



# ANNUAL REPORT ON THE SAFETY OF THE WMATA RAIL SYSTEM IN 2020

WASHINGTON METRORAIL SAFETY COMMISSION



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The Washington Metrorail Safety Commission (WMSC) conducted significant work in 2020 that is directing the Washington Metropolitan Area Transit Authority's Metrorail (Metrorail) system toward substantial safety improvements through ongoing collaboration, several significant audits, consistent inspections and oversight, and safety event investigations.

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

Given the number and extent of safety improvements that the WMSC is requiring Metrorail to implement in coming years and those changes that have already been fully implemented, I would like to thank the governors of Maryland and Virginia, Mayor of Washington, D.C., the Maryland and Virginia General Assemblies, the D.C. Council, local and regional bodies, 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.

The WMSC's comprehensive, detailed audit of Metrorail's Rail Operations Control Center (ROCC) is just one example of the important work completed by the WMSC in 2020 to identify safety issues and to require Metrorail to implement improvements. Some of these important safety changes will take time to fully implement in a lasting fashion.

The WMSC has the responsibility, commitment, and authority to require Metrorail to implement and maintain much needed safety improvements that can help Metrorail prevent future accidents. Our job is to provide an independent assessment of what must be done to improve safety. Metrorail's job is to identify, develop and implement effective ways to accomplish those improvements.

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 working 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 first Public Transportation Agency Safety Plan (PTASP), which the WMSC approved in 2020.

On the following pages we will detail the status of Metrorail safety in 2020, describe our ongoing strategies for continuously increasing safety excellence, and outline where Metrorail stands.

Sincerely,

Christopher A. Hart, Chair



**THE WMSC'S COMPREHENSIVE, DETAILED AUDIT OF METRORAIL'S RAIL OPERATIONS CONTROL CENTER (ROCC) IS JUST ONE EXAMPLE OF THE IMPORTANT WORK COMPLETED BY THE WMSC IN 2020 TO IDENTIFY SAFETY ISSUES AND TO REQUIRE METRORAIL TO IMPLEMENT IMPROVEMENTS.**

LETTER FROM THE WMSC CHAIR




# COMMISSIONERS





# COMMISSIONERS AND CEO




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CEO





# EXECUTIVE SUMMARY





# EXECUTIVE SUMMARY

Under the oversight of the independent Washington Metrorail Safety Commission (WMSC), the Washington Metropolitan Area Transit Authority (WMATA) began work in 2020 to address a number of significant Metrorail safety issues identified through WMSC inspections, investigations and audits, while demonstrating progress in a number of other areas.

This annual status report on the safety of the WMATA Rail System in calendar year 2020 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 toward ensuring continuous safety improvement.

As the state safety oversight agency (SSOA) for Metrorail, the WMSC plays a significant role in driving safety improvements through audits, safety event investigations, inspections, and oversight of CAPs, safety certification and emergency management. The WMSC's sole priority is the safety of riders, workers and all others who depend on the system's proper maintenance and operations.

This mission guided the WMSC's thoroughly investigated and deeply researched Audit of Metrorail's Rail Operations Control Center (ROCC) and related findings that identified a toxic workplace culture detrimental to safety, staffing deficiencies, problems with procedures and checklists, and emergency preparedness and response deficiencies, among other safety issues.

After the WMSC provided multiple rounds of feedback requiring Metrorail to make substantial revisions to its initial proposals, Metrorail developed and the WMSC approved 25 ROCC-related Corrective Action Plans tied to the ROCC Audit, ROCC findings issued in May 2020, and a December 2019 finding that there is dysfunction and chaos in the ROCC during unplanned emergencies. Due to the transformation required and the depths of the challenges, many of these CAPs will take years

for Metrorail to fully implement, but interim steps are in place or are planned to mitigate risk.

In other areas, Metrorail has outlined and followed through on plans to address problems identified in recent years, which led to the closure of 41 Corrective Action Plans in 2020.

Still, the WMSC responded to Metrorail safety events in 2020 including a July derailment near Silver Spring Station and 6000-series train pull-aparts in October and November.

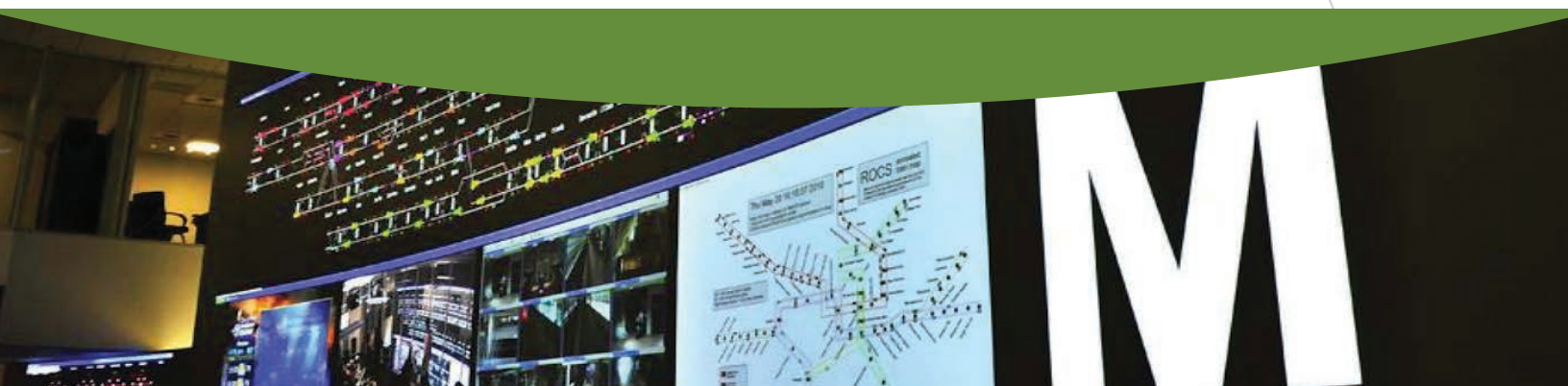
The WMSC also adopted and published final investigations into 35 safety events in 2020, including the investigation into an October 2019 collision between two trains near Farragut West Station that caused significant damage and disruption.

WMATA and the WMSC operated in 2020 with precautions in place to mitigate the risks posed by COVID-19. At WMATA, the precautions included asking customers

to wear masks, using an alternating day work schedule for several months, and having some employees telework. Metrorail significantly reduced service, and ridership dropped significantly compared to 2019. The WMSC continued its oversight of Metrorail during this period by increasing the use of electronic data, analysis, reviews and video calls wherever possible and using only socially distanced in-person interactions. Where the WMSC identified potential health-related concerns during regular inspection or oversight work, the WMSC communicated those to WMATA.

The WMSC remains focused on ensuring that Metrorail understands the importance of maintaining and planning for a long-term state of good repair even during a period of lower ridership. WMATA completed some of this work during summer shutdowns, including a long-term closure in 2020 of the Orange Line's Vienna, Dunn Loring and East Falls Church stations.

**UNDER THE OVERSIGHT OF THE INDEPENDENT WMSC, WMATA BEGAN WORK IN 2020 TO ADDRESS A NUMBER OF SIGNIFICANT METRORAIL SAFETY ISSUES IDENTIFIED THROUGH WMSC INSPECTIONS, INVESTIGATIONS AND AUDITS, WHILE DEMONSTRATING PROGRESS IN A NUMBER OF OTHER AREAS.**





includes the required transition to a Safety Management System (SMS) approach focused on safety promotion, safety policy, safety assurance, and safety risk management. WMATA expects that fully implementing the PTASP will take several years.

An SMS approach requires cooperation and coordination across an entire agency, not siloed departments that keep information to themselves. Fundamentally, Metrorail's PTASP lays out what is required to ensure a full understanding – from the frontline workers through to upper-level management – that safety work is never done. Safety is a continuing journey requiring the identification of hazards, implementation of mitigations, and a review of how those mitigations are working. This requires a positive safety culture and clear, accurate communication among individuals and departments within WMATA.

The WMSC also oversees WMATA's safety certification process, which must be used, among other things, for the Silver Line Phase 2 extension. WMATA has begun preparations to accept the line from the Metropolitan Washington Airports Authority (MWAA) when construction is substantially complete. WMATA can open the line to passengers only after the WMSC concurs that WMATA's Safety and Security Verification Report (SSCVR) demonstrates that the proper safety certification steps have been followed and there is adequate staffing and training in place for safe operations.

In late 2020, WMATA completed and the WMSC approved WMATA's first Public Transportation Agency Safety Plan (PTASP) as required by the WMSC Program Standard and Federal Transit Administration (FTA) regulations. This plan replaces the System Safety Program Plan (SSPP) and

**THE WMSC ALSO OVERSEES WMATA'S SAFETY CERTIFICATION PROCESS, WHICH MUST BE USED, AMONG OTHER THINGS, FOR THE SILVER LINE PHASE 2 EXTENSION.**







WMATA RAIL SYSTEM SAFETY IN 2020



# INTRODUCTION

The Washington Metrorail Safety Commission (WMSC) is committed to the safety of every single Washington Metropolitan Area Transit Authority (WMATA) Metrorail rider, employee, contractor, first responder, and anyone else who interacts with the system.

This annual status report on the safety of the WMATA Rail System gives a high-level snapshot of Metrorail's safety performance in calendar year 2020.

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

The report is also published at [WMSC.gov](https://www.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 the federally required top-to-bottom Safety Management System (SMS).

## COVID-19

Due to the COVID-19 pandemic, starting in March 2020, Metrorail significantly reduced service and had significantly fewer riders compared to prior years.

