WASHINGTON METRORAIL SAFETY COMMISSION

ANNUAL REPORT ON THE SAFETY OF THE WMATA RAIL SYSTEM IN 2021

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LETTER FROM THE WMSC CHAIR

The Washington Metrorail Safety Commission (WMSC) continued its important oversight work in 2021 and is helping the Washington Metropolitan Area Transit Authority's Metrorail system achieve substantial safety improvements through ongoing collaboration, safety audits, inspections, and safety event investigations.

The WMSC's ongoing work regarding the safety of the 7000 Series railcars, including serving as a party to the NTSB-led investigation into an October 12, 2021, Blue Line train derailment has led to some of the most far reaching enforcement action that the WMSC has taken since assuming direct safety oversight of Metrorail in March 2019: The WMSC ordered Metrorail to remove all 7000 Series railcars from passenger service until Metrorail develops and implements a plan, under our oversight, for the safe return to service of each 7000 Series railcar. On an ongoing basis, the WMSC communicates with Metrorail and monitors Metrorail's compliance with its own requirements, such as its return to service plan.

As we continue our work on the important issue of the 7000 Series railcars, we also continue our proactive safety oversight work throughout the Metrorail system through inspections, safety audits and other activities. In 2021, the WMSC issued six audit reports and conducted work on three additional safety audits that will be issued in 2022. These audits identify safety deficiencies that Metrorail is required to address through corrective action plans. For example, these audits identified that Metrorail is not meeting its fitness for duty requirements, not following its own safety certification procedures, and not providing and completing specific required training and inspections in multiple disciplines.

Metrorail also completed implementation in 2021 of 40 corrective action plans (CAPs) that improved the safety of the Metrorail system by addressing safety issues. For example, CAP C0036, resulted in Metrorail prohibiting ROCC managers and leadership from remotely manipulating consoles in the ROCC without coordination with the controllers, and verifying by periodic audit and/or computer-generated reports that uncoordinated remote manipulation has ceased.

Our audit work has found that WMATA lacks adequate coordination and communication across departments. It is important for Metrorail to identify and implement improvements in collaboration with employees at every level. If all of those involved are on the same page and work collaboratively, rather than keeping their concerns and remedies siloed and tightly controlled within their respective departments, they will be more able to develop and implement effective safety improvement ideas while avoiding potential unintended consequences. This collaboration is required under the Safety Management System (SMS) approach embodied in Metrorail's Public Transportation Agency Safety Plan (PTASP).

Conducting all work safely, while continuing to take all reasonable precautions related to COVID-19, helped the WMSC continue this important work with WMATA to continually improve the safety of the Metrorail system for the riders, workers, first responders and others who depend on it.

I would like to thank the governors of Virginia and Maryland, the Mayor of Washington, D.C., the Maryland and Virginia General Assemblies, the D.C. Council, Congress, and the officials in numerous local and federal agencies including the Federal Transit Administration (FTA) who continue to be crucial partners in this effort.

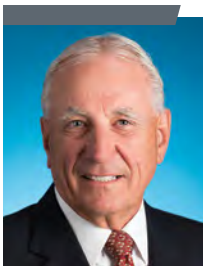
On the following pages we detail the status of Metrorail safety in 2021, describe our ongoing strategies for ensuring that Metrorail continuously improves its safety, outline where Metrorail stands, and discuss future work.

Sincerely,

Christopher A. Hart, Chair

COMMISSIONERS AND CEO

CHRISTOPHER HART
(District of Columbia), Chair



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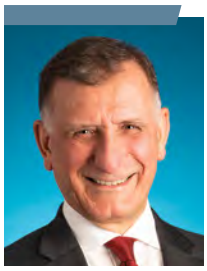

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EXECUTIVE SUMMARY

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Under the oversight of the Washington Metrorail Safety Commission (WMSC), the Washington Metropolitan Area Transit Authority (WMATA) is working towards Metrorail safety improvements that will provide for even higher levels of safety for riders and employees.

This annual status report on the safety of the WMATA Rail System in 2021 outlines WMSC directives and on-going investigations as well as the status of Metrorail's outstanding Corrective Action Plans (CAPs) and Metrorail's other progress towards ensuring continuous safety improvement.

As its State Safety Oversight Agency (SSOA), the WMSC plays a significant role in driving Metrorail safety improvements through audits, safety event investigations, inspections, and oversight of CAPS, safety certification and emergency management. The WMSC issues directives and orders or takes other enforcement action when necessary. The WMSC's priority is the safety of riders, workers and all others who depend on the system's proper maintenance and operations.

The WMSC acted on this responsibility in October and December 2021 through swift orders requiring Metrorail to remove all 7000 Series railcars from passenger service until Metrorail developed and implemented a plan to safely return each railcar to service. The first order in October followed the WMSC's response to the scene of an October 12 Blue Line train derailment between Rosslyn and Arlington Cemetery stations, and subsequent information identified during the National Transportation Safety Board (NTSB) investigation. The WMSC remains an active party to the investigation. The second order in December followed the WMSC's independent oversight identifying that Metrorail was not following its own return to service plan that the WMSC had accepted just two weeks earlier.

The WMSC, guided by its oversight function and its top priority of safety, completed six audit reports in 2021 and conducted work on three other audits that will be issued in 2022. One such audit, of the Revenue Vehicle (Railcar) Program, revealed deficiencies in document control practices, safety certification, and standardized processes to address problems such as those present during the 2020 6000 Series pull-aparts, among other safety issues. For each audit finding, Metrorail is required to develop and implement a corrective action plan that addresses

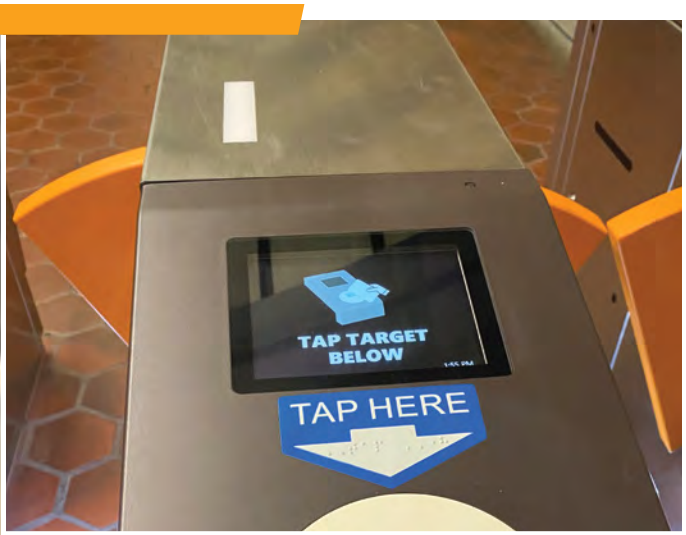
Metrorail has outlined and followed through on plans to address specific safety issues identified in recent years, which led to the closure of 40 corrective action plans in 2021.

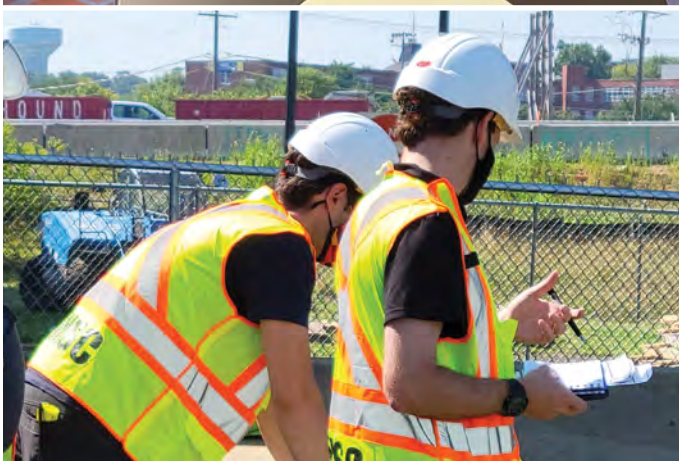
the finding and thereby improves the safety of the Metrorail system. The audits issued in 2021 were:

- Elevated Structures Inspection, Maintenance and Repair
- Roadway Maintenance Machine (RMM) Inspection, Maintenance and Training
- Automatic Train Control (ATC), Signals and Signal Machines Planning, Inspection, Maintenance and Training
- Fitness for Duty Programs
- Revenue Vehicle (Railcar) Programs
- High Voltage and Traction Power Programs

Metrorail has outlined and followed through on plans to address specific safety issues identified in recent years, which led to the closure of 40 corrective action plans in 2021. This is in addition to other safety issues Metrorail addressed through the WMSC's inspections, investigations and other oversight processes, and those actions Metrorail took as a result of safety assurance measures required under its Public Transportation Agency Safety Plan (PTASP).

The WMSC also oversees WMATA's safety certification process which must be used, among other things, for the Silver Line Phase Two extension. WMATA can open the line to passengers only after the WMSC concurs that Metrorail has met the requirements of WMATA's Safety and Security Certification Program Plan (SSCPP) and Metrorail's other written safety commitments. Metrorail's process is designed to identify and mitigate hazards to provide for the highest practicable level of safety. These commitments are one element of Metrorail's PTASP. The PTASP, which Metrorail completed its first annual revision of as required in late 2021, requires a Safety Management System (SMS) approach that involves personnel at all levels and is focused on safety promotion, safety policy, safety assurance, and safety risk management. Full implementation of the PTASP is expected to take several years of continuous improvement.





INTRODUCTION

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The Washington Metrorail Safety Commission (WMSC) is committed to the safety of every person who interacts with the Metrorail system including riders, employees, contractors and first responders. This annual status report on the safety of the WMATA Rail System gives a high-level snapshot of Metrorail's performance in 2021.

To help guide continued progress toward making Metrorail the safest possible system, and as required by law, this report is provided to the Administrator of the Federal Transit Administration, the Governor of Virginia, the Governor of Maryland, the Mayor of the District of Columbia, the Chairman of the D.C. Council, the President of the Maryland Senate, the Speaker of the Maryland House of Delegates, the President of the Virginia Senate, the Speaker of the Virginia House of Delegates, WMATA's General Manager, and each member of the WMATA Board.

The report is also published at **WMSC.gov** to provide an opportunity for the public to understand the independent safety oversight efforts of the WMSC, and the progress Metrorail has made on instituting the federally mandated top-to-bottom Safety Management System (SMS). Additional information about the WMSC's work, including audit reports, inspection reports, official actions, investigation reports, and public meetings is also available at **WMSC.gov**.

7000 SERIES RAILCARS

The WMSC is continuing our active involvement in the National Transportation Safety Board (NTSB) investigation into the October 12, 2021, derailment of a Blue Line train. The WMSC responded to the derailment and customer evacuation of a 7000 Series train between Rosslyn and Arlington Cemetery stations. The NTSB made a determination to lead the investigation. The WMSC became a party to the investigation as described in the WMSC Program Standard.

