



ANNUAL REPORT ON  
THE SAFETY OF THE WMATA RAIL SYSTEM IN 2019





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# LETTER FROM WASHINGTON METRORAIL SAFETY COMMISSION CHAIR

The Washington Metrorail Safety Commission (Commission) was created in 2017 by an interstate compact between Maryland, Virginia, and the District of Columbia to serve as the State Safety Oversight Agency for the Washington Metropolitan Area Transit Authority's Metrorail system (Metrorail). Since its creation, the Commission has worked tirelessly to hire staff, build expertise and create a new framework to oversee and enforce safety practices on one of the busiest and most important rail transit systems in the country.



The Federal Transit Administration (FTA) had overseen the safety of Metrorail since 2015, but federal law required that the jurisdictions undertake that oversight, and on March 18, 2019 the FTA certified the Commission to assume Metrorail's safety oversight role. We recognize the tremendous work the FTA did during its period of direct Metrorail safety oversight, and, since we were certified, we have been building on their achievements as we work with Metrorail to continue making the rail system safer for customers, workers and others who depend on it.

The entire national capital region should feel very proud that the three jurisdictions, Maryland, Virginia, and the District of Columbia, assisted by the close partnership of the federal government and the Metropolitan Washington Council of Governments, worked cooperatively to establish a premier safety organization that ensures robust, independent oversight of Metrorail. Our organization has more responsibilities and authorities than the FTA had, and has thereby created a new, more robust safety program.

On the following pages we will detail the status of Metrorail safety over the Commission's first year of operation, describe our ongoing strategies for continuously increasing safety excellence, and outline where Metrorail stands and where there is room to improve.

Sincerely,

A handwritten signature in black ink that reads "Christopher A. Hart". The signature is written in a cursive, flowing style.

Christopher A. Hart, Chair





# COMMISSIONERS AND CEO



**Christopher Hart**  
(District of Columbia), Chair



**Mark Rosenker**  
(Commonwealth of Virginia)  
Vice Chair



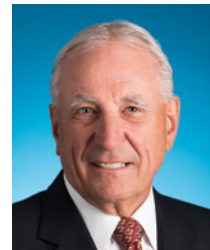
**Debra Farrar-Dyke**  
(State of Maryland)  
Secretary-Treasurer



**Robert Bobb**  
(District of Columbia)



**John Contestabile**  
(State of Maryland)



**Greg Hull**  
(Commonwealth of Virginia)



**Christopher Geldart**  
(District of Columbia –  
Alternate)



**Suhair Al Khatib**  
(State of Maryland –  
Alternate)



**Michael Rush**  
(Commonwealth of Virginia –  
Alternate)



**CEO**  
**David L. Mayer, PhD**



# EXECUTIVE SUMMARY

Under the oversight of the Washington Metrorail Safety Commission, WMATA is making progress in a number of areas and, as this report outlines, still has other areas where safety improvements must continue.

This first annual status report on the safety of the WMATA Rail System in 2019 outlines Commission directives and on-going investigations as well as the status of Metrorail's outstanding Corrective Action Plans. The report aims to help guide continual progress and efforts to make Metrorail the safest possible system, including by helping all of those invested in the system continue their own oversight work.

The report also demonstrates the significant role our Commission has played since taking over direct safety oversight responsibilities from the Federal Transit

Administration following certification on March 18, 2019, building on the important work that the FTA had done in the preceding years.

As the independent State Safety Oversight Agency for the Metrorail system, the Commission's mission is to help ensure the safety of riders, workers and all others who depend on the system's proper maintenance and operations.

We could not accomplish any of our work without the critical support of local, state and federal elected leaders and the many helpful staff members in agencies at all levels of government.

That work includes [broad safety audits](#) of Metrorail departments, overseeing [investigations](#) into all significant safety events, issuing [findings](#) if problems are found, and [overseeing](#) Metrorail's Corrective Action

**Safety is a never-ending process,  
that requires constant vigilance.**



Plans while ensuring that those plans will actually address the root causes of anything from a crash to a train routed down the wrong track.

The investigation into an October 7, 2019 collision between two out-of-service trains on the Blue, Orange and Silver Line tracks near Farragut West is being finalized and is one of the most significant ongoing investigations.

The Commission also issued findings in December raising concerns about repeats of problems in the Rail Operations Control Center that had arisen during a deadly 2015 smoke event.

In other areas, Metrorail has outlined and followed through on plans that aim to address problems identified in recent years by the FTA and others, which led to the acceptance and closure of several dozen Corrective Action Plans in 2019.