Metrorail shifted to a largely alternate-day schedule for workers for several months and instituted other safety measures including asking

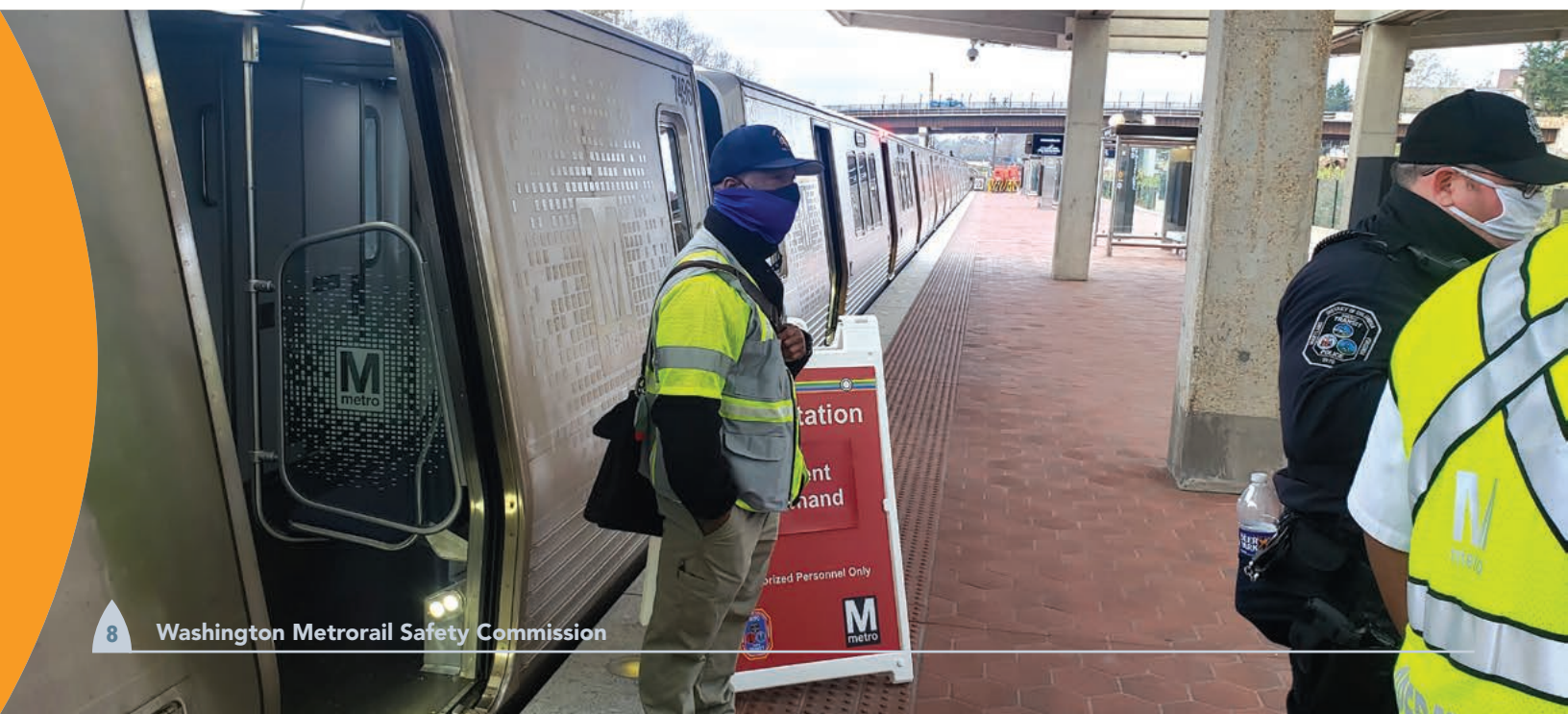
customers to wear masks, and having some employees telework. Similarly, the WMSC took safety precautions to provide for continuous safety oversight, inspections and audit work that was completed while following all public health guidelines.

The WMSC continued its robust oversight of Metrorail by increasing the use of electronic data, analysis, reviews and video conferencing wherever possible and using only socially distanced in-person interactions.

This work was assisted by the requirement in the WMSC Compact that Metrorail provide the WMSC with unfettered access to all physical and electronic systems to allow for complete and direct oversight and enforcement in a way that helped significantly limit risk to WMSC staff, WMATA staff and the public. The WMSC also transitioned to conducting audit and investigative interviews remotely, typically via video conference, while continuing to be present at Metrorail facilities when necessary, such as safety events and investigations like the July 7 derailment and October and November train pull-aparts and follow-up activities.

When the WMSC identified safety issues related to compliance with public health protocols – either independently, or by hearing from WMATA personnel – the WMSC raised the concerns to Metrorail managers so that the issues could be addressed.

Due to reduced service, Metrorail opted to take a significant portion of its older railcars out of service for an extended period. After the WMSC identified gaps during regular inspection work, the WMSC ensured that Metrorail developed storage and inspection practices for these railcars that would help maintain them in a state of good repair. Temporarily reduced service does not reduce the need to ensure a long-term state of good repair for all assets.





# FINDINGS, AUDITS, DIRECTIVES, AND ON-GOING INVESTIGATIONS

The Washington Metrorail Safety Commission issued 52 findings in 2020, with additional findings pending completion of audits, inspections or investigations that were started in 2020.

The WMSC separately issues directives to WMATA when necessary, such as a directive to address a roadway worker protection issue on the Red Line near Union Station in fall 2020 that WMATA complied with in a timely manner.

This annual report highlights some of the WMSC's findings, inspections, investigations and other oversight activities. Each investigation that requires a final report is presented and adopted at a public meeting of the WMSC and then posted online at [WMSC.gov](https://www.wmsc.gov).

Investigations, inspections and audits conducted in 2020 found a number of areas where Metrorail is fully compliant with adequate rules and procedures, but also identified a number of potentially serious issues that Metrorail is now required to address.

## AUDITS

WMSC audits are based on extensive reviews of documents, data and recordings as well as in-depth interviews with Metrorail frontline and managerial personnel, and therefore typically take months of work to complete.


Work on the WMSC's Elevated Structures Audit, for example, was largely completed in 2020, with the 12 findings and one recommendation in the audit published in January 2021. Key work for the WMSC's Audit of Roadway Maintenance Machines was also completed in late 2020, with final efforts completed in early 2021.

### Rail Operations Control Center (ROCC) Audit

Some of the most significant safety issues the WMSC identified in 2020 relate to the Rail Operations Control Center (ROCC), which is responsible for overseeing train movement on mainline tracks, track access, power restoration, communications and emergency response.

Despite fatal accidents such as the 2009 collision near the Fort Totten Station and the 2015 smoke accident near the L'Enfant Plaza

Station, numerous National Transportation Safety Board (NTSB) and Federal Transit Administration reviews, and other investigations, reports and audits that repeatedly raised alarms, the WMSC's investigations and audit work in 2020 demonstrated that ROCC management had not created an effective safety culture.



### SOME OF THE MOST SIGNIFICANT SAFETY ISSUES THE WMSC IDENTIFIED IN 2020 RELATE TO THE RAIL OPERATIONS CONTROL CENTER (ROCC).

On December 20, 2019, the WMSC issued a finding requiring Metrorail to develop a Corrective Action Plan to address dangerous dysfunction in the ROCC during emergencies. This followed a December 10, 2019 smoke event on the Red Line that the WMSC investigation found bore striking similarities to the January 12, 2015 fatal smoke accident near L'Enfant Plaza Station.

The WMSC then immediately advanced a previously planned audit of Metrorail's Department of Rail Transportation, with a focus on the ROCC.

Metrorail initially resisted significant change, with no substantive progress on development of an acceptable CAP proposal for more than six months.

In May 2020, the WMSC issued three additional ROCC findings requiring Metrorail corrective action. These three findings – improper and rushed power restoration, uncoordinated remote manipulation of train control systems by ROCC management, and a lack of ventilation fan training and playbooks required following the 2015 smoke accident – were based on the initial phases of the WMSC's ROCC Audit work.

As part of that audit work, the WMSC interviewed 21 of 26 controllers in a secure, off-site location, reviewed a wide range of documents, data records, audio recordings and video recordings, and spoke with other WMATA employees.



had checklists and procedures that lack the required urgency to address life-safety issues, and had not provided adequate emergency drill experience to controllers.

Metrorail had no training program for ROCC employees working in other positions including the Maintenance Operations Center and Rail Operations Information Center desks.

A number of these safety concerns are similar to those identified in previous investigations by the National Transportation Safety Board (NTSB) and the Federal Transit Administration (FTA), including investigations following 2009 and 2015 customer fatalities.

The audit also identified incidents where upper-level management violated or instructed controllers to violate safety procedures. Those top-level managers also told controllers not to talk to the WMSC and to resist some required corrective actions.



**THE NUMBER OF CERTIFIED RAIL TRAFFIC CONTROLLERS WAS ESSENTIALLY UNCHANGED FROM FIVE YEARS EARLIER.**

Metrorail provided initial Corrective Action Plan proposals for the 21 findings in the ROCC Audit on time in late October 2020. After several rounds of revisions directed by the WMSC, the WMSC was able to approve the last of the 21 CAP proposals for implementation in late January 2021.

The completion dates WMATA committed to for these CAPs range from fall 2021 through spring 2024 (see Appendix A).

While those are the final completion dates, there are numerous interim steps and clear deadlines that WMATA has committed to meet for each CAP, including steps meant to serve as mitigations while the longer-term solutions are developed and implemented.

**Other Audits Issued in 2020**

The WMSC issued two other WMATA safety audits in 2020: Track Maintenance and Training and Roadway Worker Protection (RWP) and Training.

The Track Audit issued in February 2020 had 16 findings.

Following the May findings that identified the additional management and training issues in the ROCC, Metrorail reassigned the ROCC Director to a different managerial position outside of the ROCC, and Metrorail leaders acknowledged that the major safety improvements the WMSC required in the ROCC were necessary. The WMSC accomplished these initial safety improvement efforts in collaboration with Metrorail leadership.

The WMSC provided the draft ROCC Audit to WMATA in August 2020 for technical review, and the WMSC issued and published the ROCC Audit in September 2020.

