 11:00AM
 - Attendees Daniel Rouleau DSLE, Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager and Brendan McDonough Transportation Safety.
3. Building and review of physical characteristics test from Gloucester Draw to Rockport Station.
 - Meeting with Rule department and signal design to review signal progression of Wilson INT, attendees Daniel Rouleau DSLE, Robert Johnson Manager of Operating Rules and David Flores Signal Design Keolis on April 29, 2022
 - Produced test and submitted to training department with MLE staff and Route Manager May 2, 2022 at 164 Canal St 11:00AM-12:00PM
 - Test was built and reviewed by Shane Percival Manager of Locomotive Engineers, Daniel Rouleau DSLE, John Raymond Manager of Locomotive Engineers Jamie Dupes Senior Route Manager, Jamie Cativera Eastern Route and Gloucester Branch Route Manager and oversight by Brendan McDonough Transportation Safety
 - Physical Characteristic Test consists of 24 questions and passing grade of 85% is required.
 - Physical Characteristic Test uploaded to site May 2, 2022
 - Each qualifying Conductor/ Subject Matter Expert/ Qualifying Manager will see the territory a minimum of one (1) round trip from headend train ride prior to taking written exam.
 - Conductor SME will take same exam as engineers DSLE and be deemed qualified per MBTA 242.123 submission

4. Requirements for physical characteristics qualifications for DSLE/ SME
 - Walking territory because of rail restrictions from Gloucester draw to Washington St. performed on May 5, 2022 to directly observe territory attendees Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager
 - Track car ride of territory from Rockport to Rock cut with Road Master on Thursday May 5, 2022 performed with Road Master Joe Neves, Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager and Brendan McDonough Transportation Safety.
5. Qualifying Managers final review of physical characteristics exam and administration of exam
 - Update and review of exam after qualifying managers completed excursion of the territory as outlined in above sections 2 and section 3. By Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager
 - Administering of test for qualifying managers Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager (Completed and passed on May 9, 2022)
6. Operating initial train will be MLE North Side Shane Percival Manager of Locomotive Engineer as engineer of record and Senior Route Manager Jamie Dupes as Conductor of record. (On May 19,2022)
 - Shane Percival will be qualifying John Raymond Manager of Locomotive engineer
 - First trip from Gloucester draw to Rockport with a train will be done with exclusive occupancy
 - First round trip will be ran with train handling consistent with being able to stop with in one half the range of vision (This is just an addition safeguard as it will be the first train to traverse territory in almost 2 years) **this will not be considered a qualifying trip.**
 - Second round trip, Mr Raymond will perform a minimum of one (1) round to operate from Gloucester Draw to Rockport at track speed this **will not be considered as a qualifying trip** but rather as a familiarization trip.
 - Third round trip Mr Raymond will perform a 240.129 ride to requalify on the territory signed by Mr Percival Manager of Locomotive engineers. This will be the first engineer to be deemed qualified on the territory
 - Transportation will work with C&S support for all grade crossing monitoring activation during all trips
 - Each Manager of Locomotive Engineer will run a round trip from Gloucester draw to Rockport and be qualified by the DSLE documented by 1875 with 240.129.
 - Each SME qualifying manager will have a Signed Head End Authorization either by locomotive engineer of record or conductor of record.



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May 31, 2022

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

**Re: Haverhill Layover Facility
No Historic Properties Affected**

Dear Ms. Simon:

The MBTA is proposing to utilize Federal Transit Administration (FTA) financial assistance for the Haverhill Layover Facility project, located at 1445 Hilledale Ave, Haverhill, MA.

The proposed project consists of a new Haverhill Line Commuter Rail train layover facility, which would replace the existing Bradford layover facility, to address the need for additional train storage capacity. The layover facility will include installation of six tracks to fit a total of six, nine-car trains. The proposed project will also include an access driveway and paved parking, a crew building, drainage, stormwater treatment, utilities, culvert replacement, and ancillary structures such as an emergency generator and communications.

The Area of Potential Effects (APE) has been established using the following parameters:

- The APE consists of the proposed limits of work including the existing rail ROW from the proposed new signals at the south end north to the proposed overhead signal bridge, and the extent of construction easements or properties to be acquired by the MBTA for the purposes of the Project. This is located entirely in Massachusetts.
- A separate APE for potential *visual effects* consists of the above, as well as a radius of 250 feet around the limits of work at the new railyard facility, and this APE for potential visual effects extends into New Hampshire.

Resources within the APE primarily consist of modern industrial properties which are ineligible for the National Register, and are described further within the attached cultural resources report.

One resource was evaluated for potential eligibility due to its age, a stone cattle pass, constructed in 1894, which consists of a 4 ft-wide stone box constructed of large, granite blocks which runs approximately 38 ft. in length under the rail ROW. Given the lack of outstanding architectural or historical significance, and the significantly diminished setting of the cattle pass, given that

the pass is no longer used for agricultural purposes and the land on either side is utilized for different purposes by different owners, the FTA finds that this structure is not eligible for the National Register.

The MBTA retained a consultant to conduct an archaeological reconnaissance survey in order to assess the archaeological sensitivity of the project area. Most of the project area has been assessed as archaeologically non-sensitive due to modern landscape disturbances. However, the consultant recommended an intensive archaeological survey for a small, potentially intact landform at the south end of the project area, based on the potential for pre-contact resources, given the landform's location in level, well-drained soils near a perennial stream in the Merrimack River Valley. The purpose of the survey will be to confirm the integrity of the sensitive landform described above and identify any potentially National Register-eligible resources that may survive within it.

On April 13th, 2022, the MBTA received concurrence from the Haverhill Historic Commission on their proposed finding of "No Historic Properties Affected."

Because the Area of Potential Effects extends into New Hampshire, the FTA consulted with the New Hampshire Division of Historical Resources via a Request for Project Review, in accordance with their procedures. NH DHR concurred on 3/2/2022 with FTA's determination that the property located within the APE (1 Hilldale Avenue in Plaistow, NH) was not eligible for the National Register of Historic Places and stated that no further inventory of properties in New Hampshire would be necessary for this project.

In accordance with 36 C.F.R. § 800.4(d)(1) of the Advisory Council on Historic Preservation's (ACHP) regulations, "Protection of Historic Properties," FTA has determined that there are no historic properties affected by the Haverhill Layover Facility. The FTA is requesting your concurrence with this determination. As a condition of this Section 106 determination that there are no historic properties affected, the FTA is requiring the MBTA to conduct an intensive archaeological survey of the small landform as was recommended by and more fully described in the attached Archaeological Reconnaissance Survey prior to commencement of construction. If any artifacts are discovered, the MBTA shall notify the FTA within 48 hours, and consistent with 36 CFR § 800.13 procedures for post-review discoveries, the FTA will engage with the consulting parties to determine eligibility and resolve potential adverse effects before construction begins.

The following information is provided to support this determination:

- Correspondence from Haverhill Historical Commission, 4/13/2022, "Haverhill Layover Facility – Section 106 Review"
- New Hampshire Division of Historical Resources Response to Request for Project Review
- Consultant Report 1/12/2022

In accordance with 36 C.F.R. § 800.4(d)(1)(i), if a response from the Massachusetts Historical Commission is not received within 30 days, the FTA will consider its responsibilities under Section 106 fulfilled. If you have any questions regarding this matter, please contact Eric Papetti at 617-494-3494 or Eric.Papetti@dot.gov.

Sincerely,

Peter Butler
Regional Administrator

Enclosure



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May 31, 2022

Mr. John Brown
Tribal Historic Preservation Officer
Narragansett Indian Tribe
Long House
4425-A, South County Trail
Charlestown, RI 02813

**Re: Haverhill Layover Facility
No Historic Properties Affected**

Dear Mr. Brown:

The MBTA is proposing to utilize Federal Transit Administration (FTA) financial assistance for the Haverhill Layover Facility project, located at 1445 Hilldale Ave, Haverhill, MA.

We have identified your tribe as one with potential interest in this undertaking and are thus inviting you to participate in the Section 106 process as a Consulting Party, providing any information which you may have to help us identify places that may have traditional religious and cultural importance to your tribal organization. During project planning, the MBTA's consultant identified an undisturbed landform within the project area, and recommended further testing of the area prior to construction in order to confirm that no national-register eligible resources, or items of religious or cultural significance to Native American tribes, are present. The FTA is requiring the MBTA to undertake this testing per the terms described below.

The proposed project consists of a new Haverhill Line Commuter Rail train layover facility, which would replace the existing Bradford layover facility, to address the need for additional train storage capacity. The layover facility will include installation of six tracks to fit a total of six, nine-car trains. The proposed project will also include an access driveway and paved parking, a crew building, drainage, stormwater treatment, utilities, culvert replacement, and ancillary structures such as an emergency generator and communications.

The Area of Potential Effects (APE) has been established using the following parameters:

- The APE consists of the proposed limits of work including the existing rail ROW from the proposed new signals at the south end north to the proposed overhead signal bridge, and the extent of construction easements or properties to be acquired by the MBTA for the purposes of the Project. This is located entirely in Massachusetts.

- A separate APE for potential *visual effects* consists of the above, as well as a radius of 250 feet around the limits of work at the new railyard facility, and this APE for potential visual effects extends into New Hampshire.

Resources within the APE primarily consist of modern industrial properties which are ineligible for the National Register, and are described further within the attached cultural resources report.

One resource was evaluated for potential eligibility due to its age, a stone cattle pass, constructed in 1894, which consists of a 4 ft-wide stone box constructed of large, granite blocks which runs approximately 38 ft. in length under the rail ROW. Given the lack of outstanding architectural or historical significance, and the significantly diminished setting of the cattle pass, given that the pass is no longer used for agricultural purposes and the land on either side is utilized for different purposes by different owners, the FTA finds that this structure is not eligible for the National Register.

The MBTA retained a consultant to conduct an archaeological reconnaissance survey in order to assess the archaeological sensitivity of the project area. Most of the project area has been assessed as archaeologically non-sensitive due to modern landscape disturbances. However, the consultant recommended an intensive archaeological survey for a small, potentially intact landform at the south end of the project area, based on the potential for pre-contact resources, given the landform's location in level, well-drained soils near a perennial stream in the Merrimack River Valley. The purpose of the survey will be to confirm the integrity of the sensitive landform described above and identify any potentially National Register-eligible resources, as well as any items of religious or cultural significance to Native American tribes, that may survive within it.

On April 13th, 2022, the MBTA received concurrence from the Haverhill Historic Commission on their proposed finding of "No Historic Properties Affected."

Because the Area of Potential Effects extends into New Hampshire, the FTA consulted with the New Hampshire Division of Historical Resources via a Request for Project Review, in accordance with their procedures. NH DHR concurred on 3/2/2022 with FTA's determination that the property located within the APE (1 Hilldale Avenue in Plaistow, NH) was not eligible for the National Register of Historic Places and stated that no further inventory of properties in New Hampshire would be necessary for this project.

In accordance with 36 C.F.R. § 800.4(d)(1) of the Advisory Council on Historic Preservation's (ACHP) regulations, "Protection of Historic Properties," FTA has determined that there are no historic properties affected by the Haverhill Layover Facility. The FTA is requesting your concurrence with this determination. As a condition of this Section 106 determination that there are no historic properties affected, the FTA is requiring the MBTA to conduct an intensive archaeological survey of the small landform as was recommended by and more fully described in the attached Archaeological Reconnaissance Survey prior to commencement of construction. If any artifacts are discovered, the MBTA shall notify the FTA within 48 hours, and consistent with 36 CFR § 800.13 procedures for post-review discoveries, the FTA will engage with the consulting parties to determine eligibility and resolve potential adverse effects before construction begins.

The following information is provided to support this determination:

- Correspondence from Haverhill Historical Commission, 4/13/2022, “Haverhill Layover Facility – Section 106 Review”
- New Hampshire Division of Historical Resources Response to Request for Project Review
- Consultant Report 1/12/2022

Your timely response to this invitation will greatly help us incorporate your concerns into project development. FTA maintains full responsibility for the consultation process for any tribal government which chooses to participate, pursuant to 36 CFR Part 800. For that purpose, we respectfully request that you respond via email to Eric Papetti at Eric.Papetti@dot.gov within 30 days of receipt of this letter. If you have questions or comments related to the proposed project, Eric can be reached by email at the above address or by phone at (617) 494-3494.

Sincerely,

Peter Butler
Regional Administrator

Enclosure



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May 31, 2022

Mr. Chris Sockalexis
Tribal Historic Preservation Officer
Penobscot Nation
12 Wabanaki Way
Indian Island, ME 4468

Chris.Sockalexis@penobscotnation.org

**Re: Haverhill Layover Facility
No Historic Properties Affected**

Dear Mr. Sockalexis:

The MBTA is proposing to utilize Federal Transit Administration (FTA) financial assistance for the Haverhill Layover Facility project, located at 1445 Hilledale Ave, Haverhill, MA.

We have identified your tribe as one with potential interest in this undertaking and are thus inviting you to participate in the Section 106 process as a Consulting Party, providing any information which you may have to help us identify places that may have traditional religious and cultural importance to your tribal organization. During project planning, the MBTA's consultant identified an undisturbed landform within the project area, and recommended further testing of the area prior to construction in order to confirm that no national-register eligible resources, or items of religious or cultural significance to Native American tribes, are present. The FTA is requiring the MBTA to undertake this testing per the terms described below.

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36 CFR § 800.13 procedures for post-review discoveries, the FTA will engage with the consulting parties to determine eligibility and resolve potential adverse effects before construction begins.

The following information is provided to support this determination:

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- New Hampshire Division of Historical Resources Response to Request for Project Review
- Consultant Report 1/12/2022

Your timely response to this invitation will greatly help us incorporate your concerns into project development. FTA maintains full responsibility for the consultation process for any tribal government which chooses to participate, pursuant to 36 CFR Part 800. For that purpose, we respectfully request that you respond via email to Eric Papetti at Eric.Papetti@dot.gov within 30 days of receipt of this letter. If you have questions or comments related to the proposed project, Eric can be reached by email at the above address or by phone at (617) 494-3494.

Sincerely,

Peter Butler
Regional Administrator

Enclosure



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May 31, 2022

Ms. Bettina Washington
Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Rd.
Aquinnah, MA 02535
THPO@wampanoagtribe.net

**Re: Haverhill Layover Facility
No Historic Properties Affected**

Dear Ms. Washington:

The MBTA is proposing to utilize Federal Transit Administration (FTA) financial assistance for the Haverhill Layover Facility project, located at 1445 Hilldale Ave, Haverhill, MA.

We have identified your tribe as one with potential interest in this undertaking and are thus inviting you to participate in the Section 106 process as a Consulting Party, providing any information which you may have to help us identify places that may have traditional religious and cultural importance to your tribal organization. During project planning, the MBTA's consultant identified an undisturbed landform within the project area, and recommended further testing of the area prior to construction in order to confirm that no national-register eligible resources, or items of religious or cultural significance to Native American tribes, are present. The FTA is requiring the MBTA to undertake this testing per the terms described below.

The proposed project consists of a new Haverhill Line Commuter Rail train layover facility, which would replace the existing Bradford layover facility, to address the need for additional train storage capacity. The layover facility will include installation of six tracks to fit a total of six, nine-car trains. The proposed project will also include an access driveway and paved parking, a crew building, drainage, stormwater treatment, utilities, culvert replacement, and ancillary structures such as an emergency generator and communications.

The Area of Potential Effects (APE) has been established using the following parameters:

- The APE consists of the proposed limits of work including the existing rail ROW from the proposed new signals at the south end north to the proposed overhead signal bridge, and the extent of construction easements or properties to be acquired by the MBTA for the purposes of the Project. This is located entirely in Massachusetts.

- A separate APE for potential *visual effects* consists of the above, as well as a radius of 250 feet around the limits of work at the new railyard facility, and this APE for potential visual effects extends into New Hampshire.

Resources within the APE primarily consist of modern industrial properties which are ineligible for the National Register, and are described further within the attached cultural resources report.

One resource was evaluated for potential eligibility due to its age, a stone cattle pass, constructed in 1894, which consists of a 4 ft-wide stone box constructed of large, granite blocks which runs approximately 38 ft. in length under the rail ROW. Given the lack of outstanding architectural or historical significance, and the significantly diminished setting of the cattle pass, given that the pass is no longer used for agricultural purposes and the land on either side is utilized for different purposes by different owners, the FTA finds that this structure is not eligible for the National Register.

The MBTA retained a consultant to conduct an archaeological reconnaissance survey in order to assess the archaeological sensitivity of the project area. Most of the project area has been assessed as archaeologically non-sensitive due to modern landscape disturbances. However, the consultant recommended an intensive archaeological survey for a small, potentially intact landform at the south end of the project area, based on the potential for pre-contact resources, given the landform's location in level, well-drained soils near a perennial stream in the Merrimack River Valley. The purpose of the survey will be to confirm the integrity of the sensitive landform described above and identify any potentially National Register-eligible resources, as well as any items of religious or cultural significance to Native American tribes, that may survive within it.

On April 13th, 2022, the MBTA received concurrence from the Haverhill Historic Commission on their proposed finding of "No Historic Properties Affected."

Because the Area of Potential Effects extends into New Hampshire, the FTA consulted with the New Hampshire Division of Historical Resources via a Request for Project Review, in accordance with their procedures. NH DHR concurred on 3/2/2022 with FTA's determination that the property located within the APE (1 Hilldale Avenue in Plaistow, NH) was not eligible for the National Register of Historic Places and stated that no further inventory of properties in New Hampshire would be necessary for this project.

In accordance with 36 C.F.R. § 800.4(d)(1) of the Advisory Council on Historic Preservation's (ACHP) regulations, "Protection of Historic Properties," FTA has determined that there are no historic properties affected by the Haverhill Layover Facility. The FTA is requesting your concurrence with this determination. As a condition of this Section 106 determination that there are no historic properties affected, the FTA is requiring the MBTA to conduct an intensive archaeological survey of the small landform as was recommended by and more fully described in the attached Archaeological Reconnaissance Survey prior to commencement of construction. If any artifacts are discovered, the MBTA shall notify the FTA within 48 hours, and consistent with 36 CFR § 800.13 procedures for post-review discoveries, the FTA will engage with the consulting parties to determine eligibility and resolve potential adverse effects before construction begins.

The following information is provided to support this determination:

- Correspondence from Haverhill Historical Commission, 4/13/2022, “Haverhill Layover Facility – Section 106 Review”
- New Hampshire Division of Historical Resources Response to Request for Project Review
- Consultant Report 1/12/2022

Your timely response to this invitation will greatly help us incorporate your concerns into project development. FTA maintains full responsibility for the consultation process for any tribal government which chooses to participate, pursuant to 36 CFR Part 800. For that purpose, we respectfully request that you respond via email to Eric Papetti at Eric.Papetti@dot.gov within 30 days of receipt of this letter. If you have questions or comments related to the proposed project, Eric can be reached by email at the above address or by phone at (617) 494-3494.

Sincerely,

Peter Butler
Regional Administrator

Enclosure



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



September 28, 2022

Steven W. Illich
Region 1 Administrator
US Department of Transportation
Federal Railroad Administration
55 Broadway 10th Floor
Cambridge, MA 02142

**RE: Notification under 49CFR213, Section 213.5 Responsibility for compliance,
Paragraph (c).**

Dear Administrator Illich,

This notification is presented to comply with the requirements of section 213.5, paragraph (c) of title 49 of the Code of Federal Regulations. The Massachusetts Bay Transportation Authority (MBTA) previously acquired the so-called #1 Yard in Readville section of Boston Massachusetts. This yard has been owned by MBTA for many years but has been maintained by ConRail and now CSX. CSX has requested and MBTA has agreed to transfer the track maintenance responsibilities to the Mass Coastal Railroad effective November 1, 2022. Mass Coastal Railroad maintains several other rail lines under contract with the MBTA and MassDOT. MBTA has determined that Mass Coastal has the technical experience and physical capacity to maintain #1 yard to not less than FRA class 1 standards.

This written notification of the assignment pursuant to 49CFR213, Section 213.5 is being provided to your office. As the owner of these properties, MBTA will provide oversight of Mass Coastal through an existing Operating Agreement with the MBTA.

The track owner is:

Massachusetts Bay Transportation Authority
Steven Poftak
General Manager
10 Park Plaza, 4th Floor
Boston, MA 02116

The assignee will be:

Massachusetts Coastal Railroad
Christopher Podgurski
President & CEO
Coastal Rail, LLC
12 Harding Street, Unit 202
Lakeville, MA 02347

Massachusetts Bay Transportation Authority
Ten Park Plaza, Boston, MA 02116
www.mbta.com

Identification of the track;

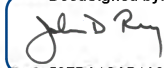
- Readville #1 Yard From Hill Interlocking where it connects to the MBTA owned Dorchester Branch via #2 yard to Transfer Interlocking where the west end of the yard connects with the Northeast Corridor in Boston and Dedham Massachusetts, Massachusetts

Mass Coastal's competence and ability has been demonstrated as the operating railroad in Southeastern Massachusetts. They currently operate control and maintain the railroad structure throughout Cape Cod and connect with the MBTA owned trackage at Cape just east of the Middleboro/Lakeville commuter rail station. Mass Coastal also maintains the Framingham Secondary, the Middleboro Subdivision, the Fall River and New Bedford lines as well as various siding along the Northeast Corridor in Massachusetts.

This notice is counter signed by the Mass Coastal acknowledging acceptance of this assignment.

Should you need or desire additional information regarding this please do not hesitate to contact me at (617) 222-4771 office, 617-293-9056 cell.

Sincerely,
DocuSigned by:


John D. Ray

Assistant General Manager –
Commuter Rail & Ferry Operations
MBTA

Sincerely,



P. Christopher Podgurski
President & CEO
Mass Coastal Railroad

cc: M. Muller – MBTA
M. Slesinger – MassDOT
M. Turra – CSX
A. Daly – CSX



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

December 19, 2022

Mr. Steve Poftak
General Manager
Massachusetts Bay Transportation Authority
10 Park Plaza, Suite 3910
Boston, MA 02116

Via email: spoftak@mbta.com

**Re: Massachusetts Bay Transportation Authority's Request for Extension of the
Advanced Civil Speed Enforcement System II North Side Non-ATC Variance –
Approval (Docket Number FRA-2010-0030)**

Dear Mr. Poftak:

The Federal Railroad Administration (FRA) received the Massachusetts Bay Transportation Authority's (MBTA) September 8, 2022, letter requesting an extension of the installation of an automatic train control (ATC) system on MBTA's North Side properties.

As background, in a letter dated April 27, 2018, FRA first conditionally approved MBTA's request for a variance from the Type Approval FRA issued for Amtrak's Advanced Civil Speed Enforcement System II (ACSES II) (Type Approval No. FRA-TA-2010-001), referenced as MBTA's "North Side Commuter Lines Non-ATC Territory Variance."¹ In its request, dated March 23, 2018, MBTA indicated that the variance was necessary only until it completes the installation of a cab signal system with ATC on all of its North Side Commuter Lines. In a letter dated June 3, 2020, MBTA submitted its request to extend the applicability of the North Side Commuter Lines Non-ATC Territory Variance to December 31, 2022. In the current request, MBTA is requesting to extend the variance to December 31, 2024.

In MBTA's July 30, 2021, quarterly progress report, MBTA stated that it was no longer on schedule to meet the ATC installation deadline of December 31, 2022, and it requested FRA's approval of an additional 18-month extension to complete ATC installation on MBTA's North Side territories by June 30, 2024. In FRA's September 10, 2021, response, FRA stated that it was not in a position to consider such a request at that time and would reconsider the extension

¹ As MBTA stated in its variance request and overall concept of operations, MBTA is implementing ACSES II, as described under Amtrak's Type Approval No. FRA-TA-2010-001, on its South Side Commuter Lines.

request if, by mid-to-late 2022, MBTA continued to encounter delays in the installation progress.

In its September 8, 2022, letter, MBTA stated that it is on schedule to complete ATC implementation on all North Side Lines by June 30, 2024, but requested a 24-month extension to December 31, 2024, to allow for schedule contingency and avoid the need to request a further extension in the event that completion of implementation is again delayed.

After careful consideration of the applicability and sufficiency of MBTA's request, FRA hereby approves MBTA's request for extension of its ACSES II North Side Commuter Lines Non-ATC Territory Variance until December 31, 2024, provided MBTA submits quarterly updates, in accordance with the table below, on the implementation of ATC on its North Side Lines starting January 31, 2023, and continuing until the project's completion.²

	Coverage Period	Due Date
Quarter 1	January 1 – March 31	April 30
Quarter 2	April 1 – June 30	July 31
Quarter 3	July 1 – September 30	October 31
Quarter 4	October 1 – December 31	January 31

FRA reserves the right to modify or rescind this approval upon receipt of information about the safety of rail operations or noncompliance with any regulatory or statutory requirement. Also, please note that MBTA must submit to FRA for review and approval an RFA to its FRA-approved PTC Safety Plan if, for example, MBTA intends to:

- Modify a safety-critical element of its PTC system; or
- Modify its PTC system in a way that would affect the safety-critical functionality of any other PTC system with which it interoperates.