After the derailment, an examination of the derailed car, car 7200, showed that both wheels had moved outward on the axle that derailed. As a result, Metrorail conducted a special inspection of wheel back-to-back measurements of all 7000 series railcars. Twenty railcars failed that special inspection due to wheels that were too far apart on at least one axle.

Metrorail had not disclosed any prior back-to-back measurement failures to the WMSC as part of the WMSC's frequent, regular interactions and questions about safety issues, or as part of the WMSC's Revenue Vehicle (Railcar) Audit, during which Metrorail provided an open engineering items list for the 7000 Series railcars that did not include this issue. However, the WMSC learned in the days following the derailment that Metrorail had previously identified 21 instances in the 12 months prior to the derailment in which the wheels on 7000 Series railcars were found to be too far apart during routine 90-day inspections, and Metrorail had identified similar back-to-back measurement failures dating back to 2017.

"BACK-TO-BACK" MEASUREMENT: THE DISTANCE BETWEEN THE INSIDES OF THE WHEELS ON A GIVEN AXLE.

Metrorail leaders stated that all railcars that failed the special inspections following the derailment were removed from passenger service. However, the WMSC identified through our independent oversight on October 17, 2021, that Metrorail was operating two trains in passenger service with railcars that had failed these inspections (two railcars total that had failed). The WMSC informed Metrorail, and Metrorail removed those railcars from passenger service.

Later on October 17, 2021, the WMSC ordered Metrorail to remove all 7000 Series railcars from passenger service until Metrorail developed and implemented a plan, under the WMSC's oversight, to safely return each 7000 Series railcar to service.

Metrorail conducted an engineering test and gathered data to support its return to service plan. The WMSC observed critical elements of the engineering test, and independently reviewed available data in addition to other information being gathered as part of the derailment investigation.

As Metrorail developed this plan, the WMSC continued frequent observations of critical parts of Metrorail's engineering test procedure, which WMATA discussed with the WMSC as part of Metrorail's return to service plan.

Following several review and feedback sessions with the WMSC, Metrorail submitted a revised return to service plan on December 11, 2021. On December 14, 2021, the WMSC accepted WMATA's revised return to service plan, and the WMSC reminded Metrorail that it was required to follow its plan, which included specific procedures as well as requirements to keep the WMSC apprised of activities and data.

Metrorail's plan included, among other things, a new procedure for back-to-back measurements, new internal Metrorail checks on these measurements as part of the procedure, and training for all personnel carrying out the new procedure. The procedure specified that frontline technicians could only mark a wheelset as passing if the wheelset was both within the overall required dimensions, and the difference from the last measurement was less than 1/32 of an inch. This limitation ensured that if wheel movement on an axle was measured by frontline technicians, that car would be kept out of service, because the incremental gauge used by frontline technicians permits measurements down to 1/32 of an inch.

Metrorail also included in its plan steps to use a more accurate tool, called a dial gauge, when axles failed using the incremental gauge. In addition, if the measurement increased over two consecutive inspections, the procedure stated that the wheelset would be condemned.

7000 SERIES RAILCARS TIMELINE

October 12, 2021 — Derailment of a Blue Line train. The WMSC became a party to the investigation as described in the WMSC Program Standard.

October 17, 2021 — The WMSC identified through our independent oversight that Metrorail was operating two trains in passenger service with railcars that had failed inspections.

October 17, 2021 — The WMSC ordered Metrorail to remove all 7000 Series railcars from passenger service until Metrorail developed and implemented a plan to safely return each 7000 Series railcar to service.

December 11, 2021 — Metrorail submitted a revised return to service plan.

December 14, 2021 — WMSC accepted WMATA's revised return to service plan.

December 17, 2021 — Metrorail began a phased return of 7000 Series railcars to passenger service in accordance with its plan, which provided for a metered release of railcars.

December 23, 2021 — Metrorail communicated to the WMSC that they had decided to increase the back-to-back measurement frequency to daily rather than every 7 days.

December 29, 2021 — WMSC identified and communicated that Metrorail was not following its return to service plan. Metrorail removed all 7000 Series railcars from passenger service.

December 29, 2021 — WMSC issued an order keeping the 7000 Series railcars out of passenger service until Metrorail provides a revised return to service plan.

More generally, Metrorail's plan increased the scheduled frequency of back-to-back measurements from every 90 days as part of other inspections, to every 7 days as a standalone inspection.

On December 17, 2021, Metrorail began a phased return of 7000 Series railcars to passenger service in accordance with its plan, which provided for a metered release of railcars to demonstrate the plan could be executed safely and effectively.

On December 23, 2021, Metrorail communicated to the WMSC that they had decided to increase the back-to-back measurement frequency to daily rather than every 7 days.

The WMSC conducted oversight of Metrorail's implementation of the plan. This included observing inspections being conducted on the railcars overnight and reviewing documents and data that were provided to the WMSC or that the WMSC accessed directly in Metrorail systems.

On December 27, 2021, Metrorail made changes to the back-to-back procedures without communication to the WMSC. The WMSC's oversight identified that Metrorail was not following its return to service plan and that Metrorail had placed railcars into passenger service that did not meet the safety requirements specified in its return to service plan.

The WMSC identified that at least 5 of the 40 7000 Series railcars that were operating in passenger service had measured wheel movement of at least 1/32 of an inch. Under Metrorail's return to service plan, these railcars were not permitted to be in service.

The WMSC identified that Metrorail's changes would have discontinued use of the more accurate dial gauge and allowed railcars to pass inspection even if Metrorail had measured wheel movement on the axle. Metrorail's accepted plan did not allow any detected movement.

Metrorail had separately submitted a request and supporting documentation on December 21, 2021, related to the planned use of a digital dial gauge to conduct at least some back-to-back measurements. The WMSC acknowledged this request, and emphasized on December 22, 2021, that all governing procedures, protocol, instructions and training would need to be revised to reflect a change to a new tool, that training would need to be conducted, and that, as Metrorail's plan stated, no railcar would be released for passenger service without passing the required inspections. The entirety of this communication about the digital dial gauge was prior to the date of any signatures on Metrorail's back-to-back inspection procedure revision dated December 27, 2021 and did not add any reference to the use of this digital dial gauge tool.

Compared to the procedure that the WMSC accepted on December 14, 2021, this "Revision 2" also completely removed the use of the dial gauge, the more accurate measuring tool. "Revision 2" would have relied solely on use of the less accurate incremental gauge. This revision was not submitted to, or discussed with, the WMSC. Consequently, Metrorail did not follow its return to service plan.

After the WMSC advised WMATA on December 29, 2021, that it had railcars operating in passenger service that were not permitted to be in service under Metrorail's return to service plan, Metrorail removed all 7000 Series railcars from passenger service.

Shortly thereafter the WMSC issued an order on December 29, 2021, keeping the 7000 Series railcars out of passenger service until Metrorail provides a revised return to service plan. This plan must meet the requirements of our orders, including specific additional protections and internal oversight, and revised inspection frequency and any other criteria based on all available data.

The WMSC consistently and clearly communicated with Metrorail regarding WMATA's plans, required under our order, to safely return each 7000 Series railcar to passenger service.

The WMSC's oversight identified that Metrorail was not following its return to service plan and that Metrorail had placed railcars into passenger service that did not meet the safety requirements specified in its return to service plan.

AUDITS

AUDITS

The WMSC audits each element of Metrorail's Public Transit Agency Safety Plan at least once every three years. During 2022, the WMSC will complete its first triennial cycle of audits. These safety audits are based on information gathered through extensive reviews of documents, data, and recordings as well as in-depth interviews with Metrorail frontline and managerial personnel. The purpose of this audit work is to review Metrorail's policies and procedures and Metrorail's compliance with its policies, procedures or other requirements, and to identify deficiencies and hazards to improve the safety of riders and personnel. The WMSC also highlights positive practices that are identified in each audit.

Although the WMSC identified several positive practices, the WMSC's detailed audit work resulted in the issuance of findings and recommendations requiring Metrorail to develop corrective action plans (CAPs) for each area examined. These audits take time to complete, consequently the reports of some audits initiated in 2020 were published in 2021, and some audits initiated in 2021 will be published in 2022.

FITNESS FOR DUTY PROGRAMS – AUGUST 31, 2021

SCOPE: This audit assessed Metrorail's fitness for duty responsibilities and programs such as fatigue and alertness management, medical and physical requirements, and medication, drug and alcohol programs.

The audit identified safety deficiencies in Metrorail's fitness for duty programs, including issues identified in

previous audits and reviews that Metrorail has not yet addressed, which pose safety risks to customers and others who rely on or work in the Metrorail system. For example, Metrorail cannot reasonably ensure that its employees and contractors who are conducting safety sensitive duties are free from impairment that could cause incapacitation. Such impairment has contributed to accidents in other rail systems. Metrorail is not conducting physical examinations required by its policies for safety sensitive employees, and Metrorail does not track when these physicals are due to occur. This creates a risk that safety sensitive employees are operating trains with undiagnosed or untreated conditions such as diabetes, hypertension and obstructive sleep apnea that, when not properly managed, increase the risk of loss of consciousness. These conditions are treatable, but Metrorail is not following its written procedures and policies that require regular monitoring to significantly mitigate this risk through the physical exam process and WMATA's fatigue management policy.

During this audit, WMATA withheld required information from the WMSC and did not provide information related to Metro Transit Police Department (MTPD) Officers as required by federal regulation, the WMSC Compact, and the WMSC Program standard until the WMSC issued a notice of noncompliance to Metrorail.

The 11 findings included that:

- Metrorail ignores the minimum daily release period (rest period) requirements in its Fatigue Risk Management Policy.
- WMATA does not have written criteria for post-incident testing and does not consistently implement post-event testing.
- Metrorail allows employees to use tools that have not gone through any safety review or approval process. WMATA does not have procedures to confirm that employees are consistently removed from service for positive drug and alcohol test results in a timely manner as required by federal regulations.
- WMATA does not have a documented procedure for and training to carry out fitness for duty checks prior to or during shifts on a regular basis for all covered employees as specified in the APTA Fitness for Duty Standard.

The four recommendations included:

- Metrorail is not providing medical oversight of contractors and does not include any requirement in contracts that contractors meet WMATA medical, fatigue or hours of service standards.

As of May 1, 2022, all CAPS related to fitness for duty remain open. The WMSC will continue to monitor progress on completion.

AUTOMATIC TRAIN CONTROL (ATC), SIGNALS AND SIGNAL MACHINES PLANNING, INSPECTION, MAINTENANCE AND TRAINING – MAY 12, 2021

SCOPE: This audit assessed Metrorail's Automatic Train Control (ATC) and signaling system inspection, maintenance, engineering and training practices, management structures, staffing, planning and governance. The ATC system provides critical safety protections for train movement and roadway workers.