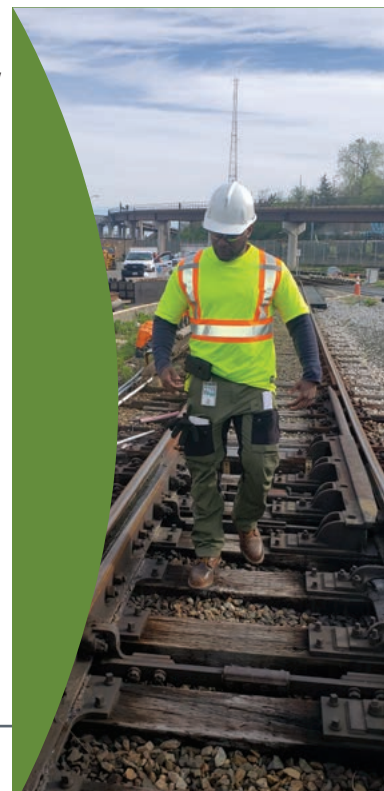
The audit report included an additional 21 findings and the related supporting documentation and evidence that demonstrated the safety issues that needed to be corrected for the safety of riders, employees, contractors and first responders.

The control center's toxic workplace environment included distractions, fear, threats, and conflicting instructions that prevented overworked and undertrained controllers from fully and properly carrying out their duties.

Metrorail had not followed its own fatigue management policies, had not addressed recurring safety issues, and had not implemented adequate recruitment hiring and training practices.

The number of certified Rail Traffic Controllers was essentially unchanged from five years earlier, despite a significant stated focus and effort and the need for additional controllers in order to open an additional operations desk that was originally supposed to launch ahead of the 2014 opening of Silver Line Phase 1. These critical staffing shortages continue to adversely affect operations. For example, Metrorail switched from a plan to maintain rail service on the Orange and Silver Lines during construction work in summer 2020 with long-term single-tracking to a complete shutdown after recognizing that ROCC staffing was insufficient to safely handle single-tracking for that prolonged period. ROCC staffing challenges became even more acute for Metrorail in spring and summer 2020 due to COVID-19 infections and precautions.

Among other findings from the ROCC Audit, Metrorail had not provided a clear and consistent communication process involving the fire liaison,





While there has been progress since 2015 to address track department staffing shortages, the WMSC found significant inconsistencies in procedures and forms, shortfalls in certain inspections, and a need for improved training. The issues included a lack of standard protocols for track maintenance, a lack of records of certain maintenance or repairs and few quality control checks by supervisors.

As of March 1, 2021, 9 CAPs related to Track Audit findings remain open with scheduled completion dates into 2022.

The RWP Audit issued in June 2020 had 11 findings related to the critical safety program meant to keep employees, contractors and first responders safe when working on or around the tracks.

There has been progress in implementing the Roadway Worker Program since the Federal Transit Administration (FTA) raised concerns in 2015, but the audit identified additional steps that are required to improve safety to address shortfalls on policy, procedure or real-world implementation of the RWP program.

Compared to the 2015 FTA Safety Management Inspection, the WMSC noticed a vastly improved process underway to ensure initial and refresher training requirements were being communicated to supervisory staff for operations and maintenance departments, helping to ensure affected Metrorail employees maintain consistent compliance with RWP qualification requirements.

However, there are at least pockets within WMATA where Roadway Worker Protection rules are regularly not being followed, which can lead to injuries, accidents and fatalities, and there were shortfalls in training and in procedural reviews.

The audit identified “practical drift” away from written procedures in a number of areas, with the reality on the ground not matching the written requirements. The WMSC has identified similar concerns in other areas, and has required Metrorail to address those issues.

Metrorail must ensure that all procedures, equipment and training lead to a consistent and reliable Roadway Worker Protection program that ensures the safety of everyone on the Metrorail right of way.

As of March 1, 2021, 7 CAPs related to the RWP audit remain open with scheduled completion dates through fall 2021.

### Ongoing Audit Work into 2021

The WMSC conducts audits of various aspects of Metrorail on a continuous basis over a three-year period, so the WMSC is typically working on more than one audit at any given time.

In winter 2021, the WMSC published audits of Metrorail’s elevated structures maintenance and inspection program and roadway maintenance machine program, based on work detailed below that was started in 2020.

Among upcoming audit reports, work began in late 2020 on the WMSC’s audit of Metrorail’s Automatic Train Control and signaling. Interviews and document reviews were completed in early 2021, with a final report expected in spring 2021.

The WMSC also initiated its Fitness for Duty Audit in late 2020, with interviews and document reviews conducted in winter and spring 2021.



### Elevated Structures Audit

In January 2021, the WMSC published its Audit of Elevated Structures Inspection, Maintenance and Repair. Most of the work on this audit was completed in fall 2020.

The elevated structures audit identified several positive steps toward improving a structural maintenance and inspection program that faced significant challenges over the past decade, but found that work remains for WMATA to fully implement these steps, and that other improvements are needed to address potentially significant shortfalls.

Metrorail does not have basic load ratings for its elevated structures to confirm the number or type of trains or size of equipment that can safely traverse the bridges or stations, which creates a risk that the structures could be inadvertently overloaded. Combined with unduly complex data systems and the long lead time for major structural rehabilitation projects, the lack of load ratings also creates the risk of a significant delay in determining whether a structure is safe for train traffic if an inspector identifies a potential concern or an event unrelated to Metrorail occurs that could impact the load rating.

Metrorail recently developed and published its first Structural Inspection Manual, but issued it without any standardized training on the revised policies and procedures for the employees who have to implement the manual.

Among the reasons departmental leaders cited for delaying training was the need to immediately make changes to the new manual due to concerns identified by different departments and frontline employees. That demonstrates a separate significant, ongoing problem facing Metrorail:



siloes departments that do not fully coordinate on work instructions, materials or procedures.

Metrorail also does not have important structural steel inspection tools available that are listed in its Structural Inspection Manual.

Metrorail's planning continues to face challenges of aging infrastructure and other equipment that may be beyond its useful life, highlighting the importance of the agency's long-term capital plans even in moments of financial challenge.

### Roadway Maintenance Machines (RMM) Audit

The WMSC completed the majority of the work on a Roadway Maintenance Machine (RMM) Audit in the final months of 2020 and issued the final audit report in March 2021 detailing several positive practices, 14 findings, and 1 recommendation.

RMMs are the vehicles that move on the rails but that are not designed to carry customers. They play a crucial role in the maintenance of the rail system – from basic 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.

Safety certification practices, RMM maintenance and operations training and certification, and a number of rules and procedures must be improved, clarified or actually implemented to resolve the issues identified in the audit.

WMATA is not performing required safety certification for new RMMs and is not following proper safety approval or engineering change processes for existing RMMs. Safety certification process concerns have been identified in connection to RMMs dating back to at least 2013, and the WMSC has identified other projects where WMATA has also not followed this important process. The audit also identified that Metrorail had not addressed safety certification of even the specific RMMs that were identified in a 2016 Tri-State Oversight Committee (TOC) audit.

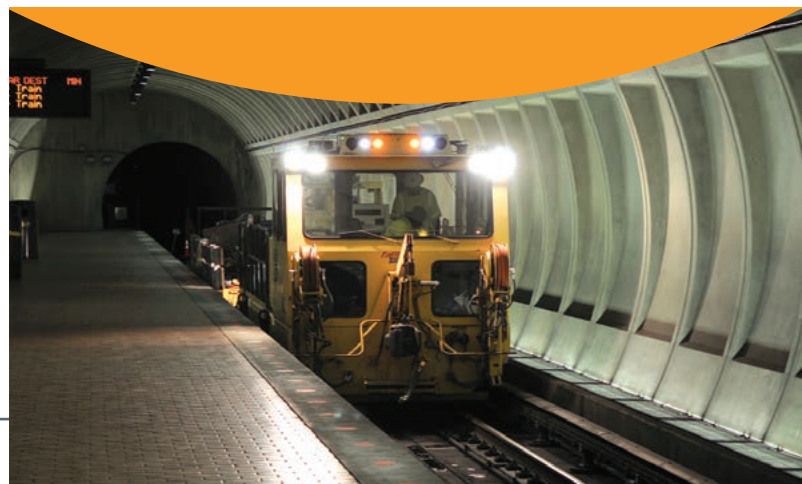
Mechanics receive only limited training on specific RMMs that would assist them in moving and maintaining RMMs, and do not receive adequate refresher training. Equipment operators receive only basic initial and recertification training and are not always fully trained on each type of vehicle they may be directed to operate. To the extent that Metrorail monitors an operator's certification on a specific vehicle, that certification never expires and supervisors in the field have no way to confirm whether an operator has proper training for that vehicle.

Given the complexities of certain vehicles that can cause significant damage to track and structures or pose special risks to personnel if proper procedures are not followed and the small number of employees that management has confidence in to operate that equipment, Metrorail risks key safety and maintenance work coming to a halt due to insufficient succession planning and training.

In addition to WMATA-owned RMMs, Metrorail regularly permits contractor-owned RMMs to enter the Metrorail system, however the procedure being used for vehicle inspections is a draft that has not been formally approved.

Employees responsible for maintenance of parts of WMATA-owned hi-rail vehicles are only familiar with the aspects of those vehicles that relate to operations on highways, and are not familiar with the ways that their maintenance work could increase the risk of a derailment or other safety event when the vehicle is operating on the rails.

### WMATA IS NOT PERFORMING REQUIRED SAFETY CERTIFICATION FOR NEW RMMs AND IS NOT FOLLOWING PROPER SAFETY APPROVAL OR ENGINEERING CHANGE PROCESSES FOR EXISTING RMMs.

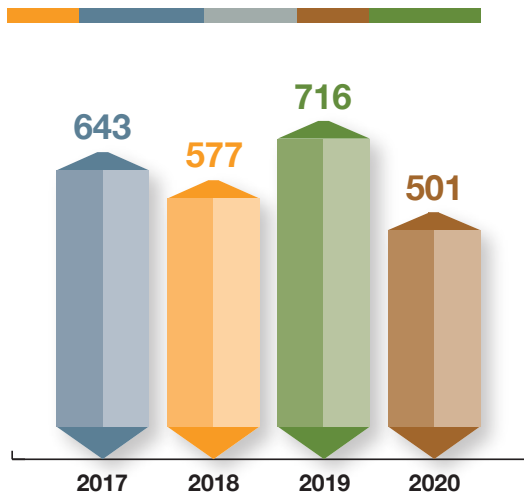




Metrorail also does not have a single, clear, complete safety procedure for the securement of vehicles using chocks, and a service bulletin that was issued to some departments contradicts Metrorail's rules and procedures.