At the direction of the Commission, Metrorail continues to work with its employees toward a very important new fatigue management policy.

The Commission is also responsible for oversight of the safety certification process for major capital projects, like the Silver Line extension to Dulles International Airport and Loudoun County. Although construction of that project is managed by the Metropolitan Washington Airports Authority, the Commission will ultimately review and need to approve Metrorail's final safety and security verification report before the line can open.

Safety is a never-ending process that requires constant vigilance to identify risks and corrective actions to keep those risks from leading injuries or damage. The ongoing effort and cooperation among all those involved in operating, overseeing and riding the rail system is crucial in helping ensure potential problems can be proactively prevented.

**As the independent State Safety Oversight Agency for the Metrorail system, the Commission's mission is the safety of riders, workers and all others who depend on the system's proper maintenance and operations.**









# INTRODUCTION

The Washington Metrorail Safety Commission (Commission) is committed to the safety of every single Metrorail rider, employee and contractor, as well as anyone else who comes into contact with the system.

This annual status report on the safety of the WMATA Rail System gives a high-level snapshot of Metrorail's performance in 2019. It includes information from both before and after the Commission was certified in March as the State Safety Oversight Agency with direct oversight and enforcement authority for the WMATA Rail System.

The Commission took over oversight of 101 open Corrective Action Plans (CAPs) that had been approved as a result of Federal Transit Administration or Tri-State Oversight Committee findings, and has since issued additional findings leading to [new CAPs](#).

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 an opportunity for the public to understand the independent safety oversight efforts of the Commission, and the progress Metrorail has made on instituting the federally mandated top-to-bottom Safety Management System (SMS).

The SMS approach requires a strong safety culture with clear commitments from every single person in the 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.

Metrorail has made some progress toward these goals by empowering WMATA's Department of Quality Assurance, Internal Compliance & Oversight (QICO) to reach across departments to look into certain issues, but even more can be done to break down silos to ensure people across Metrorail are truly working together on every safety issue.

Because the Commission is in regular contact with Metrorail employees and contractors ranging from front line workers and their immediate supervisors all the way up to the chief safety officer and general manager, we recognize that Metrorail has shown formal executive

commitment to uphold safety as a core value. We continue to work with Metrorail to ensure employees at every level are fully aware of and comfortable with what their role can be in making that safety culture a reality.

As part of [regular audits](#) of each Metrorail safety function, the Commission is focused on ensuring Metrorail is even more proactive, acts on, tracks and investigates hazards and risks as required by the SMS approach, and allows and encourages easy reporting of concerns from frontline workers, along with proper feedback and protections for those reports.

Metrorail has taken steps toward finalizing its Public Transportation Agency Safety Plan, which is meant to provide for the implementation of the SMS approach using continuous data-driven management. The plan must be completed, submitted and approved by the Commission by the end of 2020. The plan then must be updated and certified annually.

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.

**The SMS approach requires a strong safety culture with clear commitments from every single person in the organization.**

# FINDINGS, DIRECTIVES, AND ON-GOING INVESTIGATIONS

The Washington Metrorail Safety Commission issued eight findings in 2019, with additional findings pending completion of audits, inspections or investigations that were started in 2019.

This report highlights some of the [findings](#) and investigations (some findings may require multiple Corrective Action Plans). Several other investigations of specific events remain ongoing. Each investigation that requires a final report will continue to be presented and adopted at a public meeting of the Commission and then will be [posted on the Commission's website](#).

Investigations, inspections and audits that have been finalized thus far have found a number of areas where Metrorail is fully compliant with rules and procedures, but have also identified a number of potentially serious issues that Metrorail is now required to address.

## OCTOBER 7 COLLISION

Among findings issued soon after an October 7, 2019 rear-end collision between two trains that were not carrying customers, the Commission 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.