See 49 CFR § 236.1021(h). Before any such changes occur, FRA's Director of FRA's Office of Railroad Systems and Technology must approve the RFA. *See* 49 CFR § 236.1021(m).

If you have any questions regarding this letter, please contact Mr. Gabe Neal, Staff Director Signal, Train Control, and Crossings Division, at 816-516-7168 or gabe.neal@dot.gov.

Sincerely,

Karl Alexy
Associate Administrator for Railroad Safety
Chief Safety Officer

² *See, e.g.*, 49 CFR §§ 236.1009(b)(2)(ii), 236.1013.



U.S. Department
of Transportation
**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

February 6, 2023

Mr. Ryan Colohan
Chief Railroad Officer
Massachusetts Bay Transportation Authority
10 Park Plaza Suite 3910
Boston, MA 02116
rcolohan@mbta.com

Re: Massachusetts Bay Transportation Authority's Request for Amendment to Its Positive Train Control System (Temporary Discontinuance) – Conditional Approval (Docket Number FRA-2010-0030)

Dear Mr. Colohan:

The Federal Railroad Administration (FRA) has completed its review of the Massachusetts Bay Transportation Authority's (MBTA) request for amendment (RFA), dated December 21, 2022, to its positive train control (PTC) system. MBTA submitted this RFA under Title 49 Code of Federal Regulations (CFR) Section 236.1021, *Discontinuances, material modifications, and amendments*.

As background, as of December 2020, MBTA and its applicable tenant railroads have been operating an FRA-certified and interoperable PTC system, the Advanced Civil Speed Enforcement System II (ACSES II), on MBTA's PTC-mandated main lines. On June 30, 2020, FRA certified MBTA's ACSES II as a vital overlay system on MBTA's main lines where an underlying Automatic Train Control (ATC) system is in effect, and as a mixed system on MBTA's main lines where an underlying ATC system is not in effect (known as the North Side Non-ATC Variance).¹

On December 21, 2022, MBTA submitted the RFA that is the subject of this letter, to seek FRA's approval to temporarily discontinue MBTA's PTC system on its Eastern and Western Route main

¹ In a letter dated April 27, 2018, FRA conditionally approved MBTA's North Side Non-ATC Variance until December 31, 2020, to provide MBTA the opportunity to install an underlying ATC system on these lines. In a letter dated June 19, 2020, FRA approved MBTA's request for an extension to December 31, 2022, to finish installing ATC. On December 19, 2022, FRA approved MBTA's request for additional time to install ATC on its North Side lines, and FRA's approval of this extension is valid through December 31, 2024.

lines, on MBTA's North Side, for the purposes of installing ATC as required by FRA. MBTA will temporarily discontinue the operation of its PTC system in these areas by use of Construction Zone (CZ) transponders around the affected areas. Overall, these CZs will be in place between February 8, 2023, and July 30, 2023, according to the following schedule:

- Western Route Main Line from Clark St. on Wildcat Branch (Milepost (MP) 15.7) through Wilmington Jct. (MP 18.0) to new CPF State Line (SL) (MP 36.2). This CZ will be removed in phases as PTC is commissioned as follows:
 - Phase 1 – Wildcat, Wilmington Jct., Lowell Jct., and Vale – CZ in place February 8 through April 30, 2023.
 - Phase 2 – JK, Andover St., and Frost – CZ in place February 8 through May 30, 2023.
 - Phase 3 – Hall and State Line – CZ in place February 8 through July 30, 2023.
- Eastern Route Main Line from Wonderland (MP7.0) to Everett Jct. (MP 2.8). This CZ will be in place March 20 through May 30, 2023.

During this time period, MBTA's RFA specifies that there will be no revenue passenger operations through the affected areas until ATC is tested and commissioned. FRA's understanding is that MBTA intends to use buses to transport commuters before ATC is commissioned. Throughout this time period, freight traffic and non-revenue passenger trains will operate on Red Signals and at restricted speed only. ATC is scheduled to be commissioned as follows:

- Phase 1 – February 8 through February 12 to 16, 2023.
- Phase 2 – March 4 through March 12, 2023.
- Phase 3 – April 22 through May 7, 2023.
- Eastern Route – March 20 through March 28, 2023.

Pursuant to 49 CFR § 236.1021, FRA hereby conditionally approves MBTA's RFA, dated December 21, 2022, and its request therein to temporarily discontinue its PTC system while MBTA incrementally installs and commissions ATC and upgrades its PTC system, subject to the following conditions:

1. MBTA shall make reasonable efforts to schedule the temporary discontinuance of its PTC system for times posing the least risk to railroad safety;
2. MBTA shall notify all applicable train crews about the PTC system discontinuance, including in accordance with MBTA's operating rules and practices, which may require, for example, such information to be provided via track bulletins, dispatcher bulletins, or special instructions;
3. MBTA shall place its PTC system back into service without undue delay, and the PTC system may not be discontinued longer than the schedule set forth in its RFA;

4. During the period in which the PTC system is temporarily discontinued, MBTA and its tenant railroads must comply with the operating restrictions under 49 CFR § 236.1029(b), including the applicable speed limitations (*i.e.*, 59 miles per hour for passenger operations), and any more stringent requirements set forth in MBTA's RFA;
5. MBTA's RFA includes the content requirements under 49 CFR § 236.1021(d), which applies to RFAs to PTC Implementation Plans and PTC Development Plans. RFAs to PTC systems and/or PTC Safety Plans are subject to the process and content requirements under 49 CFR § 236.1021(m). MBTA must submit the additional information required under § 236.1021(m) to FRA by February 20, 2023; and
6. Under 49 CFR § 236.1021(f), FRA may require a railroad that submits an RFA, for a discontinuance or material modification, to perform field testing, including revenue service demonstration (RSD), in accordance with 49 CFR § 236.1035. MBTA may resume commuter rail operations and its tenant railroads may resume regular operations after MBTA fully tests and commissions ATC, while MBTA continues field testing ACSES II, but any rail operations shall be subject to the data collection and reporting requirements and other limitations that previously applied during MBTA's RSD period. Specifically, MBTA must comply with the data collection and reporting requirements and other limitations set forth in FRA's RSD letter, dated January 29, 2019.²

In addition, FRA notes that MBTA must continue to comply with the conditions FRA previously imposed in its letter dated June 30, 2020, certifying MBTA's PTC system. As noted in FRA's certification letter, dated June 30, 2020, FRA will consider noncompliance with any condition of FRA's PTC system Certification as a violation of the underlying requirement under 49 CFR part 236, subpart I, and 49 CFR § 236.1009(g)(1). Also, any tenant railroad that operates ACSES II on MBTA's PTC-governed main lines must comply with all applicable provisions of MBTA's PTC Safety Plan (PTCSP), any applicable FRA-approved RFA to MBTA's PTCSP, and the applicable conditions FRA placed on its certification of MBTA's ACSES II.³

FRA reminds MBTA that, in accordance with 49 CFR §§ 236.1041–236.1049, and consistent with MBTA's training and qualification programs for PTC systems, if MBTA files an RFA to request alteration of the installation, maintenance, repair, modification, inspection, testing, or operating tasks that must be performed on its PTC system, MBTA may need to perform refresher training and evaluation to ensure that the persons who perform these tasks have the necessary knowledge and skills to effectively complete their duties related to operation and maintenance of its PTC system.

FRA reserves the right to modify or rescind this conditional approval upon receipt of information about the safety of rail operations or noncompliance with any applicable regulatory or statutory

² Letter from Robert C. Lauby, Associate Administrator for Railroad Safety and Chief Safety Officer, FRA, to Karen Antion, Program Manager – PTC, MBTA (Jan. 29, 2019), <https://www.regulations.gov/document/FRA-2010-0030-0075>.

³ Unless a tenant railroad's operations are subject to an exception under 49 CFR § 236.1006(b).

requirement. Also, please note that MBTA must submit to FRA for review and approval an RFA to its FRA-approved PTCSP if, for example, MBTA intends to:

- Modify a safety-critical element of its PTC system; or
- Modify its PTC system in a way that would affect the safety-critical functionality of any other PTC system with which it operates.

See 49 CFR § 236.1021(h). Before any such changes occur, FRA's Director of FRA's Office of Railroad Systems and Technology must approve the RFA. *See* 49 CFR § 236.1021(m).

The comment period for the *Federal Register* notice announcing MBTA's request to amend its PTC system closed on January 30, 2023. *See* 88 Fed. Reg. 1313 (Jan. 9, 2023). At the time of issuance of this letter, no comments in response to that notice were posted to this railroad's PTC docket.

If you have any questions regarding this letter, please contact Mr. Gabe Neal, Staff Director Signal, Train Control, and Crossings Division at 816-516-7168 or gabe.neal@dot.gov.

Sincerely,

Carolyn Hayward-Williams
Director, Office of Railroad Systems and Technology



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

September 29, 2022

Mr. Bill Adams
Engineer, Communications and Signal
Consolidated Rail Corporation
1000 Howard Boulevard
Mount Laurel, NJ 08054
bill.adams@conrail.com

Ms. Karen Antion
Program Manager, Positive Train Control
Massachusetts Bay Transportation Authority
7 Wells Avenue, Suite 34
Newton, MA 02459
kantion@mbta.com

Mr. Anishkumar Gandhi
Executive Director, Positive Train Control
Metro-North Commuter Railroad
420 Lexington Avenue, 10th Floor
New York, NY 10017
agandhi@mnrt.org

Mr. Jonathan Kirby
Senior Director, PTC
New Jersey Transit
One Penn Plaza East, 10th Floor
Newark, NJ 07105
jkirby@njtransit.com

Mr. John Frisoli
Chief Engineering Officer, Communications and Signal
Southeastern Pennsylvania Transportation Authority
1234 Market Street, 13th Floor
Philadelphia, PA 19107
jfrisoli@septa.org

**Re: Back-to-Back Signal Functionality for the Advanced Civil Speed Enforcement
System II and the Advanced Speed Enforcement System II (Docket Nos. FRA-2010-**

0029; FRA-2010-0030; FRA-2010-0031; FRA-2010-0032; FRA-2010-0033; FRA-2010-0036; and FRA-2010-0064)

Dear Ms. Antion and Messrs. Adams, Gandhi, Kirby, and Frisoli:

The Federal Railroad Administration (FRA) has recently become aware that the nature of certain interlockings or other locations might require railroads to use additional positive train control (PTC) system software, known sometimes as Back-to-Back (B2B) software. This Back-to-Back software is designed for signal indication and route enforcement at nested interlocking locations that are currently mitigated by operational procedures. FRA is hereby requiring each host railroad operating the Advanced Civil Speed Enforcement System II (ACSES II) or Advanced Speed Enforcement System II (ASES II) to evaluate its PTC-governed main lines to determine whether any segments will require the host railroad and/or any of its tenant railroads to use such B2B software. FRA hereby requires each host railroad to whom this letter is addressed to submit to FRA's Secure Information Repository by October 31, 2022, a document identifying:

- Any applicable locations that require B2B software;
- Any tenant railroads that are impacted and will need B2B software; and
- A schedule of work identifying the timeframe to acquire, install, and implement B2B software on locomotives and wayside signal locations that require this technology.

If you have any questions regarding this letter, please contact Mr. Gabe Neal, Staff Director, Signal, Train Control, and Crossings Division at 816-516-7168 or gabe.neal@dot.gov.

Sincerely,

Carolyn Hayward-Williams
Director, Office of Railroad Systems and Technology

cc: Mr. Nicholas Croce, Amtrak nick.croce@amtrak.com
Mr. Andrew Arenth, Long Island Rail Road ajarent@lirr.org



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0013**
Date: March 1, 2022
Contract No.: MBTA-42-14
Response: **NRR**
Ref. Letter: None

Gabe Neal
Staff Director
Signal, Train Control, and Crossing Division
Federal Railroad Administration
800 N. King Street – Suite 301
Wilmington, DE 19801

Subject: Notice of Change to Signal System – MBTA Western Route Main Line (WRML)

Dear Mr. Neal:

In compliance with 49 CFR § 235.6 Expedited application for approval of certain changes to the train control system in support of the installation of Positive Train Control (PTC), the Massachusetts Bay Transportation Authority (MBTA) is submitting this Expedited application to install an Automatic Train Control System on the MBTA's Western Route Main Line (WRML) portion of the north side Commuter Rail System. This will involve removing the intermediate wayside automatic block signals and replacing them with cab signal coded cut sections.

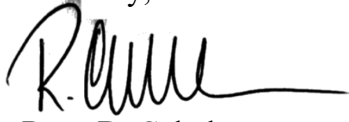
This application involves work done to have an FRA compliant ACSES PTC System in place on the MBTA's WRML, which has been defined as ACSES with ATC. Please note that the WRML is currently undergoing installation and testing along the entire line in support of ACSES and ATC integration.

Simultaneous with this filing, the MBTA is serving notice of the changes to the signal system to representatives of employees responsible for maintenance, inspection, and testing of the affected signal system as well as representatives of the employees responsible for operating trains or locomotives in the affected area. Included with this letter is a list of the names and addresses of the representatives who have been notified of these changes.

FRA approval of this application is in keeping with protocol and in support of the implementation of the PTC System as presented in the FRA-approved MBTA Non-ATC Variance (reference FRA Conditional Approval letter dated April 27, 2018).

If you require additional information, please contact me at 617-222-6266 or rcoholan@mbta.com

Sincerely,



Ryan D. Coholan

Chief Railroad Officer

Massachusetts Bay Transportation Authority

Attachments: Notice of Change to Signal System – WRML
List of Individuals Notified of Change to Signal System

cc:	Carolyn Hayward-Williams, FRA	(via email)
	Lawrence Warren, FRA	(via email)
	Robert Winstel, FRA	(via email)
	FRAWaivers@dot.gov	(via email)
	Michael Muller, MBTA	(via email)
	J. Ray, MBTA	(via email)
	J. Neider, MBTA	(via email)
	K. Antion, MBTA	(via email)
	P. Salvatore, LTK	(via email)
	David Fink, Pan Am	(via email)
	John Morris, Pan Am	(via email)
	Abdellah Chajai, Keolis	(via email)
	Robert Huggan, Keolis	(via email)
	James DellaPietro, Amtrak	(via email)
	Brian Mellen, MBTA	(via email)
	D. Byrne, MBTA	(via email)
	K. Choe, MBTA	(via email)
	R. Zmudzinski, AECOM	(via email)
	B. Wells, HNTB	(via email)
	Timothy Kunzler, Pan Am	(via email)
	M. B. Wallace, Pan Am	(via email)
	Brody LaBuick, Keolis	(via email)
	Chris Jagodzinski, Amtrak	(via email)
	MBTA_ATC_DOC_CTRL	

Notice of Change to Signal System – Western Route Main Line

1. **The Corporate Name of the applicant:** Massachusetts Bay Transportation Authority (MBTA).
2. **The Manner in which the applicants are involved:** The MBTA owns the segment of the track and right-of-way, and Keolis Commuter Services (KCS) operates and maintains the segment of the track, and right-of-way owned by the MBTA. Both the Amtrak and Pan Am Railways (Pan Am) have operating rights on the WRML.
3. **Location of the Project:** WRML starts from the easterly limits of Reading Junction Interlocking and terminates at CPF-SL (MA/NH State Line).
4. **Track or Tracks involved:** Main Tracks Single, 2, 3 and 4 from the easterly limits of Reading Junction Interlocking to CPF-SL (MA/NH State Line).
5. **Description:** The MBTA is in the process of implementing PTC on its commuter rail network. On the MBTA's North Side, an FRA compliant ACSES PTC System is being implemented, which has been defined as ACSES with ATC.

MBTA is in the process of implementing ATC on the WRML between the easterly limits of Reading Junction Interlocking and new CPF-SL (MA/NH State Line). The MBTA is installing microprocessor-based electronic track circuitry with cab signals. All work on the signal systems is being performed by Hitachi Rail STS USA, Inc. who are the PTC Systems Integrator and Keolis Commuter Services who operate and maintain MBTA Commuter Rail systems.

The project also includes the removal of intermediate automatic block signals R718, D22, D37/D38, D65, D70, D71, D81, D82, D93, D94, D99, D100, D109, D114, D130, D154, D155, R6P, R4P (CPF-FR), D290-2/D291-2, D290-1/D291-1, D306-2/D305-2, D306-1/D305-1, D320-2/D321-2, D320-1/D321-2 and D362-2/D363-2, D362-1/D363-1.

These locations are being modified or replaced with new cut-sections with cab signals. Additional cut sections have been added creating new intermediate blocks as depicted in the list of modifications below.

Attached is a profile plan depicting the existing and proposed layout, with red showing removed and yellow showing new and/or retrofitted construction that will serve as the final layout.

Modifications:

<u>Location</u>	<u>Proposed Work</u>
Reading Jct. Interlocking	Convert all signals from searchlight to LED. Add LED Clear Block signal heads on the R700, R702, L708, L710, L712, L714 and L716 signals. Modify existing and add new SIH's.
CP-Foley Street	Convert to a full Interlocking. Retire D22 and R718 Signals and, spring switch. Install new #15 power turnout with new L2 / R4 (cantilever) and L4 LED signals with Clear Block signals. Install new PTC Case and 8x18 Main SIH.
CS30	Add new cut section CS30 and new SIH.
ABS D37 / D38	Remove intermediate signals PTC case and HDM.
CS38	Add new cut section CS38 and new SIH.
CS47	Add new cut section CS47 and new SIH
Fells Interlocking	Modify existing interlocking wayside signals L92, R92 / L94 by equipping signals to provide clear block indications. Retire existing SIH and install new SIH.
CS62	Add new cut section CS62 for at Wyoming Ave. and new SIH. Remove PTC house.
ABS D65	Remove intermediate signal.
West Foster Street	Add new SIH.
West Emerson Street. CS68	Add new cut-section CS68 and add new SIH.
ABS D70 / D71	Remove intermediate signals.
Highland's crossover	Remove hand operated #10 switches at Highlands crossover.

Franklin Street	Add new SIH
CP-Doherty (new interlocking)	Install 2 new #20 crossovers with new L2 / L4 and R2 / R4 signals with Clear Block signals. Install new Main, West and East SIH's
ABS D81 / D82	Remove intermediate signals
Greenwood Street	Add new SIH
CS84	Add new cut section CS84
Forest Street	Add new SIH
CS92	Add new cut section CS92 and new SIH
Wakefield Junction crossover	Remove hand operated #20 crossover switches.
D94 / D93	Remove intermediate signals
Electric Lock 9.32 at Newburyport Branch	Install new Electric Lock at m.p. 9.32 for Newburyport Branch and new SIH.
Broadway	Add new SIH
Albion Street	Add new SIH.
ABS D99	Remove intermediate signal
CS99	Add new cut sections
Chestnut Street	Add new SIH
ABS D100	Remove intermediate signal
Prospect Street	Add new SIH
CS107	Add new cut sections CS107 and add new SIH.
ABS D109	Remove existing intermediate signal .
Electric Lock 10.9	Install new Electric Lock at 10.9 (Reading middle track) and new SIH

ABS D114	Remove existing signal. Add 2 new SIH's at New Crossing Rd.
Ash Interlocking	Modify existing interlocking wayside signals L4 and LA2 & LD2 and R2 by equipping signals to provide clear block indications. Install new SIH's.
Reading Highlands	Modify existing interlocking wayside signals L2 and R2 by equipping signals to provide clear block indications. Install new SIH's.
ABS D130	Remove intermediate signal.
CS130 Willow St	Add new cut section CS130.
CS137	Add new cut section CS137 and install new SIH
CS144 Kilmarnock Rd.	Add new cut section CS144 and install new SIH. Retire HDM
CS149 Woburn St.	Add new cut section CS149 and install new SIH.
ABS D154 / D155 CS155	Remove intermediate signals and modify existing SIH to become a new cut section CS155
RCS 161	Add new repeating cut section RCS161 and install new SIH
CS163 Middlesex Ave	Add new cut section CS163 and new SIH.
North Wilmington Sta.	Add new SIH
CS168 Salem Street	Add new cut section CS168 and install new two new SIH.
CPW-WJ	Modify existing interlocking wayside signals L2, L4, L6 and R2, R4 by equipping signals to provide clear block indications. Modify existing SIH's.

CS189	Add new cut section CS189 and new SIH.
CPF-LJ	Modify existing interlocking wayside signals R2 & R4 and L2, L4 & L6 by equipping signals to provide clear block indications. Modify existing SIHs.
Andover & Tewksbury Street	Add new SIH
Ballardvale Station. CS209	Add new cut section CS209 and new SIH
CPF-VA (Vale Int)	Modify existing interlocking wayside signals L2, L4 and R2, R4 by equipping signals to provide clear block indications. Modify existing SIH's.
Cemetery Crossing	Modify existing SIH
Essex and Pearson St's. CS226W	Add new cut section CS226W and modify existing SIH
Essex and Pearson St's. CS226E	Add new cut section CS226E and modify existing
CS234	Add new cut section CS234 and new SIH
CPF-JK	Modify existing interlocking wayside signals L2, L4 and R2A, RD2 & R4 by equipping signals to provide clear block indications. Modify existing SIH's.
CPF-AS	Modify existing interlocking wayside signals L4, L6 and R4, R6 & R8 by equipping signals to provide clear block indications. Modify existing SIH's.
CPF-FR	Modify existing interlocking wayside signals L2, L4, L6 and R4 & R6 by equipping signals to provide clear block indications. Add three new SIH's.
Marblehead St.	Modify existing SIH.
Sutton St.	Modify existing SIH.

North Main St.	Modify existing SIH.
CS278	Retire R6P and R4P repeater signals. Add new cut section CS278 and new SIH.
CS285	Add new cut section CS285 and new SIH
ABS D290-2, D291-2, D290-1, D291-1	Remove intermediate signals, SIH and PTC house.
Electric Lock 29.2	Install Electric Lock 29.2
CS294	Add new cut section CS294 and new SIH
CS302	Add new cut section CS302 and new SIH
ABS D306-2, D305-2, D306-1, D305-1 Cross St.	Remove intermediate signals. Modify existing SIH.
CS310	Add new cut section CS310 and new SIH
Bradford crossovers	Install Electric Locks on both ends of crossovers at Bradford Layover. Modify existing SIH. . West end EL31.94 and 31.97 East end EL32.05 and 32.09
CS 320	Add new cut section CS320 and modify existing SIH
ABS D320-2, D321-2, D320-1, D321-1	Remove intermediate signals.
CS326	Add new cut section CS326 and new SIH
CPF-HA	Modify existing interlocking wayside signals L4, L6, and R4, R6 by equipping signals to provide clear block indications. Add three SIH's and modify existing SIH's.
CS346	Add new cut section CS346 and new SIH
Rosemont St. CS354	Add new cut section CS354 and modify existing SIH
Electric Lock 35.9	Install new Electric Lock 35.9 and new SIH

CPF-SL	Install new Control Point CPF-SL. Signals R2 and R4 will be equipped with clear block indications. L2 and L4 will not. Install New SIH.
ABS D362-2, D363-2, D362-1, D363-1	Remove intermediate signals.

6. **Reason for Proposed change:** The MBTA is in the process of implementing PTC on its commuter rail network. On the MBTA's North Side, an FRA compliant ACSES PTC System is currently being designed, which has been defined as ACSES with ATC.
7. **Approximate Dates of the Project:** The MBTA in the final stages of installation and is in the process implementing testing and commissioning of the changes. The changes are anticipated to be completely placed into service by June of 2024.
8. **Changes in Operating Practices, Temporary or Permanent:** NORAC Operating Rules are in effect on this line. The operation will permanently change from NORAC Rule 261 to NORAC Rule 562 as a result of converting this line to ATC (cab signals without wayside intermediate signals) with fixed interlocking signals.
9. **Operating Speeds:** Currently the maximum authorized speed (MAS) on this line is:
Passenger: 79 mph
Freight: 40 mph
10. **Whether Safety of Operation will be affected:** The MBTA is improving safety and reliability with the addition of PTC and ATC along with electronic track circuitry which will eliminate potential mechanical relay failure.
11. **Whether proposed changes will conform to the Federal Railroad Administration's Rules, Standards, and Instructions (part 236 of this title.):** All changes and improvements conform to FRA Rules, Standards, and Instructions per 49 CFR Part 236.