Metrorail is required to propose Corrective Action Plans by late April 2021.

## SAFETY EVENTS



*Number of safety events reported by Metrorail to oversight body each year. Note: Numbers based on categorization and reporting at or around time of event. Numbers prior to March 19, 2019 were under FTA oversight.*

Metrorail reported 501 total safety events to the WMSC in 2020.

This reflects improved tracking and reporting, safety adjustments, and decreased service and ridership.

Each event that is formally reportable to the WMSC is defined in technical terms as an accident, incident or occurrence in the event reporting matrix in the WMSC Program Standard. This matrix, which was updated in July 2020, is based on FTA regulations and WMSC operational experience.

Some of those safety events that may be more serious, or that are most likely to be linked to broader trends or deeper issues, trigger a more extensive investigation.

In 2020, the Commission adopted 35 of those more detailed final reports of investigation (see Appendix B). The WMSC also processed 66 preliminary reports providing interim investigative information related to other events that required additional review but that did not require a final report.

Investigations into additional events that occurred in 2020 are continuing and are expected to be finalized in 2021.

Some of the most significant events that occurred in 2020 or that had investigations completed in 2020 are described below, including a July 7 derailment as a Red Line train departed Silver Spring Station and two 6000-series train pull-aparts that occurred in October and November.

Further improvements to Metrorail's safety measurement system to collect safety-related data and the implementation of other aspects of a data and information-focused safety management system approach under WMATA's Public Transportation Agency Safety Plan may help provide improved data comparisons and trend analysis in future years.

### July 7, 2020 derailment (Silver Spring)

On July 7, 2020 a Red Line train derailed as it departed from Silver Spring Station toward Forest Glen Station. The WMSC quickly responded to the scene. Following the derailment, Metrorail did not follow emergency response procedures and there were several communications issues.

As the Train Operator moved the train out of the station, passing a red signal, the switch at that location moved under the train in response to a Rail Operations Control Center command to return the switch to a normal position that would have provided for the correct movement of this train to continue toward Forest Glen Station.

The first car of the train followed the path the switch was initially set in, toward the center, pocket track where an out-of-service train had been routed a few minutes earlier. The switch movement led to the leading wheels of the second car of the train derailling in the area of the switch when the train was moving approximately 11 mph.

31 passengers on the train were evacuated directly onto the station platform through the trailing cars of the train, which were not yet beyond the platform. Because the derailment led to the rear door of the first car being blocked due to the misalignment of the first and second cars, the train operator and one passenger who was on the lead car of the train were evacuated through the front bulkhead door and walked on the roadway back to the platform.



After the train derailed, Metrorail management provided conflicting direction to ROCC personnel on actions to take in response to the derailment and how to continue service elsewhere on the Red Line. Some of these directions violated emergency response procedures because they were not properly vetted by, routed through, or approved by Montgomery County Fire and Rescue Services incident command.

Metrorail personnel on scene did not properly report to incident command, did not properly establish unified command, and did not properly report to the staging area.

The WMSC also identified that the ROCC controller's microphone did not transmit multiple messages that were related to the emergency response.

Separately, the fire liaison in the ROCC also could not communicate on the fire department radio system with Montgomery County Fire and Rescue Services due to radio system issues and the unavailability of a backup cell phone. At the time of this event, Metrorail had instituted changes that replaced the uniformed fire liaison officers in the ROCC with Metrorail Office of Emergency Management (OEM) staff. The OEM employee acting as the fire liaison did not have any training or procedures to follow to carry out their duties. Regular staffing of the fire liaison position by uniformed officers of local fire departments resumed July 19, 2020 after adjustments to pandemic precautions.

In addition to any other corrective actions directly related to the investigation, a number of issues related to this event were reflected in the WMSC's ROCC Audit findings. Metrorail must address those areas through the related Corrective Action Plans.

### October train pull-apart

On October 9, 2020, a 6000-series Red Line train pulled apart into two separate sections – two cars at the front of the train, and six cars at the rear, shortly after it departed Union Station for NoMa-Gallaudet. The WMSC quickly responded to the scene.

Following the pull-apart, conflicting information and communications related to rail operations personnel, first responders, and others led to customers being stranded on and around the train for an extended period. Due to the separation, the train operator had no way to make announcements to the passengers on the trailing six cars of the train. As time went on, customers also opened emergency doors to provide air flow. There were 108 customers on board.

After the pull-apart, Metrorail removed all 6000-series trains from service for coupler inspections.

At the WMSC's urging, follow-up post-event debriefs with first responders to identify areas for improvement were held for this event, the Silver Spring derailment, and the following train pull-apart in November. The WMSC has emphasized the importance of these debriefs to improving emergency preparedness, and WMATA's Chief Safety Officer and Fire



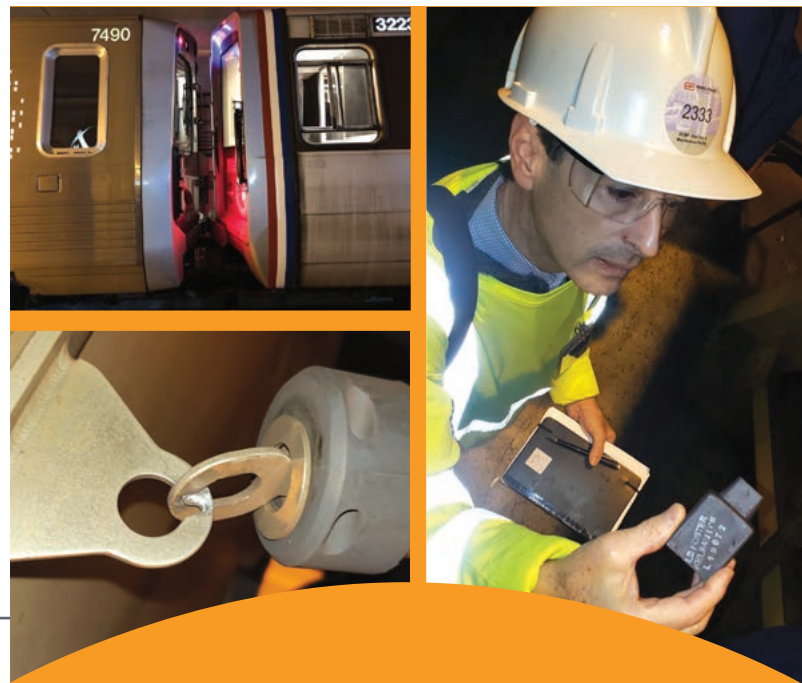
Marshal have worked with the WMSC to establish these for events with a significant fire rescue response.

In this event, the debrief identified that WMATA had not worked with first responders to establish a standard response for an event like a train pull-apart. That contributed to delayed response times, and to challenges in determining the best way to safely and efficiently get customers off the roadway and back to a station platform.

### Evidence Manipulation

When the WMSC, WMATA's Safety Department, and other investigative personnel arrived at the Greenbelt Rail Yard the morning after the October 9 pull-apart to inspect and evaluate the coupler assemblies, investigators found that the coupler assemblies had been manipulated between the time the railcars had been stored and the time investigators had arrived to conduct their examination.

The WMSC was later told and saw evidence that, at the direction of supervision, a bolt was manipulated outside of the safety event investigation process. Among other evidence, the torque stripe on the bolt had







moved clockwise, indicating that the bolt had been tightened. Any such manipulation of evidence related to a safety event investigation is prohibited by Metrorail Standard Operating Procedure (SOP) 800-01.

The WMSC had raised similar concerns before regarding the integrity of evidence related to safety event investigations, including in the recently published Rail Operations Control Center (ROCC) Audit Report and in safety event investigation report W-0042 regarding an August 15, 2019 collision on Largo Town Center Tail Track, Track 2.

In the ROCC Audit, the WMSC found that ROCC managers were not providing complete information such as audio recordings, and that SAFE was only obtaining information through ROCC employees.

In the Largo Town Center Tail Track collision, an individual train operator attempted to decouple the accident vehicles without permission, thereby disturbing the scene.

**A HOLISTIC SAFETY MANAGEMENT SYSTEM APPROACH REQUIRES NOT ONLY SUFFICIENT AND CURRENT WRITTEN POLICIES, BUT ALSO PROPER TRAINING FOR THE PEOPLE RESPONSIBLE FOR IMPLEMENTING THOSE POLICIES.**

These examples demonstrated that from the frontline worker involved in a safety event up to the level of department leaders, Metrorail employees were not properly trained on and familiarized with their basic responsibilities related to safety event investigations. This has led to violations of SOP 800-01 that have compromised the integrity of the investigative process and the reliability of lessons learned.

A holistic Safety Management System approach requires not only sufficient and current written policies, but also proper training for the people responsible for implementing those policies. It also requires a robust investigation process with integrity to ensure maximum learning from safety events.

Therefore, the WMSC issued a finding on October 20, 2020 that Metrorail puts the integrity of safety event investigations 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.

Metrorail was required to and later did develop a Corrective Action Plan to institute policy changes to ensure all proper steps are followed to



protect the integrity of all investigations and to provide initial and ongoing refresher training to ensure each Metrorail employee and all relevant contractors understand their roles and responsibilities as those relate to safety event investigations.

**November train pull-apart**

On November 24, 2020, a 6000-series Red Line train departing Glenmont Station pulled apart into two sections.

WMATA operations personnel already on the train and those at the station effectively responded to the event and evacuated passengers, however the Rail Operations Control Center (ROCC) made two separate, conflicting calls to first responders that led to some initial confusion regarding the appropriate response.

Twelve customers and two WMATA employees were safely evacuated from the train.

The investigation into this event and the continuing investigation into the October 9 event, which was still ongoing at the time showed that the 6000-series coupler inspections WMATA conducted following the October 9 pull-apart were not comprehensive, and focused only on the specific bolt linked to the October 9 event.

Preliminarily, the November 24 pull-apart appears to have had a similar proximate cause, improperly torqued bolts, but the specific bolts that were loose were different than those identified as loose in the October 9 event.