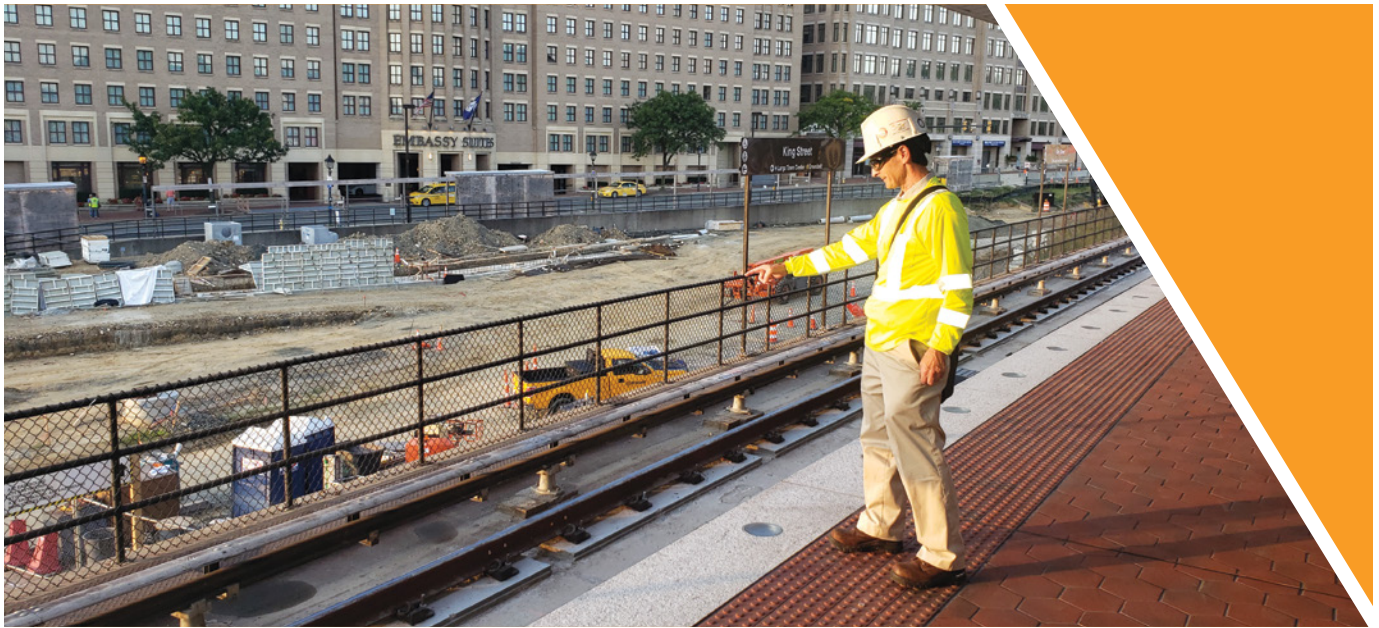
**Both the October 7 collision and December 10 Red Line fire response show there is more work to do – and how important it is that WMATA continue to welcome our oversight and the transparency we seek. Our only interest is making Metrorail safer.**

Speed commands essentially provide train operators with an automated authorized speed limit. When that limit drops to zero, train operators 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 through about 11 mph at the time of the collision, causing significant damage to the rail cars.





## DECEMBER 10 SMOKE EVENT

Another on-going investigation that triggered findings is tied to a Dec. 10, 2019 smoke incident on the Red Line.

In that event, dangerous dysfunction in the Rail Operations Control Center (ROCC) was reminiscent of the major problems during the 2015 smoke event near L'Enfant Plaza that resulted in a fatality.

Commission findings issued on Dec. 20, 2019 focused on management concerns in the ROCC because managers appeared to be routinely negating the written procedures that controllers were attempting to follow. Choosing not to use required checklists contributed to dozens of riders being stuck in a slow crawl back to a station platform to avoid a fire.

The procedural and operational mistakes at the ROCC on December 10 included restoring live, electrified third-rail power while first responders were still on the tracks, and chaos and confusion with managers yelling and issuing conflicting instructions.

**At the Commission's direction  
Metrorail has made great progress  
on addressing fatigued workers by  
working to develop an hours of  
service policy.**

Metrorail is still developing Corrective Action Plans to address our December findings, and there have been additional, related concerns since that incident.

The Commission expects ROCC leaders to follow procedures, and to revise any procedures that are out of date or otherwise inappropriate. We will maintain our regular oversight to ensure that Metrorail's nerve center is operating appropriately and safely.

Both the October 7 collision and December 10 Red Line fire response show there is more work to do – and how important it is that WMATA continue to embrace our oversight and the transparency we seek. Our only interest is making Metrorail safer.

As WMATA has recognized, that work must include improvements beyond reactions to major incidents like the two mentioned above, to include regular ongoing training, safety stand downs, and careful reviews of operations.



## FATIGUE, OTHER SAFETY EVENTS

The Commission has identified and given serious attention to a number of incidents that might appear to be small on the surface, but that could pose more serious risks if the causes are not rooted out.

For example, one focus area has been station overruns, when the front of a train goes past the end of the platform where it is supposed to stop.