ADDITIONAL INFORMATION AND ATTACHMENTS

Enclosed attachments include:

- 1) Signal Line Plan drawings (11"x17") indicating the "Existing" and "Proposed" arrangement of track and signal system facilities.
- 2) Existing KCS Operating Rules for the WRML:
 - a. Keolis MBTA Commuter Rail Service Employee Timetable No.3 July 1,2019
 - b. 3-32 SUM Keolis Summary Bulletin Order

List of Individuals Notified of Change to Signal System

Name	Company	Title	Address
Abdellah Chajai	Keolis	General Manager and Chief Executive Officer	470 Atlantic Ave Boston, MA 02210
Brody LaBuick	Keolis	Chief Engineer	32 Cobble Hill Rd Somerville, MA 02143
Robert Huggan	Keolis	Chief Transportation Officer	470 Atlantic Ave Boston, MA 02210
John D. Ray	MBTA	Director of Engineering Railroad Operations	32 Cobble Hill Rd Somerville, MA 02143
Michael Muller	MBTA	Executive Director of Commuter Rail	32 Cobble Hill Rd Somerville, MA 02143
Brian Mellen	MBTA	Director of Engineering	32 Cobble Hill Rd Somerville, MA 02143
David Fink	Pan Am	President	Pan Am Railways 1700 Iron Horse Park North Billerica, MA 01862
Timothy Kunzler	Pan Am	Vice President - Engineering	Pan Am Railways 1700 Iron Horse Park North Billerica, MA 01862
James DellaPietro	Amtrak	Superintendent Operations Transportation	700 Atlantic Ave, Boston, MA 02110
Chris Jagodzinski	Amtrak	Asst. Vice President Operations	30th St Station 2955 Market St. Philadelphia, PA 19104



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0015**
Date: July 29, 2022
Contract No.: MBTA-42-14 ATC
Response: **NRR**
Ref. Letter: RSC-200608-009

Mr. Karl Alexy
Associate Administrator for Safety
Federal Railroad Administration
1200 New Jersey Avenue NE
Washington, DC. 20590
Office W35-302

**Subject: Advanced Civil Speed Enforcement System North Side Non-ATC Territory
Conditional Approved Variance – ATC Progress Report – 2Q2022
(Docket Number FRA-2010-0030)**

Dear Mr. Alexy:

The Massachusetts Bay Transportation Authority (MBTA) is pleased to report that MBTA's program to implement a cab signal system with automatic train control (ATC) on all of its North Side Commuter Lines continues to progress, however, as previously reported, it is no longer on schedule to be completed by the December 31, 2022 deadline required by FRA's June 19, 2020 letter referenced above. This quarterly report is provided in accordance with the conditions of FRA's extension of the applicability of the North Side Commuter Lines Non-ATC Territory Variance.

The work to implement ATC on the North Side Lines has been in process since June 2019 and is ongoing. Funding is in place, and design, installation, testing, and commissioning of ATC is in progress at an expedited pace pursuant to the schedule provided to FRA. FRA has been notified of the signal system changes for all of the lines. The work is being performed in segments on each line. MBTA has placed ATC in service on the New Hampshire ML/Wildcat Lines, on the 50 miles of the Fitchburg Line that are owned by the MBTA, and on 19 miles of the Eastern Route between Newburyport and Salem. Currently, 97 of the 170 miles of line (57%) on the MBTA's North Side are equipped with and operating ACSES with ATC.

MBTA is continuing to test and commission the ATC system on the Eastern Route with the 14 miles between Salem and Everett Jct. planned to be commissioned during the third quarter. Design, installation, and pre-testing is proceeding for the remaining lines and commissioning of ATC on the Gloucester Branch is planned for the fourth quarter of 2022.

The continuing repercussions of the COVID-19 pandemic are negatively impacting work productivity and supply chains. Positive COVID test results continue to impact the work force

July 29, 2022

Page 2

and the contractor has informed the MBTA that they are experiencing delays in obtaining equipment due to shortages of key components.

The chart below shows progress against the schedule approved by FRA that calls for completion at the end of 2022. The rightmost column indicates the projected completion date for each line based on MBTA's request for extension.

North Side Line	Commence Installation Work	Commence Testing and Commissioning	ACSES with ATC Operational	MBTA Projected Completion Per Extension Request
New Hampshire	Complete	Complete	Complete	Complete
Wildcat Branch	Complete	Complete	Complete	Complete
Fitchburg Line*	Complete	Complete	Complete	Complete
Western Route	Underway	August 31, 2022	December 31, 2022	June 30, 2024
Eastern Route**	Underway	Underway	December 31, 2022	June 30, 2023
Gloucester Branch	Underway	Underway	December 31, 2022	December 31, 2023

* ATC on the CSX-owned Wachusett Extension (5 miles) will be installed and commissioning by CSX subject to their availability.

** MBTA plans to commission the final 3-mile segment of this line between Everett Jct. and Tower A in conjunction with the Western Route.

Progress over the past quarter continues to support the MBTA's contention that it will not be possible to mitigate the delays completely and accelerate the work sufficiently to allow completion of all of the North Side Lines by the current December 31, 2022 deadline.

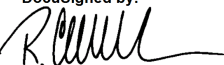
Please be aware that there continues to be risk of further delays to the schedule in the event of further COVID-19 pandemic disruptions, delays resulting from the transition of Pan Am operations to CSX, major weather disruptions, or due to limited railroad signal resources provided by Keolis Commuter Services (MBTA's Commuter Rail System operator). MBTA has been and will continue to closely monitor the progress of the work and will take appropriate actions to mitigate the impact of any further delays that occur to ensure that ATC on the North Side Lines is completed as soon as possible.

July 29, 2022

Page 3

If you require additional information, please contact me at jray@mbta.com.

Sincerely,

DocuSigned by:

DA71979273934C3...

John D. Ray
Assistant General Manager –
Commuter Rail and Ferry Operations

cc:	Carolyn Hayward-Williams, FRA	(via email)
	Lawrence Warren, FRA	(via email)
	Steve Illich, FRA Region 1	(via email)
	Gabe Neal, FRA	(via email)
	R. Coholan, MBTA	(via email)
	B. Mellen, MBTA	(via email)
	K. Choe, MBTA	(via email)
	R. Zmudzinski, WSP	(via email)
	B. Wells, HNTB	(via email)
	MBTA_ATC_DOC_CTRL	
	D. Byrne, MBTA	(via email)
	J. Neider, MBTA	(via email)
	K. Antion, MBTA	(via email)
	C. Marin, MBTA	(via email)
	P. Salvatore, LTK	(via email)



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0016**
Date: September 8, 2022
Contract No.: MBTA-42-14 ATC
Response: **RR**
Ref. Letter: RSC-200608-009
MBTA_ATC-FRA-0015
MBTA_ATC-FRA-0008

Mr. Karl Alexy
Associate Administrator for Safety
Federal Railroad Administration
1200 New Jersey Avenue NE
Washington, DC. 20590
Office W35-302

**Subject: Advanced Civil Speed Enforcement System North Side Non-ATC Territory
Conditional Approved Variance –Request for Extension of Variance
(Docket Number FRA-2010-0030)**

Dear Mr. Alexy:

The Massachusetts Bay Transportation Authority (MBTA) continues to make progress on its program to implement a cab signal system with automatic train control (ATC) on all of its North Side Commuter Rail Lines as reported in MBTA's letter of July 29, 2022. However, as previously reported, this work will not be completed by the December 31, 2022 deadline required by FRA's June 19, 2020 letter referenced above. Currently, 101 of the 170 miles of line (59%) on the MBTA's North Side are equipped with and operating ACSES with ATC.

MBTA has prioritized the ATC work over other capital projects and has utilized extensive commuter rail service outages to expedite ATC implementation. The outages include a 2-month outage on 30 miles of the Fitchburg Line in the spring of 2021, 3-month outage on the Eastern Route in the spring of 2022, and a planned 2-month outage of the Gloucester Branch in the fall of 2022. In addition, commuter rail service has been suspended on the various lines almost every weekend since 2019 to facilitate ATC work. These outages have caused significant inconvenience to the MBTA's ridership.

Despite these efforts, the MBTA will not be able to complete implementation of ATC on all of the North Side Lines by the current December 31, 2022 deadline. Accordingly, MBTA hereby requests an extension of the variance approval for use on the remaining lines until ATC implementation is completed. MBTA notes that there have been no issues with the PTC system on the North Side lines operating under the variance.

Per MBTA's letter of September 7, 2021 (MBTA_ATC-FRA-0008) MBTA requested an 18-month extension of the variance to June 30, 2024. While MBTA is currently on schedule to complete ATC implementation on all the North Side Lines by that date, MBTA respectfully requests a 24-month extension to December 31, 2024. This completion date will provide some

September 8, 2022
Page 2

schedule contingency and avoid the need to request a further extension in the event that completion of implementation is delayed for reasons outside the MBTA's control. The challenges that MBTA faces in attempting to meet the current deadline include:

Limited Signal Resources - MBTA has a limited pool of signal resources available to commission the ATC system. MBTA has taken steps to increase the number of resources through contracting and hiring. We have been able to expand the pool of resources sufficiently to create two teams that can work on two projects or shifts simultaneously. However, there is a limited supply of qualified and available contract signal employees and hiring and training signal personnel takes years. In addition, other MBTA projects are competing for these same railroad signal resources. These projects all have various safety implications and almost all result in improved safety of our rail network. Given the promised completion dates for ATC, MBTA continues to prioritize compliance with ATC deadlines over the completion of the other projects, delaying the safety benefits that they will provide. These other projects, many of which are federally funded, require the use of the limited signal resources for commissioning. Choosing to commission any of these other projects would further delay progress on the North Side ATC work. These other projects include replacement of structurally deficient bridges and updating very old interlocking and train control equipment.

Employee Burn-out – The signal labor force employed by MBTA's commuter rail operator, Keolis Commuter Services, is a limited resource that has been working virtually every weekend for several years on the PTC and now North Side ATC programs. MBTA is concerned that the signal labor force may experience burn out, and their utilization needs to be managed to avoid that possibility. MBTA has seen evidence that this may be happening and has taken steps to manage this risk such as minimizing weeknight work to support weekend outages.

Contractor Performance Issues – MBTA has encountered problems with the quality and timeliness of the work performed by the North Side ATC contractor, Hitachi Rail STS, Inc. MBTA had to direct a safety stand down in 2021 and take other measures to address design quality issues as previously reported. These measures have included developing additional grade crossing testing, replacing a design subcontractor, and adding independent design checking firms to the Hitachi team. These issues and the steps taken to address them have yielded the desired quality improvements for the remainder of the design but have delayed progress.


Schedule Adherence – Scheduling continuous ATC commissioning work leaves no float in the schedule and thus even small issues can result in schedule slippage. The lack of float creates anxiety that can lead to performance issues and/or employee burn-out as mentioned above. The schedule adherence pressure does not reinforce our own safety culture designed to keep proper balance and perspective for fatigue management. The schedule is also at risk from further causes: COVID-19 pandemic disruptions; delays resulting from the sale of Pan Am to CSX; and major weather disruptions. MBTA, Keolis, and Hitachi recently engaged in a partnering session and all agreed that the current no-float schedule is creating unnecessary stress and risk to the project.

September 8, 2022
Page 3

MBTA will continue to closely monitor the progress of the work and will take appropriate actions to mitigate the impact of any further delays that occur to ensure that ATC on the North Side Lines is completed as soon as possible. Bi-monthly meetings have been, and will continue to be, held with FRA to monitor the progress of the work.

If you require additional information, please contact me at spoftak@mbta.com.

Sincerely,

DocuSigned by:

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Steve Poftak
General Manager

cc:	Carolyn Hayward-Williams, FRA	(via email)
	Lawrence Warren, FRA	(via email)
	Steve Illich, FRA Region 1	(via email)
	Gabe Neal, FRA	(via email)
	J. Ray, MBTA	(via email)
	D. Byrne, MBTA	(via email)
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	C. Brennan, MBTA	(via email)
	R. Zmudzinski, WSP	(via email)
	B. Wells, HNTB	(via email)
	MBTA_ATC_DOC_CTRL	



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0017**
Date: October 21, 2022
Contract No.: MBTA-42-14 ATC
Response: **NRR**
Ref. Letter: RSC-200608-009

Mr. Karl Alexy
Associate Administrator for Safety
Federal Railroad Administration
1200 New Jersey Avenue NE
Washington, DC. 20590
Office W35-302

**Subject: Advanced Civil Speed Enforcement System North Side Non-ATC Territory
Conditional Approved Variance – ATC Progress Report – 3Q2022
(Docket Number FRA-2010-0030)**

Dear Mr. Alexy:

The Massachusetts Bay Transportation Authority (MBTA) is pleased to report that MBTA's program to implement a cab signal system with automatic train control (ATC) on all of its North Side Commuter Lines continues to progress, however, as previously reported, it is no longer on schedule to be completed by the December 31, 2022 deadline required by FRA's June 19, 2020 letter referenced above. This quarterly report is provided in accordance with the conditions of FRA's extension of the applicability of the North Side Commuter Lines Non-ATC Territory Variance.

The work to implement ATC on the North Side Lines has been in process since June 2019 and is ongoing. Funding is in place, and design, installation, testing, and commissioning of ATC is in progress at an expedited pace pursuant to the schedule provided to FRA. FRA has been notified of the signal system changes for all of the lines. The work is being performed in segments on each line. MBTA has placed ATC in service on the New Hampshire ML/Wildcat Lines, on the 50 miles of the Fitchburg Line that are owned by the MBTA, and on 29 miles of the Eastern Route between Newburyport and Salem. Currently, 105 of the 170 miles of line (62%) on the MBTA's North Side are equipped with and operating ACSES with ATC.

MBTA was able to test and commission the ATC system on 10 of the 14 miles of the Eastern Route between Salem and Everett Jct. planned to be commissioned during the third quarter. However, the commissioning of the last 4 miles has been postponed to the spring of 2023. Changes in MBTA transit system project schedules pushed this work to a time when the Keolis signal cutover personnel were unavailable. Design, installation, and pre-testing is proceeding for the remaining lines. Commissioning of ATC on the Gloucester Branch commenced on October 15th and is planned to complete by the end of the fourth quarter 2022.

The continuing repercussions of the COVID-19 pandemic are negatively impacting work productivity and supply chains. Positive COVID test results continue to impact the work force and the contractor has informed the MBTA that they are experiencing delays in obtaining equipment due to shortages of key components.

The chart below shows progress against the schedule approved by FRA that calls for completion at the end of 2022. The rightmost column indicates the projected completion date for each line based on MBTA's September 8, 2022 request for extension.

North Side Line	Commence Installation Work	Commence Testing and Commissioning	ACSES with ATC Operational	MBTA Projected Completion Per Extension Request
New Hampshire	Complete	Complete	Complete	Complete
Wildcat Branch	Complete	Complete	Complete	Complete
Fitchburg Line*	Complete	Complete	Complete	Complete
Western Route	Underway	August 31, 2022	December 31, 2022	December 31, 2024
Eastern Route	Underway	Underway	December 31, 2022	December 31, 2024
Gloucester Branch	Underway	Underway	December 31, 2022	December 31, 2024

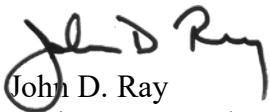
** ATC on the CSX-owned Wachusett Extension (5 miles) will be installed and commissioning by CSX subject to their availability.*

Progress over the past quarter continues to support the MBTA's contention that it will not be possible to mitigate the delays completely and accelerate the work sufficiently to allow completion of all of the North Side Lines by the current December 31, 2022 deadline. Accordingly, MBTA submitted a revised request for extension on September 8, 2022.

Please be aware that there continues to be risk of further delays to the schedule in the event of further COVID-19 pandemic disruptions, delays resulting from the transition of Pan Am operations to CSX, major weather disruptions, or due to limited railroad signal resources provided by Keolis Commuter Services (MBTA's Commuter Rail System operator). MBTA has been and will continue to closely monitor the progress of the work and will take appropriate actions to mitigate the impact of any further delays that occur to ensure that ATC on the North Side Lines is completed as soon as possible.

If you require additional information, please contact me at jray@mbta.com.

Sincerely,



John D. Ray
Assistant General Manager –
Commuter Rail and Ferry Operations

cc:	Carolyn Hayward-Williams, FRA	(via email)
	Lawrence Warren, FRA	(via email)
	Steve Illich, FRA Region 1	(via email)
	Gabe Neal, FRA	(via email)
	M. Muller, MBTA	(via email)
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	B. Wells, HNTB	(via email)
	MBTA_ATC_DOC_CTRL	



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0018**
Date: October 31, 2022
Contract No.: MBTA-42-14 ATC
Response: **NRR**
Ref. Letter: RRS-220926-009

Ms. Carolyn Hayward-Williams
Director, Office of Railroad Systems and Technology
Federal Railroad Administration
1200 New Jersey Avenue NE
Washington, DC 20590

Subject: Back-to-Back Signal Functionality for the Advanced Civil Speed Enforcement System II (Docket FRA-2010-0030)

Dear Ms. Hayward-Williams:

In response to your letter of September 29, 2022, the MBTA analyzed its positive train control (PTC) system to determine if there are locations that will require the use of “Back-to-Back” (B2B) PTC software.

MBTA has determined that there are four (4) locations on its PTC system that will require B2B software as they have consecutive facing signals with no DS transponder set between them:

1. Eastern Route Main Line – FX interlocking
2. New Hampshire Main Line – CPF-BY interlocking
3. Gloucester Branch – Gloucester Draw & CP-Wilson interlockings
4. Greenbush Branch – Green & Adams Junction Interlockings

MBTA’s tenants CSX (and New Hampshire North Coast), Amtrak, and Fore River Transportation will require B2B software as their operations traverse one or more of these locations.

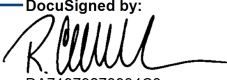
A schedule of work defining a timeframe to acquire, install, and implement B2B software on locomotives and wayside signal locations is not possible at this time. The MBTA will work with the other NEC Railroads and suppliers to determine a schedule and will provide to the FRA when available and advising of its progress.

October 31, 2022

Page 2

If you require additional information, please contact me at 617-222-6266 or rcoholan@mbta.com.

Sincerely,

DocuSigned by:

DA71979273934C3...

Ryan D. Coholan

Chief Railroad Officer

Massachusetts Bay Transportation Authority

cc: G. Neal, FRA (via email)
Lawrence Warren, FRA (via email)
Robert Winstel, FRA (via email)
M. Muller, MBTA (via email) K. Viera, MBTA (via email)
J. Ray, MBTA (via email) C. Brennan, MBTA (via email)
J. Neider, MBTA (via email) B. Mellen, MBTA (via email)
K. Antion, MBTA (via email) R. Zmudzinski, AECOM (via email)
P. Salvatore, LTK (via email) B. Wells, HNTB (via email)
MBTA_ATC_DOC_CTRL FRA SIR Site



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0019**
Date: November 09, 2022
Contract No.: MBTA-42-14 ATC
Response: **NRR**
Ref. Letter: none

Steven W. Illich
Railroad Administrator
Safety Management Team - 1
Federal Railroad Administration
800 N. King Street – Suite 301
Wilmington, DE 19801

Subject: False Proceed Signal Report – MBTA ATC CS MicroLok

Dear Mr. Illich:

On October 26, 2022, during MBTA's testing for placing the ATC system on the Gloucester branch in service it was discovered a cut section was not functioning properly. During the troubleshooting process the MicroLok entered into a stable selective shutdown mode. When the MicroLok unit is in the selective shutdown mode it cuts off all vital outputs with the exception of the vital ECODE track signal codes.

This creates a situation where the application logic is processing and the ECODE track codes continue communicating to the adjacent cut section the most permissive signal codes. However, the cab signal generator has been cut off which causes the failed location to transmit the least permissive cab signal code. This results in a train receiving a maximum speed cab signal at one location into the next location where a MicroLok is in selective shutdown and outputting a STOP code.

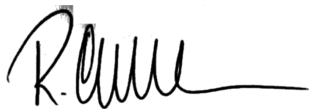
Investigation indicates that this issue exists on all lines where MBTA has recently commissioned and placed in service ATC including the Fitchburg, New Hampshire, Eastern, Franklin, Needham, and Worcester lines. Please see attached presentation that describes the issue in detail.

MBTA has worked with its commuter rail operating contractor, Keolis Commuter Services, and its ATC contractor, Hitachi Rail STS USA, Inc., to develop a software solution to address this issue. MBTA has tested and validated this solution and work has commenced on the Fitchburg Line. A risk analysis has been performed to determine the priority order of correction on the various line segments based on curvature and freight traffic. There are eight locations on the Fitchburg Line that are the highest priority and the corrective work at these locations commenced on November 9th are expected to be completed on November 10th, 2022.

MBTA has mobilized additional railroad and contractor resources to ensure that this issue is corrected systemwide as quickly as possible. The corrective work at the cut sections on the two highest priority line segments is expected to be completed by November 15, 2022. MBTA plans to complete work at the cut sections on all the remaining line segments by January 31, 2023.

If you require additional information, please contact me at 617-222-6266 or rcoholan@mbta.com.

Sincerely,



Ryan D. Coholan
Chief Railroad Officer
Massachusetts Bay Transportation Authority

Attachments:

1. Completed False Proceed Signal Report form
2. Presentation prepared by MBTA's ATC contractor, Hitachi Rail STS USA, Inc. entitled "Safety Overview of CS MicroLok in Selective Shutdown Mode – and the Systematic Ramifications on the MBTA Architecture".
3. VCOR MicroLok Analysis

cc:	fra.af_fp.reporting@dot.gov	Lawrence Warren, FRA	(via email)
	Gabe Neal, FRA	Robert Winstel, FRA	(via email)
	M. Muller, MBTA	J. Ray, MBTA	(via email)
	K. Viera, MBTA	B. Mellen, MBTA	(via email)
	J. Neider, MBTA	C. Brennan, MBTA	(via email)
	K. Antion, MBTA	R. Zmudzinski, AECOM	(via email)
	P. Salvatore, Hatch	K. Newkirk, Hatch	(via email)
	T. Wildermuth, WSP	B. Wells, HNTB	(via email)
	MBTA_ATC_DOC_CTRL		



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0020**
Date: December 21, 2022
Contract No.: MBTA-42-14 ATC
Response: **NRR**
Ref. Letter: MBTA_ATC-FRA-0013
RSC-200608-009
RRS-220928-008

Mr. Karl Alexy
Associate Administrator for Safety
Federal Railroad Administration
1200 New Jersey Avenue NE
Washington, DC 20590
Office W35-302

Subject: Request for Amendment (RFA) for Change to PTC System – February to July 2023 Construction Zones per Regulation filed under Docket FRA-2010-0030

Dear Mr. Alexy:

In compliance with 49 CFR §236.1021 Discontinuances, material modifications, and amendments, modifications to the MBTA's Positive Train Control (PTC) train control system are required in support of the installation of Automatic Train Control (ATC) on its North Side Lines. Accordingly, the Massachusetts Bay Transportation Authority (MBTA) is submitting this RFA to install Construction Zone (CZ) Transponders on two line segments between February and May 2023.

This application involves planned work to implement an FRA compliant ACSES PTC System on the MBTA's North Side Lines which has been defined as ACSES with ATC. Installation and testing in support of ACSES and ATC integration is currently ongoing.

The installation of the CZs is required to implement ATC on the North Side Lines. The CZs will result in the suspension of portions of the PTC system on these lines. During this time there will be no revenue passenger operations until the ATC system is placed into operation. Freight and non-revenue passenger operations will be conducted under NORAC rule 241 that limits trains to Restricted Speed. Once the ATC system is in operation, the ATC system along with the operating rules, will govern train operations until the ACSES system can be reconfigured and retested.

The first CZ is planned for the Western Route Main Line (WRML). This CZ will cover ATC implementation from Clark St on the Wildcat Branch (MP 15.7) through Wilmington Jct. interlocking (CPW-WJ MP 18.0) to the new CPF-SL (State Line) interlocking (MP 36.2). This CZ will be implemented on February 4, 2023 and will be removed (shortened) in stages proceeding easterly as ATC implementation and PTC testing is completed. The work is scheduled to be completed and the CZ completely removed by July 30, 2023.

Several options were evaluated prior to development of this CZ plan. These options included:

- Having one CZ placed and then removed all at once, however with this option the CZ would need to be in place continuously for 7 months;
- Having multiple CZs for shorter overlapping segments, however, this would require multiple changes in CZ limits that would add operational complexity without any offsetting schedule benefit to the project; and
- The chosen plan of one CZ removed in stages. This option provides the greatest safety, schedule, and operational benefit.

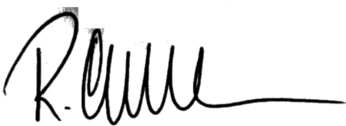
The second CZ is planned for the Eastern Route Main Line (ERML). This CZ will cover ATC implementation from Wonderland interlocking (MP 7.0) to Everett Jct. interlocking (MP 2.8). This CZ is scheduled to be implemented on March 20, 2023 and be removed by June 30, 2023.

In order to avoid creating a single point of failure with restarting PTC at the ends of a CZ, duplicate CZ transponder sets will be installed.

Simultaneous with this filing, the MBTA is serving notice of these changes to the PTC system to representatives of employees responsible for maintenance, inspection, and testing of the affected signal system as well as representatives of the employees responsible for operating trains or locomotives in the affected area. Included with this letter is a list of the names and addresses of the representatives who have been notified of these changes.

If you require additional information, please contact me at 617-222-6266 or rcoholan@mbta.com.