Findings included that Metrorail has not adequately trained employees on safety procedures to ensure that all employees fully understand their roles with respect to safety.

Other audit findings included:

- Metrorail has continued efforts to return to Automatic Train Operation without following its safety certification procedures.
- WMATA is not conducting all inspections and maintenance required by its ATC manuals and ATC manuals have incorrect or incomplete information and outdated references.
- Metrorail allows employees to use tools that have not gone through any safety review or approval process.
- Metrorail does not have a standardized determination of which preventative maintenance work must be prioritized as critical.

As of May 1, 2022, two CAPs related to the ATC Audit have been closed. The remaining CAPs are scheduled for completion in 2022 and 2023.

REVENUE VEHICLE (RAILCAR) PROGRAM – SEPTEMBER 14, 2021

SCOPE: This audit covered Metrorail's activities related to railcars, including regular maintenance and engineering as well as rehabilitation and overhauls.

The audit identified that Metrorail did not follow its safety certification processes for the 6000 Series rehabilitation and overhaul project. Safety certification is designed to ensure that hazards are addressed or mitigated prior to a safety event, such as the two 6000 Series train pull-aparts that occurred in fall 2020 involving trains that were carrying passengers. This and other findings related specifically to Metrorail's work on the 6000 Series railcars are described in more detail later in this report.

Others of the audit's 12 findings included:

- Metrorail does not require or receive all necessary OEM documentation, parts or tools.
- The 7000 Series rehabilitation and subsystems overhaul program is being developed without full SAFE coordination, involvement or approval.
- Metrorail does not have adequate document control practices for car maintenance job plans.
- Metrorail does not have a systematic process to ensure that mechanics and engineers are trained for specific tasks they are assigned to perform.
- Metrorail does not consistently follow a standard process to address wheels out-of-round, to prevent railcars with wheels out-of-round from operating, and to identify and address the root causes of wheels out-of-round.

The audit included three recommendations:

- Metrorail railcars do not include inward- and outward-facing audio and image recorders in all operating compartments.
- Part numbers are not being consistently entered in Maximo Work Orders for 7000 Series railcars.
- Some WMATA job descriptions have not been reviewed in more than 20 years.

As of May 1, 2022, one CAP related to the Railcar Audit has been completed and 13 remain open.

HIGH VOLTAGE AND TRACTION POWER PROGRAMS – OCTOBER 27, 2021

SCOPE: This audit assessed Metrorail's high voltage and traction power systems and involved a broad review of engineering, inspection and maintenance programs, as well as upgrades and rehabilitation.

The eight findings included:

- Metrorail is not complying with its safety certification and approval requirements that are specified in its SSCPP before installing and placing traction power systems into service.
- Metrorail is not documenting, tracking and conducting all preventive maintenance inspections that are required by WMATA policy, manuals and instructions.
- Metrorail is relying on vital traction power equipment that is beyond its useful life and has not fully followed through on implementation of prioritized renewal plans to ensure a state of good repair.
- There is inadequate awareness, documentation, interdepartmental coordination, training and supervisory oversight to ensure knowledge of and compliance with documented procedure.

Recommendations included:

- Metrorail does not have a policy, process or procedure to ensure effective prioritization of corrective maintenance work orders.
- Metrorail risks equipment quality and availability issues that impact operational safety due to gaps in materials tracking, storage, and procurement practices.

As of May 1, 2022, all twelve CAPs related to the High Voltage and Traction Power Audit remain open.

RMMs are vehicles that move on the rails but are not designed to carry customers.

AUDIT OF ROADWAY MAINTENANCE MACHINE (RMM) INSPECTION, MAINTENANCE AND TRAINING – MARCH 9, 2021

SCOPE: This audit of Metrorail's Roadway Maintenance Machine (RMM) inspection, maintenance and training assessed Metrorail's programs related to all hi-rail or rail-bound machines other than shuttle wagons and track maintenance small equipment.

RMMs are vehicles that move on the rails but are not designed to carry customers. RMMs range from the basic, like flatcars used to carry tools, materials or equipment to a work site, to complex equipment such as the heavy-duty tamper used to maintain track geometry.

The 14 findings included:

- Metrorail is not following and does not have effective safety certification and acceptance procedures for new RMMs. There is no Metrorail-wide safety certification procedure to implement the Safety and Security Certification Program Plan (SSCPP).
- Metrorail does not always follow safety certification or safety approval process requirements for modifications to existing RMMs.
- Metrorail is not following its engineering change procedures.
- Equipment operators are not fully trained on each type of vehicle they may be directed to operate. Some training has not included sufficient hands-on experience.
- Equipment operator certifications for specific vehicles do not expire or require recertification.

All CAPs related to the RMM Audit are closed. The WMSC will continue to monitor the effectiveness of implemented CAPs through our regular inspection activities.

AUDIT OF ELEVATED STRUCTURES INSPECTION, MAINTENANCE AND REPAIR – JANUARY 25, 2021

SCOPE: This audit assessed Metrorail's programs related to bridges and other elevated structures throughout the Metrorail system with special emphasis on the Minnesota Ave Station aerial structure, the Yellow Line Charles R. Fenwick Bridge over the Potomac River, and the National Airport elevated structure.

The 12 audit findings included:

- Metrorail departments involved in structures inspections and maintenance operate in unacceptable silos, which creates safety risk.
- Metrorail does not have load ratings for its bridges and aerial structures.
- Metrorail has not clearly assigned responsibility for the Structural Inspection Manual and has not set a timeline for review of the manual.
- A new Structural Inspection Manual was made effective without any associated training for the employees responsible for implementing it.

This audit also included a repeat recommendation to Metrorail to assess the need to incorporate replacement or mitigation plans for rocker bearings on 10 structures into long-term capital projects on those bridges given the risk of failure in a seismic event. The Tri-State Oversight Committee issued a similar recommendation in 2010.

As of May 1, 2022, four CAPs related to the audit have been closed, with the remaining CAPs scheduled to be completed by the end of 2023.

ONGOING AUDIT WORK INTO 2022

AUDIT OF EMERGENCY MANAGEMENT AND FIRE AND LIFE SAFETY PROGRAMS – FEBRUARY 22, 2022

SCOPE: This audit evaluated Metrorail's programs, procedures and equipment related to emergency management and fire and life safety. This audit included physical assets such as standpipes and emergency egress paths or shafts as well as other critical aspects of emergency management such as emergency procedures and communication.

Findings from this audit included:

- Metrorail does not consistently follow the incident command system (ICS) structure and has procedures that do not comply with National Incident Management System (NIMS)/ICS requirements such as the use of plain language. Further, Metrorail's training requirements are insufficient to prepare personnel to respond to and/or manage emergencies within the NIMS/ICS framework. These deficiencies have contributed to ineffective and improper emergency response and emergency management.
- MTPD personnel routinely enter the roadway despite not having RWP qualifications required by Metrorail rules and procedures, exposing themselves and others to the risk of serious injury or death.
- Metrorail's calls to public safety answering points (911 call centers) are inconsistent, incomplete and contribute to delayed or ineffective emergency response.
- Metrorail does not ensure that experts in fire and life safety are included in and have a documented role in Metrorail project development, planning, review and approvals, which contributes to hazards being introduced into the Metrorail system or hazards being allowed to continue to exist without adequate mitigation.

MTPD personnel routinely enter the roadway despite not having RWP qualifications required by Metrorail rules and procedures, exposing themselves and others to the risk of serious injury or death.

The five recommendations included:

- Metrorail has opportunities to improve and expand training and training coordination related to fire and life safety and emergency management.
- Metrorail's organizational structure contributes to mismatches between fire and life safety and emergency management personnel and their responsibilities.

AUDIT OF RAIL OPERATIONS – APRIL 7, 2022

SCOPE: This audit evaluated rail operations and the personnel directly involved in railcar (Class 1 vehicle) movement both on mainline and in the rail yards, as well as station managers and station operations. This includes interlocking operators, train operators, station managers, rail supervisors, and other associated management, training and quality assurance personnel and practices.

Findings from this audit included:

- Elements of Metrorail have a culture that accepts noncompliance with written operational rules, instructions, and manuals.
- Metrorail does not effectively identify, track, communicate and address operational hazards as required by its Agency Safety Plan.
- Metrorail creates safety risk by not requiring and conducting territory familiarization and physical characteristics training, and not assessing knowledge of physical characteristics prior to assigning operations personnel work on a line, in a terminal or in a yard.

The four recommendations included:

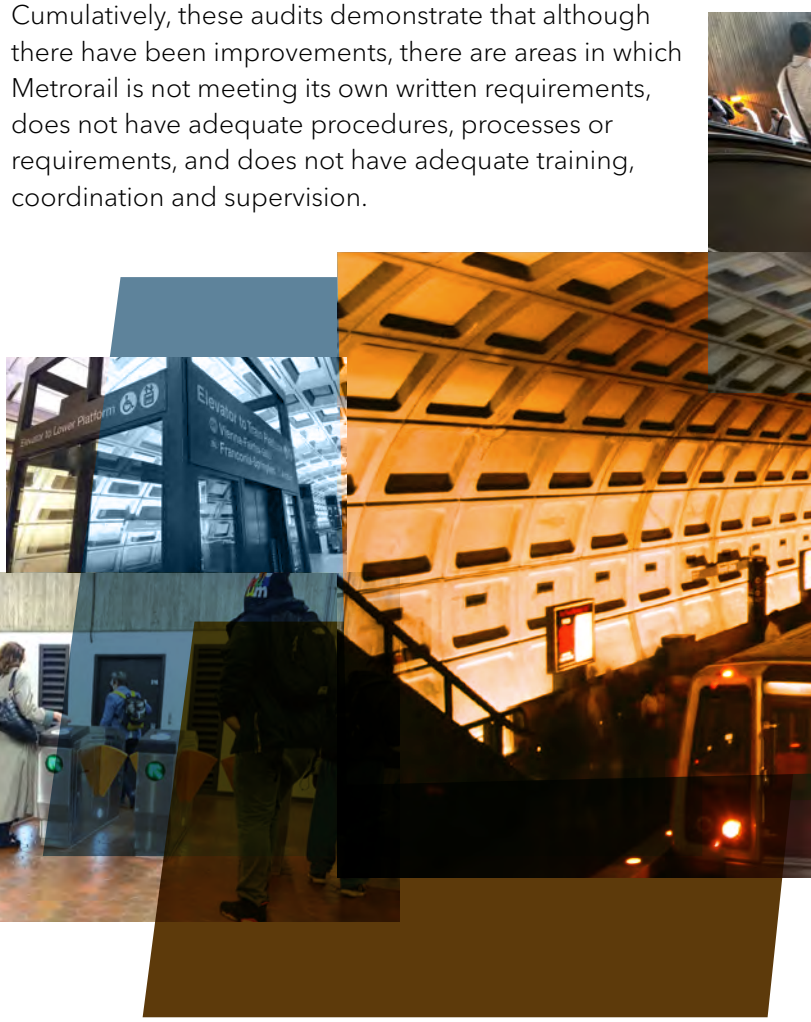
- Metrorail operations departments do not have effective processes to consider and act upon safety input from employees at all levels of the organization.
- Metrorail has an opportunity to improve training by assigning dedicated instructors to each division.