**Constant vigilance is required since even safety events that may initially seem small could be a warning sign of deeper issues.**

Although these incidents do not usually cause any injuries on their own, each does pose a risk. For example, a train could hit workers who might be on the tracks ahead.

One likely cause for safety events is fatigue, which has been another top priority for the Commission.

Metrorail has made great progress on addressing fatigued workers by working to develop an hours of service policy. Although federal law limits hours of service for freight railroad workers and truck drivers, there are no such federal limits for transit system employees.

While developing an implementable plan has been a long-term concern, the Commission has helped

push this closer to reality, with an agreement between WMATA and its employees possible in 2020.

As part of this effort, the Commission, at the direction of Chair Christopher Hart, has insisted on a more complete consideration of fatigue in Metrorail's own safety event investigations so that actual hours of rest are considered, rather than just whether the duty hours comply with WMATA scheduling policies.

The Commission wishes union leadership and WMATA staff every success in finalizing the revised fatigue and alertness policy and hours of duty policy as soon as possible.







## AUDITS

The Commission conducted its first [safety audit work](#) in 2019, focusing the first phase of a triennial review on Metrorail's track and structures.

That track and structures audit, formally adopted in Feb. 2020, contained 16 findings.

While there has been progress since 2015 to address track department staffing shortages, the Commission 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.

The Commission is now finalizing an audit of Metrorail's Roadway Worker Protection program meant to keep employees and contractors safe when working on or around the tracks.

Ongoing or upcoming audits include reviews of Metrorail operations rules, traction power, elevators and escalators, and capital projects.

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.

The Commission's audits of each element of Metrorail's safety plan are repeated on a three-year cycle, with other more focused inspections conducted in the intervening periods.



**The track and structures audit, formally adopted in Feb. 2020, contained 16 findings.**

## ADDITIONAL COMMISSION OVERSIGHT WORK

The Commission also regularly inspects all aspects of the Metrorail system, and participates in investigations and testing of Metrorail personnel, equipment, facilities, vehicles and operations.

Metrorail is required by law to provide the Commission with unfettered access to all physical and electronic systems to allow for complete and direct oversight and enforcement.

The Commission is also responsible for overseeing safety certification of major capital projects. Right now, that means a significant focus on the Silver Line extension to Dulles International Airport and Loudoun County.

The Metropolitan Washington Airports Authority and its contractors are responsible for constructing the line to meet the standards outlined in the construction contract. WMATA is responsible for determining acceptance of all systems and facilities including the stations, tracks and rail yard, then conducting final training before opening the line. The Commission must approve Metrorail's safety and security certification report before the line can open.

The Commission has conducted assessments and oversight to ensure that all safety certification plans are followed and to identify any issues early that could otherwise be a concern in the final report.

That report is required before the line opens, but it remains up to Metrorail to determine when to accept ownership of the rail line, including whether any construction or software concerns have been addressed.

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

In 2020 and beyond, the Commission expects a major focus will also be on Metrorail's return to more normal service levels in the wake of the COVID-19 pandemic. That work will include closely monitoring the return of older railcars to service that were not needed under reduced schedules.

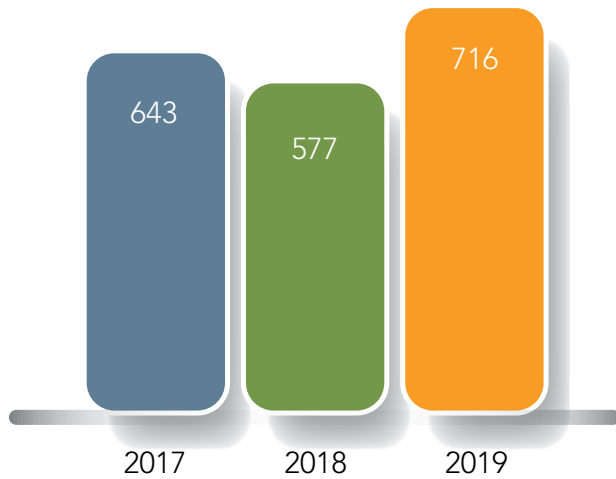
Additional technical details on the Commission's work are available in the Commission's separate 2019 Annual Operations Report and on [WMSC.gov](https://www.wmata.gov/safety).