Sincerely,



Ryan D. Coholan

Chief Railroad Officer

Massachusetts Bay Transportation Authority

Attachments:

Request for Amendment (RFA) for Change to PTC System – North Side Lines
Construction Zones – February to July 2023: WRML and ERML
List of Individuals Notified of RFA to PTC System

cc: Carolyn Hayward-Williams, FRA (via email)
Lawrence Warren, FRA (via email)
Robert Winstel, FRA (via email)
FRAWaivers@dot.gov (via email)
M. Muller, MBTA (via email) K. Viera, MBTA (via email)
J. Ray, MBTA (via email) C. Brennan, MBTA (via email)
J. Neider, MBTA (via email) B. Mellen, MBTA (via email)
K. Viera, MBTA (via email) K. Antion, MBTA (via email)
R. Zmudzinski, AECOM (via email) P. Salvatore, LTK (via email)
B. Wells, HNTB (via email) A. Chajai, Keolis (via email)
J. Steiniger, Keolis (via email) M. Rooks, Keolis (via email)
D. Rouleau, Keolis (via email) J. Schroeder, CSX (via mail)
J. Morris, CSX (via email) C. Jagodzinski, Amtrak (via email)
S. Cochran, Amtrak (via email) J. DellaPietro, Amtrak (via email)
MBTA_ATC_DOC_CTRL



Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
Gina Fiandaca, Secretary & CEO
Jeffrey Gonneville, Interim General Manager



Letter No.: **MBTA_ATC-FRA-0021**
Date: January 31, 2023
Contract No.: MBTA-42-14 ATC
Response: **NRR**
Ref. Letter: RSC-200608-009
RRS-220928-008

Mr. Karl Alexy
Associate Administrator for Safety
Federal Railroad Administration
1200 New Jersey Avenue NE
Washington, DC. 20590
Office W35-302

**Subject: Advanced Civil Speed Enforcement System North Side Non-ATC Territory
Conditional Approved Variance – ATC Progress Report – 4Q2022
(Docket Number FRA-2010-0030)**

Dear Mr. Alexy:

The Massachusetts Bay Transportation Authority (MBTA) is pleased to report that MBTA's program to implement a cab signal system with automatic train control (ATC) on all of its North Side Commuter Lines continues to progress and is on schedule to be completed by the December 31, 2024 deadline required by FRA's December 19, 2022 letter referenced above. This quarterly report is provided in accordance with the conditions of FRA's extension of the applicability of the North Side Commuter Lines Non-ATC Territory Variance.

The work to implement ATC on the North Side Lines has been in process since June 2019 and is ongoing. Funding is in place, and design, installation, testing, and commissioning of ATC is in progress at an expedited pace pursuant to the schedule provided to FRA. FRA has been notified of the signal system changes for all of the lines. The work is being performed in segments on each line. MBTA has placed ATC in service on the New Hampshire ML/Wildcat Lines, on the 50 miles of the Fitchburg Line that are owned by the MBTA, on 29 miles of the Eastern Route between Newburyport and Wonderland, and on the Gloucester Branch. Currently, 121 of the 170 miles of line (72%) on the MBTA's North Side are equipped with and operating ACSES with ATC.

ATC implementation work is now focused on the Western Route. MBTA has submitted an RFA to FRA for approval of PTC construction zones required to support this work during the months of February through July 2023.

The chart below shows progress against the schedule approved by FRA that calls for completion at the end of 2024.

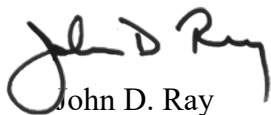
North Side Line	Commence Installation Work	Commence Testing and Commissioning	ACSES with ATC Operational
New Hampshire	Complete	Complete	Complete
Wildcat Branch	Complete	Complete	Complete
Fitchburg Line*	Complete	Complete	Complete
Western Route	Underway	Underway	December 31, 2024
Eastern Route	Underway	Underway	December 31, 2024
Gloucester Branch	Underway	Underway	December 31, 2024

** ATC on the CSX-owned Wachusett Extension (5 miles) will be installed and commissioning by CSX subject to their availability.*

Please be aware that there continues to be risk of further delays to the schedule in the event of further COVID-19 pandemic disruptions, delays resulting from the transition of Pan Am operations to CSX, major weather disruptions, or due to limited railroad signal resources provided by Keolis Commuter Services (MBTA's Commuter Rail System operator). MBTA has been and will continue to closely monitor the progress of the work and will take appropriate actions to mitigate the impact of any further delays that occur to ensure that ATC on the North Side Lines is completed as soon as possible.

If you require additional information, please contact me at jray@mbta.com.

Sincerely,



John D. Ray
Assistant General Manager –
Commuter Rail and Ferry Operations

cc: Carolyn Hayward-Williams, FRA (via email)
Lawrence Warren, FRA (via email)
Steve Illich, FRA Region 1 (via email)
Gabe Neal, FRA (via email)
M. Muller, MBTA (via email) R. Coholan, MBTA (via email)
K. Viera, MBTA (via email) B. Mellen, MBTA (via email)
J. Neider, MBTA (via email) C. Brennan, MBTA (via email)
K. Antion, MBTA (via email) R. Zmudzinski, WSP (via email)
C. Marin, MBTA (via email) B. Wells, HNTB (via email)
G. Chertock, Hatch (via email) MBTA_ATC_DOC_CTRL



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Jamey Tesler, MassDOT Secretary & CEO
Steve Poftak, General Manager



Letter No.: **MBTA_ATC-FRA-0022**
Date: February 14, 2023
Contract No.: MBTA-42-14 ATC
Response: **NRR**
Ref. Letter: RRS-230127-004
MBTA_ATC-FRA-0020

Mr. Karl Alexy
Associate Administrator for Safety
Federal Railroad Administration
1200 New Jersey Avenue NE
Washington, DC 20590
Office W35-302

Subject: Additional Information Regarding Request for Amendment (RFA) to PTC System (Temporary Discontinuance) – February to July 2023 Construction Zones per Regulation filed under Docket FRA-2010-0030

Dear Mr. Alexy:

FRA's conditional approval of MBTA's RFA dated February 6, 2023 required MBTA to submit the additional information required under § 236.1021(m) per condition 5. The additional information required under the respective subsections is as follows:

(2)(i) – MBTA is not proposing any changes to the safety critical elements of the MBTA ACSES II PTC system. The ACSES II PTC system components are being placed back into service on the new underlying ATC system as required by the FRA approved Northside Variance. Therefore, no effect on the safety-critical functionality of the ACSES II PTC system and no new hazards are introduced to the MBTA ACSES II PTC system.

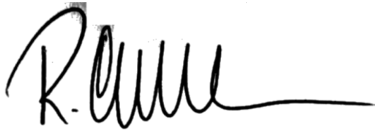
(2)(ii) – MBTA is not modifying any of the safety critical elements of the MBTA ACSES II PTC system, therefore current revision levels will not change and thus software release notes are not required.

(2)(iii) – MBTA has served notice of the PTC system discontinuance to representatives of our tenant railroads who operate trains or locomotives in the affected areas. Please reference the original RFA, page 3, for the list of the names and addresses of the representatives of CSX and Amtrak who have been notified of these changes.

(2)(iv) – Ryan D. Coholan, Chief Railroad Officer, Massachusetts Bay Transportation Authority, confirms that the PTC system placed back into service after the discontinuance will meet all technical requirements under this 49 CFR § 236, and provides a greater level of safety with the addition of the underlying ATC system. Furthermore, the PTC system placed back into service after the discontinuance will not impact interoperability with our tenant railroads, CSX and Amtrak.

If you require additional information, please contact me at 617-222-6266 or rcoholan@mbta.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Coholan', with a long horizontal flourish extending to the right.

Ryan D. Coholan
Chief Railroad Officer
Massachusetts Bay Transportation Authority

cc: Carolyn Hayward-Williams, FRA (via email)
Lawrence Warren, FRA (via email)
Robert Winstel, FRA (via email)
FRAWaivers@dot.gov (via email)
M. Muller, MBTA (via email) J. Ray, MBTA (via email)
C. Brennan, MBTA (via email) J. Neider, MBTA (via email)
B. Mellen, MBTA (via email) K. Antion, MBTA (via email)
R. Zmudzinski, AECOM (via email) G. Chertock, LTK (via email)
B. Wells, HNTB (via email) A. Chajai, Keolis (via email)
J. Steiniger, Keolis (via email) M. Rooks, Keolis (via email)
D. Rouleau, Keolis (via email) J. Schroeder, CSX (via mail)
J. Morris, CSX (via email) C. Jagodzinski, Amtrak (via email)
S. Corcoran, Amtrak (via email) J. DellaPietro, Amtrak (via email)
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U.S. Department
of Transportation

**Federal Transit
Administration**

REGION 1
Connecticut, Maine,
Massachusetts,
New Hampshire,
Rhode Island, Vermont

Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093
617-494-2055
617-494-2865 (fax)

RECEIVED

AUG 23 2022

MASS. HIST. COMM

RC 35332

August 15, 2022

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

After review of the MHC's files and the materials you submitted, the MHC has determined that the proposed project will have "no adverse effect" on significant historic or archaeological properties.

Brona Simon 9/16/22

**RE: Ruggles Station Phase II Project, Boston, MA
Section 106 No Adverse Effect**

Brona Simon
Executive Director
State Historic Preservation Officer
Massachusetts Historical Commission

Date

Dear Ms. Simon:

The Massachusetts Bay Transportation Authority (MBTA) is proposing to utilize Federal Transit Administration (FTA) financial assistance for the Ruggles Station Phase II project. This undertaking consists of the construction of a new headhouse and ramps at the Columbus Ave entrance.

The undertaking also includes other improvements which the FTA has determined are exempt under Appendix A of the Advisory Council on Historic Preservation's *Program Comment to Exempt Consideration of Effects to Rail Properties within Rail Rights-of-Way*. Those elements consist of various accessibility improvements to Orange Line platforms, Commuter Rail platforms, construction of new emergency exits off the Orange Line and Commuter Rail Platforms, station-wide lighting upgrades, the installation of accessible bathrooms, and replacement of the fire protection system. A detailed scope of work is available in the attached Cultural Resources Technical Memorandum.

The Area of Potential Effects (APE) is defined as 400 feet from the Project Area on all sides and is documented within the attached Cultural Resources Technical Memorandum.

There are three previously identified and two newly identified historic resources over 50 years of age in the APE that were evaluated as part of this effort. Of these, the Lower Roxbury Historic District is NRHP-listed (1994), and none of the other inventoried resources were on or eligible for the NRHP.

For this undertaking, the sole listed resource in the APE, the Lower Roxbury Historic District, is not clearly visible to or from the proposed new Columbus Ave headhouse at any point. The proposed headhouse will therefore not introduce any new visual element to the district. The location of the new headhouse is shown in photographs on page 7 of the attached consultant report.

The MBTA has consulted with the Boston Landmarks Commission (BLC) on both design features of the project and on the determination of effects. Following a submission by the

MBTA, the Boston Landmarks Commission concurred with the recommendation of a no adverse effects finding on August 3, 2022.

In accordance with 36 C.F.R. § 800.5(b) of the Advisory Council on Historic Preservation's (ACHP) regulations, "Protection of Historic Properties", FTA has determined that the Ruggles Station Phase II project will have no adverse effect on historic or archaeological resources. The FTA is requesting your concurrence with this determination. The following information is provided to support this determination:

- Cultural Resources Technical Memorandum, February 2022
- BLC concurrence email, August 3, 2022

In keeping with 36 C.F.R. § 800.5(c)(1), if a response from the Massachusetts Historical Commission is not received within 30 days, the FTA will consider its responsibilities under Section 106 fulfilled. If you have any questions regarding this matter, please contact Eric Papetti at 617-494-3494.

Sincerely,

PETER SHANNON
N BUTLER

Digitally signed by
PETER SHANNON
BUTLER
Date: 2022.08.15
14:59:18 -04'00'

Peter Butler
Regional Administrator

Attachment

cc: Tess Paganelli, Manager of Environmental Construction, MBTA

RECEIVED

SEP 23 2022

MASS. HIST. COMM

RC. 32805
and
RC. 53253



U.S. Department
of Transportation
**Federal Transit
Administration**

REGION I
Connecticut, Maine,
Massachusetts,
New Hampshire,
Rhode Island, Vermont

Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093
617-494-2055
617-494-2865 (fax)

September 21, 2022

Ms. Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

CONCURRENCE:

10/14/22

Brona Simon
BRONA SIMON
STATE HISTORIC
PRESERVATION OFFICER
MASSACHUSETTS
HISTORICAL COMMISSION

**RE: MBTA Widett Circle, Boston, MA
No Historic Properties Affected**

Dear Ms. Simon:

The Massachusetts Bay Transportation Authority (MBTA) is proposing to utilize Federal Transit Administration (FTA) financial assistance to construct a rail layover facility at Widett Circle in Boston, MA.

The goal of the Widett Circle Layover Facility is to provide the MBTA with a South Side Commuter Rail storage area as part of a larger program need to modernize South Side operations. A layover facility at Widett Circle was previously evaluated as part of the South Station Expansion project's Federal Railroad Administration's Environmental Assessment. Following consultation among the FRA, MassDOT/MBTA, Tribes with interest in the South Station Expansion project area, and local and regional stakeholders, the MHC concurred on May 9, 2017 with FRA's "conditional no adverse effect" determination for the full build South Station Expansion project. This determination included conditions to be implemented during project design and construction that would avoid adverse effects to the three identified historic properties, none of which apply to the Widett Circle area.

While most of the South Station Expansion project, including any proposed improvements to the South Station Headhouse or Fort Point Channel seawall, is on hold at the 30% design stage, the MBTA is progressing development of the Widett Circle Layover Facility. The conceptual layout of the SSX Widett Circle Layover Facility (the Project) included the acquisition of approximately 30 acres of land to accommodate MBTA's commuter rail layover tracks, along with supporting infrastructure: crew building, power substation, support shed, and crew parking areas. Since that time, recognizing MBTA's need for layover space, the private developer that recently purchased the site approached the MBTA with a development proposal. Per this proposal, the MBTA seeks to acquire an additional approximate 3.7-acre portion of Amtrak's wet/dry loop tracks and wash facility from The New Boston Foodmart Development Corporation. The existing railroad use and operations of this parcel will remain the same as operated by Amtrak today. In total, the MBTA seeks to acquire approximately 34 acres of land.

The revised Area of Potential Effects is contained within one of the three discontinuous Areas of Potential Effects (APE) previously established for the South Station Expansion project. The Section 106 consultation for the South Station Expansion project identified three historic resources; however, none of these three historic resources are in the Widett Circle APE.

In accordance with the 2017 finding of effect for the South Station Expansion project, an Unanticipated Discoveries Plan to address the possibility of encountering previously undocumented archaeological resources during construction of the South Station Expansion project was submitted to and accepted by the MHC on May 10, 2021 (which included the Tower 1 Interlocking project). VHB has prepared an Unanticipated Discoveries Plan for the Widett Circle Layover Facility Project for FTA's Section 106 update to MHC.

In reaching a finding of conditional No Adverse Effect, the Federal Railroad Administration reached out to the Boston Landmarks Commission in 2016, documenting that the BLC had "no comment" on the proposed project per telephone communication on January 8, 2016. This outreach is noted in the attached correspondence from 8/4/2016.

In accordance with 36 C.F.R. § 800.4(d)(1) of the Advisory Council on Historic Preservation's (ACHP) regulations, "Protection of Historic Properties", FTA has determined that there are no historic properties affected by the Widett Circle Layover project. The FTA is requesting your concurrence with this determination. The following information is provided to support this determination:

- Consultant Report on Cultural Resources
- 2017 MHC Correspondence
- Unanticipated Discovery Plan
- Documentation of local and tribal consultation – FRA Correspondence 8/4/2016

In accordance with 36 C.F.R. § 800.4(d)(1)(i), if a response from the Massachusetts Historical Commission is not received within 30 days, the FTA will consider its responsibilities under Section 106 fulfilled. If you have any questions regarding this matter, please contact Eric Papetti at 617-494-3494.

Sincerely,

PETER

SHANNON

BUTLER

Peter Butler

Regional Administrator

Digitally signed by
PETER SHANNON
BUTLER
Date: 2022.09.21
15:46:44 -04'00'

Attachment

cc: Tess Paganelli, Manager of Environmental Construction, MBTA

Pre-Revenue Service Safety Validation Plan

MBTA Gloucester Branch MP 30.9 to MP 35.0

Introduction

This document serves as the Pre-Revenue Service Safety Validation Plan, as required by 49 USC 20170, for the resumption of regular commuter rail service on the MBTA's Gloucester Branch (Rockport Line) on May 23, 2022. Train operations have been suspended for approximately 2 years (more than 180 days) on a 4.1-mile stretch of main track between Gloucester Drawbridge and CP-Loop (Rockport station) during replacement of the drawbridge. The two-track bridge, constructed in 1911, has been demolished and is being replaced with two independent spans to bring the bridge to a state of good repair and provide for some modest operating improvements. Major Components include:

- Modernized E80 rated bridge spans, allowing removal of load-based speed restrictions
- New bridge drives, control tower and control system
- Upgrade of spring switch at CP-Wilson to dual-controlled power switch
- Upgrade of CP-Wilson with new controlled signals for movement in both directions
- Upgrade of existing signal system from relay- to microprocessor-based logic
- Modernization of wayside signal components (LED lights, new cabling, etc)
- Addition of ATC in conjunction with the MBTA's ATC project

In 2018 the MBTA initiated the replacement of the Gloucester Drawbridge with a plan to maintain service. In the spring of 2020, the discovery of unexpected field conditions meant the replacement project could no longer support service during bridge construction. With ridership extremely limited due to COVID-19, the MBTA suspended commuter rail service and provided passengers with replacement bus service to connect with commuter rail trains still operating west of Gloucester Drawbridge. Bridge construction has now progressed to the point where rail traffic is ready to resume.

The MBTA's track chart showing area impacted by the bridge project has been attached.

System Change/Control

With the resumption of service on the identified segment of track the MBTA, with their operator Keolis, has reviewed internal plans for changes according to the Operator Safety Compliance Plan, Element 18 which is comparable to the conditionally approved 49 CFR 270-compliant System Safety Plan, Element 18. The only changes to plans come because of changes related to the drawbridge project. Notably, changes will be made to update the following plans and procedures:

- Bridge Safety Management Plan
- Drawbridge Maintenance Plan
- Drawbridge Operation and Maintenance Manual
- Employee Timetable

Ongoing Construction

In the 2 years since service was suspended, the project has address outstanding field issues and has one of the two new spans (span 1) ready to be placed into service. Upon resumption of service, construction will continue on span 2 through the fall of 2022 with service operating on span 1. Due to Coast Guard restrictions for navigation, span 2 will be left open except for testing needs. Once construction of span 2 is completed, track will be restored across the bridge, the temporary spring switch will be removed, the signal system interface will be tested and upgraded to include ATC, and the PTC system configuration updated.

The resumption of service across span 1 is a return to the initial plan to maintain service during construction of the bridge, which was only interrupted due to unanticipated field conditions. Service was always envisioned to be running while construction activities were ongoing. The conditions at the drawbridge work site will be nearly identical, except for some signal upgrades. MBTA will maintain the existing 10mph speed restriction over the drawbridge until work is substantially complete.

Operating Plan

The MBTA, with their contracted operator Keolis, plans to resume commuter rail operations in nearly the same manner as existed prior to the suspension of service for bridge construction. During the suspension of train service, the area remained active railroad. MBTA performed extensive heavy maintenance activities, including tie replacement, rail de-stressing and replacement of 12 culverts. Regular inspections of both the track and signal systems were performed, in compliance with 49 CFR parts 213, 234, 235 and 236.

The MBTA will conduct an initial round-trip at reduced speed, able to stop at half the range of vision, with field support from the C&S department at all grade crossings to monitor performance. C&S will then monitor a round-trip at track-speed. Any unexpected performance by the signal, crossing or PTC systems will be identified and addressed.

Gloucester Drawbridge: Bridge tenders will all be trained and qualified on the operation of the new bridge by the contracted bridge construction entity. They will begin operating the in-service span 1 jointly with the contractor on May 9 and take over sole operation with the resumption of revenue service on May 23. The contractor will remain in control of span 2, which is still under construction, until it is placed into service in the fall of 2022. The new bridge has been inspected monthly during construction and will have an additional inspection prior to resumption of service.

Train Equipment & Schedule: MBTA operates push-pull commuter service utilizing a diesel locomotive (F40PH/GP40MC/MP36/HSP46) and control coach, with a mix of single- and bi-level coaches. Train consists serving the Gloucester Branch typically operate with 4-6 coaches. The schedule effective May 23 will have 26 weekday and 18 weekend trains split evenly between eastbound and westbound service. This is a resumption of full revenue service on the line.

Operating rules: MBTA operations are under NORAC operating rules, as supplemented by timetable special instructions. The territory being re-activated has a bi-directional Automatic Block Signal system (NORAC 261) with interlockings and has Positive Train Control installed. A small segment near the end of track at Rockport operates as other-than-main track (NORAC 98). Timetable changes related to the Gloucester Branch will be distributed to train service employees via Bulletin Orders.

Requalification of T&E Staff: Train service staff qualified on the Gloucester Branch will be re-qualified on the territory. This will consist of a review of existing physical characteristics and changes, a 24-question test (85% passing grade) and operating a minimum of 1 round trip between Gloucester Draw and Rockport at track speed under the supervision of a manager in accordance with 49 CFR 240 and 242.

3.1.3 Physical Characteristics (CFR 240.123)

If an Engineer has not operated over the territory within the previous twelve (12) months, he/she will be required to re-qualify on the physical characteristics before being allowed to operate over the territory without a qualified pilot who is not also a member of the train crew. Engineers re-qualifying must make at least one (1) round trip under the supervision of a certified Engineer. A DSLE will then conduct a skills performance test with the Engineer re-qualifying at the controls of the train. The test will monitor the Engineer's ability to safely operate the train in accordance with railroad safety and Railroad Operating Rules, Timetable and Practices, in the most demanding type of service he/she will be qualified to perform. The test will be of sufficient duration to assure the DSLE that the Engineer has adequately demonstrated safe train handling procedures. The test results will be documented contemporaneously with the observations or as soon thereafter as is feasible.

ODRL 3.10-008 Safety and Security: 49 CFR PART 242 Conductor Certification

D. Before a certified Conductor operates on a territory over which they have been absent for a period of at least a year:

1. Any Conductor who exceeds this time limit (1 year) must make a sufficient number of qualifying trips with a train or engine employee or transportation manager who is qualified on the physical characteristics and be reexamined by the proper division officer before performing service as a conductor over the territory involved.

E. Changes such as the introduction of new technology or rule books will be addressed

Ongoing educational programs.

1. Please refer to Section 2A, and

2. If there are significant changes in operations, including alterations in the territory over which Conductors are authorized to work or new territory, Keolis may elect to use high rail equipment, observation cars, light locomotives, simulators, or other similar equipment or devices to permit the Conductor to initially observe and experience the physical characteristics of the territory. Following this initial training, the Conductor will be tested on the operating instructions and physical characteristics pertaining to track speeds, methods of operation, timetable special instructions and/or any other unique characteristics of that territory.

Dispatchers will be re-familiarized with the territory and shown the changes in the vicinity of the Gloucester Drawbridge via hi-rail.

A total of 15 engineers and 15 conductors will be re-qualified on the territory between May 18-22, 2022 to protect revenue service. The remaining engineers & conductors requiring re-qualification will be qualified over the following month.

Track: MBTA has taken the opportunity do extensive track maintenance during the 2-year service outage including tie replacement, de-stressing of CWR and culvert replacement. All track work was done under the MBTA's MW-1 and CWR plan and complies with FRA's track safety standards found in 49 CFR

213. The rail was also subjected to ultrasonic testing during this time. Track and switch inspections were performed at their required intervals, and inspections of new track and switches installed as part of the drawbridge project will be performed prior to resumption of service. All disturbed track will be inspected and de-stressed prior to resumption of service, or protected as required under the MW-1 and CWR plans.

- MP 32-MP 35 was de-stressed between July 7-27, 2021
- Cleveland St. grade crossing was renewed and de-stressed on August 26, 2021
- Washington St. grade crossing was renewed and de-stressed on May 14, 2021
- Ultrasonic Testing was performed on May 7, 2022 except for a small stretch still undergoing work. That stretch (MP 32.31-32.33) was tested on September 19, 2021.
- The final work area will have track restored for train traffic on May 18, 2022
- De-stressing of that work area is planned for May 21-22, 2022. A 30 MPH speed restriction will remain in place per the CWR plan until de-stressing occurs.
- Inspection of the track, switches and expansion rails to occur on May 18, 2022 after the work area is restored for traffic

Signals: The existing signal system remained in service, with upgrades installed at Gloucester Draw and as part of the drawbridge project. The interface between the signal system and the new drawbridge, along with the upgrades will be cut-in and tested according to C&S 1 and 2 to be compliant with 49 CFR 236 before being placed into service.

- Washington St. crossing was commissioned in Sept. 2021
- Gloucester Draw initial commissioning tests completed December 10, 2021, to January 6, 2022
- Wilson and Loop commissioning tests completed December 10, 2021, to January 6, 2022
- Gloucester Draw retested 2/23/2022 for minor fix and complete standby box commissioning
- Testing of Control Systems with CROCC completed for all locations on May 4-5, 2022
- Periodical FRA testing and operational tests to be completed between May 15-20, 2022

Grade Crossings: All crossing continued to be tested during the service outage in compliance with 49 CFR 234. One crossing, Washington Street, was upgraded from an island-only circuit with a stop sign to a constant warning time crossing.