Elements of Metrorail have a culture that accepts noncompliance with written operational rules, instructions, and manuals.

STATION MAINTENANCE, ELEVATOR AND ESCALATOR AUDIT

SCOPE: This audit examined WMATA's station maintenance, elevator and escalator programs. Station maintenance includes ground maintenance, custodial services and station rehabilitation at Metrorail's 91 stations, while elevator and escalator programs include maintenance, engineering, special projects and capital improvement projects for WMATA's more than 300 elevators and 600 escalators.

Cumulatively, these audits demonstrate that although there have been improvements, there are areas in which Metrorail is not meeting its own written requirements, does not have adequate procedures, processes or requirements, and does not have adequate training, coordination and supervision.



The WMSC's first triennial cycle of safety audits concludes in spring 2022. This means that the WMSC will have audited all elements of Metrorail's safety plan and will then begin the next three-year cycle of audits. The WMSC will continue to conduct these audits on an ongoing basis over the three-year period as specified in the WMSC Program Standard to provide for the appropriate depth of review in each area.

CORRECTIVE ACTION PLANS

After the WMSC issues findings, Metrorail must develop and implement Corrective Action Plans (CAPs) to resolve the issues and reduce the risk of future safety events. The WMSC closed 40 CAPs in 2021 based on Metrorail completing those plans.

Because their purpose is to improve safety, the existence of one or more CAPs is not necessarily a negative thing. The goal, however, is to be proactive instead of reactive in corrective action development to prevent major safety events. Consequently, it is crucial that Metrorail expeditiously addresses findings in a manner that creates lasting change.

Metrorail submits proposed CAPs to the WMSC for review so the WMSC can ensure that the plans, when fully and properly implemented, will fully address the finding. Once the WMSC approves a CAP for implementation, Metrorail must carry out the plan. When the plan is complete, Metrorail submits a detailed request to close the CAP including evidence of completion for WMSC review. The WMSC monitors implementation of the CAP and closes the CAP once WMATA has shown that it has been fully completed.

Even after CAPs are closed, the WMSC continues its oversight to ensure that the plans remain implemented and effective as intended, in accordance with WMATA's responsibility to maintain safety improvements long-term.

In some cases, including very large-scale capital projects or organizational culture changes, finishing a corrective action plan can take a significant amount of time. In other cases, Metrorail will be able to completely address the issue within a few weeks or months.

Some corrective action plans approved for implementation in 2021 address safety gaps in:

- Metrorail's intrusion detection warning systems that are designed to prevent a collision and stop train traffic in the event, for example, a freight or commuter rail train or work equipment operating in a common corridor with tracks parallel to the Metrorail tracks were to enter Metrorail's roadway.
- Metrorail's radio communications systems in rail yards and shops.
- Metrorail's lack of rules, control and oversight related to vehicle and switch movement in non-signalized (dark) territory.
- Metrorail not consistently following its safety certification process, which leads to project activation and use without proper hazard identification and mitigation, putting Metrorail customers, personnel and first responders at risk.

In addition to corrective action plans to address findings from WMSC audit reports, the WMSC also required Metrorail to develop the four other corrective action plans noted above in 2021. In total, there are 99 open CAPs as of May 1, 2022, and others still in development (see appendix A).

Metrorail submits proposed CAPs to the WMSC for review so the WMSC can ensure that the plans, when fully and properly implemented, will fully address the finding.

Corrective actions identified as part of safety event investigation reports are tracked as Recommended Corrective Actions (RCAs), as specified in the WMSC's Program Standard. For events that occurred in 2021 with WMSC-adopted investigation reports, Metrorail has documented completion of approximately 42 percent of the RCAs.

RCAs initiated in 2021 but not yet complete include changes to Metrorail's rulebook and Roadway Worker Protection (RWP) program following deficiencies identified in multiple safety event investigations, including both interim steps such as increased compliance checks and initial revisions, and long-term processes to overhaul the existing policies, procedures and training.

Specific examples of rulebook revisions associated with investigations as an RCA are that the Safety Department will ensure procedures are established and implemented for the use of self-propelled work vehicles – prime movers – to set up work areas and will ensure there are clear policies and procedures that are followed related to the safety of piggybacking work crews.

Metrorail has committed to completing an assessment of its RWP program as a whole in the first half of 2022. Metrorail is also developing improvements to the way it identifies and maintains the list of "hot spots" where additional roadway worker protection is required. Metrorail has laid out a schedule for improvements that includes implementation of the rulebook revisions by summer 2023, and additional RWP-focused implementation through 2024.

The WMSC will continue to monitor these safety improvements as Metrorail develops the broader RWP and rulebook revisions.

Metrorail also executes internal corrective action plans to address findings from the Department of Quality Assurance, Internal Compliance and Oversight (QICO), and WMATA's Office of Inspector General (OIG).

Both QICO and the OIG can play important roles in the identification of safety risk from within WMATA through audits and reviews, and it is important that WMATA leaders continue to value and prioritize the work and findings of both QICO and the OIG.

SAFETY EVENTS

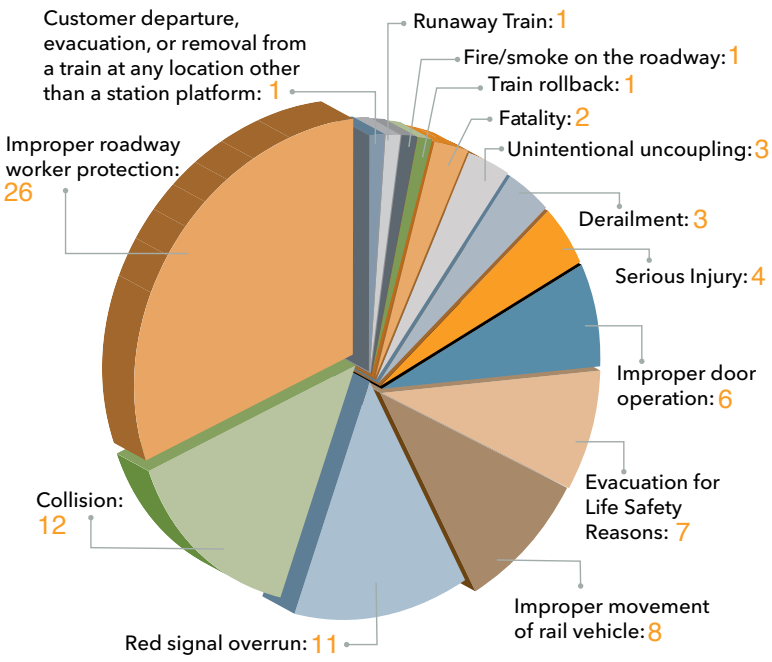
The October 12, 2021, Blue Line derailment described earlier in this report and the associated investigation led to the broadest effect on Metrorail riders of any event in 2021 and the first NTSB investigation of a Metrorail accident since the 2015 smoke accident near L'Enfant Plaza Station.

Other significant safety events in 2021 included a March 26, 2021, runaway train event that was only identified due to the WMSC's independent oversight, and several investigations into improper roadway worker protection events. The WMSC also completed investigations in 2021 into important safety events that occurred in late 2020, such as two 6000 Series train pull-aparts that occurred on the Red Line. These events are summarized below in more detail. Complete safety event investigation reports are available at **WMSC.gov/reports**.

Metrorail reported 662 total safety events to the WMSC in 2021

Some of the Most Common Safety Events

86 Final Investigation Reports
by event type



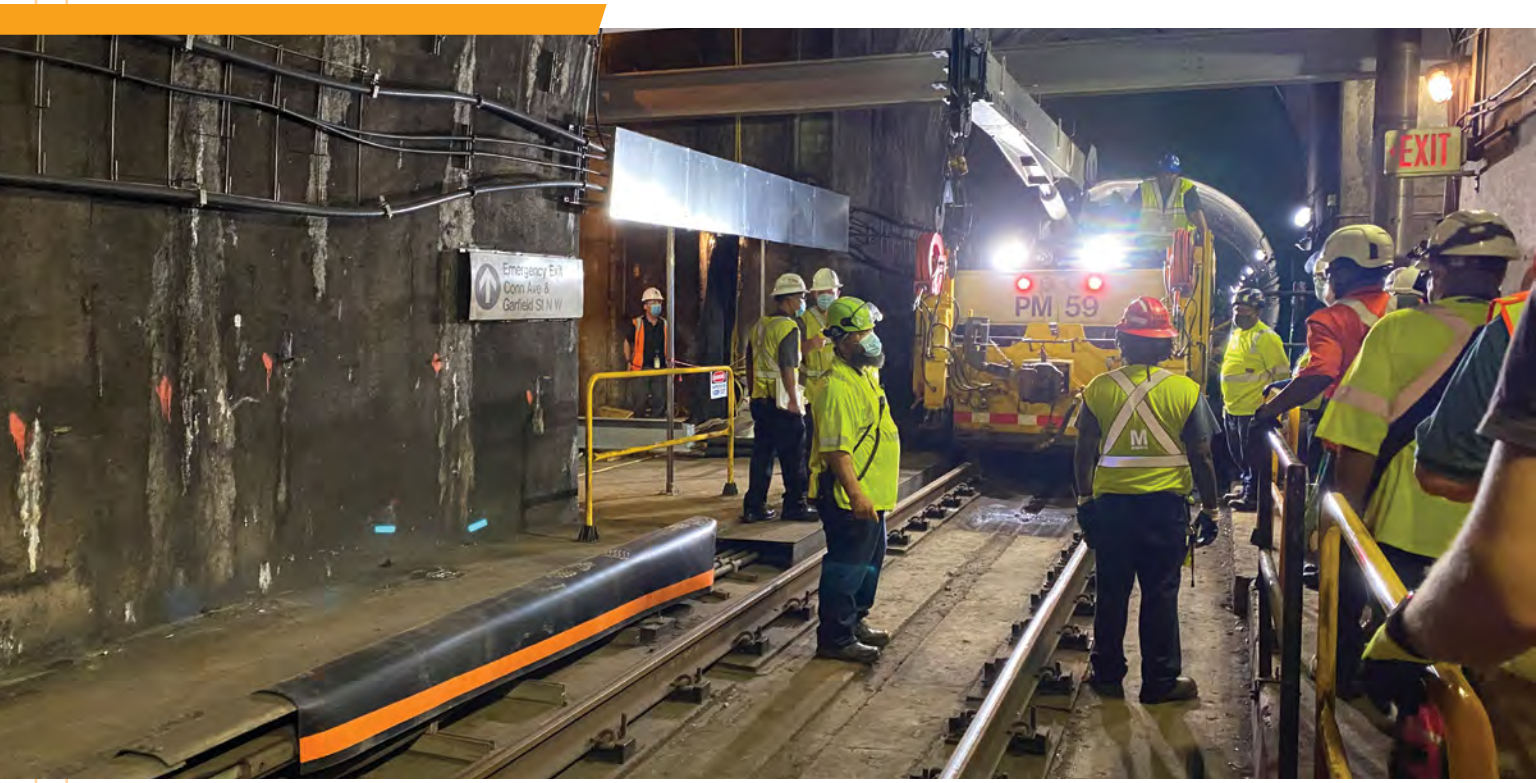
Overall, Metrorail reported 662 total safety events to the WMSC in 2021. The WMSC Program Standard defines events that are formally reportable to the WMSC as either an accident, incident or occurrence. Investigations are required to be conducted on events that may have broader safety implications, and the WMSC Program Standard requires that certain investigations be documented in a final report for WMSC adoption. These requirements are based on FTA regulations and WMSC operational experience. As described above, corrective actions identified during safety event investigations are implemented and tracked through the Recommended Corrective Action (RCA) process.