The WMSC, WMATA and representatives from the coupler manufacturer participated in a detailed review of the coupler assembly involved in the November 24 event and of maintenance documentation that serves as the basis for coupler overhauls.

The investigation into the November 24 event has demonstrated that Metrorail did not have the proper tools to conduct 6000-series railcar overhauls, raising concerns about Metrorail's safety certification process that require further investigation.

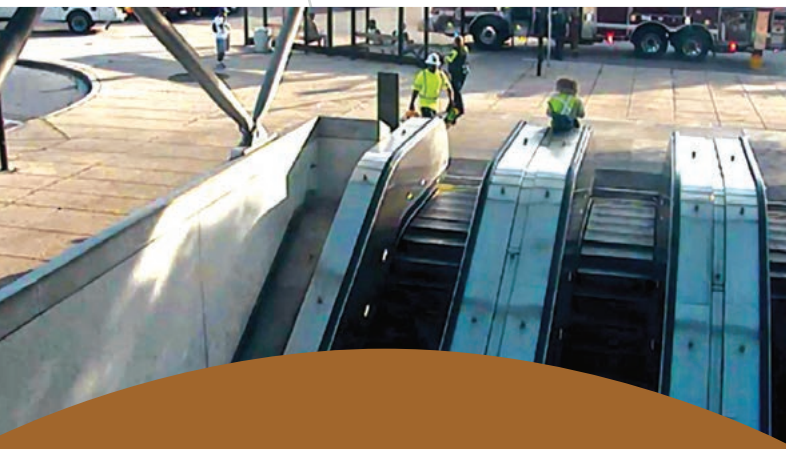
The investigation into these pull-aparts continued well into 2021.

## Capitol Heights Smoke Event

On June 6, 2020, arcing insulators near Capitol Heights Station led to smoke in the station. However, Rail Operations Control Center staff did not stop train service or call the fire department when the station manager reported the smoke.

WMATA personnel across multiple departments did not follow emergency procedures, an emergency response team initiated a conflict with firefighters, and there were a number of communications lapses.

The Station Manager reported smoke at 6:07 p.m., but there was no call to first responders until seven minutes later, and the Station Manager continued to be pressed as to whether the smoke was actually “brake dust”. A Rail Operations Information Center Specialist who asked those questions on the radio stated that they are taught to avoid the use of the word smoke.



For clear safety reasons, if there is smoke, Metrorail is required to implement its emergency procedures, which put safety first.

Another train operator was directed to use an out of service train to conduct an inspection, but that train operator did not follow speed restriction rules for such inspections and could not stop at the correct location.

WMATA did not properly communicate with the fire department on scene or in the ROCC. At Capitol Heights Station, WMATA employees including Metro Transit Police officers and the rail emergency response team (ERT) did not establish unified command with the fire department’s Incident Commander and entered the station without approval from the incident commander.

Firefighters were on the roadway placing Warning Strobe Alarm Devices as a safety measure after third rail power was de-energized, when the first ERT member on the platform initiated a conflict with the firefighters. Specifically, ERT moved toward restoring power without coordination with the Incident Commander.

The Incident Commander reported over the fire department radio that ERT put them in a “bad position.” In the Rail Operations Control Center, a

Superintendent was required to provide frequent updates to upper-level management on the phone, which detracted from the Superintendent’s ability to perform their other duties, including their duty to share information provided by the fire liaison with the Utility Assistant Superintendent and ROCC Controllers. A utility assistant superintendent is a controller who sometimes fills in as an assistant superintendent.

Although it was clear at the time of the event that several ROCC employees may have played a role, none were removed from service for post-incident testing as required.

This event was triggered by an arcing insulator in a tunnel and demonstrates the importance of taking additional steps to keep water out of tunnels to prevent smoke and fire events and to prevent rapid infrastructure deterioration. The WMSC plans a continued focus on this issue in 2021.

This event occurred in June, prior to the conclusion of the WMSC’s ROCC Audit work. Some aspects of this event were incorporated into the audit findings released in September that, as noted above, require several safety changes in the Rail Operations Control Center that are relevant to improving emergency response. These include improved training, additional emergency exercise experience, improved fire and smoke procedures, revision of checklists, improved communication between the fire liaison and controllers, proper staffing of the fire liaison position, and the proper removal of service of ROCC personnel for post-event testing. As discussed above, the ROCC Audit also identified staffing, leadership and workload concerns in the ROCC.

## Station Overruns, Red Signal Overruns

The WMSC issued a finding requiring a Corrective Action Plan to address station overruns in fall 2019. Metrorail’s approved Corrective Action Plan stated improvements would be in place by October 2020, however Metrorail has still not completed this CAP.

Due to an increased prevalence of station overruns and the lack of progress Metrorail has made on this issue despite an existing Corrective Action Plan, the WMSC conducted its own review of station overrun events in late 2020 and presented the findings to WMATA safety officials to assist with the continuous improvement of safety in the system.

Even after Metrorail safety and operations officials later outlined some steps to the WMSC that had been taken that were intended to address this issue, confusion and lack of progress continued.

As an open, past-due CAP, the WMSC pays special attention to these issues to emphasize to Metrorail the importance of efficiently and sufficiently addressing safety hazards. This led to WMATA taking additional steps in early





2021 toward fully implementing the Corrective Action Plan and addressing root causes of station overruns.

Station and red signal overruns can have similar underlying causes or causes that create similar risks in some cases if Metrorail does not act to mitigate these risks.

For example, investigation W-0052 into improper roadway worker protection at East Falls Church Station on August 19, 2020 demonstrated a train operator entered the station, which was closed to customers, at 33 mph, above the 25 mile per hour limit for trains that are bypassing a station, and could not see and had no warning that an advance mobile flagger was present requiring trains to stop for a safety briefing regarding workers on the tracks ahead. This event suggested that Metrorail had established the bypassing of stations without fully considering all hazards, and highlighted that Metrorail has a rule for train speeds for trains bypassing stations, but no rule for train speeds of trains entering stations where the trains are supposed to stop.

Metrorail has identified areas to address such as train speeds and train operator training but must follow through on these improvements in order to address this issue.

Due to Program Standard reporting code improvements made in 2020, these numbers will now be even more readily trackable by WMSC staff over the long-term in coming years.



**October 7, 2019 Farragut West collision investigation (final report completed in 2020)**

The investigation into a 2019 collision near Farragut West Station was completed in 2020.

Among findings issued soon after the October 7, 2019 rear-end collision between two trains that were not carrying customers, the WMSC directed immediate steps to improve Metrorail's policies governing distractions for operators like cell phones, and required renewed efforts to address the consistent loss of speed commands in numerous parts of the system.

**THIS WAS AN EXTREMELY SERIOUS EVENT THAT HIGHLIGHTED SEVERAL SIGNIFICANT ISSUES FACING THE METRORAIL SYSTEM. THE ACCIDENT WAS AVOIDABLE IF PROPER PROCEDURES AND PROTECTIONS WERE IN PLACE.**

Speed commands essentially provide train operators with an automated authorized speed limit. When that limit drops to zero, they are not supposed to move the train without explicit authorization from the Rail Operations Control Center. However, there are parts of the Metrorail system where the speed commands regularly drop out, which could lead to skipped procedures that could cause another crash like this one.

The striking train was accelerating at about 11 mph at the time of the collision, causing significant damage to the railcars. This event demonstrates the risks that arise from a long-term failure to address the unauthorized movement of trains with zero speed commands.

This was an extremely serious event that highlighted several significant issues facing the Metrorail system. The accident was avoidable if proper procedures and protections were in place.

The full WMSC team responded to this accident because of the severity of this event, and the WMSC will ensure that Metrorail takes the proper steps needed to significantly reduce the likelihood of any similar event occurring in the future.

**Other safety events**

The WMSC also responded to or adopted final reports on a number of other safety events in 2020.

A May fire on the upper floors of Metrorail's downtown D.C. headquarters, the Jackson Graham Building, caused significant damage and limited WMATA access to some of its own records for several months.

Other events included a February 14, 2020 event where a train was routed into an area where power was down to protect a train operator and a person who had been struck by a train at Minnesota Avenue Station, a number of improper roadway worker protection events, collisions, and several derailments of maintenance vehicles.

Additional examples include a December 13, 2020 event where two trains stopped near Fort Totten Station after the third rail de-energized due to breakers opening uncommanded. Customers were evacuated from the trains by Metro Transit Police officers without the use of a Warning Strobe and Alarm Device (WSAD). A WSAD is a critical piece of safety equipment when employees, contractors, first responders or customers are on the roadway because it sounds an alarm if third rail power is restored, thereby warning those on the roadway of this dangerous situation. This event also included a number of communication and coordination issues.



These events and other issues identified through the WMSC's oversight activities demonstrate that there is more work to do to continue to improve safety at Metrorail. As WMATA has recognized, that work must include improvements beyond reactions to safety events like those mentioned above, to include regular ongoing training, safety stand downs, and careful reviews of operations.

## SILVER LINE & SAFETY CERTIFICATION OVERSIGHT

As construction work on Silver Line Phase 2 by the Metropolitan Washington Airports Authority (MWAA) continued in 2020, WMATA took some additional steps toward preparing to take ownership of and operate the rail line.

From WMATA's side, proper training and staffing is crucial for safe operations. The WMSC has clearly communicated this to WMATA on several occasions, including in the ROCC Audit and in direct communications with the General Manager.

The WMSC oversees the safety certification process for both MWAA and WMATA to ensure that they have complied with the safety processes that are in place to identify and carry out any necessary safety mitigations, including in regard to construction, training and staffing. As part of this oversight, the WMSC conducts inspections, assessments and discussions to identify areas where safety changes are required and to understand MWAA and WMATA's actions. The WMSC's role is focused solely on safety-related issues.

In relation to MWAA's construction, the WMSC conducted a Fire-Life Safety Assessment in March 2020 to identify areas where construction-related changes were required or recommended for fire-life safety reasons. MWAA and the WMSC worked together to be sure that required changes will be implemented.

MWAA is responsible for constructing the line to meet the standards outlined in the construction contract. WMATA is responsible for determining acceptance of the stations, tracks and rail yard, then conducting final training before opening the line.