PTC: The ACSES II PTC system remains unchanged from the Spring of 2020.

Simulated Service: Simulated service will operate between West Gloucester and Rockport according to the attached simulated service schedule on May 20-21. Train crews will not open doors for boarding so passengers who are in the station area awaiting alternate busing do not attempt to board the train. However, a member of the crew will still flag the platform according to established Keolis-2 Door & Trap procedures for a train departing a station. These trips will serve as dual-purpose simulated service and qualifying trips. Managers will be on-board the trains as part of qualifications and will handle any potential violations, and will monitor schedule adherence.

MONDAY THROUGH FRIDAY			141	101	143	103	145	105	191	147	107	149	109	151	111	197	153	113	155	115	157	117	159	119	161	121	163	123	165	125	167
Train No.			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
OUTBOUND			A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Bikes Allowed			**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
North Station	5:35	6:35	7:35	7:50	8:35	9:05	9:35	10:05	10:35	11:35	12:05	1:05	1:35	2:05	2:35	3:05	3:35	4:05	4:35	5:05	5:35	6:05	6:40	7:20	8:05	8:50	9:35	11:00	----	----	
Chelsea	f:46	f:46	f:46	----	f:46	f:16	f:46	f:10:16	f:10:46	f:11:46	f:12:16	f:1:16	f:1:46	f:2:16	f:2:46	f:3:16	3:46	4:16	4:46	5:16	5:46	6:16	6:51	f:7:31	f:8:16	f:9:01	f:9:46	f:11:11	----	----	
River Works	f:53	f:53	f:53	----	----	----	----	----	----	----	----	----	----	----	f:1:54	f:2:16	f:2:54	f:3:24	f:3:54	f:4:24	----	f:5:24	f:5:54	----	f:6:59	f:7:39	----	----	f:11:19	----	
Lynn	5:56	6:56	7:56	----	8:55	9:25	9:55	10:25	10:55	11:55	12:25	1:25	1:56	2:25	2:56	3:26	3:56	4:26	4:55	5:26	5:56	6:25	7:01	7:41	8:25	9:10	9:55	11:21	----	----	
Swampscott	5:59	6:59	7:59	----	8:58	9:28	9:58	10:28	10:58	11:58	12:28	1:28	1:59	2:28	2:59	3:29	3:59	4:29	4:58	5:29	5:59	6:28	7:04	7:44	8:28	9:13	9:58	11:24	----	----	
Salem	6:06	7:06	8:06	8:16	9:05	9:35	10:05	10:35	11:05	12:05	12:35	1:35	2:06	2:35	3:06	3:36	4:06	4:36	5:05	5:36	6:06	6:35	7:11	7:51	8:35	9:20	10:05	11:31	11:40	----	
Beverly	6:10	7:10	8:10	8:20	9:09	9:39	10:10	10:39	11:09	12:09	12:39	1:39	2:10	2:40	3:10	3:40	4:10	4:40	5:09	5:40	6:10	6:39	7:15	7:55	8:39	9:24	10:09	11:35	11:44	----	----
North Beverly	f:14	----	f:14	----	f:13	----	----	f:10:43	----	f:12:13	----	----	f:1:43	----	----	f:3:14	----	4:14	----	5:13	----	6:14	----	7:19	----	8:43	----	10:13	----	11:48	----
Hamilton/Wenham	f:18	----	f:18	----	f:17	----	----	f:10:47	----	f:12:17	----	----	f:1:47	----	----	f:3:18	----	4:19	----	5:18	----	6:19	----	7:24	----	8:47	----	10:17	----	11:52	----
Ipswich	6:24	----	8:24	9:23	----	----	----	10:53	----	12:23	----	----	1:53	----	----	3:24	----	4:25	----	5:25	----	6:26	----	7:30	----	8:53	----	10:23	----	11:58	----
Rowley	f:30	----	f:30	----	f:29	----	----	f:10:59	----	f:12:29	----	----	f:1:59	----	----	f:3:30	----	4:31	----	5:31	----	6:32	----	7:36	----	f:8:59	----	f:10:29	----	f:12:04	----
Newburyport	6:39	----	8:39	9:39	----	----	----	11:09	----	12:39	----	----	2:09	----	----	3:40	----	4:41	----	5:41	----	6:42	----	7:46	----	9:09	----	10:39	----	12:14	----
Montserrat	----	f:14	----	f:14	----	f:13	----	----	----	f:11:13	----	----	f:12:43	----	f:2:14	----	----	f:3:44	----	4:44	----	5:44	----	6:43	----	f:7:59	----	f:9:28	----	f:11:39	----
Beverly Farms	----	f:20	----	f:20	----	f:19	----	----	----	f:11:19	----	----	f:12:49	----	f:2:20	----	----	f:3:50	----	4:51	----	5:51	----	6:50	----	f:8:05	----	f:9:34	----	f:11:45	----
Manchester	----	7:26	----	8:36	----	9:55	----	11:25	----	12:55	----	----	2:26	----	3:56	----	4:57	----	5:57	----	6:56	----	7:56	----	8:11	----	9:40	----	11:51	----	----
West Gloucester	----	f:32	----	f:32	----	f:10:01	----	----	----	f:11:31	----	----	f:1:01	----	f:2:32	----	----	f:4:02	----	5:03	----	6:03	----	7:02	----	f:8:17	----	f:9:46	----	f:11:57	----
Gloucester	----	7:38	----	8:48	----	10:08	----	11:38	----	1:08	----	----	2:39	----	3:59	----	4:59	----	5:11	----	6:11	----	7:10	----	8:24	----	9:53	----	12:04	----	----
Rockport	----	7:48	----	8:58	----	10:19	----	11:49	----	1:19	----	----	2:50	----	3:50	----	4:20	----	5:22	----	6:22	----	7:21	----	8:35	----	10:03	----	12:14	----	----

SATURDAY AND SUNDAY																			
	Saturday Train No.	1151	1101	1153	1103	1155	1105	1157	1107	1159	1109	1161	1111	1163	1113	1165	1115	1167	1117
	Sunday Train No.	2151	2101	2153	2103	2155	2105	2157	2107	2159	2109	2161	2111	2163	2113	2165	2115	2167	2117
OUTBOUND		A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Bikes Allowed		**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
North Station		5:30	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30	7:30	8:30	10:00	11:00
Chelsea		f 5:41	f 6:41	f 7:41	f 8:41	f 9:41	f 10:41	f 11:41	f 12:41	f 1:41	f 2:41	f 3:41	f 4:41	f 5:41	f 6:41	f 7:41	f 8:41	f 10:11	f 11:11
Lynn		5:50	6:50	7:50	8:50	9:50	10:50	11:50	12:50	1:50	2:50	3:50	4:50	5:50	6:50	7:50	8:50	10:20	11:20
Swampscott		5:53	6:53	7:53	8:53	9:53	10:53	11:53	12:53	1:53	2:53	3:53	4:53	5:53	6:53	7:53	8:53	10:23	11:23
Salem		6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:30	11:30
Beverly		6:04	7:04	8:04	9:04	10:04	11:04	12:04	1:04	2:04	3:04	4:04	5:04	6:04	7:04	8:04	9:04	10:34	11:34
North Beverly		f 6:08	----	f 8:08	----	f 10:08	----	f 12:08	----	f 2:08	----	f 4:08	----	f 6:08	----	f 8:08	----	f 10:38	----
Hamilton/Wenham		6:12	----	8:12	----	10:12	----	12:12	----	2:12	----	4:12	----	6:12	----	8:12	----	10:42	----
Ipswich		6:18	----	8:18	----	10:18	----	12:18	----	2:18	----	4:18	----	6:18	----	8:18	----	10:48	----
Rowley		6:24	----	8:24	----	10:24	----	12:24	----	2:24	----	4:24	----	6:24	----	8:24	----	10:54	----
Newburyport		6:35	----	8:35	----	10:35	----	12:35	----	2:35	----	4:35	----	6:35	----	8:35	----	11:05	----
Montserrat		----	f 7:08	----	f 9:08	----	f 11:08	----	f 1:08	----	f 3:08	----	f 5:08	----	f 7:08	----	f 9:08	----	f 11:38
Beverly Farms		----	f 7:14	----	f 9:14	----	f 11:14	----	f 1:14	----	f 3:14	----	f 5:14	----	f 7:14	----	f 9:14	----	f 11:44
Manchester		----	7:20	----	9:20	----	11:20	----	1:20	----	3:20	----	5:20	----	7:20	----	9:20	----	11:50
West Gloucester		----	f 7:26	----	f 9:26	----	f 11:26	----	f 1:26	----	f 3:26	----	f 5:26	----	f 7:26	----	f 9:26	----	f 11:56
Gloucester		----	7:33	----	9:33	----	11:33	----	1:33	----	3:33	----	5:33	----	7:33	----	9:33	----	12:03
Rockport		----	7:44	----	9:44	----	11:44	----	1:44	----	3:44	----	5:44	----	7:44	----	9:44	----	12:14

Rockport Simulated Service Plan
5/20-21/2022

ROCKPORT SIMULATED SERVICE 5/20/22-5/21/22

Train No.	PX	PX	PX	PX	PX	PX	PX	PX	PX
INBOUND	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
	**				**	**	**	**	**
Rockport	8:30	9:46	11:02	12:18	1:34	2:49	4:04	5:20	6:36
Gloucester	8:37	9:53	11:09	12:25	1:41	2:56	4:11	5:27	6:43
West Gloucester	8:43	9:59	11:15	12:31	1:47	3:02	4:17	5:33	6:49

ROCKPORT SIMULATED SERVICE 5/20/22-5/21/22

Train No.	PX	PX	PX	PX	PX	PX	PX	PX	PX
OUTBOUND	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
	**	**	**	**	**	**	**	**	
West Gloucester	8:58	10:14	11:30	12:46	2:02	3:17	4:32	5:48	7:04
Gloucester	9:05	10:21	11:37	12:53	2:08	3:24	4:39	5:55	7:11
Rockport	9:16	10:32	11:48	1:04	2:19	3:35	4:50	6:06	7:22



Gloucester Branch Qualification Process for DSLE/ SME

1. Establish course for physical characteristics qualification with the certification and training department.
 - Course code established April 28, 2022 for DSLE/ Qualifying Managers; T00086
 - Course code established April 29, 2022 for Qualifying Train and Engine Service Employees; T10016
 - Keolis will after it has qualified managers be qualifying approximately 74 locomotive engineers and 74 conductors under the course code T100016.
2. Review of Changes Gloucester Branch per course outline.
 - Section of track that the qualification process is for is 4.1 miles starts at Gloucester Draw and ends at Rockport Station.
 - All upgrades to territory and new signal apparatus have been documented both in Gloucester branch bulletin and physical characteristic test in section 3.
 - Meeting with North Side Manager of Locomotive Engineers Staff (formerly known as Road Foreman of Engines), Senior Route Manager, Gloucester Branch Route Manager and Transportation Safety to review operational changes, physical characteristic changes and proposed bulletin to change timetable to Gloucester branch. May 2, 2022 at 164 Canal St 10:30AM- 11:00AM
 - Attendees Daniel Rouleau DSLE, Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager and Brendan McDonough Transportation Safety.
3. Building and review of physical characteristics test from Gloucester Draw to Rockport Station.
 - Meeting with Rule department and signal design to review signal progression of Wilson INT, attendees Daniel Rouleau DSLE, Robert Johnson Manager of Operating Rules and David Flores Signal Design Keolis on April 29, 2022
 - Produced test and submitted to training department with MLE staff and Route Manager May 2, 2022 at 164 Canal St 11:00AM-12:00PM
 - Test was built and reviewed by Shane Percival Manager of Locomotive Engineers, Daniel Rouleau DSLE, John Raymond Manager of Locomotive Engineers Jamie Dupes Senior Route Manager, Jamie Cativera Eastern Route and Gloucester Branch Route Manager and oversight by Brendan McDonough Transportation Safety
 - Physical Characteristic Test consists of 24 questions and passing grade of 85% is required.
 - Physical Characteristic Test uploaded to site May 2, 2022
 - Each qualifying Conductor/ Subject Matter Expert/ Qualifying Manager will see the territory a minimum of one (1) round trip from headend train ride prior to taking written exam.
 - Conductor SME will take same exam as engineers DSLE and be deemed qualified per MBTA 242.123 submission

4. Requirements for physical characteristics qualifications for DSLE/ SME
 - Walking territory because of rail restrictions from Gloucester draw to Washington St. performed on May 5, 2022 to directly observe territory attendees Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager
 - Track car ride of territory from Rockport to Rock cut with Road Master on Thursday May 5, 2022 performed with Road Master Joe Neves, Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager and Brendan McDonough Transportation Safety.
5. Qualifying Managers final review of physical characteristics exam and administration of exam
 - Update and review of exam after qualifying managers completed excursion of the territory as outlined in above sections 2 and section 3. By Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager
 - Administering of test for qualifying managers Shane Percival Manager of Locomotive Engineers, John Raymond Manager of Locomotive Engineers, Jamie Dupes Senior Route Manager North Side, Jamie Cativera Eastern Route and Gloucester Branch Route Manager (Completed and passed on May 9, 2022)
6. Operating initial train will be MLE North Side Shane Percival Manager of Locomotive Engineer as engineer of record and Senior Route Manager Jamie Dupes as Conductor of record. (On May 19,2022)
 - Shane Percival will be qualifying John Raymond Manager of Locomotive engineer
 - First trip from Gloucester draw to Rockport with a train will be done with exclusive occupancy
 - First round trip will be ran with train handling consistent with being able to stop with in one half the range of vision (This is just an addition safeguard as it will be the first train to traverse territory in almost 2 years) **this will not be considered a qualifying trip.**
 - Second round trip, Mr Raymond will perform a minimum of one (1) round to operate from Gloucester Draw to Rockport at track speed this **will not be considered as a qualifying trip** but rather as a familiarization trip.
 - Third round trip Mr Raymond will perform a 240.129 ride to requalify on the territory signed by Mr Percival Manager of Locomotive engineers. This will be the first engineer to be deemed qualified on the territory
 - Transportation will work with C&S support for all grade crossing monitoring activation during all trips
 - Each Manager of Locomotive Engineer will run a round trip from Gloucester draw to Rockport and be qualified by the DSLE documented by 1875 with 240.129.
 - Each SME qualifying manager will have a Signed Head End Authorization either by locomotive engineer of record or conductor of record.



U.S. Department
of Transportation
**Federal Transit
Administration**

REGION 1
Connecticut, Maine,
Massachusetts,
New Hampshire,
Rhode Island, Vermont

Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093
617-494-2055
617-494-2865 (fax)

May 26, 2021

Andrew Brennan
Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02142

Re: MBTA Pawtucket Layover Facility Project

Dear Mr. Brennan:

Based on the information provided in the WSP memorandum dated April 12, 2021, transmitted by the MBTA to the FTA on April 21, 2021, FTA has determined that Appendix A of the Advisory Council on Historic Preservation's (ACHP) *Program Comment to Exempt Consideration of Effects to Rail Properties within Rail Rights-of-Way*, published August 24, 2018 (83 Fed. Reg. 42920), applies to the Pawtucket Layover Facility project, located in Pawtucket, RI, as follows:

- Replacement of existing tracks to facilitate realignment within the existing railbed qualify for exemption under II.A.1 as they will be within the existing footprint and will not result in a substantial visual change in the relationship between the trackbed and surrounding environment.
- Construction of a train inspection building and canopy qualifies for exemption under II.M.1 because the new structure is compatible with the existing rail infrastructure, is comparable to a similar, adjacent Amtrak facility, and will be supervised by an SOI-qualified professional.
- Additionally, the project is limited to areas of right-of-way that have previously been disturbed and no non-rail properties will be affected.

Given these exemptions, no further Section 106 review is required. If you have any questions, please contact Leah Sirmin in my office at 617-494-2459 or Leah.Sirmin@dot.gov.

Sincerely,

Peter Butler
Regional Administrator

Naidoo, Nayan

From: Paganelli, Tess
Sent: Thursday, May 6, 2021 1:59 PM
To: Engel, Marla; Naidoo, Nayan
Cc: Filomena Maybury; Burckardt, Rachel J.; Palmgren, Holly; Hogan, Samantha
Subject: Re: Pawtucket Railyard Interim Enviro checklist

Thank you Marla,

This looks good- I have no comments.

Just as an update, the Section 106 memo went to FTA on 4/21. When we get concurrence from FTA, we will also confirm c-list NEPA applicability.

Thanks,
Tess

Tess Paganelli
Environmental Compliance Officer
Massachusetts Bay Transportation Authority
(c): 617-549-4357

From: Engel, Marla <Marla.Engel@wsp.com>
Sent: Friday, April 30, 2021 10:47 PM
To: Paganelli, Tess <tpaganelli@MBTA.com>; Naidoo, Nayan <nnaidoo@MBTA.com>
Cc: Filomena Maybury <F.Maybury@wsp.com>; Burckardt, Rachel J. <Rachel.Burckardt@wsp.com>; Palmgren, Holly <HPalmgren@MBTA.com>; Hogan, Samantha <samantha.hogan@wsp.com>
Subject: Pawtucket Railyard Interim Enviro checklist

Hi Tess and Nayan,
Please See attached, which contains the checklist and consultant's letter. If you have questions about the RI items, please contact Sam Hogan, copied on this email. Also, she can answer other questions about it, as I am out all next week.

Marla Engel, AICP
Director of Environmental Planning



p: 617 960 4930
email: marla.engel@wsp.com

WSP USA

We moved! As of August 17, 2020, our new address is:

100 Summer Street, 13th Floor
Boston, MA 02110

wsp.com

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U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

April 28, 2022

Mr. Ronald L. Ester, Jr.
Chief Safety Officer
Massachusetts Bay Transportation Authority
185 Kneeland Street, 3rd Floor
Boston, MA 02111
Via email: rester@MBTA.com

RE: FRA System Safety Program Plan Review

Dear Mr. Ester:

On March 28, 2022, Massachusetts Bay Transportation Authority (MBTA) submitted a System Safety Program (SSP) Plan, dated February 10, 2022, for the Federal Railroad Administration (FRA) to review and approve under FRA's SSP regulation, 49 CFR Part 270 (Part 270). Part 270 requires MBTA to adopt and fully implement an SSP through a written SSP Plan that FRA has reviewed and approved. Along with its SSP Plan, MBTA also submitted the required consultation statement and service list.

After comprehensive review and consideration of the submitted SSP Plan and its consultation statement, FRA determined the SSP Plan contains the elements required by 49 CFR § 270.103. Therefore, FRA approves MBTA's SSP Plan, dated February 10, 2022. Because the SSP Plan references statutes and regulations other than 49 CFR § 270.103, FRA makes clear that its approval does not indicate FRA has determined MBTA is in compliance with any legal requirements other than 49 CFR § 270.103. Further, approval of a passenger rail operation's SSP Plan does not constitute approval of the specific actions the operation will implement under its SSP Plan pursuant to 49 CFR § 270.103(q)(2) and shall not be construed as establishing a Federal standard regarding those specific actions. *See* 49 CFR § 270.201(b)(4).

FRA's approval is effective as of the date of this letter. In accordance with 49 CFR § 270.201(b)(2), FRA is also providing this notification to each individual identified in the consultation statement service list submitted along with MBTA's SSP Plan.

As the Rail Safety Improvement Act of 2008 and FRA regulations require, MBTA must implement its SSP in accordance with its SSP Plan, including any FRA-approved amendments. *See* 49 CFR § 270.101(a). It is important for MBTA to implement and maintain all aspects of its SSP so that it will remain in compliance with the requirements of Part 270. If MBTA should amend its SSP Plan in the future, it must do so in accordance with 49 CFR § 270.201(c). FRA also reserves the right to reopen review of MBTA's SSP Plan under 49 CFR § 270.201(d) for cause stated.

If you have any questions or concerns, please contact Mr. Larry Day, Audit Management Division. Mr. Day may be reached at (909) 782-0613 or larry.day@dot.gov.

Sincerely,



Karl Alexy
FRA Associate Administrator for Railroad Safety
Chief Safety Officer

cc:

Steve Irons – ARASA - Stephen.Irons@keoliscs.com

John Pelland – ARASA - john.pelland@keoliscs.com

James Parker – ATDA - jaypmakenap11@hotmail.com

Gary Hobson – BLET - deertrac68@aol.com

Sheldon Swain – BMWWE - sswain1887@gmail.com

Kevin Sheehan – BRS - kevin.sheehan@keoliscs.com

Danial Tavares – IAM - dtavares1965@gmail.com

Chris Browning – IBB - cbrowning@boilermakers.org

Andrew Mannion – IBEW - Andrew.Mannion@keoliscs.com

Jacob Rosco – JCC - jacoblrosko@yahoo.com

James Leary – TWU - james.leary@keoliscs.com

Ed Flaherty – TWU - flabo0327@gmail.com

Jason Callahan – NCFO - jcal1996@gmail.com

Kevin Petrie – SMART/SMWIA - kpetrie@live.com

Edward Kilduff – TCU - edward.kilduff@keoliscs.com

Cole Czub – SMART/UTU - cole.czub@yahoo.com

Wayne Thistle – SMART/UTU - WJTKMY@yahoo.com


Timothy Lesniak – MBTA - TLesniak@MBTA.com

Attention: One or more violations have been cited on this report.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

INSPECTION REPORT

OMB Approval No.: 2130-0509

Inspector's Name Smith, Owen D.		Digitally signed by OWEN DAVID HAYE SMITH Date: 2022.05.16 14:08:16 -04'00'		Inspector's ID No. 82320	Report No. 98	Date yy mm dd 2022 05 16							
Railroad/Company Name & Address MASSACHUSETTS BAY TRANSPORTATION AUTHORITY 32 Cobble Hill Road Somerville MA 02143				R/C R RR/Co. Code MBTA	Division SOUTH Subdivision MIDDLEBORO MN	RR/Co. Representative (Receipt Acknowledged) Name Steve Stock Title Resident Engineer Email sstock@mbta.com Signature 							
From: City MIDDLEBORO	Codes 0770	Destination City & County			Codes	From Latitude							
State MA	25	City				From Longitude							
County PLYMOUTH	C023	County				To Latitude							
Mile Post: From BM0035.00 To BM0035.10		Inspection Point PILGRIM INTERLOCKING				To Longitude							
Activity Code:	CWRP	TREC											
Units:	1	1											
Sub Units:	0	2											
Item	Initials/Milepost	Equipment/Track #	Type/Kind	49 CFR/USC	Defect	Subrule	Speed	Class	Train #/Site	SNFR*	RCL**	# of Occ.***	Activity Code
1	BM0035.05	SINGLE	M	213	0119	J	30	2	NEW ENTRANCE	N	N	1	CWRP
Description FAILURE TO COMPLY WITH WRITTEN CWR PROCEDURES - RECORDKEEPING. A Report 'A' dated May 14, 2022 for the Middleboro Main near MP BM35.2 did not list the footage of rail removed or installed on the east rail. Field measurements taken determined that 179 feet of rail was installed.													
Seal Applied		Seal Removed		Hazard Class			UN/NA ID						
Violation Recommended		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Latitude:			Longitude:						
Written Notification to FRA of Remedial Action is:		<input type="checkbox"/> Required <input checked="" type="checkbox"/> Optional		Railroad Action Code		<input type="text"/>		Date(mm/dd/yyyy):		<input type="text"/>		Comments on back?	

Inspector's ID No. 82320	Report No. 98	Report Date 5/16/2022
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Item	Initials/Milepost	Equipment/Track #	Type/Kind	49 CFR/USC	Defect	Subrule	Speed	Class	Train #/Site	SNFR*	RCL**	# of Occ.***	Activity Code
2	BM0035.05	SINGLE	M	213	0119	J	30	2	NEW ENTRANCE	N	N	1	CWRP

Description
FAILURE TO COMPLY WITH WRITTEN CWR PROCEDURES - RECORDKEEPING.

A Report 'A' dated May 14, 2022 for the Middleboro Main near MP BM35.2 stated 185 feet of rail was installed on an unknown rail. Field measurements taken determined that 178 feet 10 inches of rail was installed.

Seal Applied	Seal Removed	Hazard Class	UN/NA ID
--------------	--------------	--------------	----------

Violation Recommended	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Latitude:	Longitude:
Written Notification to FRA of Remedial Action is:	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Optional	Railroad Action Code	Date(mm/dd/yyyy):
			Comments on back?

Item	Initials/Milepost	Equipment/Track #	Type/Kind	49 CFR/USC	Defect	Subrule	Speed	Class	Train #/Site	SNFR*	RCL**	# of Occ.***	Activity Code
3	BM0035.10	SINGLE	M	213	0007	C			NEW ENTRANCE	N	N	2	TREC

Description
FAILURE OF TRACK OWNER TO USE QUALIFIED PERSONS TO INSPECT, RESTORE OR RENEW CWR.

Charles Bartholomew signed both Report A documents. Mr. Bartholomew is not listed as qualified under 213.7(a).