In 2021, the WMSC adopted 86 final safety event investigation reports.

Runaway Train

On March 26, 2021, a safety event near Rhode Island Ave. Station occurred involving a customer evacuation and a runaway 7000 Series train that was only identified and investigated due to the WMSC's robust independent oversight.

After a prolonged period of unsuccessful troubleshooting of a disabled train near Rhode Island Ave. Station, limited communication with riders, and delays in calling 911 for potential assistance with a



controlled evacuation, two customers self-evacuated. Metrorail personnel notified the ROCC of the self-evacuation, but third rail power was not de-energized as required by Metrorail safety procedures. Third rail power was eventually de-energized and the other customers were safely walked-through another train back to the station platform.

Just after the evacuation was completed, inadequate communication, procedures and training led to the train rolling away on its own as Metrorail prepared to move it using another train as a recovery train.

The WMSC's Program Standard and FTA regulation define a runaway train as a vehicle in motion that is not under the control of an operator regardless of whether the operator is physically on the vehicle at the time. In this case, the train rolled approximately 137 feet.

Metrorail as an organization did not identify or report this runaway train to the WMSC or to the FTA as required by the WMSC Program Standard and federal regulation. The WMSC identified this event through our independent oversight and access to Metrorail systems and data and required Metrorail to report the event to the WMSC and FTA. Due to the WMSC's oversight, this event was investigated, and corrective actions were identified to reduce the risk that a similar event and response occur in the future.

As a result of this event Metrorail developed 12 RCAs, including:

- Develop Service Bulletin SBF (7000 Series procedure for checking battery System Circuit Breaker Terminal Bolts). Conduct a fleet inspection during periodic inspection and submit additional terminal bolt findings to Kawasaki for action.
- Reinstruct Rail Traffic Controllers on recovery operations, including taking into consideration track physical characteristics such as track grade.
- Conduct a Failure Mode, Effects & Criticality Analysis (FMECA) to determine the impacts of load shedding during emergency events and mitigate high hazard findings to ensure continued communication with customers.
- Explore providing direct railcar troubleshooting from CMNT personnel rather than through ROCC personnel. Troubleshooting guidance should include road mechanic experience and be provided in real time while CMNT personnel are responding to the scene. Note that the response time could be impacted by systems delays which are the result of the emergency.
- Include how to check and reset circuit breakers on the down car in the 7000 series troubleshooting guide.

- Provide guidance on the proper process to report safety events.
- Standardize how emergencies are communicated to 911 services by ROCC personnel, including using common phrases that do not rely on WMATA terminology that may be misunderstood.

Pull-Aparts

Two pull-apart events involving 6000 series trains occurred on **October 9, 2020** and **November 24, 2020**. The investigations were completed in 2021.

These investigations, and related findings in the WMSC's Revenue Vehicle (Railcar) Audit, demonstrated deficiencies in communication, coordination, training and procedures related to the railcars themselves and to Metrorail's emergency preparedness and response.

Some of the findings and corrective actions resulting from these events included:

Railcar Audit findings:

- Metrorail's 6000 Series Rehabilitation program, including coupler overhaul work, was implemented by CMOR, CENV and CMT without safety certification and approvals required by WMATA's SSCPP.
- SAFE-approved SMP documentation that was incomplete and that did not match approved forms, and Metrorail did not comply with safety certification requirements defined in the SSCPP.
- 6000 Series cars that underwent rehabilitation were put into service without SAFE approval.
- Metrorail removed the coupler overhaul from the 6000 Series SMP process without documenting that change or completing a review of that change by the SCRC.

RCAs included:

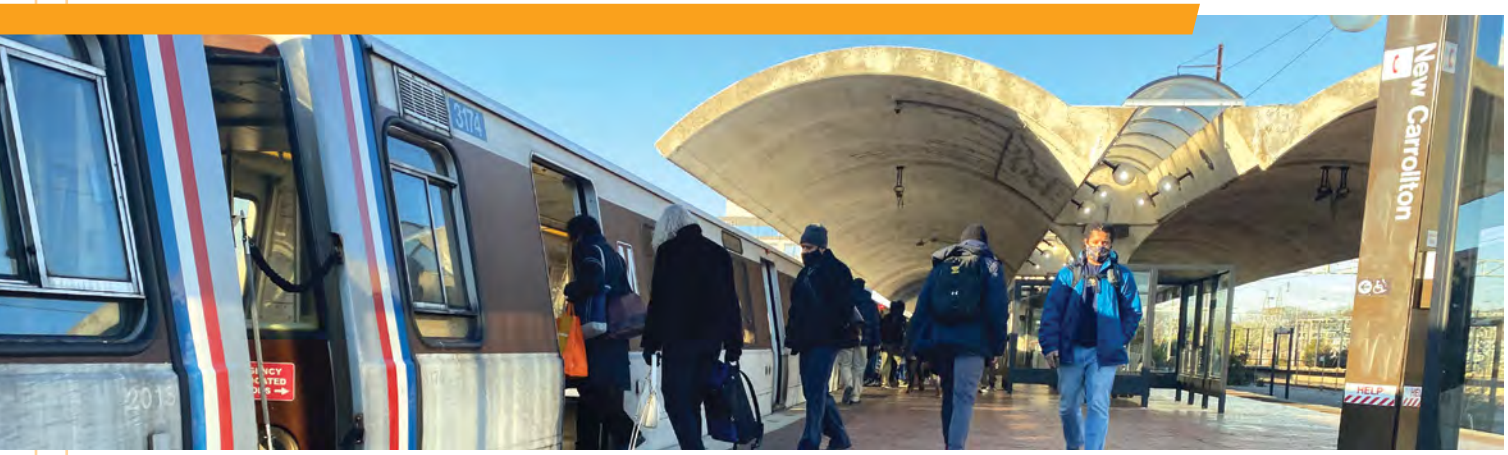
- Revise the 6000 series PI procedure to require visual inspection of couplers and fasteners.
- Develop and institute a quality assurance process to ensure correct fasteners are utilized during the overhaul process.
- Develop a Quality Compliance Group for CENV, whose primary responsibilities shall be auditing CMOR shop practices and policies.
- Revise the 6000 series PI procedure to require physical vertical movement of coupler horn to identify play in the gland nut and require a visual inspection of couplers and fasteners to include gland nut threads.

Roadway Worker Protection

The WMSC has identified several safety concerns related to Metrorail's Roadway Worker Protection (RWP) program and the program's implementation, including repeated issues with performance, fatigue, training and adherence to established procedures. Improper roadway worker protection was the subject of 26 final safety event investigation reports adopted by WMSC Commissioners in 2021. Investigations into other events continued into 2022. Examples of these serious safety events and near misses include:

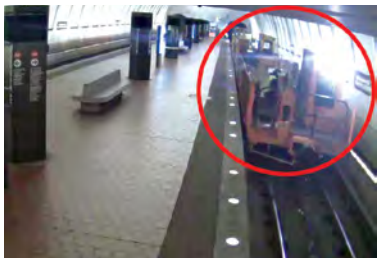
- On **January 18, 2021**, an Advance Mobile Flagger (AMF) assigned to warn Red Line train operators of track inspectors on Track 2 between Takoma Station and Fort Totten Station positioned themself at the wrong end of the Takoma Station platform. A Train Operator was therefore not warned of work crews on the roadway and proceeded as if there were no workers on the tracks ahead. The work crew urgently moved to a place of safety as the train approached. Upon seeing personnel on the roadway, the Train Operator stopped the train and notified the ROCC.

Improper roadway worker protection was the subject of 26 final safety event investigation reports adopted by WMSC Commissioners in 2021.



- On **December 12, 2020**, a Traction Power Maintenance (TRPM) crew entered a Tie-breaker Station to avoid being hit by a prime mover near Fort Totten Station. A rail traffic controller granted foul time protection to the TRPM crew just before a shift turnover in the ROCC. While the crew was still on the roadway, a different controller who had taken over the desk gave permission to the equipment operator of the prime mover to move through the area where the work crew was under foul time protection, creating a near-miss event.

- On **April 9, 2021**, two improper RWP events occurred at Tenleytown Station. The first event occurred when an Office of Track and Structures (TRST) Roadway Worker in Charge (RWIC) was establishing a work zone and directed the Equipment Operator they were aboard a Prime Mover (PM) vehicle with to travel beyond the RWIC's working limits into another occupied work zone. This was the result of a miscommunication between the RWIC and the ROCC Rail Traffic Controller (RTC). The RWIC intended to use a hot stick to verify that third-rail power had been de-energized where his personnel would be working, prior to them entering the roadway. The RTC provided the RWIC with starting and ending chain markers and the RWIC understood that to mean they were required to hot stick and confirm that third-rail power was de-energized at both of those chain marker locations, one of which was outside working limits. However, the requirement was only that hot sticking be performed in an area anywhere within the given chain marker limits.



(A *chain marker* is a survey marker used to identify specific locations along the roadway in a similar way that mile markers are used along a highway).

During the investigation into this improper movement and associated improper roadway worker protections, a separate improper roadway worker protection event that contributed to the event described above was identified involving the Plant Maintenance (PLNT) crew in the work zone that the prime mover crew inadvertently entered. Investigators found that the crew in that work zone had not properly set up their work location with required shunts, lights and work mats to provide protection against improper movement into the work zone, which contributed to the encroachment event. Placement of the shunts would have indicted to the TRST RWIC and Equipment Operator that the area they were entering was occupied. The ROCC RTC who allowed the PLNT crew to work without proper protection was unfamiliar with the hazards and characteristics of the work location, including the absence of handrails at the vent and emergency shaft which made those parts of the roadway unsafe without proper protection.