# REPORTABLE EVENTS

## METRORAIL REPORTED 716 TOTAL SAFETY EVENTS IN 2019



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

Each formally reportable event is defined in technical terms as an accident, incident or occurrence based on a specific list of events that must be reported that was developed first by the FTA and has now been adopted by the Commission. (The FTA transferred direct safety oversight to the Commission on Mar. 18, 2019.)

Some of those safety events that involve extensive damage or injury or that are most likely to be linked to broader trends or deeper issues, get an even more extensive investigation.

In 2019, the Commission [adopted](#) 17 of those more detailed final reports of investigation. The Commissioners adopted five more reports in February 2020 (see Appendix B).

Under different 2019 measures reported to the federal National Transit Database, Metrorail reported 12 collisions involving rail vehicles, six other collisions,

two derailments, one fire, and 78 security events. The definitions, however, are different from those used for the Commission's safety oversight purposes.

In WMATA's 2019 fiscal year (Jul. 2018-Jun. 2019), WMATA calculated its own Metrorail rider injury rate of 1.38 per million trips. Slips, trips or falls were the most common injury, and Metrorail found the most common factors in the injuries were wet surfaces, rider distraction or intoxication.

For the same fiscal year, WMATA calculated its own Metrorail employee injury rate at 3.4 per 100 workers. Slips, trips and falls, lifting injuries, and stress or assault were the most common injury types recorded.

Metrorail reported 71 fire incidents in its 2019 budget year.





## CORRECTIVE ACTION PLANS

After the Commission issues findings, Metrorail must develop and implement Corrective Action Plans (CAPs) to resolve the issues and reduce the risk of future safety events.

When the Commission took over direct safety oversight and enforcement authority from the FTA in March 2019, there were 101 open CAPs, some of which date back years.

In some cases, like very large-scale capital projects, finishing a Corrective Action Plan can take a significant amount of time. In others, there have been similar overlapping CAPs that may address the issue.

In each case, Metrorail must submit its plans and the Commission reviews those plans to verify that they will actually address the findings. Then, once the plans are implemented, Metrorail submits a request to close the

CAP, and the Commission ensures changes have been implemented.

**Metrorail is making some significant progress, but there is much more work to be done.**

Even after a CAP is closed, the Commission continues its oversight to ensure that the plans do not fall by the wayside and required actions remain implemented and effective as intended.

Because there is always room for improvement, the existence of a CAP is not in and of itself a negative thing. A CAP is a path toward addressing a hazard or risk.

The goal, however, is to develop corrective actions proactively before a major safety event occurs, rather than solely reactively after a major event.

This is why the Commission's triennial audit work and regular inspections and oversight are crucially intertwined with the investigations into major incidents.



This is also why it is so crucial that Metrorail move as quickly as possible to address our findings through effective rules, improved training and comprehensive engineering solutions that create lasting change.

The Commission closed 52 CAPs in 2019.

The Commission has the authority 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.

Twenty-six CAPs remain open that the Commission assumed oversight of from the FTA, while other similar CAPs have been adjusted to fit into other corrective actions.

The Commission has also required new Corrective Action Plans in response to its own sets of findings. Some of those plans remain in development due to revisions required by the Commission to ensure the plans, when implemented, will truly address the root causes of problems.

In total, **42 CAPs are now open as of May 15, 2020**, in addition to those that are still in development (see Appendix A).

These totals do not include separate internal corrective action plans that Metrorail has developed to address issues identified by its internal Department of Quality Assurance, Internal Compliance & Oversight (QICO) reviews, or internal plans developed in response to findings from Metro's Office of Inspector General.

Both QICO and the Office of Inspector General are playing significant positive roles in the identification of actual or potential risks from within WMATA, and it is important that future WMATA leaders continue to value and prioritize the work and findings of both QICO and the Office of Inspector General.

## CONCLUSION

Safety is not something that is achieved at some point, and the work stops. Metrorail and its stakeholders must recognize that this is a never-ending journey of continual improvement.

**The goal is to eliminate or mitigate as many risks as possible.**

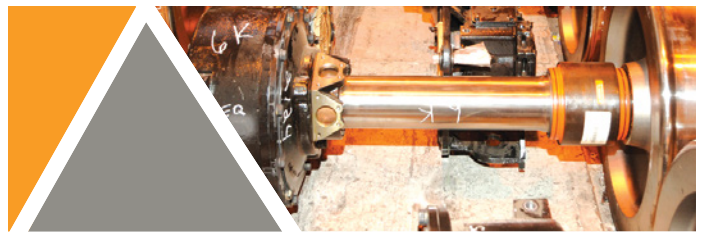
In areas like fatigue, things appear to be headed in the right direction. However, challenges remain on some other issues identified again in 2019, but that have been raised before, like concerns in the Rail Operations Control Center.