Seal Applied	Seal Removed	Hazard Class	UN/NA ID
--------------	--------------	--------------	----------


Violation Recommended	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Latitude:	Longitude:
Written Notification to FRA of Remedial Action is:	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Optional	Railroad Action Code	Date(mm/dd/yyyy):
			Comments on back?

USCG

1. Date of Inspection 14JUL22	2. COTP/OCMI Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7506539	4. ON/IMO# 1068099
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7. Alternate Inspection Program: ☐ ACP ☐ MSP ☐ MSP Select ☐ TSMS ☐ SIP/TBSIP ☒ N/A - Traditionally Inspected

8. Deficiency				Action	SMS	Self Re- Work
No.	Code	Description	Cite	Action	Code	Related ported List Item

9. Copy Provided to: <u>STEVE DESCHENES</u> (Printed name of vessel representative)	Signature: <u></u>
Phone Number: <u>[REDACTED]</u> Email: <u>[REDACTED]</u>	
Name of MI: <u>DAVID J. TAYLOR</u> (Printed name of qualified marine inspector)	Signature: <u>TAYLOR.DAVID</u> Digitally signed by TAYLOR.DAVID.J.1243963547 Date: 2022.07.19 12:12:55 -04'00'
Phone Number: <u>[REDACTED]</u> Email: <u>[REDACTED]</u>	

Codes for action taken, see below (Note: code numbers are derived from international harmonization; U.S. uses similar codes and those are reflected below.)

CG-835V (06/20) Reset Page 1 of

**DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard**

OMB No: 1625-0001
Exp. Date: 07/31/2022

REPORT of MARINE CASUALTY, COMMERCIAL DIVING CASUALTY, or OCS-RELATED CASUALTY

Section I - Reporting Vessel/Facility Information

1. Vessel or Facility Name Astiera		2. Vessel Official Number or IMO Number 1068099		3. Vessel Flag USA	
4. Vessel Length 110 <input checked="" type="checkbox"/> Feet <input type="checkbox"/> Meters		5. Vessel Gross Tons 98GRT		6. Vessel Propulsion Type JET Drive	
7. Vessel or Facility Type Passenger		8. Vessel or Facility Service or Occupation Commuter and Whale Watching Passenger			
9. FOR TOWING ONLY	9a. Arrangement: <input type="checkbox"/> Pushing Ahead <input type="checkbox"/> Towing Astern <input type="checkbox"/> Towing Alongside	9b. Number of Vessels Towed: Empty _____ Loaded _____ Total _____	9c. Maximum Size of Tow/Tow-Boat(s): Length _____ feet Width _____ feet		9d. Did one or more of the barges in the tow cause or sustain damage in the marine casualty? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes complete and attach one or more CG-2692A forms to this report)

Section II - Reason for Submitting this Report (Check all that apply)

10. The above vessel was involved in a Marine Casualty consisting in (46 CFR 4.05-1 and 4.05-10):

- ☐ 1. Unintended grounding or an unintended strike of (allision with) a bridge
- ☐ 2. Intended grounding or intended strike of a bridge that created a hazard to navigation, the environment or the safety of the vessel, or that meets any of the criteria in 3 through 8 below
- ☐ 3. Loss of main propulsion, primary steering, or any associated component or control system that reduces the maneuverability of the vessel
- ☒ 4. Occurrence materially and adversely affected the vessel's seaworthiness or fitness for service or route
- ☐ 5. Loss of life
- ☐ 6. Injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties
- ☐ 7. Occurrence causing property damage in excess of \$75,000
- ☐ 8. Occurrence involving significant harm to the environment

11. The above facility or vessel was involved in a Commercial Diving Casualty involving (46 CFR 197.484):

- ☐ 1. Loss of life
- ☐ 2. Diving-related injury to any person causing incapacitation for more than 72 hours
- ☐ 3. Diving-related injury to any person requiring hospitalization for more than 24 hours

12. The above facility or vessel was involved in an OCS Facility Casualty Resulting in (33 CFR 146.30 and 146.35):

- ☐ 1. Death
- ☐ 2. Injury to 5 or more persons in a single incident
- ☐ 3. Injury causing any person to be incapacitated for more than 72 hours
- ☐ 4. OCS Facility only - Damage affecting the usefulness of primary lifesaving or firefighting equipment
- ☐ 5. OCS Facility only - Damage to the facility exceeding \$25,000 resulting from a collision by a vessel with the facility
- ☐ 6. OCS Facility only - Damage to a floating OCS facility exceeding \$25,000

Section III - Associated Parties Information (Fill all fields that apply)

13. Name of Owner Boston Harbor Cruises LLC		Telephone 617-227-4321		14. Name of Operator or Manager SAME AS OWNER		Telephone	
Address 455 N CITYFRONT PLAZA SUITE 2600 CHICAGO IL, 60611 UNITED STATES		Email address or [REDACTED]		Address		Email address	
15. Name of Master or Person-In-Charge (Last, First, Middle) James mondello		5082656593		16. Name of Agent (Last, First, Middle)		Telephone	
Address		Email address [REDACTED]		Address		Email address	
17. Name of Dive Supervisor (Last, First, Middle)		Telephone		18. Name of Pilot (Last, First, Middle)		Telephone	
Address		Email address		Address		Email address	

Section IV - Casualty Information

19. Date/Time (local) of Occurrence 14JUL2022/0823		20. Location-Name of Body of Water or Waterway: Latitude: _____ River Mile Marker: _____ Boston HARBOR Longitude: _____ OR	
21. Property Damage Estimated Damage Cost(s) to: Vessel: \$2500 Cargo: \$ _____ Facility: \$ _____ Other: \$ _____		Describe the Extent of Property Damage 2"X12" PENETRATION INTO THE HULL 2.5' ABOVE WATER LINE IN PORT SIDE ENGINE ROOM	
22. Status of Involved Persons (If there are 1 or more injured, dead or missing persons complete and attach one or more CG-2692C forms to this Report) Total Number of Persons: _____ On Board the Vessel: _____ Injured: 0 Dead: 0 Missing: 0			

Section IV - Casualty Information (continued)

23. Was This Casualty a Serious Marine Incident (SMI) as Defined in 46 CFR 4 03-2?

☐ Yes ☒ No ☐ Not at this Time, But is Likely to Become an SMI (If Yes or Is Likely to Become an SMI complete/attach one or more CG-2692B forms to this report)

24a. Is there any evidence of alcohol or drug use by or intoxication of individuals directly involved in the casualty?

☐ Yes ☒ No (If Yes, identify those individuals for whom evidence has been obtained and specify the method to obtain such evidence in block 24c)

24b. Did any individual directly involved in a casualty refuse to submit to, or cooperate in, the administration of a timely chemical test, when directed by a law enforcement officer or by the marine employer?

☐ Yes ☒ No (If Yes, note the individual(s) who refused in block 24c)

24c. Individuals with evidence of drug or alcohol use, evidence of intoxication, or who refused to submit/cooperate in a timely chemical test (if more space is needed, continue in block 25c)

24d. Is there evidence that alcohol use contributed to this casualty?

☐ Yes ☒ No (If Yes, discuss in block 25b)

25. Nature and Circumstance of the Casualty:

25a. Activity or Operation Being Conducted at the Time of the Casualty:

While docking, the vessel came in contact with sharp edge of dock piercing the hull above the waterline.

25b. Description of the Casualty (casualty events and the conditions and actions that were believed to be causal factors as well as any hazards created as a result of the casualty. Attach additional sheets if necessary.):

ALLISION WITH THE DOCK AT ROWES WHARF

GOOD VISIBILITY WINDS LIGHT AND VARIABLE

VESSEL FULLY FUNCTIONAL

CONTRIBUTING FACTORS- MASTER WAS TRAINING THE SENIOR DECK HAND IN DOCKING THE VESSEL

25c. Any other comments, including with respect to use of or need for emergency response equipment:

Section V - Person Making this Report

24. Name (PRINT) (Last, First, Middle)

JEFFREY F TAYLOR

25. Signature: Jeffrey Taylor

Digitally signed by Jeffrey Taylor
Date: 2022.07.16 13:05:26 -04'00'

26. Date

16JUL2022

27. Title

DIRECTOR OF MARINE OPERATIONS

28. Address

[REDACTED], MA 01876

29. Telephone No.

978-479-9337

30. Email

[REDACTED]

INSTRUCTIONS FOR COMPLETION OF FORM CG-2692
REPORT OF MARINE CASUALTY, COMMERCIAL DIVING CASUALTY, OR OCS-RELATED CASUALTY

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The Coast Guard estimates that the average burden for this report is 1 hour. You may submit any comments concerning the accuracy of this burden estimate or any suggestions for reducing the burden to: Commandant (CG-INV), U.S. Coast Guard Stop 7501, 2703 Martin Luther King Jr Ave SE, Washington, DC 20593-7501 or Office of Management and Budget, Paperwork Reduction Project (1625-0001), Washington, DC 20503.

WHEN TO USE THIS FORM

1. This form satisfies the requirement for written reports of casualties and accidents found in the Code of Federal Regulations for vessels, commercial diving operations, and Outer Continental Shelf (OCS) facilities. Depending on the circumstances surrounding an incident, a written report may be required if it meets one or more of the conditions described in instructions 2 - 4.
2. **VESSELS.** If you are the owner, agent, master, operator, or person in charge of a vessel, other than a public vessel or an uninspected recreational or state-numbered vessel, you must submit a report if your vessel:
 - A. is involved in a marine casualty or accident that occurs upon the navigable waters of the United States, its territories or possessions and meets any of the criteria in block 10, or
 - B. is a United States vessel involved in a marine casualty or accident, wherever such casualty or accident occurs, that meets any of the criteria in block 10, or
 - C. is a foreign vessel engaged in OCS activities as defined in 33 CFR 140.10 and is involved in a marine casualty or accident that meets any of the criteria in block 10, or
 - D. is a foreign tank vessel operating in waters subject to the jurisdiction of the United States, including the Exclusive Economic Zone (EEZ), which involves significant harm to the environment or material damage affecting the seaworthiness or efficiency of the vessel.
3. **DIVING.**
 - A. **Commercial Diving.** If you are the master or person in charge of a vessel or facility from which a commercial diving operation is conducted: (1) at any deepwater port or the safety zone thereof as defined in 33 CFR Part 150; (2) from any artificial island, installation, or other device on the Outer Continental Shelf (OCS) and the waters adjacent thereto as defined in 33 CFR Part 147 or otherwise related to activities on the OCS; (3) from any vessel required to have a certificate of inspection issued by the Coast Guard, including mobile offshore drilling units, regardless of their geographic location; or (4) from any vessel connected with a deepwater port or within the deepwater port safety zone or from any vessel engaged in activities related to the OCS, you must submit a report if there is a diving casualty meeting the criteria in block 11, except if the diving operation is:
 1. performed solely for marine scientific research and development purposes by educational institutions,
 2. performed solely for research and development for the advancement of diving equipment and technology, or
 3. performed solely for search and rescue or related public safety purposes by or under the control of a governmental agency.
 - B. **All Other Diving.** Any occurrence of injury or loss of life to any person while diving from a vessel subject to instruction 2 and using underwater breathing apparatus must be reported under instruction 2.
4. **OUTER CONTINENTAL SHELF (OCS) FACILITIES.** If you are the owner, operator, or person in charge of an OCS facility engaged in OCS activities as defined in 33 CFR 140.10, you must submit a report if your facility is involved in a casualty or accident that meets any of the criteria in block 12.

COMPLETION OF THIS FORM

5. In accordance with 46 CFR §4.05-10, 46 CFR §197.486, and 33 CFR §146.35, this form shall be filled out as completely and accurately as possible. Please type or print clearly. Fill in all blanks that apply to the kind of accident that has occurred. If a block is not applicable, the abbreviation "NA" should be entered in that space. If the answer is unknown and cannot be obtained before the report has to be submitted (i.e. within 5 days of the accident), the abbreviation "UNK" should be entered in that block. If "NONE" is the correct response, enter it in the block.
6. Once completed, deliver, email, or fax this form within 5 days of the casualty to the Coast Guard Sector, Marine Safety Unit, or Activity nearest the location of the casualty or, if at sea, nearest the arrival port. <https://www.uscg.mil/Units/Organization/>
7. Tugs or towboats with tows under their control shall complete blocks 9a through 9d and, if one or more barges in their tow causes or sustains damage or meets any other reporting criteria, use the "Barge Addendum," CG-2692A to report information on the barge(s) involved.
8. If an incident involves multiple barges suffering or causing damage while moored or anchored (such as in a fleeting area), or breaking away from their moorage and causing or sustaining damage, enter the location of the moorage in Block 1 of the CG-2692 and complete the form except for blocks 2-8. Details for the barges will be entered on the CG-2692A. If a single barge is involved in a marine casualty while moored or anchored, it shall be documented as any other vessel using the CG-2692.
9. If the casualty meets the criteria for a serious marine incident as defined in 46 CFR §4.03, use the "Chemical Drug and Alcohol Testing Addendum," CG-2692B to report information on required drug and alcohol testing following a serious marine incident.
10. If one or more persons on the vessel or facility were injured, killed, or missing as a result of the casualty, use the "Personnel Casualty" Addendum," CG-2692C to report information on the extent of all personnel casualties.
11. For facilities and vessels engaged in OCS activities who are reporting a casualty in accordance with 33 CFR §146.35 or 33 CFR §146.303, use the "Involved Persons and Witnesses Addendum," CG-2692D to provide a list of all involved persons and witnesses to the casualty being reported. The CG-2692D may also be used to provide data on persons involved or witnessing a marine casualty or commercial diving casualty.
12. Block 20 - "Location": Always identify the body of water or waterway. Latitude and longitude to the nearest tenth of a minute should always be entered except in those rivers and waterways where a mile marker system is commonly used. In those cases, the mile number to the nearest tenth of a mile should be entered. If the latitude and longitude, or mile number, are unknown, reference to a known landmark or object (buoy, light, etc.) with distance and bearing to the object is permissible.

Privacy Act Notice

(CG-2692, CG-2692A, CG-2692B, CG-2692C and CG-2692D)

Authority Title 46, United States Code (U.S.C.) §6301, Title 46, Code of Federal Regulations (CFR), Parts 4 and 197, and Title 33, CFR Part 146 authorizes the collection of this information. Specifically, 46 CFR §4.05-10 mandates that vessel owners, agents, masters, operators, or persons in charge file a written report of any marine casualty required to be reported under 46 CFR §4.05-1, 46 CFR §197.486 mandates that persons in charge of vessels or facilities file a report of any diving casualty required to be reported under 33 CFR §197.484, and 46 CFR §146.35 mandates that owners, operators, or persons in charge of an OCS facility or vessel engaged in OCS activities file a report of any OCS-related casualty required to be reported under 33 CFR §146.30. For marine casualties, diving casualties when the diving installation is on a vessel, and The written report must be provided on Form CG-2692 (Report of Marine Casualty, Commercial Diving Casualty, or OCS-Related Casualty) supplemented as necessary by appended Forms CG-2692A (Barge Addendum), CG-2692B (Chemical Drug and Alcohol Testing Addendum), CG-2692C (Personnel Casualty Addendum), and CG-2692D (Involved Persons and Witnesses Addendum). The forms may be used for diving casualties when the diving installation is on a facility or for OCS-related casualties that are not also marine casualties under 46 CFR Part 4.

Purpose The Coast Guard uses this information in gathering facts to determine causes surrounding reportable marine casualties. This information assists in promoting the safety of life, property, and the protection of the marine environment through preventing the recurrence of accidents.

Routine Uses Reportable marine casualty information is needed for Coast Guard investigations of vessel casualties involving injury, death, property damage, environmental damage and dangerous conditions and for preparation and submission of data reports mandated by Congress (see 46 U.S.C. 6301). Information gathered is also used to determine whether new or revised safety laws, regulations, and policies are necessary. Additionally, chemical testing information is needed to improve Coast Guard detection and reduction of drug use by mariners. The information contained on forms CG-2692, CG-2692A, CG-2692B, CG-2692C, and CG-2692D may be disclosed under the Freedom of Information Act (FOIA) in response to a written FOIA request.

Disclosure Furnishing this information is mandatory per 46 CFR §4.05-10. Failure to furnish the requested information for occurrences that are reportable marine casualties, diving casualties, or OCS-related casualties may result in civil penalty sanctions as outlined in 33 CFR Part 1. Coast Guard credentialed mariners may be subject to administrative adjudication per 46 CFR Part 5 for reporting failures. Some of the casualty information collected on this form may be made available for public inspection; however, information collected is protected from use in civil litigation per 46 U.S.C. §6308. Personal privacy information will not be disclosed routinely. Social Security numbers are not mandated on this form.

DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard

OMB No: 1625-0001

Exp. Date: 07/31/2022

REPORT of MARINE CASUALTY, COMMERCIAL DIVING CASUALTY, or OCS-RELATED CASUALTY

Section I - Reporting Vessel/Facility Information

1. Vessel or Facility Name Champion		2. Vessel Official Number or IMO Number 1277165		3. Vessel Flag US	
4. Vessel Length 90 <input checked="" type="checkbox"/> Feet <input type="checkbox"/> Meters		5. Vessel Gross Tons 91 GRT		6. Vessel Propulsion Type diesel jet propulsion	
7. Vessel or Facility Type Passenger		8. Vessel or Facility Service or Occupation Commuter Ferry			
9. FOR TOWING ONLY	9a. Arrangement: <input type="checkbox"/> Pushing Ahead <input type="checkbox"/> Towing Astern <input type="checkbox"/> Towing Alongside	9b. Number of Vessels Towed: Empty _____ Loaded _____ Total _____	9c. Maximum Size of Tow/Tow-Boat(s): Length _____ feet Width _____ feet		9d. Did one or more of the barges in the tow cause or sustain damage in the marine casualty? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes complete and attach one or more CG-2692A forms to this report)

Section II - Reason for Submitting this Report (Check all that apply)

10. The above vessel was involved in a Marine Casualty consisting in (46 CFR 4.05-1 and 4.05-10):
- ☐ 1. Unintended grounding or an unintended strike of (allision with) a bridge
 - ☐ 2. Intended grounding or intended strike of a bridge that created a hazard to navigation, the environment or the safety of the vessel, or that meets any of the criteria in 3 through 8 below
 - ☒ 3. Loss of main propulsion, primary steering, or any associated component or control system that reduces the maneuverability of the vessel
 - ☐ 4. Occurrence materially and adversely affected the vessel's seaworthiness or fitness for service or route
 - ☐ 5. Loss of life
 - ☐ 6. Injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties
 - ☐ 7. Occurrence causing property damage in excess of \$75,000
 - ☐ 8. Occurrence involving significant harm to the environment
11. The above facility or vessel was involved in a Commercial Diving Casualty involving (46 CFR 197.484):
- ☐ 1. Loss of life
 - ☐ 2. Diving-related injury to any person causing incapacitation for more than 72 hours
 - ☐ 3. Diving-related injury to any person requiring hospitalization for more than 24 hours
12. The above facility or vessel was involved in an OCS Facility Casualty Resulting in (33 CFR 146.30 and 146.35):
- ☐ 1. Death
 - ☐ 2. Injury to 5 or more persons in a single incident
 - ☐ 3. Injury causing any person to be incapacitated for more than 72 hours
 - ☐ 4. OCS Facility only - Damage affecting the usefulness of primary lifesaving or firefighting equipment
 - ☐ 5. OCS Facility only - Damage to the facility exceeding \$25,000 resulting from a collision by a vessel with the facility
 - ☐ 6. OCS Facility only - Damage to a floating OCS facility exceeding \$25,000

Section III - Associated Parties Information (Fill all fields that apply)

13. Name of Owner MBTA		Telephone 617-22-6695		14. Name of Operator or Manager Boston Harbor City Cruises		Telephone 617-5138402	
Address South Station, 2nd Floor Boston, Ma 02110		Email address		Address 455 N. Cityfront Plaza Suite 2600. Chicago IL 60611		Email address	
15. Name of Master or Person-in-Charge (Last, First, Middle) Eric Stenson		Telephone 978-4951818		16. Name of Agent (Last, First, Middle)		Telephone	
Address		Email address		Address		Email address	
17. Name of Dive Supervisor (Last, First, Middle)		Telephone		18. Name of Pilot (Last, First, Middle)		Telephone	
Address		Email address		Address		Email address	

Section IV - Casualty Information

19. Date/Time (local) of Occurrence 7-15-22 1710		20. Location-Name of Body of Water or Waterway: Latitude: Weymouth Fore River Longitude: OR River Mile Marker:	
21. Property Damage Estimated Damage Cost(s) to: Vessel: \$150,000 Cargo: \$ Facility: \$ Other: \$		Describe the Extent of Property Damage mechanical failure of port main engine	
22. Status of Involved Persons (If there are 1 or more injured, dead or missing persons complete and attach one or more CG-2692C forms to this Report) Total Number of Persons: On Board the Vessel: 45 Injured: 0 Dead: 0 Missing: 0			

Section IV - Casualty Information (continued)

23. Was This Casualty a Serious Marine Incident (SMI) as Defined in 46 CFR 4.03-2?

☒ Yes ☐ No ☐ Not at this Time, But is Likely to Become an SMI (If Yes or is Likely to Become an SMI complete/attach one or more CG-2692B forms to this report)

24a. Is there any evidence of alcohol or drug use by or intoxication of individuals directly involved in the casualty?

☐ Yes ☒ No (If Yes, identify those individuals for whom evidence has been obtained and specify the method to obtain such evidence in block 24c)

24b. Did any individual directly involved in a casualty refuse to submit to, or cooperate in, the administration of a timely chemical test, when directed by a law enforcement officer or by the marine employer?

☐ Yes ☒ No (If Yes, note the individual(s) who refused in block 24c)

24c. Individuals with evidence of drug or alcohol use, evidence of intoxication, or who refused to submit/cooperate in a timely chemical test (if more space is needed, continue in block 25c)

24d. Is there evidence that alcohol use contributed to this casualty?

☐ Yes ☒ No (If Yes, discuss in block 25b)

25. Nature and Circumstance of the Casualty:

25a. Activity or Operation Being Conducted at the Time of the Casualty:

Champion had departed Hull enroute to Hingham with 42 passengers on a regular commuter service. No reported issues at the time

25b. Description of the Casualty (casualty events and the conditions and actions that were believed to be causal factors as well as any hazards created as a result of the casualty. Attach additional sheets if necessary.):

At 1705 the Champion departed Hull, after the turn towards Hingham in the Fore River the engines were brought up to 2055 RPM. A short itme after, the RPM on the port engine beginning to fluctuate between 2045 and 2070 which was out of the ordinary. A deckhand was sent to the engineroom to investigate. Prior to the deckhand reaching the engine room the port engine went up to 2250 RPM and 85 PSI without touching any throttels. The Captain began bringing both engines down to idle but the port would not come down. The port engine then dropped in RPM and in oil PSI. The engine alarms started going off at which time the Captain activated the emergency stop on the port main engine. The Captain maneuvered the vessel to the Hingham dock, where 42 passengers were unloaded. The vessel was immediatly taken out of service and brought her to our Quincy facilty with no passengers to affect repairs.

25c. Any other comments, including with respect to use of or need for emergency response equipment:

Section V - Person Making this Report

24. Name (PRINT) (Last, First, Middle)
Deschenes, Stephen

25. Signature: Stephen Deschenes

26. Date
7-16-22

27. Title
Port Director

28. Address
[REDACTED] Weymouth, Ma 02191

29. Telephone No.
617515-8402

30. Email
[REDACTED]

DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard
PERSONNEL CASUALTY ADDENDUM

OMB No: 1625-0001

Exp. Date: 07/31/2022

Note: This form shall be used to report data on persons who were injured, killed, or are missing as a result of the marine casualty described on form CG-2692.
This form may only be used in addition to form CG-2692, never alone.