As described earlier in this report, safety improvements are required as part of the investigation reports adopted in 2021, and Metrorail is implementing these through the Recommended Corrective Action (RCA) process specified in our Program Standard.

SILVER LINE PHASE TWO

In 2021, Metrorail and the Metropolitan Washington Airports Authority (MWAA) made progress toward completion of the Silver Line Phase 2 project, which will extend the Silver Line from Wiehle-Reston East Station through Dulles International Airport to Ashburn Station.

The WMSC conducted ongoing oversight of the safety certification process being carried out by Metrorail and MWAA under the requirements of Metrorail's Safety and Security Certification Program Plan (SSCPP) and the cooperative agreement between MWAA and WMATA. As of the end of 2021, there were paths to closure in place for each of the open items in the WMSC's Pre-Revenue Service Review (PRSR) Part 1, which focused on construction of the line. These included items that the WMSC identified in 2020 as part of our independent fire-life safety assessment.

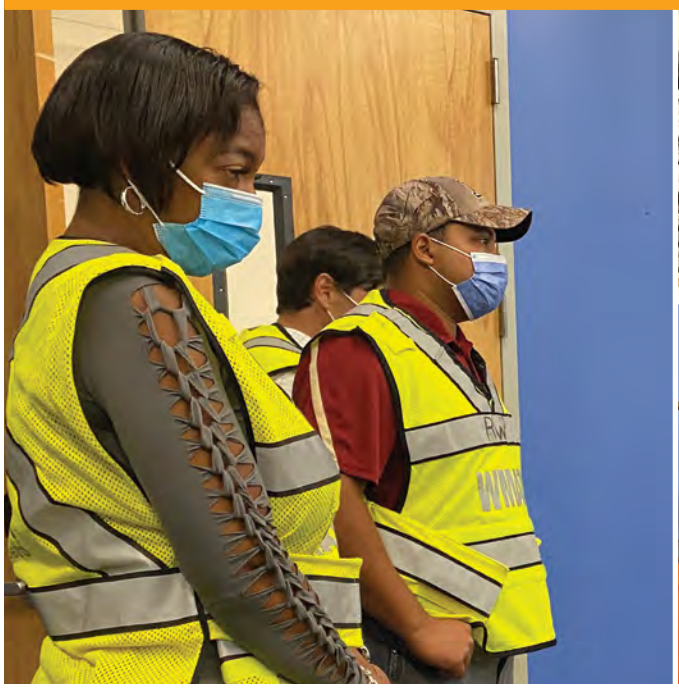
During 2022, the WMSC expects to prepare the remainder of its PRSR, which is focused on Metrorail's preparedness to operate the line, including adequacy of staffing, training and testing.

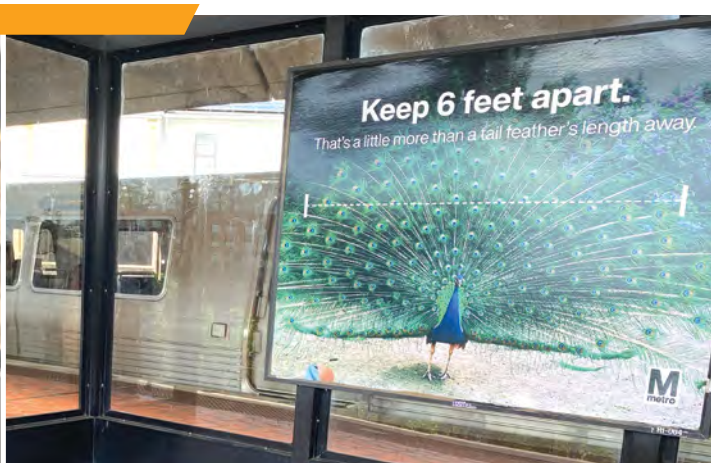
The final stages of our work include ensuring that Metrorail has met its requirements to safely operate the extension, and that Metrorail has taken the other steps required by its safety certification program plan and the cooperative agreement between MWAA and WMATA.

As part of the documentation required for the WMSC to concur that Metrorail has properly conducted its safety certification process, including any necessary safety mitigations or corrective actions, Metrorail will provide the WMSC with WMATA's Safety and Certification Verification Report (SSCVR) approved by the Safety Certification Review Committee (SCRC) which serves as Metrorail's documentation that it has identified and appropriately mitigated known hazards and that the project has followed other aspects of the design construction and implementation process, evidence of that approval, and evidence that the Silver Line Phase 2 project has achieved certification by the Metro Chief Safety Officer. This certification is part of Metrorail's safety certification process, and a requirement of the cooperative agreement between WMATA and the Airport Authority.

Our concurrence is required before the line may open for passenger service. We continue to closely monitor Airports Authority and Metrorail progress.

During 2022, the WMSC expects to prepare the remainder of its PRSR, which is focused on Metrorail's preparedness to operate the line, including adequacy of staffing, training and testing.





PUBLIC TRANSPORTATION AGENCY SAFETY PLAN

As required by the WMSC Program Standard and Federal Transit Administration (FTA) regulations, the Public Transportation Agency Safety Plan (PTASP) includes Metrorail's commitment to and process for implementation of a Safety Management System (SMS). This is a proactive, data driven approach to safety management emphasizing continuous improvement through commitments from each member of the organization.

The PTASP is intended as a living document, subject to regular updates as part of continuous safety improvement. In 2021, Metrorail completed its first required annual revision of its PTASP, following initial adoption of a PTASP in 2020 to replace the former System Safety Program Plan (SSPP).

WMSC staff provided detailed feedback to Metrorail regarding Metrorail's proposed 2021 revisions before Metrorail staff presented its revisions to its board of directors in October 2021. The WMSC Commissioners considered and approved the revision on December 7, 2021.

Some of Metrorail's 2021 updates included:

- Adjustments to planned SMS implementation timelines and tasks for the next two years.
- Safety Department organizational changes associated with these implementation tasks.
- Some specific requirements of the WMSC's Program Standard such as notification to Metrorail personnel and contractors that those individuals should cooperate with and respond immediately to the WMSC.

The WMSC will continue to oversee implementation of the PTASP through regular oversight work including inspections, audits, and investigations.

COVID-19

WMATA and the WMSC operated with health precautions in place throughout 2021 due to the ongoing public health emergency. Metrorail operated varying levels of service throughout the year based on the public health situation, as well as operating limitations due to safety issues described elsewhere in this report pertaining to the 6000 Series and 7000 Series railcars, and capital improvement projects.

Health safety precautions such as wearing masks, and vaccination were taken to keep riders, employees and others safe. In addition, where it did not compromise safety activities or safety oversight activities, meetings and interviews were conducted via video conference.

The WMSC utilized tools including direct access to WMATA systems to assist with these efforts. The WMSC Compact requires that the WMSC have direct access to Metrorail's physical and electronic systems to conduct safety oversight, which also served to limit health risk to WMSC staff, WMATA staff and the public.

The PTASP is intended as a living document, subject to regular updates as part of continuous safety improvement.

CONCLUSION

Metrorail has made significant progress in some areas under the oversight of the WMSC, and is required to continue to make progress in many other areas due to the WMSC's oversight and the commitments WMATA has made in its PTASP.

In 2021, the WMSC's six published audits, regular inspections, and oversight of Metrorail's 7000 Series Return to Service Plan identified areas where safety improvements are required for Metrorail to meet its documented commitments to safety. The WMSC's oversight work also identified positive practices, and led to Metrorail implementing new safety improvements, many of which are described above. Safety is not something that is achieved on a particular day; rather, safety is a journey of continual improvement.

In 2022, the WMSC is continuing its robust safety oversight work with a continued focus on the safety of riders, workers and first responders. This work includes expected collaboration with new Metrorail leaders who will play a key role in the continued rollout of the required safety management system (SMS) approach that is required to achieve a positive safety culture. Metrorail's increasing work to measure the status of its safety culture, and to implement corrective action plans required by the WMSC to address elements of Metrorail's culture that have accepted noncompliance with written rules and procedures, are critical elements that can help further improve the safety of the WMATA Rail System in the future.

The WMSC's six published audits, regular inspections, and oversight of Metrorail's 7000 Series Return to Service Plan identified areas where safety improvements are required for Metrorail to meet its documented commitments to safety.

OPEN CORRECTIVE ACTION PLANS (CAPs)

AS OF MAY 1, 2022

CAP #	CAP COMPLETION DATE (EXPECTED CAP COMPLETION DATE)	FINDING
FTA-17-1-10	7/29/2022	**Finding 4**: Traction power cables are often loose on the ground, subjecting them to contamination, vibration, and damage from movement. **Finding 9:** There is insufficient dielectric insulation for cable terminations used in the traction power system. **Finding 17:** The cable replacement and upgrade program for 8-car train roll out has been deferred. **Finding 18:** WMATA's negative return system (at traction power substations) has not been upgraded to address plans for 50 percent and 100 percent operation of 8-car trains. **Finding 19:** WMATA has suspended its contact rail expansion joint elimination program until further analysis is completed.
FTA-TSR-18-003	06/31/22	WMATA does not consistently implement its Hazard Management Procedure.
TOC-COL-15-003-A		Unsecured railing entered dynamic envelope of train in car wash.
WMSC-19-C0008-B	9/30/2022	Metrorail does not currently have an effective hours of service policy.
WMSC-19-C0026	3/18/2022	WMATA does not conduct annual culvert inspections as specified in Section 105.1 of the TRST-1000.
WMSC-20-C0037	4/29/2022	Third rail power restoration is routinely rushed by ROCC management with a focus on restoring train service rather than a focus on following safety procedures.
WMSC-20-C0042	6/24/2022	WMATA employees are not consistently following RWP Rule 5.12 for equipment calibration.
WMSC-20-C0049	12/1/2023	ROCC management contributes to a chaotic environment. Use of profanities, threats and racial, sexual or other forms of harassment are regular features of the control centers environment, which makes it difficult for controllers to do their jobs and drives low morals and significant turnover.
WMSC-20-C0051	10/13/2023	Metrorail does not record all critical ROCC communications, limiting the lessons that can be learned from safety events.
WMSC-20-C0052	2/24/2023	There is no consistent, clear, concise, immediate and reliable Metrorail communication process for safety-critical information between Metrorail personnel and fire liaison.
WMSC-20-C0053	1/6/2023	Some Metrorail procedures lack the required urgency to address life-safety issues.
WMSC-20-C0055	12/16/2022	WMATA does not always follow or clearly define its fatigue risk management procedures for the Rail Operations Control Center, including those limiting the length of controller shifts.
WMSC-20-C0056	8/30/2024	Metrorail ROCC recruitment and retention approach is failing. Some controller trainees have left the ROCC immediately after or shortly after the training course, which is scheduled to last nine months.
WMSC-20-C0057	1/6/2023	A high rate of staff turnover in the Rail Operations Control Center contributes to staffing challenges and a lack of positive institutional knowledge that can contribute to safety challenges.
WMSC-20-C0058	12/2/2022	Controllers still have too many responsibilities and are frequently rushed to complete tasks by management.
WMSC-20-C0059	4/26/2024	WMATA has failed to regularly update the Rail Operations Control Center Procedures Manual.
WMSC-20-C0060	1/6/2023	WMATA has not reviewed SOPs or OAPs on a regular basis.
WMSC-20-C0061	7/29/2022	Ride alongs are not effectively utilized to increase controller knowledge, contributing to a lack of controller understanding of what is actually happening on the roadway.
WMSC-20-C0065	2/17/2023	Not all controllers experience emergency drills. If each ROCC controller does not get this experience, it diminishes the value of the drills
WMSC-20-C0066	7/1/2022	The certification process for ROCC instructors, assistant superintendents, superintendents and controllers is inconsistent, not properly documented, and lacks proper controls to ensure the integrity and meaning of certification.
WMSC-20-C0068	1/26/2024	WMATA does not have a standardized training program for personnel working at desks such as the MOC or ROIC. Metrorail could not provide any documentation of MOC training materials, a curriculum or a training description. Metrorail provided only a study guide for the ROIC.
WMSC-20-C0070	10/27/2023	Metrorail puts the integrity of safety event investigation at risk by not following procedures requiring proper chain of custody and control of evidence as outlined in SOP 800-01 and Policy/Instruction 10.4/1, not following procedures requiring direct access for investigators to all information, recordings and other evidence that is potentially relevant to the investigation, and not fully training all personnel on the steps they are required to take when a safety event occurs.
WMSC-21-C0072	4/14/2023	WMATA does not have load ratings for its bridges and aerial structures.