Metrorail must complete a Safety and Security Certification Verification Report (SSCVR), and the WMSC must concur that certification has been fully and properly completed before the line can open.

WMSC safety certification oversight responsibilities also include the new Potomac Yard infill station in Alexandria and Metrorail's procurement of its next new railcars, the 8000 Series.

## 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.

Each CAP is designed to improve safety. Therefore, the existence of one or more CAPs is not necessarily a negative thing. The goal, however, is to develop corrective actions proactively before a major safety event occurs, rather than reactively after a major event.

Since these CAPs are paths toward addressing a hazard or risk, it is crucial that Metrorail move as quickly as possible to address the WMSC's findings through policies that create lasting change.

Metrorail submits proposed CAPs to the WMSC for review so that the WMSC can ensure that the plans, when fully and properly implemented, will address the finding or other issue that must be corrected. Once the WMSC approves a CAP for implementation, Metrorail must carry out the plan. When the plan is complete, Metrorail submits a request to close the CAP for WMSC review. The WMSC monitors the implementation of the CAPs and closes CAPs once WMATA has shown that each of the interim and final steps in the CAP have been completed.





**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.**

Even after CAPs are closed, the WMSC continues its oversight to ensure that the plans do not fall by the wayside and remain implemented and effective as intended, since WMATA is responsible for maintaining safety improvements long-term.

When the WMSC took over direct safety oversight and enforcement authority from the FTA in March 2019, there were 101 open CAPs, some of which dated back years. Additional CAPs, some of which have now been closed, were created in 2019 and 2020 due to WMSC findings.

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 others, Metrorail may be able to completely address the issue within a few weeks or months.



After taking responsibility for the CAPs, the WMSC acted in 2019 to close 52 CAPs, and in 2020 to close 41 CAPs. Some of these CAPs were those related to findings issued by the WMSC, while others closed in 2020 related to the older CAPs that were carried over from the FTA or, like C-0007 related to ROCC staffing, were superseded by more recent findings and Corrective Action Plans.

The WMSC reserves the right to reopen closed CAPs or to take enforcement action if Metrorail does not follow through on the approved plans, or if the approved plans do not lead to the required substantive changes needed to address the identified issues.

In total, there are 59 open CAPs as of March 1, 2021, and others still in development (see Appendix A).

These totals do not include separate internal Corrective Action Plans that Metrorail has developed to address findings from Department of Quality Assurance, Internal Compliance & Oversight (QICO) reviews, or internal plans developed in response to findings from Metro's Office of Inspector General (OIG).

Both QICO and the OIG can play significant positive roles in the identification of actual or potential risks 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.

**PUBLIC TRANSPORTATION AGENCY SAFETY PLAN (PTASP)**

In late 2020, Metrorail completed and the WMSC approved WMATA's first Public Transportation Agency Safety Plan (PTASP).

This plan, required by the WMSC Program Standard and Federal Transit Administration (FTA) regulations, requires a continuous data-driven approach to safety management known as a Safety Management System (SMS) approach. The PTASP replaces the System Safety Program Plan (SSPP) previously required by the WMSC and FTA, but includes areas that remain similar such as internal safety reviews WMATA is required to conduct on a recurring basis.

The PTASP was approved, adopted and made effective as required prior to the federal enforcement deadline.

The SMS approach requires a strong safety culture with clear commitments from every single person in the Metrorail organization that allows all employees to report potential problems through clear communications channels in order to drive continuous improvements through training, maintenance, policies and procedures. Under a fully implemented SMS, every employee in every department is accountable for upholding commitments to safety.

This takes clear direction, training, avenues for reporting safety issues, and communication to keep everyone up to date on how these reports are being used to proactively improve safety.

As the WMSC has identified in audit and inspection work, WMATA can do more to break down silos to ensure people across Metrorail are truly working together on every safety issue. This requires regular collaboration and interaction not just within departments, but also among people across multiple departments that have joint responsibilities in areas such as inspections, maintenance, operations and planning.

The WMSC has played a critical role by attempting to start to break down some of the barriers between Metrorail departments by bringing various departments together to address important safety issues such as railcar vibration and maintenance, and by ensuring that WMSC experts interact

directly with individuals at all levels of the Metrorail organization as required by federal regulations.

The WMSC understands that properly developing and providing the necessary training and direction required in a strong safety culture takes time. WMATA has begun to roll out the SMS approach in the Rail Operations Control Center (ROCC), with training for other departments expected in the future.

The WMSC is focused on ensuring that Metrorail is proactive, acts on, tracks and investigates hazards and risks as required by the SMS approach, and allows easy reporting of concerns from frontline workers, along with providing proper feedback and protections for those reports.

WMATA must make its employees at every level fully aware of and comfortable with what their role can be in making safety as a core value a reality.

The goal is to help limit ebbs and flows of safety performance and to keep safety a top priority at all times, not just in the immediate aftermath of a safety-related event.

As part of that continuous improvement, WMATA is required to review and revise its PTASP as appropriate at least annually. Each revision must be submitted to the WMSC for approval.



## CONCLUSION

Safety is not something that is achieved one day, and the work stops. Metrorail must recognize that this is a never-ending journey of continual improvement.

Metrorail has made progress in some areas, but significant work remains in others.

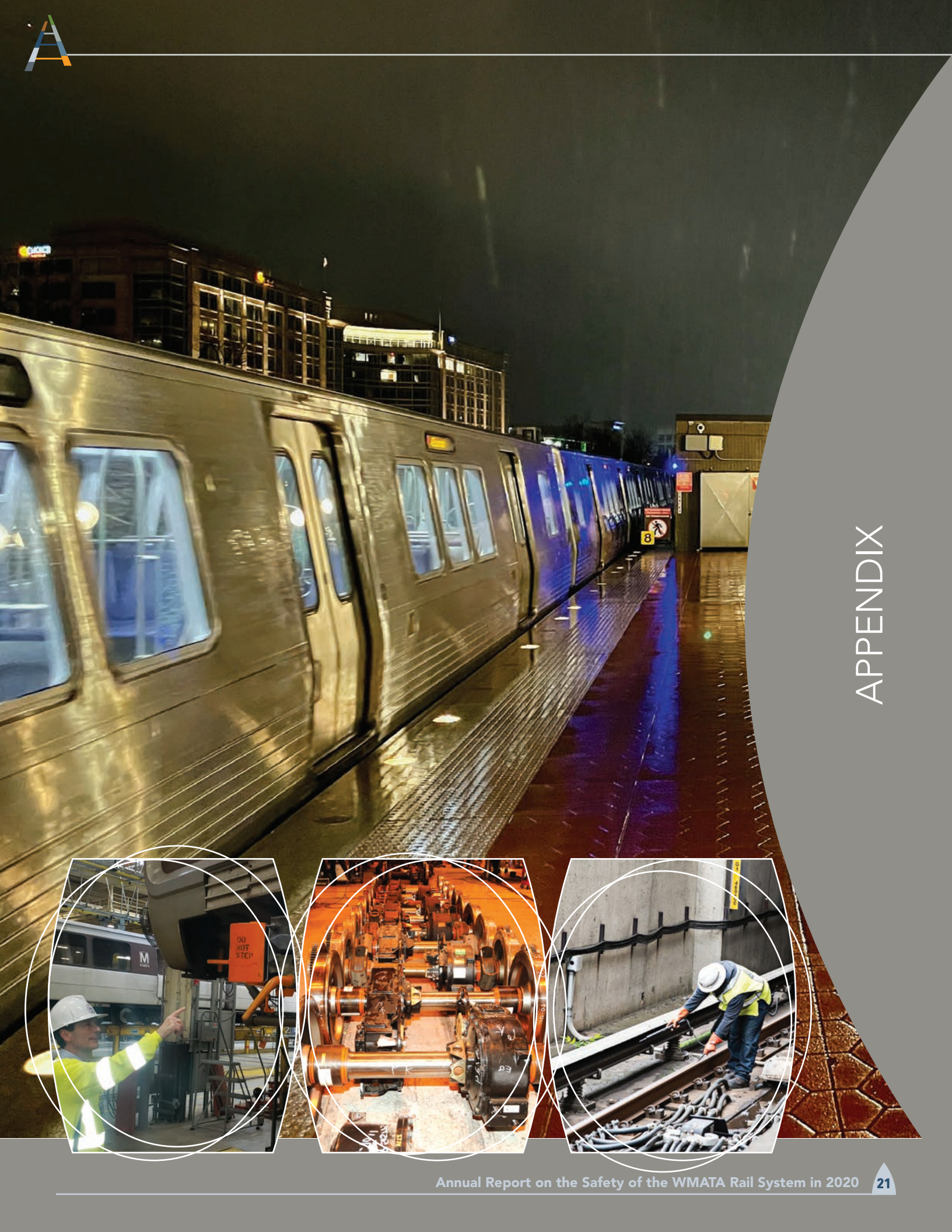
Achieving major organizational culture change, such as the change required in the Rail Operations Control Center, requires consistent focus over a prolonged period, but it can be done if WMATA dedicates the required resources and emphasis to complete its Corrective Action Plans and to maintain a continuous improvement process as required by an SMS approach and WMATA's PTASP.

There will never be a day with zero Corrective Action Plans, and there should not be. That would be an unacceptable sign of complacency because there is always room for safety improvement. Still, the goal is to mitigate or eliminate as many risks as possible, which will be accomplished through constructive feedback and open communication.

The WMSC's oversight promotes the highest levels of safety achievable by Metrorail. This is what WMATA has committed to and this is what WMSC will do its part in upholding.

The WMSC's only interest is making Metrorail safer.