Section I - Reporting Vessel/Facility Information - Casualty Date/Time

1. Vessel or Facility Name CHAMPION	2. Date/Time (local) of Occurrence JULY 5th 2022 1015
---	--

Section II - Injured, Dead, and Missing Person Details

3a. Name (Last, First, Middle) [REDACTED]		3b. Relationship to Vessel or Facility <input checked="" type="checkbox"/> Crew - Position: DECK HAND <input type="checkbox"/> Passenger <input type="checkbox"/> Other - Describe: _____		3c. Status <input checked="" type="checkbox"/> Injured <input type="checkbox"/> Dead <input type="checkbox"/> Missing
3d. Address [REDACTED] MA 02343		3e. Telephone [REDACTED]		3f. Email Address [REDACTED]
3g. For Crew - On Duty at Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3h. Date of Birth [REDACTED]		3i. Date of Death [REDACTED]
3j. Activity of Person at Time of Casualty: PREPARING TO SECURE VESSEL AT THE DOCK				
3k. Location on Vessel or Facility Where Casualty Occurred: BOW DECK				
3l. Extent of Injuries to Person (Parts of Body and Type of Injuries): HEADACHE, BRUISED + SCRAPED ELBOW, SORE ON WHOLE RIGHT SIDE				
4a. Name (Last, First, Middle) [REDACTED]		4b. Relationship to Vessel or Facility <input checked="" type="checkbox"/> Crew - Position: DECK HAND <input type="checkbox"/> Passenger <input type="checkbox"/> Other - Describe: _____		4c. Status <input checked="" type="checkbox"/> Injured <input type="checkbox"/> Dead <input type="checkbox"/> Missing
4d. Address [REDACTED] WYEMOUTH, MA 02191		4e. Telephone [REDACTED]		4f. Email Address [REDACTED]
4g. For Crew - On Duty at Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		4h. Date of Birth [REDACTED]		4i. Date of Death [REDACTED]
4j. Activity of Person at Time of Casualty: PREPARING TO SECURE VESSEL AT THE DOCK				
4k. Location on Vessel or Facility Where Casualty Occurred: STERN DECK				
4l. Extent of Injuries to Person (Parts of Body and Type of Injuries): BRUISES THROUGHOUT, MODERATE PAIN IN LEFT SHOULDER				
5a. Name (Last, First, Middle) [REDACTED]		5b. Relationship to Vessel or Facility <input type="checkbox"/> Crew - Position: _____ <input type="checkbox"/> Passenger <input type="checkbox"/> Other - Describe: _____		5c. Status <input type="checkbox"/> Injured <input type="checkbox"/> Dead <input type="checkbox"/> Missing
5d. Address [REDACTED]		5e. Telephone [REDACTED]		5f. Email Address [REDACTED]
5g. For Crew - On Duty at Time? <input type="checkbox"/> Yes <input type="checkbox"/> No		5h. Date of Birth [REDACTED]		5i. Date of Death [REDACTED]
5j. Activity of Person at Time of Casualty:				
5k. Location on Vessel or Facility Where Casualty Occurred:				
5l. Extent of Injuries to Person (Parts of Body and Type of Injuries):				
6a. Name (Last, First, Middle) [REDACTED]		6b. Relationship to Vessel or Facility <input type="checkbox"/> Crew - Position: _____ <input type="checkbox"/> Passenger <input type="checkbox"/> Other - Describe: _____		6c. Status <input type="checkbox"/> Injured <input type="checkbox"/> Dead <input type="checkbox"/> Missing
6d. Address [REDACTED]		6e. Telephone [REDACTED]		6f. Email Address [REDACTED]
6g. For Crew - On Duty at Time? <input type="checkbox"/> Yes <input type="checkbox"/> No		6h. Date of Birth [REDACTED]		6i. Date of Death [REDACTED]
6j. Activity of Person at Time of Casualty:				
6k. Location on Vessel or Facility Where Casualty Occurred:				
6l. Extent of Injuries to Person (Parts of Body and Type of Injuries):				
7a. Name (Last, First, Middle) [REDACTED]		7b. Relationship to Vessel or Facility <input type="checkbox"/> Crew - Position: _____ <input type="checkbox"/> Passenger <input type="checkbox"/> Other - Describe: _____		7c. Status <input type="checkbox"/> Injured <input type="checkbox"/> Dead <input type="checkbox"/> Missing
7d. Address [REDACTED]		7e. Telephone [REDACTED]		7f. Email Address [REDACTED]
7g. For Crew - On Duty at Time? <input type="checkbox"/> Yes <input type="checkbox"/> No		7h. Date of Birth [REDACTED]		7i. Date of Death [REDACTED]
7j. Activity of Person at Time of Casualty:				
7k. Location on Vessel or Facility Where Casualty Occurred:				
7l. Extent of Injuries to Person (Parts of Body and Type of Injuries):				


DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard
VESSEL INSPECTION REQUIREMENTS

1. Date of Inspection 10/28/2022	2. COTP/OCMI Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7585540	4. ON/IMO# 1277165
5. Vessel Name CHAMPION		6. Inspection Type Annual Inspection	

7. Alternate Inspection Program: ☐ ACP ☐ MSP ☐ MSP Select ☐ TSMS ☐ SIP/TBSIP ☒ N/A - Traditionally Inspected

Nature of Deficiency: The vessel representative must inform the Recognized Organization, the Coast Guard, and/or the Streamlined Inspection Program (SIP/TBSIP) Coordinator, as applicable, when the following item(s) have been corrected. Note: "RO" includes ROs (33 CFR 96), Authorized Classification Societies (46 CFR 8), and Third Party Organizations (46 CFR 139).

[illegible]

9. Copy Provided to:	S. DeSchenes (Printed name of vessel representative)	Signature: 
Phone Number:	617-515-8402 Email: Stephen.Deschenes@cityexperien	
Name of MI:	Philip M. Harris, MSTC (Printed name of qualified marine inspector)	HARRIS.PHILIP.MI Digitally signed by HARRIS.PHILIP.MICHAEL.1166 651863 Signature: CHAEL.11666518 Date: 2022.10.28 13:00:38 -04'00' 63
Phone Number:	[REDACTED] Email: [REDACTED]	

10. Copies forward to - check as appropriate:

☐ OTHER:


☐ Vessel Owner ☐ PSC Authority ☐ RO ☐ COMDT (CG-CVC) ☐ CG-5P-TI ☐ CG District: _____ ☐ CG Area: _____

Codes for action taken, see below (Note: code numbers are derived from international harmonization; U.S. uses similar codes and those are reflected below.)

10	Deficiency Rectified	60	Rectify deficiencies prior to movement	66	Prior to drilling or production operations		ACTION CODE
15	Rectify deficiencies by next port	40	Rectify deficiencies prior to next US port after sailing foreign	701	Prior to carriage of passengers/cargo	a	To the satisfaction of RO
16	Rectify deficiencies w/in 14 days	30	Ship detained	702	Prior to embarking on International Voyage	c	To the satisfaction of the Coast Guard
50	Rectify deficiencies w/in 30 days	20	Ship expelled	703	Prior to bunkering operations	d	To the satisfaction of the SIP/TBSIP coordinator
17	Rectify deficiencies prior to departure	25	Ship denied entry	705	Other; Restricted to less than 1NM		

1. Date of Inspection 07/22/2022	2. COTP/OCMI Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7513392	4. ON/IMO# 1277239
5. Vessel Name GLORY		6. Inspection Type Administrative Inspection	
7. Alternate Inspection Program: <input type="checkbox"/> ACP <input type="checkbox"/> MSP <input type="checkbox"/> MSP Select <input type="checkbox"/> TSMS <input type="checkbox"/> SIP/TBSIP <input checked="" type="checkbox"/> N/A - Traditionally inspected			

[illegible]

Signature: 
 HARRIS.PHILIP.MI
 Digitally signed by
 HARRIS.PHILIP.MICHAEL.1166
 651863
 Date: 2022.07.22 08:11:18
 -04'00'

Codes for action taken, see below (Note: code numbers are derived from International harmonization; U.S. uses similar codes and those are reflected below.)						
10	Deficiency Rectified	60	Rectify deficiencies prior to movement	66	Prior to drilling or production operations	ACTION CODE
15	Rectify deficiencies by next port	40	Rectify deficiencies prior to next US port after sailing foreign	701	Prior to carriage of passengers/cargo	a To the satisfaction of RO
16	Rectify deficiencies w/in 14 days	30	Ship detained	702	Prior to embarking on International Voyage	c To the satisfaction of the Coast Guard
50	Rectify deficiencies w/in 30 days	20	Ship expelled	703	Prior to bunkering operations	d To the satisfaction of the SIP/TBSIP coordinator
17	Rectify deficiencies prior to departure	25	Ship denied entry	705	Other:As prescribed above.	

From: [Stieb, Jeffrey D CIV USCG D1 \(USA\)](#)
To: [Paganelli, Tess](#); [Ray, John](#); [Lannin, Mimi](#)
Cc: [Chase, Timothy William CIV USCG SEC BOSTON \(USA\)](#); [Lyons, Benjamin C LCDR USCG SEC BOSTON \(USA\)](#); [Fisher, Donna A CIV USCG D1 \(USA\)](#)
Subject: RE: Vertical and Horizontal Clearance proposed for a replacement superstructure for the Long Island Bridge
Date: Monday, October 3, 2022 2:33:16 PM

Tess, John, Mimi,

Thank you for your assistance. My apologies for knocking on your door twice with the same question. I looked in every folder and stored file and could not find John Ray's e-mail of Jan 5, 2022. However the e-mail was sent to the right address and I obviously received it. I should be all set with your Jan 5 reply. I will add your reply to the record verbatim.

Regards, Jeff

Jeffrey Stieb
Senior Bridge Management Specialist
First Coast Guard District
781-901-0348 (m)

From: Paganelli, Tess <tpaganelli@MBTA.com>
Sent: Monday, October 3, 2022 1:21 PM
To: Stieb, Jeffrey D CIV USCG D1 (USA) <Jeffrey.D.Stieb@uscg.mil>
Subject: [Non-DoD Source] Fw: Vertical and Horizontal Clearance proposed for a replacement superstructure for the Long Island Bridge

Hi Jeff!

I reached out to a couple additional people in our Ferry group and was sent this correspondence from January, but I was under the impression that you looking for a more specific letter either in support or opposition of the project?

Thanks,
Tess

Tess Paganelli
Manager of Environmental Construction
Massachusetts Bay Transportation Authority
(c): 617-549-4357

From: Ray, John <JRay@MBTA.com>
Sent: Wednesday, January 5, 2022 10:23 AM
To: Stieb, Jeffrey D CIV USCG D1 (USA) <Jeffrey.D.Stieb@uscg.mil>

Cc: Lannin, Mimi <mlannin@MBTA.com>

Subject: Vertical and Horizontal Clearance proposed for a replacement superstructure for the Long Island Bridge

Jeff

I am sorry for the delay but mostly due to me being on vacation between the holidays.

I was able to ascertain the various dimensions for the passenger vessel typically used in the MBTA's Boston to Hingham/Hull service.

Historically when the original Long Island Bridge was there we would not route the Salacia (45 feet) underneath the bridge at ½ tide or more, due to the risk of either damaging the mast or single side band antenna. This concern would be continued with the currently proposed height. The MBTA does not want to cause any undue delay or cost increase to the City's project but if there is any ability to increase the vertical dimension that would be helpful. If increasing the vertical clearance under the bridge is problematic then we resume routing the Salacia through Hull Gut at ½ tide or more when the bridge is completed.

Here are the dimensions of the vessels for the service:

Regency – 115x27x8.5'; Air Draft 40'

Salacia – 145x40x6.5'; Air Draft 45'

Bowditch – 92x30x9.8'; Air Draft 36'

Cetacea – 90x30x9'6"; Air Draft 35'

Sanctuary – 115x30x9'7"; Air Draft 37'

Ruth E Hughes – 115x24x7'9"; Air Draft 36'

Asteria/Aurora – 125x33x9'8"; Air Draft 40'

We may see an additional vessel added to the Boston fleet and it would be a 29m cat with roughly the same dimensions as the Salacia. It too would have be routed through the Hull Gut at ½ tide or more.




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1. Date of Inspection 22NOV2022	2. COTP/OCMI Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7598291	4. ON/IMO# 962634
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7. Alternate Inspection Program: ☐ ACP ☐ MSP ☐ MSP Select ☐ TSMS ☐ SIP/TBSIP ☒ N/A - Traditionally Inspected

No.	Deficiency Code	Description	Cite	Action	SMS Code	Self Reported	Work List Item
8.							

9. Copy Provided to: <u>Steve Deschenes</u> (Printed name of vessel representative)	Signature: 
Phone Number: <u>(617) 515-8402</u> Email: 	
Name of MI: <u>David J. Taylor</u> (Printed name of qualified marine inspector)	Signature: TAYLOR.DAVID Digitally signed by TAYLOR.DAVID.J.1243963547
Phone Number: <u>(617) 223-3020</u> Email: 	J.1243963547 Date: 2022.11.22 08:08:00 -05'00'

Codes for action taken, see below (Note: code numbers are derived from international harmonization; U.S. uses similar codes and those are reflected below.)

CG-835V (06/20) Reset Page 1 of 1


**DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard
VESSEL INSPECTION REQUIREMENTS**

1. Date of Inspection 09/07/2022	2. COTP/OCM Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7547084	4. ON/IMO# 1077034
5. Vessel Name SANCTUARY		6. Inspection Type Annual Inspection	

7. Alternate Inspection Program: ☐ ACP ☐ MSP ☐ MSP Select ☐ TSMS ☐ SIP/TBSIP ☒ N/A - Traditionally Inspected

Nature of Deficiency: The vessel representative must inform the Recognized Organization, the Coast Guard, and/or the Streamlined Inspection Program (SIP/TBSIP) Coordinator, as applicable, when the following item(s) have been corrected. Note: "RO" includes ROs (33 CFR 96), Authorized Classification Societies (46 CFR 8), and Third Party Organizations (46 CFR 139).

8. No.	Deficiency Code	Description	Cite	Action	Code	SMS Related	Self Re-ported	Work List Item
01	C2107	The discharge ends of fuel tank vent pipes must be fitted with removable flame screens or flame arrestors. The flame screens must consist of a single screen of corrosion resistant wire of at least 30 x 30 mesh. Flame screen for port fuel tank goose vent was wasted and had numerous holes compromising it's ability to prevent flame/spark from entering the fuel tank. Goose neck vent float ball was also wasted and needs replacement.	46 CFR 119.450	701	c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02	16103	The vessel owner or operator must ensure the restricted areas are designated on board the vessel, as specified in the approved plan. Restricted areas must include, as appropriate: Spaces with access to potable water tanks, pumps, or manifolds. Correctly designate and control access to potable water tank and fuel fill piping to the satisfaction of the Marine Inspector.	33 CFR 104.270	705	c	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
03	13199	Electrical equipment on a vessel must be installed and maintained to protect passengers, crew, other persons, and the vessel from electrical hazards, including fire, caused by or originating in electrical equipment, and electrical shock. In the port engine room on the	46 CFR 120.200	705	c	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

9. Copy Provided to: <u>Steve Deschenes</u> (Printed name of vessel representative) Phone Number: <u>617-515-8402</u> Email: <u>Stephen.Deschenes@cityexperien</u> Name of MI: <u>David J. Taylor</u> (Printed name of qualified marine inspector) Phone Number: <u>617-223-3020</u> Email: <u>david.j.taylor@uscg.mil</u>	Signature:  TAYLOR.DAVID Digitally signed by Signature: <u>J.1243963547</u> TAYLOR.DAVID.J.1243963547 Date: 2022.09.12 12:22:39 -04'00'
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10. Copies forward to - check as appropriate: ☐ OTHER: _____

☐ Vessel Owner ☐ PSC Authority ☐ RO ☐ COMDT (CG-CVC) ☐ CG-5P-TI ☐ CG District: _____ ☐ CG Area: _____

Codes for action taken, see below (Note: code numbers are derived from international harmonization; U.S. uses similar codes and those are reflected below.)

10	Deficiency Rectified	60	Rectify deficiencies prior to movement	66	Prior to drilling or production operations	ACTION CODE
15	Rectify deficiencies by next port	40	Rectify deficiencies prior to next US port after sailing foreign	701	Prior to carriage of passengers/cargo	a To the satisfaction of RO
16	Rectify deficiencies w/in 14 days	30	Ship detained	702	Prior to embarking on International Voyage	c To the satisfaction of the Coast Guard
50	Rectify deficiencies w/in 30 days	20	Ship expelled	703	Prior to bunkering operations	d To the satisfaction of the SIP/TBSIP coordinator
17	Rectify deficiencies prior to departure	25	Ship denied entry	705	Other: Prior to next Hull Exam credit	

VESSEL INSPECTION REQUIREMENTS (continued)

1. Date of Inspection 09/07/2022	2. COTP/OCMI Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7547084	4. ON/IMO# 1077034
5. Vessel Name SANCTUARY		6. Inspection Type Annual Inspection	

Nature of Deficiency: The vessel representative must inform the Recognized Organization, the Coast Guard, and/or the Streamlined Inspection Program (SIP/TBSIP) Coordinator, as applicable, when the following item(s) have been corrected. Note: "RO" includes ROs (33 CFR 96), Authorized Classification Societies (46 CFR 8), and Third Party Organizations (46 CFR 139).

[illegible]

3. Copy Provided to: <u>Steve Deschenes</u> (Printed name of vessel representative)	Signature: _____
Phone Number: <u>617-515-8402</u> Email: <u>Stephen.Deschenes@cityexperien</u>	_____
Name of MI: <u>David J. Taylor</u> (Printed name of qualified marine inspector)	Signature: _____
Phone Number: <u>617-223-3020</u> Email: <u>david.j.taylor@uscg.mil</u>	_____

10	Deficiency Rectified	60	Rectify deficiencies prior to movement	66	Prior to drilling or production operations		ACTION CODE
15	Rectify deficiencies by next port	40	Rectify deficiencies prior to next US port after sailing foreign	701	Prior to carriage of passengers/cargo	a	To the satisfaction of RO
16	Rectify deficiencies w/in 14 days	30	Ship detained	702	Prior to embarking on International Voyage	c	To the satisfaction of the Coast Guard
50	Rectify deficiencies w/in 30 days	20	Ship expelled	703	Prior to bunkering operations	d	To the satisfaction of the SIP/TBSIP coordinator
17	Rectify deficiencies prior to departure	25	Ship denied entry	705	Other: Prior to next Hull Exam credit		


**DEPARTMENT OF HOMELAND SECURITY
U.S. Coast Guard
VESSEL INSPECTION REQUIREMENTS**

1. Date of Inspection 09/07/2022	2. COTP/OCM Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7547084	4. ON/IMO# 1077034
5. Vessel Name SANCTUARY		6. Inspection Type Annual Inspection	

7. Alternate Inspection Program: ☐ ACP ☐ MSP ☐ MSP Select ☐ TSMS ☐ SIP/TBSIP ☒ N/A - Traditionally Inspected

Nature of Deficiency: The vessel representative must inform the Recognized Organization, the Coast Guard, and/or the Streamlined Inspection Program (SIP/TBSIP) Coordinator, as applicable, when the following item(s) have been corrected. Note: "RO" includes ROs (33 CFR 96), Authorized Classification Societies (46 CFR 8), and Third Party Organizations (46 CFR 139).

8. No.	Deficiency Code	Description	Cite	Action	SMS Code	Self Re-Work
01	C2107	The discharge ends of fuel tank vent pipes must be fitted with removable flame screens or flame arrestors. The flame screens must consist of a single screen of corrosion resistant wire of at least 30 x 30 mesh. Flame screen for port fuel tank goose vent was wasted and had numerous holes compromising it's ability to prevent flame/spark from entering the fuel tank. Goose neck vent float ball was also wasted and needs replacement.	46 CFR 119.450	701	c	<input type="checkbox"/>
02	16103	The vessel owner or operator must ensure the restricted areas are designated on board the vessel, as specified in the approved plan. Restricted areas must include, as appropriate: Spaces with access to potable water tanks, pumps, or manifolds. Correctly designate and control access to potable water tank and fuel fill piping to the satisfaction of the Marine Inspector.	33 CFR 104.270	705	c	<input checked="" type="checkbox"/>
03	13199	Electrical equipment on a vessel must be installed and maintained to protect passengers, crew, other persons, and the vessel from electrical hazards, including fire, caused by or originating in electrical equipment, and electrical shock. In the port engine room on the	46 CFR 120.200	705	c	<input checked="" type="checkbox"/>

9. Copy Provided to: <u>Steve Descheres</u> (Printed name of vessel representative) Phone Number: <u>617-515-8402</u> Email: <u>[REDACTED]</u> Name of MI: <u>David J. Taylor</u> (Printed name of qualified marine inspector) Phone Number: <u>617-223-3020</u> Email: <u>[REDACTED]</u>	Signature:  Signature: <u>TAYLOR.DAVID</u> J.1243963547 <small>Digitally signed by TAYLOR.DAVID J.1243963547 Date: 2022.09.12 12:22:39 -04'00'</small>
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10. Copies forward to - check as appropriate: ☐ OTHER: _____
☐ Vessel Owner ☐ PSC Authority ☐ RO ☐ COMDT (CG-CVC) ☐ CG-5P-TI ☐ CG District: _____ ☐ CG Area: _____

Codes for action taken, see below (Note: code numbers are derived from international harmonization; U.S. uses similar codes and those are reflected below.)

10	Deficiency Rectified	60	Rectify deficiencies prior to movement	66	Prior to drilling or production operations	ACTION CODE
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16	Rectify deficiencies w/in 14 days	30	Ship detained	702	Prior to embarking on International Voyage	c To the satisfaction of the Coast Guard
50	Rectify deficiencies w/in 30 days	20	Ship expelled	703	Prior to bunkering operations	d To the satisfaction of the SIP/TBSIP coordinator
17	Rectify deficiencies prior to departure	25	Ship denied entry	705	Other: Prior to next Hull Exam credit	

VESSEL INSPECTION REQUIREMENTS (continued)

1. Date of Inspection 09/07/2022	2. COTP/OCMI Zone/Unit SECTOR BOSTON	3. MISLE Activity Number 7547084	4. ON/IMO# 1077034
5. Vessel Name SANCTUARY		6. Inspection Type Annual Inspection	

Nature of Deficiency: The vessel representative must inform the Recognized Organization, the Coast Guard, and/or the Streamlined Inspection Program (SIP/TBSIP) Coordinator, as applicable, when the following item(s) have been corrected. Note: "RO" includes ROs (33 CFR 96), Authorized Classification Societies (46 CFR 8), and Third Party Organizations (46 CFR 139).

[illegible]

9. Copy Provided to: <u>Steve Deschenes</u> (Printed name of vessel representative)		Signature: _____
Phone Number: <u>617-515-8402</u> Email: <u>Stephen.Deschenes@cityexperien</u>		
Name of MI: <u>David J. Taylor</u> (Printed name of qualified marine inspector)		Signature: _____
Phone Number: <u>617-223-3020</u> Email: <u>david.j.taylor@uscg.mil</u>		

10	Deficiency Rectified	60	Rectify deficiencies prior to movement	66	Prior to drilling or production operations		ACTION CODE
15	Rectify deficiencies by next port	40	Rectify deficiencies prior to next US port after sailing foreign	701	Prior to carriage of passengers/cargo	a	To the satisfaction of RO
16	Rectify deficiencies w/in 14 days	30	Ship detained	702	Prior to embarking on International Voyage	c	To the satisfaction of the Coast Guard
50	Rectify deficiencies w/in 30 days	20	Ship expelled	703	Prior to bunkering operations	d	To the satisfaction of the SIP/TBSIP coordinator
17	Rectify deficiencies prior to departure	25	Ship denied entry	705	Other: Prior to next Hull Exam credit		



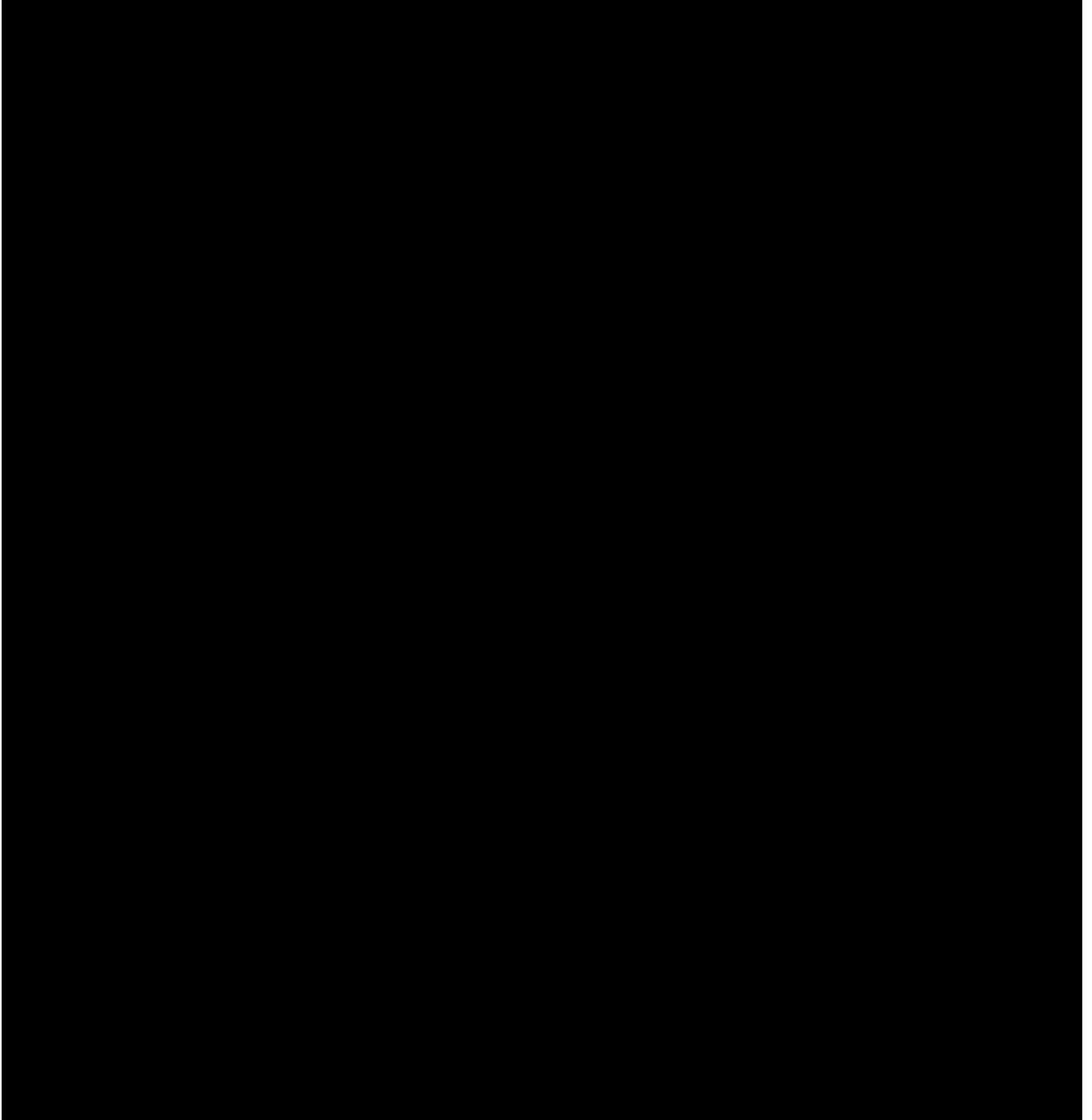
Bridge Work Notification – Inspections and Repairs

The timely notification of bridge inspections and repairs allows the Coast Guard to notify vessels transiting the waterway. Type or print clearly and e-mail to the Bridge Management Specialist listed above at least fifteen (15) days prior to commencing work. Please note that the Coast Guard needs 90 days notice of projects which require waterway closures.