OPEN CORRECTIVE ACTION PLANS (CAPs)

AS OF MAY 1, 2022

CAP #	CAP COMPLETION DATE (EXPECTED CAP COMPLETION DATE)	FINDING
WMSC-21-C0074	5/13/2022	A new Structural Inspection Manual was made effective without any associated training for the employees responsible for implementing it.
WMSC-21-C0075	5/13/2022	Standard Operating Procedure 208-07 (dated March 2020) contains outdated and conflicting references.
WMSC-21-C0076	5/13/2022	Metrorail does not have important structural steel inspection tools available that are listed in its Structural Inspection Manual.
WMSC-21-C0077	4/14/2023	Metrorail does not have consistent requirements for refresher or additional training for structures inspection and maintenance teams.
WMSC-21-C0078	7/16/2022	Structures inspection supervisors are not able to spend adequate time in the field, creating concerns about work quality and workload.
WMSC-21-C0080	7/29/2022	Metrorail inspection, repair and design data are spread across disparate systems in a way that makes certain work challenging, creating the risk that safety issues could be misidentified or slip through the cracks.
WMSC-21-C0081	8/12/2022	Metrorail does not review contractor credentials, qualifications or trainings before a contractor conducts an elevated structure inspection.
WMSC-21-C0083	11/10/2023	Ten Metrorail structures have steel rocker bearings, which creates a risk in the event of an earthquake or other seismic event.
WMSC-21-C0084	7/19/2024	Metrorail is not following and does not have effective safety certification and acceptance procedures for new RMMs. There is no Metrorail-wide safety certification procedure to implement the SSCP.
WMSC-21-C0087	8/12/2022	Metrorail is not utilizing reliability data for its RMMs, including the specific nature of any failure, which prevents WMATA from realizing the safety benefits of a complete, ongoing analysis program.
WMSC-21-C0088	11/18/2022	Equipment operators are not fully trained on each type of vehicle they may be directed to operate. Some training has not included sufficient hands-on experience.
WMSC-21-C0090	11/18/2022	Supervisors or others have no way of confirming while in the field whether an operator is properly trained to operate a specific RMM.
WMSC-21-C0091	2/22/2023	Metrorail risks key safety and maintenance work coming to a halt due to insufficient succession planning and training.
WMSC-21-C0095	8/12/2022	CTEM mechanics get only limited training on specific vehicles that would assist them in moving and maintaining RMMs, and do not get adequate refresher training.
WMSC-21-C0098	6/6/2025	Several Metrorail preventive maintenance instructions do not include acceptable tolerances for required measurements.
WMSC-21-C0099	4/7/2028	A lack of an Intrusion Detection Warning (IDW).
WMSC-21-C0100	10/30/2026	Metrorail is not maintaining a fully functioning radio communications system in all rail yards and shops.
WMSC-21-C0101	11/16/2022	Metrorail does not have, provide training on, or otherwise follow specific rules related to rail vehicle and switch movement in non-signalized territory. Further, Metrorail provides no controls on or oversight of movement in dark territory.
WMSC-21-C0102	9/23/2022	Metrorail has not adequately trained ATCM employees on safety procedures to ensure that all employees fully understand their roles with respect to safety.
WMSC-21-C0103	2/25/2022	Metrorail has continued efforts to return to Automatic Train Operation without following its safety certification procedures.
WMSC-21-C0104	11/18/2022	WMATA is not conducting all inspections and maintenance required by its ATC manuals and ATC manuals have incorrect or incomplete information and outdated references.
WMSC-21-C0105	8/12/2022	Metrorail allows employees to use tools that have not gone through any safety review or approval process.
WMSC-21-C0106	8/12/2022	Metrorail does not have a standardized determination of which preventive maintenance work must be prioritized as safety critical.
WMSC-21-C0107	1/13/2023	There is no formal process for ATCM, the department that performs the work in the field, to initiate or request an engineering modification or manual change from ATCE.
WMSC-21-C0108	11/18/2022	Departments responsible for ATC do not have clear, documented, effective working relationships which contributes to communication and coordination challenges that limit safety improvements.

OPEN CORRECTIVE ACTION PLANS (CAPs)

AS OF MAY 1, 2022

CAP #	CAP COMPLETION DATE (EXPECTED CAP COMPLETION DATE)	FINDING
WMSC-21-C0109	7/29/2022	WMATA does not have a standardized process to prioritize and advance ATC capital projects.
WMSC-21-C0110	3/17/2023	Training and parts needed for maintenance appear to be an afterthought in WMATA procurements.
WMSC-21-C0111	8/25/2023	Metrorail does not have adequate replacement parts or materials and has not planned for the obsolescence of critical equipment.
WMSC-21-C0112	12/16/2022	Metrorail has no specific minimum training course requirements, documented OJT requirements or equipment certifications for ATCM employees, or requirements that individuals be trained on a system element prior to conducting maintenance work on it.
WMSC-21-C0113	9/29/2023	Metrorail is not effectively managing turnover, vacancies and experience levels of ATC personnel.
WMSC-21-C0115	8/4/2023	Metrorail's written procedures do not reflect changes that employees are being directed to implement.
WMSC-21-C0117	5/20/2022	Metrorail does not have documented ATC software standards.
WMSC-21-C0118	7/7/2023	Metrorail does not consistently follow its safety certification process, which leads to project activation and use without proper hazard identification and mitigation, putting Metrorail customers, personnel and first responders at risk.
WMSC-21-C0119	1/27/2023	Safety sensitive physicals are not conducted as required by Metrorail policy, and Metrorail does not document or track when these physicals are due for all existing employees.
WMSC-21-C0120	7/18/2025	Metrorail ignores the minimum daily release period (rest period) requirements in its Fatigue Risk Management Policy.
WMSC-21-C0121	10/25/2024	There is not adequate access to, documentation of, or compilation of data for WMATA to assess compliance with its hours of service requirements.
WMSC-21-C0122	9/16/2022	WMATA does not conduct safety sensitive physicals at the time of or soon after hire as required by its policies.
WMSC-21-C0123	12/30/2022	Not all safety sensitive employee position have fully documented and up-to-date physical and medical requirements.
WMSC-21-C0124	10/21/2022	Many follow up and random drug and alcohol tests required by Metrorail policies and federal regulations were not completed with no documented reason why the tests were missed.
WMSC-21-C0125	6/24/2022	WMATA does not have written criteria for post-incident testing and does not consistently implement post-event testing.
WMSC-21-C0126	11/18/2022	Supervisors are not receiving reasonable suspicion training, as required by Metrorail policy and federal regulation.
WMSC-21-C0127	8/12/2022	WMATA does not provide adequate, clear, understandable information to employees regarding what over-the-counter medications must be disclosed.
WMSC-21-C0128	12/30/2022	WMATA does not have procedures to confirm that employees are consistently removed from service for positive drug and alcohol test results in a timely manner as required by federal regulations.
WMSC-21-C0129	6/21/2024	WMATA does not have a documented procedure for and training to carry out fitness for duty checks prior to or during shifts on a regular basis for all covered employees as specified in the APTA Fitness for Duty Standard.
WMSC-21-C0130	8/23/2024	Metrorail does not collect fitness for duty data in a manner that allows for identification, tracking and trending of issues.
WMSC-21-C0131	12/19/2025	Metrorail is not providing medical oversight of contractors and does not include any requirement in contracts that contractors meet WMATA medical, fatigue or hours of service standards.
WMSC-21-C0132	12/15/2023	WMATA does not have a policy in place to test employees or contractors involved in a safety event who are hospitalized but conscious and providing consent.
WMSC-21-C0133	2/17/2023	Metrorail does not confirm the accuracy of new hires' self-reported list of prior DOT-covered employers.
WMSC-21-C0134	12/2/2022	Metrorail's 6000 Series rehabilitation program, including coupler overhaul work, was implemented by CMOR, CENV and CMNT without safety certification and approvals required by WMATA's SSCPP.
WMSC-21-C0135	8/26/2022	SAFE approved SMP documentation that was incomplete and that did not match approved forms, and Metrorail did not comply with safety certification requirements defined in the SSCPP.