APPENDIX





# APPENDIX A

## OPEN CORRECTIVE ACTION PLANS (CAPS) AS OF MARCH 1, 2021

<b>FTA-TSR-18-003</b>	January 2022	WMATA does not consistently implement its Hazard Management Procedure.
<b>FTA-17-1-10</b>	June 2021	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.
<b>FTA-RED-16-003-B</b>	August 2021	WMATA has not fully implemented sufficient protections against the unauthorized movement of trains with zero speed commands.
<b>TOC-OSP-15-001-A</b>	July 2021	WMATA's hearing conservation program does not meet OSHA requirements.
<b>TOC-RWP-15-008-A</b>	January 2021	The development and issuance of technical documentation does not appear to be governed by an engineering standard or procedure.
<b>TOC-COL-15-003-A</b>	February 2022	Unsecured railing entered dynamic envelop of train in car wash.
<b>FTA-RED-16-004-A</b>	January 2021	WMATA does not ensure consistent understanding among train and equipment operators and the ROCC or Interlocking Controllers.
<b>FTA-Rail-4-27-A</b>	January 2021	Documented maintenance procedures and standard operating procedures are not implemented as required.
<b>FTA-17-1-16</b>	January 2021	WMATA does not implement a consistent program regarding the testing, inspection, and maintenance of its negative return system.
<b>WMSC-19-C0005</b>	September 2022	Metrorail lacks sufficient capability to collect safety-related data from assets via telemetry sources and analyze that data for use by rail and operations staff to improve the safety of those assets, which is a critical element of SMS.
<b>WMSC-19-C0006</b>	July 28, 2021	The Rail Operations Control Center must be appropriately staffed to meet the current operational needs.
<b>WMSC-19-C0008-A</b>	September 2020	Metrorail does not currently have an effective hours of service policy.
<b>WMSC-19-C0008-B</b>	September 30, 2022	Metrorail does not currently have an effective hours of service policy.
<b>WMSC-19-C0015</b>	October 2020	Metrorail lacks adequate controls to reduce station overruns.
<b>WMSC-19-C0016</b>	June 25, 2021	Metrorail has not fully implemented sufficient protections against the unauthorized movement of trains with lost speed commands.
<b>WMSC-19-C0017</b>	February 2021	Metrorail has not fully implemented sufficient protections against the unauthorized movement of trains with lost speed commands.





## APPENDIX A (CONTINUED)

<b>WMSC-19-C0019</b>	April 30, 2021	Metrorail must do more to prevent unauthorized use of PEDs.
<b>WMSC-19-C0020</b>	October 22, 2021	Dysfunction in the ROCC during unplanned events detracts from the ROCC's ability to manage the rail system appropriately and effectively.
<b>WMSC-19-C0022</b>	+ 30 days from completion of actionable item #2	WMATA personnel responsible for conducting track maintenance activities follow no formal protocols to govern their repair and installation work.
<b>WMSC-19-C0023</b>	November 30, 2020	In 2019 WMATA conducted heat-ride inspections on thirteen percent, or 11 of 85, days when the outside air temperature reached the point at which WMATA's protocols require such inspections be conducted.
<b>WMSC-19-C0025</b>	December 3, 2021	WMATA had no records to indicate that TRST personnel are refilling rail lubricators consistent with the TRST-1000.
<b>WMSC-19-C0026</b>	March 18, 2022	WMATA does not conduct annual culvert inspections as specified in Section 105.1 of the TRST-1000.
<b>WMSC-19-C0027</b>	February 10, 2021	WMATA does not have a weed spraying program consistent with industry standards.
<b>WMSC-19-C0031</b>	April 16, 2021	Quality control checks by TRST supervisors occur infrequently and inconsistently with TRST's protocols.
<b>WMSC-19-C0032</b>	February 19, 2021	WMATA uses equipment operators to perform track repairer duties without first providing such personnel with formal training.
<b>WMSC-19-C0033</b>	July 24, 2020	WMATA cannot verify that defects identified during track geometry vehicle inspections are repaired.
<b>WMSC-19-C0034</b>	July 30, 2021	TRST lacks job-specific training for newly hired or promoted supervisors.
<b>WMSC-20-C0035</b>	April 23, 2021	ROCC Controllers are not prepared to operate the emergency ventilation fans to respond to smoke and fire events, which could lead to a repeat of the January 12, 2015 L'Enfant Plaza station electrical arcing and smoke accident, or worse.
<b>WMSC-20-C0036</b>	February 19, 2021	ROCC management routinely remotely manipulates controllers' consoles without expressly sharing or coordinating train movement plans with the controllers, which is an unsafe practice that could lead to a collision, derailment or jeopardize the safety of front-line personnel under the direction of controllers.
<b>WMSC-20-C0037</b>	December 24, 2021	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.
<b>WMSC-20-C0038</b>	February 5, 2021	WMATA employees are not consistently following Roadway Worker Protection Rule 5.13.6 for watchman/lookout placement, placing work crews at risk.
<b>WMSC-20-C0040</b>	May 14, 2021	RWP classes for Level II and Level IV and the requalification for both do not provide sufficient practical experience or testing to ensure that these workers who are critical to safe operations under RWP rules truly understand the importance and function of key safety equipment.

## APPENDIX A (CONTINUED)

<b>WMSC-20-C0041</b>	April 2, 2021	WMATA employees are not consistently following Personal Protective Equipment (PPE) requirements for personnel entering or traversing WMATA's roadway.
<b>WMSC-20-C0042</b>	November 24, 2021	WMATA employees are not consistently following RWP Rule 5.12 for equipment calibration.
<b>WMSC-20-C0043</b>	March 17, 2021	WMATA does not have a clear definition of a train "in approach" to a foul time area, which leads to inconsistent use of checklists and inconsistent radio communication that could cause a train operator to be unaware of work crews on the tracks ahead.
<b>WMSC-20-C0046</b>	April 30, 2021	Practical exercises and testing in RWP classes are not standardized, which could lead to workers getting Level II or Level IV certification without proper instruction.
<b>WMSC-20-C0048</b>	December 18, 2020	RWP SOP section 13.2.5 states, "All curriculum, guidelines, policies and processes shall be submitted to SAFE and MTPD for review and compliance with the SSPP and SEPP." Based on interviews with SAFE and MTPD personnel, this requirement is not being followed, despite the critical safety importance of the RWP program.
<b>WMSC-20-C0049</b>	December 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.
<b>WMSC-20-C0050</b>	April 30, 2021	ROCC management attempts to manipulate safety event investigations and baselessly threatens controllers with arrest or termination.
<b>WMSC-20-C0051</b>	July 29, 2022	Metrorail does not record all critical ROCC communications, limiting the lessons that can be learned from safety events.
<b>WMSC-20-C0052</b>	February 24, 2023	There is no consistent, clear, concise, immediate and reliable Metrorail communication process for safety-critical information between Metrorail personnel and fire liaison.
<b>WMSC-20-C0053</b>	January 6, 2023	Some Metrorail procedures lack the required urgency to address life-safety issues.
<b>WMSC-20-C0054</b>	February 25, 2022	Repeated failures to address safety issues have contributed to a culture where front-line workers no longer see any.
<b>WMSC-20-C0055</b>	December 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.
<b>WMSC-20-C0056</b>	August 30, 2024	Metrorail's 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.
<b>WMSC-20-C0057</b>	January 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.



## APPENDIX A (CONTINUED)

<b>WMSC-20-C0058</b>	December 2, 2022	Controllers still have too many responsibilities and are frequently rushed to complete tasks by management.
<b>WMSC-20-C0059</b>	April 26, 2024	WMATA has failed to regularly update the Rail Operations Control Center Procedures Manual.
<b>WMSC-20-C0060</b>	January 6, 2023	WMATA has not reviewed SOPs or OAPs on a regular basis.
<b>WMSC-20-C0061</b>	July 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.
<b>WMSC-20-C0062</b>	February 18, 2022	Controllers are not provided with the full extent of training necessary to do their jobs, including sufficient familiarization with roadway operations and procedures.
<b>WMSC-20-C0063</b>	January 7, 2022	Aspects of ROCC training are inconsistent and must be structured. Multiple controllers reported that significant time is wasted during initial training.
<b>WMSC-20-C0064</b>	October 29, 2021	Required on the job training (OJT) is not carried out in a structured or standardized fashion.
<b>WMSC-20-C0065</b>	February 17, 2023	Not all controllers experience emergency drills. If each ROCC controller does not get this experience, it diminishes the value of the drills.
<b>WMSC-20-C0066</b>	July 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.
<b>WMSC-20-C0067</b>	April 15, 2022	Certification and recertification scenarios required of ROCC employees are repeated year after year, diminishing the value of the testing and training process.
<b>WMSC-20-C0068</b>	January 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.
<b>WMSC-20-C0069</b>	November 19, 2021	WMATA does not have minimum training requirements for Metrorail employees or contractors who serve in the fire liaison position.
<b>WMSC-20-C0070</b>	October 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.

As of March 1, 2021, WMATA was still developing Corrective Action Plan proposals for the 12 findings in the Elevated Structures Audit and a response to that recommendation. Those proposals were submitted on schedule in March 2021. As of March 1, 2021, the WMSC was reviewing several CAP closure requests from WMATA.



# APPENDIX B

## FINAL INVESTIGATION REPORTS ADOPTED BY THE WMSC IN 2020

Report Number	Date of Adoption	Report Title	Summary
W-0018	Feb. 13, 2020	Green Line train passed work crew moving faster than 10 mph	A train operator departing Branch Avenue was not told that a work crew was on the tracks ahead, and therefore passed the work crew at excessive speed on July 16, 2018.
W-0019	Feb. 13, 2020	Green Line train failure to service station after operator may have dozed off	A train operator appeared to doze off while operating a revenue train and did not stop that train or attempt to service Waterfront Station on June 25, 2019.
W-0020	Feb. 13, 2020	Arcing event with intense damage to switchgear at Alexandria Yard	A fire in a traction power substation completely burned two breaker cubicles and damaged three others on August 14, 2018. The breakers were overloaded.
W-0021	Feb. 13, 2020	Undesired Uncoupling: Silver Line train outside Wiehle-Reston East	A 3000-series train separated in the Wiehle-Reston East Tail Track on April 15, 2019. The RH Electrical Coupler had moisture inside the pin box, the FWD train line was short circuited to the uncouple train line, and the uncoupling was activated by the train operator keying up after reversing ends of the train.
W-0022	Feb. 13, 2020	Collision with Object: Old rail left in right of way contacted collector shoes, blowing fuses and disabling train	An old piece of rail left at Reagan National Airport Station contacted collector shoes on an early-morning employee train on October 31, 2018, short circuiting the collector shoe fuses and breaking off a collector shoe paddle.
W-0023	Mar. 12, 2020	Doors failed to open, then failed to close at Smithsonian	An Orange Line train's doors would not open at Smithsonian Station on June 25, 2019. The train operator opened the doors from the third car without informing ROCC, and then could not close the doors from the lead car of the train. The 3000-series train's lead car door control panel was stuck with the door closed button depressed.
W-0024	Mar. 12, 2020	Serious Injury: TRST employee injured while welding	A Track and Structures employee working in the 2019 Blue and Yellow Line summer shutdown area was injured while welding in the Huntington Interlocking on August 29, 2019. The employee's foot became wedged in place, and a piece of hot slag from the newly welded rail hit the employee. The employee was later admitted to the hospital and diagnosed with third degree burns.
W-0025	Mar. 12, 2020	Employee Injury: CTEM employee burned at Branch Ave. Yard while spraying mist from aerosol can onto battery connector	A Car and Track Equipment Maintenance (CTEM) employee was burned on November 11, 2019 after spraying the mist from an aerosol can onto a low voltage battery connector.
W-0026	Mar. 12, 2020	Incorrect Routes: Orange Line trains misrouted	On March 25, 2019 and March 28, 2019, Orange Line trains were incorrectly moved toward Largo Town Center rather than New Carrollton when departing from Stadium-Armory Station. ROCC controllers and ATC personnel did not properly manage the routes.