Bridge Owner and Point of Contact: MBTA – Victor Tharmalingam		
Address: 10 Park Plaza, Boston, MA 02116		
Office Phone: NA	Cell: 617-921-4054	
Project Description, Bridge Name, Waterway: Project Description: Installation of work platforms at bridge piers 1, 2, 3 and 4. Project Location: Haverhill, MA Bridge Name: Merrimack River Bridge (MBTA Commuter Rail West Route over Merrimack River) Waterway: Merrimack River		
Start Date: 5/31/2022	Finish Date: 7/1/2022	Work Hours: 6am – 2pm
Work Methods, Reduction of Vertical and Horizontal Clearance, and Impact on Navigation: Work will be done from a 30'x80' work barge with 24"x40' hydraulic spuds. A tugboat will be used to mobilize the work barge from the I-95 Bridge in Haverhill, MA to the project site. The tugboat will also be used to move the barge from bridge pier to bridge pier throughout the duration of the work. A work skiff will be used as a safety boat throughout the duration of the work. During the day shift only one pier will be worked on from the water at a time. During off shift hours the work barge will be placed at northern most span of bridge (outside the main channel). Impacts on navigation is not expected. A chart or map of the bridge location, photographs, and/or an elevation view of work locations and the effect of the work on clearances will allow the Coast Guard to provide a faster response.		
Contractor Name and Contact Information: SPS New England – Chris Pickford (603-502-8797)		
Vessels on Scene, Location of Vessels, and Radio Frequency Monitored: Work barge, tugboat, and work skiff located at the MBTA Merrimack Bridge. Radio Frequency VHF 5 and 13.		
24 Hour On-Scene Point of Contact and Cell Number: SPS New England – Chris Pickford (603-502-8797)		

Bridge Work Notification – Inspections and Repairs

Figure 1 – Project Locus



MEMORANDUM OF UNDERSTANDING
Between the
U.S. Coast Guard
and
Federal Highway Administration
and
Federal Transit Administration
and
Federal Railroad Administration
To Coordinate and Improve Bridge Planning and Permitting

I. Parties

The Parties to this Memorandum of Understanding (MOU) are the U.S. Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Federal Railroad Administration (FRA) (FHWA, FTA, and FRA are referred to collectively as the Operating Administrations (OAs)).

II. Purpose

The purpose of this MOU is to expedite and coordinate the planning, environmental review, and decision-making for bridge permits by:

- a. Determining which bridge design concepts unreasonably obstruct navigation as soon as practicable and prior to or concurrent with the scoping process carried out pursuant to the National Environmental Policy Act (NEPA) in order to inform project alternatives to be evaluated;
- b. Preparing a coordinated environmental document that satisfies both the USCG and OAs NEPA implementing procedures and results in a shared or joint environmental decision document, where practicable, and concurrent decision documents at all other times; and
- c. Concurrently conducting the environmental evaluation and processing of the Bridge Permit application materials, whenever possible.

III. Authorities

- a. USCG enters into this MOU pursuant to 14 U.S.C. § 141.
- b. FHWA, FTA, and FRA enter into this MOU pursuant to 49 U.S.C. § 301.
- c. Programmatic Authorities, where applicable:
 1. National Environmental Policy Act of 1969 (NEPA), Pub. L. No. 91-190, 83 Stat. 852 (1970), *as amended; classified to* 42 U.S.C. §§ 4321-4347.

2. Act of Aug. 18, 1894, c. 299, § 5, 28 Stat. 362; *as amended; classified to 33 U.S.C. § 499.*
3. Act of March 3, 1899, c. 425, § 9, 30 Stat. 1151; *as amended; classified to 33 U.S.C. § 401, 406, 502 (commonly referred to as the: "Rivers and Harbors Appropriations Act of 1899").*
4. Act of March 23, 1906, c. 1130, § 1, 34 Stat. 84; *as amended; classified to 33 U.S.C. § 491-498 (commonly referred to as the: "General Bridge Act of 1906").*
5. Act of June 21, 1940, c. 409, 54 Stat. 497; *as amended; classified to 33 U.S.C. §§ 511-524; (commonly referred to as the: "Truman-Hobbs Act").*
6. Act of August 2, 1946, 60 Stat. 847; *as amended; classified to 33 U.S.C. §§ 525-533 (commonly referred to as: "the General Bridge Act of 1946").*
7. "An Act to give the consent of Congress to the construction of certain international bridges, and for other purposes," Pub. L. No. 92-434 (H.R. 15577), 86 Stat. 731-733 (September 26, 1972); *as amended; classified to 33 U.S.C. §§ 535-535i (commonly referred to as: "the International Bridge Act of 1972").*
8. Efficient Environmental Reviews for Project Decisionmaking, 23 U.S.C. § 139.
9. Coast Guard Aids to Navigation, 14 U.S.C. §§ 81 and 85.
10. National Bridge and Tunnel Inventory and Inspection Standards, 23 U.S.C. § 144.

IV. Definitions

For the purposes of this MOU, the definitions contained in the Council on Environmental Quality (CEQ) regulations (40 CFR parts 1500-1508) and the following definitions are applicable:

- a. Bridge means a structure erected across navigable waters of the United States, including waters shared by Canada and Mexico, and includes causeways, approaches, fenders, and other appurtenances thereto. See 33 U.S.C. § 535 and 33 CFR § 114.05.
- b. Bridge Permit means the approval by USCG of the location and plans of a bridge, pursuant to the Federal Bridge Statutes listed in Section III.c.2-7, and Acts of Congress authorizing the construction of bridges, including international bridges. This does not include bridges covered by 23 U.S.C. § 144(c). Bridge permits are approvals subject to the provisions of 23 U.S.C. § 139.
- c. Navigable Waters of the United States means the following except where Congress has designated otherwise: "(1) Territorial seas of the United States; (2) Internal

waters of the United States that are subject to tidal influence; and (3) Internal waters of the United States not subject to tidal influence that: (i) Are or have been used, or are or have been susceptible for use, by themselves or in connection with other waters, as highways for substantial interstate or foreign commerce, notwithstanding natural or man-made obstructions that require portage; or (ii) A governmental or non-governmental body, having expertise in waterway improvement, determines to be capable of improvement at a reasonable cost (a favorable balance between cost and need) to provide, by themselves or in connection with others waters, as highways for substantial interstate or foreign commerce.” 33 CFR § 2.36(a).

- d. Project Sponsor means an agency or entity seeking Federal transportation funds and responsible for initiating and carrying forward the planning, design, environmental review, and construction of a project in conjunction with the OA. This agency or entity could include a political subdivision of a State, an authority created or authorized under State law, or a private entity such as a railroad.

V. Responsibility of Operating Administrations (OAs)

For any project that may require a Bridge Permit, it is the responsibility of the relevant OA in cooperation with the Project Sponsor, as appropriate, to take the following actions:

- a. Initiate early engagement with USCG, no later than commencement of the NEPA scoping process, and maintain continuing coordination throughout project development in accordance with the project plan described in (b) below.
- b. Cooperatively with the Project Sponsor and prior to starting the NEPA scoping process, consult the latest published edition of the USCG Bridge Permit Application Guide as well as regulations, orders, and guidance related to the USCG and OA NEPA processes and prepare a project plan for successful completion of the NEPA and Bridge Permit processes. This project plan will serve as a framework for both the OA and USCG throughout the project development process, and should be informed by early engagement meetings between USCG and the OA. The project plan may be integrated with the project’s coordination plan or other project management tools as appropriate. The project plan should:
 - 1. Summarize areas of lead responsibility for the OA and USCG;
 - 2. Identify issues and concerns specific to the project that could affect the Bridge Permit decision;
 - 3. Identify the need for one or more OA and USCG public meetings and hearing opportunities, and consider joint public meetings and hearings where appropriate.
 - 4. Identify the requirements for a complete Bridge Permit application and identify the earliest possible stage of the project that the Project Sponsor should submit

specific Bridge Permit application materials to USCG to allow adequate time for a reasonable review, comment, response, and revision process.

5. Include a project schedule with milestones for document submission and specific time frames for review periods and document turnaround.
- c. Acquire the information necessary to prepare a navigation impact report concurrent with the NEPA alternatives analysis.
 - d. Analyze the navigational impacts of bridge design alternatives and based on this analysis, prepare a navigational impact report concurrent with the NEPA alternatives analysis. The OA will use this information to inform the alternatives advanced for further consideration under NEPA. The OA will consider unreasonable obstruction to navigation as a reason to eliminate alternatives from further consideration in the environmental review.
 - e. When serving as the Lead Agency and prior to the NEPA scoping process, invite USCG to become a Cooperating Agency in the environmental review process. Prepare the appropriate NEPA document(s)—a Categorical Exclusion (CE), Environmental Assessment (EA)/ Finding of No Significant Impact (FONSI), or Environmental Impact Statement (EIS)/ Record of Decision (ROD)— in a manner that satisfies both the OAs' and USCG's NEPA implementing procedures to the maximum extent practicable.
 - f. Provide written notice to USCG and to the relevant regulatory agencies (e.g. U.S. Army Corps of Engineers or the U.S. Fish and Wildlife Service) and associated consulting parties stating that the OA will act as the lead Federal agency on behalf of USCG, as appropriate, for coordination with the U.S. Army Corps of Engineers and compliance with applicable environmental laws. The OA will furnish USCG with a written statement when it concludes all required consultations.
 - g. When new information or facts become known to the OA that may result in a reevaluation or supplemental NEPA document in accordance with the OA's NEPA implementing procedures, share with USCG the new information or facts and results from any reevaluation already developed or additional coordination performed with resource agencies. Where both the OA and USCG concur that a supplemental NEPA document is required, the roles and responsibilities of Lead and Cooperating Agencies will remain the same as for the preparation of the original NEPA document in order to prepare a single supplemental NEPA document that satisfies both the USCG's and OA's NEPA implementing procedures to the maximum extent practicable.
 - h. Work with USCG in reviewing and responding to comments and issues raised by the public during public comment and notice under NEPA and the Bridge Permit application process.

where both the OA and USCG concur that a supplemental NEPA document is required.

- g. Assist the OA and the Project Sponsor in reviewing and updating as necessary the navigational impact report at the completion of the NEPA process.
- h. Where it is necessary for USCG to hold a meeting or public review of the navigational aspects of the proposal following receipt of a complete permit application, the USCG public notice will make reference to the OA environmental documentation and navigational impact report. The USCG notice will limit public comment to the navigation impacts of the proposed bridge.
- i. Determine permit application completeness within the time agreed upon as part of the project plan. USCG will notify the OA as soon as it determines that additional information is required or new information or circumstances arise that will delay a USCG permit decision. For projects subject to 23 U.S.C. § 139, CG will coordinate with FHWA or FTA to determine if the additional information or circumstances would support a no fault certification under 23 U.S.C. § 139(h)(6). When warranted, USCG will provide any information needed for FHWA or FTA to issue the no fault certification.

VII. Issue Resolution Process

- a. Conflict resolution is intended to identify and resolve issues as early as possible and to elevate issues as soon the parties determine that they cannot resolve the issues in accordance with the most current conflict resolution guidance.¹
- b. The OAs and USCG will seek to resolve issues by discussion at the lowest possible organizational level. If an issue cannot be resolved through meetings between the parties that have day-to-day involvement in a project, then project-level staff should notify the appropriate OA, USCG, and Project Sponsor personnel having regional management responsibilities (e.g., USCG District Commander, OA Division or Regional Administrator or Program Official, Executive Director representing the Project Sponsor). Should those further discussions fail to achieve resolution in a timely fashion, the issues should be elevated incrementally to the next organizational level. Such elevation will continue until the issues reach the Secretarial level of each of the Departments with oversight of the agencies involved. Although this process does not supersede the formal issue resolution process for FHWA or FTA projects under 23 U.S.C. § 139(h)(5), it may be used as an alternative to the formal process.

VIII. Limitations

¹ See, e.g., CEQ-OMB Joint Environmental Conflict Resolution Memorandum, signed 9-7-12, DOT Order 5611.1A "U.S. Department of Transportation National Procedures for Elevating Highway and Transit Disputes," or other applicable guidance. See also, 23 U.S.C. § 139(h)(5) for projects subject to the environmental review process under section 139.

- i. Coordinate with the Project Sponsor to review and update as necessary the navigational impact report at the completion of the NEPA process and advise USCG of any new information or facts relevant to the navigational impacts.
- j. In accordance with 23 U.S.C. § 139, FTA and FHWA will work with the Project Sponsor and USCG to provide any additional information necessary for USCG to make its permit decision in a timely manner. FHWA and/or FTA will provide “no fault certifications” when appropriate under 23 U.S.C. § 139(h)(6).

VI. Responsibility of the Coast Guard (USCG)

When a project that is administered by or federally funded under the authority of one or more of the OAs requires a Bridge Permit, it is the responsibility of USCG to take the following actions:

- a. Work closely with the OAs and Project Sponsor in all stages of the project, including planning, development of purpose and need, NEPA scoping, and navigation impact evaluations to ensure that the OA and Project Sponsor are aware of and address the navigational and environmental impacts of the bridge necessary for the USCG to expeditiously process the Bridge Permit application.
- b. Work with the OA and Project Sponsor to develop a project plan for successful completion of the NEPA and Bridge Permit processes. This project plan will serve as a framework for both the OA and USCG throughout the project development process, and should be informed by early engagement meetings between USCG and the OA. Refer to Section V.b. for the project plan content.
- c. Assist the OA and Project Sponsor in acquiring the information necessary to prepare a navigational impact report concurrent with the NEPA alternatives analysis.
- d. Review the navigational impact report and advise the OA and the Project Sponsor as to which bridge designs unreasonably obstruct navigation prior to or concurrent with the NEPA alternatives analysis.
- e. Upon receipt of invitation to become a Cooperating Agency in the environmental review process, promptly provide written acceptance of the appropriate status and work with the OA to prepare environmental documentation that satisfies both the OA's and the USCG's NEPA implementing procedures to the maximum extent practicable.
- f. Review any new environmental information or facts identified by the OA subsequent to the completion of the NEPA documents to determine if the USCG's NEPA requirements necessitate a supplemental NEPA document. To the maximum extent practicable USCG will work with the OA to prepare a single supplemental NEPA document that satisfies both the USCG's and OA's NEPA implementing procedures

- a. Nothing in this MOU is intended to conflict with current law or regulation or the directives of USCG or OAs. If a term of this MOU is inconsistent with such authority, that term is invalid, but the remaining terms and conditions of this MOU remain in full force and effect.
- b. This MOU does not create any right or benefit, substantive or procedural, enforceable by law or equity, against the United States, any party, their officers or employees, or any other person. This MOU does not direct or apply to any person outside the parties to this MOU.
- c. As required by the Antideficiency Act, 31 U.S.C. §§ 1341 and 1342, all commitments made by the parties in this MOU are subject to the availability of appropriated funds and budget priorities. Nothing in this MOU, in and of itself, obligates the parties to expend appropriations or to enter into any contract, assistance agreement, interagency agreement, or incur other financial obligations. Any transaction involving transfers of funds between the parties to this MOU will be handled in accordance with applicable laws, regulations, and procedures under separate written agreements.
- d. This MOU does not limit the signatories from developing agreements for specific procedures and processes to improve efficiencies and effectiveness related to interactions between the agencies to focus on unique issues and concerns in order to facilitate permit decision making and improved project delivery. Any agreements made between the parties in furtherance of this MOU must be consistent with Section II and subject to all of the terms and provisions of this MOU.

IX. Commencement/ Modification/ Discontinuation

This MOU is operative upon the signature of all the parties. This MOU may be modified at any time by the mutual written consent of the parties. Any party may withdraw from this MOU at any time by providing at least 90 days written notice to the other parties.

X. Revocation

This MOU hereby replaces the 1981 *U.S. Coast Guard/Federal Highway Administration Memorandum of Understanding on Coordinating the Preparation and Processing of Environmental Documents* and subsequent amendments.

XI. Points of Contact

United States Coast Guard
Office of Bridge Programs (CG-BRG)
US Coast Guard Stop 7418
2703 Martin Luther King Jr Ave, SE
Washington, DC 20593-7418
202-372-1511

Federal Highway Administration (FHWA)
Office of Planning, Environment & Realty
1200 New Jersey Ave SE
East Building – 7th Floor
Washington, DC 20590
(202) 366-0116

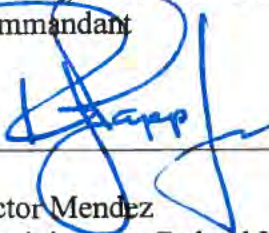
Federal Transit Administration (FTA)
Office of Planning and Environment (TPE)
1200 New Jersey Ave., SE
East Building - 4th Floor
Washington, DC 20590
(202) 366-4033

Federal Railroad Administration (FRA)
Office of Railroad Policy and Development
Office of Passenger and Freight Programs
Division of Environment and Systems Planning
1200 New Jersey Avenue, SE, MS-20
Washington, DC 20590
(202) 493-6381

XII. Signatory Authority

This MOU is approved and authorized on behalf of each party by:

R. J. Papp, Jr.
Admiral, U.S. Coast Guard
Commandant



Date: 14 Jan 2014

Victor Mendez
Administrator, Federal Highway Administration



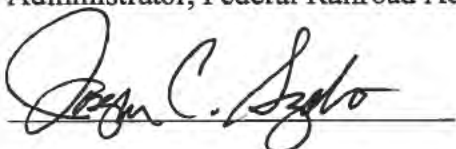
Date: 12/13/2013

Peter Rogoff
Administrator, Federal Transit Administration

A handwritten signature in blue ink, appearing to be 'P. Rogoff', written over a horizontal line.

Date: 12/12/13

Joseph Szabo
Administrator, Federal Railroad Administration

A handwritten signature in black ink, appearing to be 'Joseph C. Szabo', written over a horizontal line.

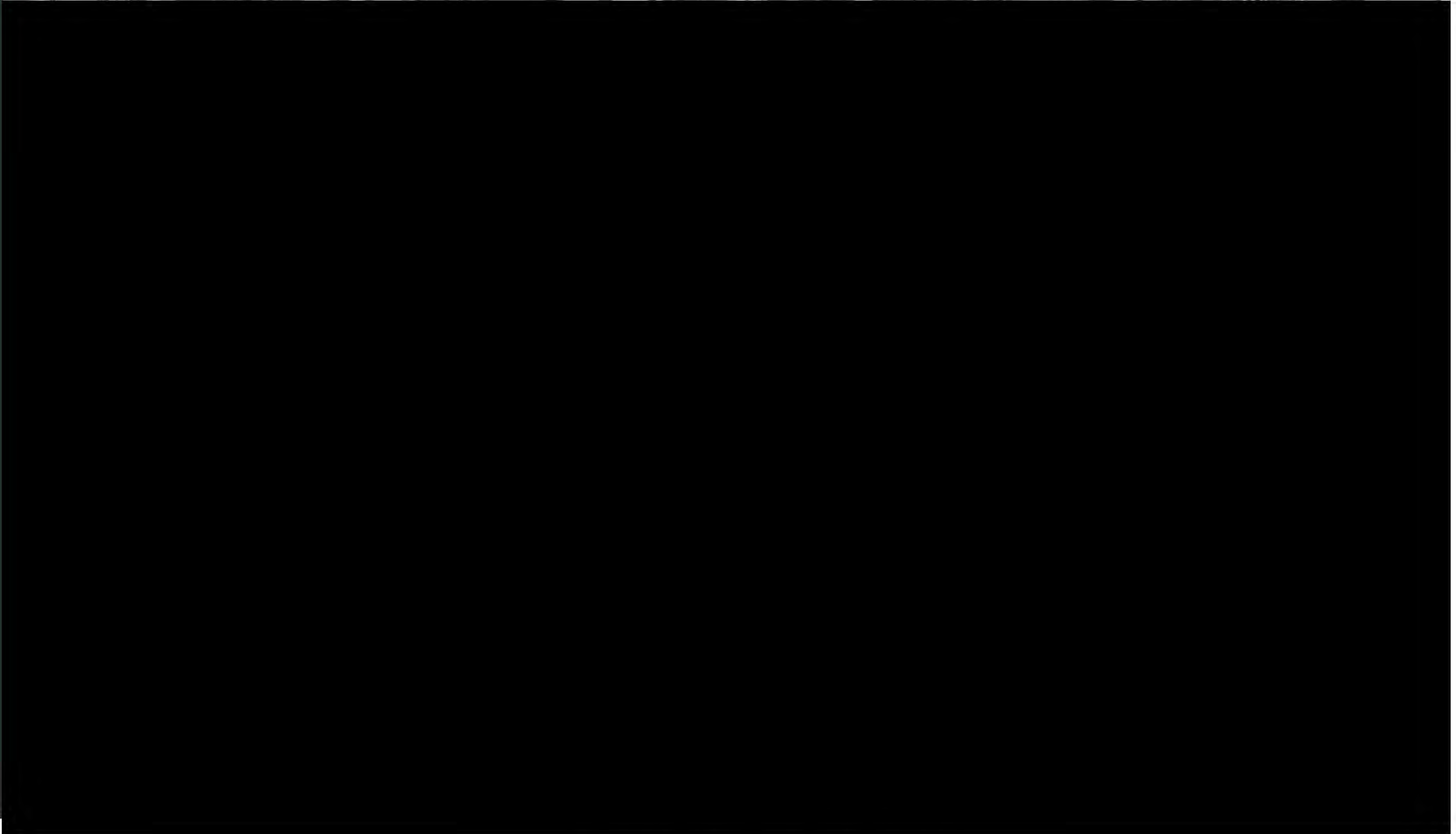
Date: 12/12/13



Bridge Work Notification – Inspections and Repairs

The timely notification of bridge inspections and repairs allows the Coast Guard to notify vessels transiting the waterway. Type or print clearly and e-mail to the Bridge Management Specialist listed above at least fifteen (15) days prior to commencing work. Please note that the Coast Guard needs 90 days notice of projects which require waterway closures.

Bridge Owner and Point of Contact: Massachusetts Bay Transportation Authority/Ben Weinstein		
Address: 10 Park Plaza Boston, MA 02116		
Office Phone:	Cell: [REDACTED]	
Project Description, Bridge Name, Waterway: Lechmere Viaduct Bridge Inspection/Charles River		
Start Date: 01/23/2023	Finish Date: 05/26/2023	Work Hours: 06:00AM to 05:00PM
Work Methods, Reduction of Vertical and Horizontal Clearance, and Impact on Navigation: Lechmere viaduct inspection will occur from a self-propelled barge with a lift. Inspection will occur in each span. Inspection WILL INCLUDE the navigable channel span. When not in the navigable channel the barge will be used to inspect the approach spans. We are providing a wide range of dates to allow for a good weather window but plan to complete the inspection as quickly as possible in several consecutive days. The horizontal clearance on the navigation channel measures approximately 50 ft. The self-propelled barge we will be utilizing to inspect the bridge measures 50 ft x 24 ft. Horizontal clearance will be temporarily reduced while working in the span up to 50% of the width. However, the barge will be able to quickly move from the span to restore 100% of the horizontal clearance for any passing marine traffic. A chart or map of the bridge location, photographs, and/or an elevation view of work locations and the effect of the work on clearances will allow the Coast Guard to provide a faster response.		
Contractor Name and Contact Information: VHB – Steve Dobron – (267) 394-0782		
Vessels on Scene, Location of Vessels, and Radio Frequency Monitored: 50ft x 24ft self-propelled barge. Monitor VHF Channel 9. Barge will be moved throughout the entire bridge site. See attached image.		
24 Hour On-Scene Point of Contact and Cell Number: VHB – Steve Dobron – (267) 394-0782		



Inspection Location Map