OPEN CORRECTIVE ACTION PLANS (CAPs)

AS OF MAY 1, 2022

CAP #	CAP COMPLETION DATE (EXPECTED CAP COMPLETION DATE)	FINDING
WMSC-21-C0136	12/2/2022	6000 Series cars that underwent rehabilitation were put into service without SAFE approval.
WMSC-21-C0137	12/2/2022	Metrorail removed the coupler overhaul from the 6000 Series SMP process without documenting that change or completing a review of that change by the SCRC.
WMSC-21-C0138	12/2/2022	Metrorail does not require or receive all necessary OEM documentation, parts or tools.
WMSC-21-C0139	5/24/2024	The 7000 Series rehabilitation and subsystems overhaul program is being developed without full SAFE coordination, involvement or approval.
WMSC-21-C0141	8/26/2022	Metrorail does not have adequate document control practices for car maintenance job plans.
WMSC-21-C0142	1/6/2023	Metrorail does not have a systematic process to ensure that mechanics and engineers are trained for the specific tasks they are assigned to perform.
WMSC-21-C0143	7/26/2024	Metrorail does not consistently follow a standard process to address wheels out-of-round, to prevent cars with wheels out-of-round from operating, and to identify and address the root causes of wheels out-of-round.
WMSC-21-C0144	3/24/2023	Metrorail does not clearly define the proper use of engineering modification instructions (EMIs), service bulletins (SBs), and other railcar engineering change documents.
WMSC-21-C0145	3/24/2023	Metrorail utilizes multiple versions of the same inspection form that do not all include the same pass/fail criteria.
WMSC-21-C0146	2/5/2027	Metrorail railcars do not include inward-and outward-facing audio and image recorders in all operating compartments.
WMSC-21-C0147	2/17/2023	Part numbers are not being consistently entered in Maximo Work Orders for 7000 Series railcars.
WMSC-21-C0148	1/4/2023	Some WMATA job descriptions have not been reviewed in more than 20 years.
WMSC-21-C0149	10/19/2022	WMATA has not fully implemented sufficient protections against the unauthorized movement of trains with zero speed commands.
WMSC-21-C0150	11/18/2022	Metrorail is not complying with its safety certification and approval requirements that are specified in its SSCPP before installing and placing traction power systems into service.
WMSC-21-C0151	7/12/2024	Metrorail is not documenting, tracking and conducting all preventive maintenance inspections that are required by WMATA policy, manuals and instruction.
WMSC-21-C0152	11/25/2022	Metrorail is relying on vital traction power equipment that is beyond its useful life and has not fully followed through on implementation of prioritized renewal plans to ensure a state of good repair.
WMSC-21-C0153	8/26/2022	There is inadequate awareness, documentation, interdepartmental coordination, training and supervisory oversight to ensure knowledge of and compliance with documented procedures.
WMSC-21-C0154	5/12/2023	Traction Power Maintenance employees do not get all required information and training to maintain equipment that they are directed to work on, and there is no process in place to ensure that personnel are trained on specific equipment prior to working on that equipment.
WMSC-21-C0155	9/30/2022	Metrorail is not effectively identifying, tracking and mitigating hazards related to high voltage and traction power.
WMSC-21-C0156	4/24/2026	Metrorail is behind schedule on its floating slab testing to monitor for deterioration due to stray current.
WMSC-21-C0157	11/18/2022	The latest as-built schematics are not available in each traction power facility, as required by the TRPM-1000 and Metrorail preventive maintenance instructions.
WMSC-21-C0158	11/18/2022	Metrorail does not have a policy, process or procedure to ensure effective prioritization of corrective maintenance work orders.
WMSC-21-C0159	5/26/2023	Metrorail risks equipment quality and availability issues that impact operational safety due to gaps in materials tracking, storage, and procurement practices.
WMSC-21-C0160	1/13/2023	Metrorail databases include many electrical tools that are beyond their required calibration dates.
WMSC-21-C0161	12/30/2022	Some WMATA job descriptions have not been reviewed in more than 30 years.

FINAL INVESTIGATION REPORTS ADOPTED

BY THE WMSC IN 2021

Complete safety event investigation reports adopted in 2021 are available at **WMSC.gov/reports**.

Report Number	Date of Adoption	Report Title
W-0053	January 26, 2021	Improper Door Operation at Largo Town Center Station
W-0054	January 26, 2021	Derailment in Greenbelt Yard
W-0055	January 26, 2021	Improper Operation in New Carrollton Yard leading to unintended coupling
W-0056	January 26, 2021	Improper RWP near Fort Totten Station
W-0057	January 26, 2021	Improper RWP near Fort Totten and Takoma Stations
W-0058	January 26, 2021	Improper RWP near Silver Spring Tie Breaker Station
W-0059	January 26, 2021	Improper RWP at Tysons Corner Station
W-0060	January 26, 2021	Fire/Smoke at Capitol Heights Station
W-0061	March 2, 2021	Improper Movement at Branch Avenue Yard Lead
W-0062	March 2, 2021	Improper Roadway Worker Protection at Anacostia Station Interlocking
W-0063	March 2, 2021	Red Signal Overrun at Brentwood Yard Entrance
W-0064	March 2, 2021	Red Signal Overrun at Greenbelt Yard
W-0065	March 2, 2021	Serious Injury (Contractor) in Vent Shaft FF2 (on the National Mall between L'Enfant Plaza and Archives stations)
W-0066	March 2, 2021	Fatality at Gallery Place-Chinatown Station
W-0067	March 2, 2021	Improper Movement from Metro Center Station
W-0068	April 13, 2021	Person Struck By Train at Bethesda Station
W-0069	April 13, 2021	Person Struck By Train at Union Station
W-0070	December 7, 2021	Red Signal Overrun at U Street Station
W-0071	April 13, 2021	Train Rollback at New Carrollton Yard
W-0072	April 13, 2021	Red Signal Overrun at Brentwood Yard
W-0073	April 13, 2021	Red Signal Overrun at Greenbelt Yard
W-0074	April 13, 2021	Improper RWP near Rockville Station
W-0075	April 13, 2021	Improper RWP Takoma Station Interlocking
W-0076	April 13, 2021	Improper RWP near Suitland Station
W-0077	April 13, 2021	Improper RWP near West Hyattsville Station
W-0078	May 18, 2021	Person Struck By Train at L'Enfant Plaza Station
W-0079	May 18, 2021	Pull-Apart Outside Union Station
W-0080	May 18, 2021	Pull-Apart Outside Glenmont Station
W-0081	May 18, 2021	Derailment Outside Silver Spring Station
W-0082	June 29, 2021	Fatality on Yellow Line at L'Enfant Plaza Station
W-0083	June 29, 2021	Person Struck by Train at Navy Yard Station
W-0084	December 7, 2021	Customer Evacuation near Fort Totten and Georgia Ave-Petworth station
W-0085	June 29, 2021	Improper Roadway Worker Protection near Fort Totten Station
W-0086	June 29, 2021	Improper Vehicle Movement on Red Line
W-0087	June 29, 2021	Improper Door Operation at Capitol Heights Station
W-0088	June 29, 2021	Improper Door Operation at Franconia-Springfield Station
W-0089	June 29, 2021	Red Signal Overrun at Eastern Market Station
W-0090	June 29, 2021	Red Signal Overrun in New Carrollton Yard
W-0091	June 29, 2021	Red Signal Overrun in Largo Tail Track
W-0092	August 3, 2021	Improper RWP near Columbia Heights Station
W-0093	August 3, 2021	Improper Movement from U Street Station
W-0094	August 3, 2021	Improper Movement from King Street Station
W-0095	August 3, 2021	Derailment near Arlington Cemetery Station

FINAL INVESTIGATION REPORTS ADOPTED

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Report Number	Date of Adoption	Report Title
W-0096	August 3, 2021	Collision in Greenbelt Rail Yard
W-0097	August 3, 2021	Serious Injury (Contractor) Potomac Yard Station construction site
W-0098	August 3, 2021	Improper RWP at L'Enfant Plaza Station
W-0099	December 7, 2021	Improper RWP at Takoma Station
W-0100	August 3, 2021	Improper RWP at U Street Station
W-0101	August 3, 2021	Collision at Suitland Station
W-0102	August 3, 2021	Collision, Fatality Shaw-Howard U Station
W-0103	August 3, 2021	Improper Door Operation Court House Station
W-0104	September 21, 2021	Collision, Customer Fatality at White Flint Station
W-0105	September 21, 2021	Collision, Customer Fatality at NoMa-Gallaudet U Station
W-0106	September 21, 2021	Improper Movement from Foggy Bottom Station
W-0107 and W-0108	September 21, 2021	Improper Roadway Worker Protection at Tenleytown Station
W-0109	September 21, 2021	Derailment near Farragut West Station
W-0110	September 21, 2021	Improper Roadway Worker Protection Naylor Road-Southern Avenue station
W-0111	September 21, 2021	Serious Injury at Shaw-Howard U Station
W-0112	September 21, 2021	Serious Injury near Clarendon Station
W-0113	September 21, 2021	Evacuation for Life Safety Reasons of Capitol South Station
W-0114	September 21, 2021	Evacuation for Life Safety Reasons at Greensboro Station
W-0115	October 26, 2021	Collision, Customer Fatality Near Rhode Island Ave Station
W-0116	October 26, 2021	Evacuation, Runaway Train Near Rhode Island Ave Station
W-0117	October 26, 2021	Improper RWP at C&A Connector
W-0118	October 26, 2021	Near-Miss-Red Signal Overrun at West Falls Church Rail Yard
W-0119	October 26, 2021	Improper Door Operation at Rhode Island Ave Station
W-0120	October 26, 2021	Improper Door Operation at Glenmont Station
W-0121	October 26, 2021	Collision, Customer Fatality at Union Station
W-0122	October 26, 2021	Improper Roadway Worker Protection near Grosvenor-Strathmore Station
W-0123	October 26, 2021	Improper Roadway Worker Protection Ronald Reagan Washington National Airport Station
W-0124	October 26, 2021	Evacuation for Life-Safety Reasons at Federal Center SW Station
W-0125	October 26, 2021	Improper Vehicle Movement at Woodley Park Station
W-0126	December 7, 2021	Evacuation for Life-Safety Reasons at Metro Center Station
W-0127	December 7, 2021	Runaway Maintenance Vehicle, Collision near Southern Avenue Station
W-0128	December 7, 2021	Improper Vehicle Movement from Franconia-Springfield Station
W-0129	December 7, 2021	Red Signal Overrun at Largo Town Center Station
W-0130	December 7, 2021	Improper Roadway Worker Protection Red Line
W-0131	December 7, 2021	Improper Roadway Worker Protection near Fort Totten Station
W-0132	December 7, 2021	Improper Roadway Worker Protection at L'Enfant Plaza Station
W-0133	December 7, 2021	Improper Roadway Worker Protection near Forest Glen Station
W-0134	December 7, 2021	Improper Roadway Worker Protection near Fort Totten Station
W-0135	December 7, 2021	Improper Roadway Worker Protection near Fort Totten Station
W-0136	December 7, 2021	Improper Roadway Worker Protection reported near Van Dorn St. Station
W-0137	December 7, 2021	Evacuation for Life-Safety Reasons at Pentagon Station
W-0138	December 7, 2021	Evacuation for Life-Safety Reasons at Metro Center Station
W-0139	December 7, 2021	Evacuation for Life-Safety Reasons at Minnesota Ave Station

WASHINGTON METRORAIL SAFETY COMMISSION

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