## APPENDIX B (CONTINUED)

Report Number	Date of Adoption	Report Title	Summary
W-0027	Mar. 12, 2020	RWP Event: AMF not properly established; train operator did not expect to encounter work crew	An advanced mobile flagger (AMF) was not notified by the work crew to begin their AMF duties, was distracted by a cell phone and was not performing their duties when a track inspection crew accessed the roadway between Pentagon City and Crystal City stations on April 25, 2019.
W-0028	Mar. 12, 2020	Smoke Event: Capitol Heights. Cables meant to be used for less than 6 months were used for about 18 months	Smoke in Capitol Heights Station on July 2, 2019 was traced to the disconnect between the switch gear and automatic transfer switch in AC Switchboard Room 104. Cables in use were supposed to be temporary (less than six months) but had been in place for approximately 18 months with no record of any periodic inspections.
W-0029	June 18, 2020	March 9, 2020 Collision at Vienna Station	A Metrorail customer intentionally placed themselves in front of a train at Vienna Station on March 9, 2020.
W-0030	June 18, 2020	Collision: Train operator accelerates train into back of another train near Farragut West on Oct. 7, 2019	A train operator moved an out-of-service train that was showing zero speed commands multiple times, leading to a collision with another train near Farragut West Station on October 7, 2019.
W-0031	June 18, 2020	March 4, 2020 Serious Injury: IT employee escorting work crew breaks ankle	An employee tripped on the roadway near Reagan National Airport Station while setting up track protection on March 4, 2020. The employee suffered a broken ankle.
W-0032	June 18, 2020	February 14, 2020 Derailment: Hi-Rail Vehicle at Brentwood Yard	A hi-rail vehicle derailed in Brentwood Yard on February 14, 2020 after operating through a misaligned switch. The unit operator was operating in reverse using a rear-view camera. The Interlocking Operator in this event was a utility interlocking operator in training, who did not verify the location of the hi-rail vehicle and established a different route for a prime mover just as the hi-rail vehicle approached the switch.
W-0033	June 18, 2020	January 23, 2020 Collision: Medical emergency at Court House	A Metrorail customer appeared to have a medical emergency that led to falling onto the roadway at the Court House Station on January 23, 2020 just as a train approached.
W-0034	Aug. 4, 2020	December 9, 2019 Fatality at Farragut West	A Metrorail customer jumped from the Farragut West Station platform onto the roadway as a train entered the station on December 9, 2019.
W-0035	Aug. 4, 2020	December 3, 2019 Fatality at Capitol Heights	A Metrorail customer jumped from the Capitol Heights Station platform onto the roadway as a train entered the station on December 3, 2019.
W-0036	Aug. 4, 2020	July 8, 2019 Derailment at Van Dorn Street Interlocking	A hi-rail vehicle derailed in the Van Dorn Street Interlocking during a summer-long shutdown on July 8, 2019. Airbag pressure on the vehicle was not checked.



## APPENDIX B (CONTINUED)

Report Number	Date of Adoption	Report Title	Summary
W-0037	Aug. 4, 2020	August 27, 2019 Derailment at Alexandria Yard entrance	A hi-rail vehicle entering the Alexandria Yard derailed on August 27, 2019. This area was part of a summer-long shutdown.
W-0038	Aug. 4, 2020	August 30, 2019 Derailment at Franconia-Springfield Interlocking	A contractor-owned flat cart derailed in the interlocking near Franconia-Springfield Station on August 30, 2019 during a summer-long shutdown of the area. The flat cart was not a type normally permitted on Metrorail property.
W-0039	Aug. 4, 2020	September 26, 2019 Derailment at West Falls Church Rail Yard	A hi-rail vehicle derailed in the West Falls Church Yard on September 26, 2019. The vehicle had attempted to finish work and then to move back to the yard even after the crew identified a flat tire, which likely led to additional damage.
W-0040	Aug. 4, 2020	October 23, 2019 Collision at New Carrollton Rail Yard grade crossing	A Metrorail flat cart being pushed by a prime mover struck a Metrorail van at the New Carrollton Rail Yard grade crossing nearest to the vehicle entrance to the yard. The driver of the van, an ATC mechanic, had continued through a stop sign at the grade crossing as the rail vehicles moved forward.
W-0041	Aug. 4, 2020	January 4, 2020 Collision in Shady Grove Rail Yard maintenance shop	Two 6000-series railcars collided in the Shady Grove Yard shop on January 4, 2020. The train operator operating a moving four-car consist from the third car did not perform safety stops and did not respond to radio communications to stop the train. There was no communication between the Interlocking Operator and Car Maintenance personnel.
W-0042	Aug. 4, 2020	August 15, 2019 Collision at Largo Town Center Tail Track	An out-of-service train moving from the Largo Town Center Station platform collided with a stationary train in the Largo Tail Track. The train operator attempted to alter the scene. The train operator was violating electronic device policies and using a sun visor in 7000-series cabs to block the inward facing camera.
W-0043	Aug. 4, 2020	October 19, 2019 Serious Injury (Employee) between Dupont Circle and Woodley Park stations	Two employees were injured on October 19, 2019 when part of a 1,200-foot section of stringer rail they had just removed tipped over and fell on their feet or ankles. The crew had left a place of safety to begin clipping the new rail without communicating with the vehicle operator who was adjusting the old rail.
W-0044	Sept. 22, 2020	February 25, 2020 Collision near Rockville	A person climbed a fence separating the CSX freight rail tracks and the Metrorail roadway, then deliberately placed themselves in the path of a Red Line train.
W-0045	Sept. 22, 2020	May 1, 2020 Serious Injury (Contractor) at Vienna	A Metrorail contractor working on inappropriately constructed scaffolding in an enclosed area with toxic fumes fell and suffered a broken collar bone at the Vienna Station on May 1, 2020. Metrorail did not inspect the scaffolding or ventilation setup to ensure that proper safety procedures and safeguards were in place.



## APPENDIX B (CONTINUED)

Report Number	Date of Adoption	Report Title	Summary
W-0046	Sept. 22, 2020	February 10, 2020 Collision/ Derailment in Alexandria Rail Yard	A 3000-series train struck a hi-rail vehicle in the Alexandria Yard on February 10, 2020. The hi-rail unit did not reach its intended signal, and the train operator then assumed that the train had room to pass on the adjacent track, however the hi-rail unit was fouling the adjacent track. During the event, the Interlocking Operator was watching a movie trailer in the Yard Tower.
W-0047	Sept. 22, 2020	February 14, 2020 Collision, train routed onto dead rail near Minnesota Ave	Deficiencies in emergency response actions led to a train carrying customers being routed into an area where third rail power had been de-energized that should have been protected following a person deliberately placing themselves in the path of a train at Minnesota Ave Station on February 14, 2020. Power was then restored incorrectly to the area where the original incident train remained.
W-0048	Sept. 22, 2020	March 14, 2019 Collision, self-evacuation, evacuation on Red Line near Fort Totten	A Metrorail customer who had been wandering the Fort Totten Station for more than two hours walked through a platform end gate and continued for a significant distance toward Takoma Station on March 14, 2019. A Red Line train from Takoma Station toward Fort Totten Station later struck the customer. Customers on that train were not provided with any information regarding the event, and approximately 16 passengers then chose to self-evacuate. An additional 59 passengers were then led to Fort Totten in a controlled evacuation.
W-0049	Oct. 20, 2020	February 4, 2020 Train sent through smoke report at L'Enfant Plaza Station	A train carrying customers was used to investigate a report of smoke on the roadway, in violation of Metrorail procedures. It was later determined that the smoke was caused by ATC personnel improperly using a grinder to cut a lock in a train control room.
W-0050	Oct. 20, 2020	July 11, 2020 Improper Roadway Worker Protection (RWP) between Rosslyn and Foggy Bottom-GWU stations	A track inspection crew moving from Rosslyn Station to Foggy Bottom-GWU Station on July 11, 2020 did not ask for or receive the necessary level of protection to traverse an area identified as a hot spot due to a turbulent air vortex.
W-0051	Oct. 20, 2020	August 5, 2020 Serious Injury (Contractor) at West Falls Church Station	A Metrorail contractor working on the 2020 summer shutdown project suffered a broken leg on August 5, 2020 when barriers fell out of lifting straps and onto the contractor's leg. Metrorail did not conduct oversight of the contractor's work plans, which allowed for the inadequately planned work to proceed.
W-0052	Nov. 10, 2020	August 19, 2020 Improper RWP at East Falls Church	The operator of a Silver Line train toward Wiehle-Reston East Station on August 19, 2020 did not stop at the East Falls Church Station platform for an advance mobile flagger (AMF). East Falls Church was closed to customers at the time for a months-long construction project. The train entered above the maximum speed for station bypass, and there had been little communication regarding the work crew or AMF location.



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