To address these issues, all levels of Metrorail must be open to constructive feedback and communication both with the Commission and within the agency.

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 eliminate or mitigate as many risks as possible.

Metrorail is making some significant progress, but there is much more work to be done.







# APPENDIX A: CORRECTIVE ACTION PLAN (CAP) TRACKING

Corrective Action Plan (CAP) ID	Findings/Required Action	Approved WMATA Planned Completion Date
NTSB R-8-004-A	Promptly implement appropriate technology that will automatically alert wayside workers of approaching trains and that will automatically alert train operators when approaching areas with workers on or near the tracks.	December 2022
FTA-Rail-1-1-A	WMATA must fully staff the Rail Operations Control Center.	July 2021
FTA-Rail-1-3-A	WMATA must establish a program to provide each Rail Traffic Controller with mandatory road days for territory familiarization and to keep up with changing system elements.	January 2020
FTA-Rail-1-5-A	WMATA must ensure Rail Traffic Controller workload and distraction do not interfere with the safe and efficient movement of trains.	January 2020
FTA-Rail-4-27-A	Documented maintenance procedures and standard operating procedures are not implemented as required. For all major departments with inspection and maintenance responsibilities for critical infrastructure, WMATA must establish and/or update a preventive maintenance and inspection testing quality audit process to ensure compliance with established maintenance and testing practices, and to monitor missed or incomplete preventive maintenance activities and/or inspections.	January 2021
FTA-RAIL-4-32A	WMATA must ensure that each department within Transit Infrastructure and Engineering Services creates a formal program of Supervisory inspections to observe maintenance, look at quality of work in the field, and formally intervene to evaluate, re-train (if necessary), and enhance the professional development of employees.	March 2020
FTA-Rail-5-35-A	WMATA must do more to prevent and manage conditions that cause smoke in tunnels. WMATA must establish clear definitions for infrastructure conditions requiring immediate or emergency action, such as "arcing insulator."	July 2020
FTA-Rail-7-41-A	WMATA's IT Department lacks necessary authority to ensure that all WMATA departments use IT applications in the same manner to ensure data sharing, coordination of training, and conduct of audits in a consistent manner. WMATA must assess data accessibility and coordination needed to support safety functions throughout the agency including the operations and maintenance departments.	WMSC to reissue findings on this CAP
TOC-ATC-15-002-A	The ATC Branch or SAMS must provide a revised Maximo inventory list with obsolete tools removed and regained calibration compliance. Also, the ATC Branch and SAMS must develop a documented tool distribution control method so that new equipment/tools are not issued until old ones are returned, and the person receiving the old equipment removes it from the inventory and maintenance cycle in Maximo.	June 2020
TOC-ATC-15-006-A	WMATA's ATC management must develop a procedure and conduct quality control spot checks of Supervisors' work to ensure they are fully completing their duties (such as reviewing Data Sheets and adding defects to new work orders).	February 2020
TOC-ATC-15-011-A	WMATA's ATC Branch must establish requirements in its Maintenance Control Policy (MCP) for quality control spot checks and resulting documentation to be completed by each Supervisor. (Note: This is different than TOC-ATC-15-006 that prescribes spot checks of Supervisor work; this finding relates to Supervisor spot checks of technician work.)	November 2020
TOC-COL-15-003-A	Design and install a new railing system that reduces the number of openings and eliminates the ability of the hand rails to swing into the direction of the dynamic envelope of a rail car in all shop locations and rail facilities to replace the sectional type of railing system currently installed.	February 2022
TOC-OSP-15-001-A	WMATA must develop and implement a hearing conservation program in compliance with Occupational Safety and Health Administration (OSHA) requirements.	July 2021
TOC-OSP-15-006-A	WMATA must separate incompatible hazardous materials into their respective compatible flammable storage cabinets, and take steps to ensure continued compliance such as reinstruction of personnel, and emphasis on the topic during each Car Maintenance 12-point shop inspection.	January 2020
TOC-RWP-15-008-A	The development and issuance of technical documentation does not appear to be governed by an engineering standard or procedure. WMATA must develop or update its engineering process for developing, reviewing, approving, issuing and updating technical documentation.	January 2021
TOC-SRT-15-004-A	WMATA requires the Maintenance Control Policy (MCP) be reviewed annually, but the last update was in February 2013. WMATA must complete the required MCP revision with full updates to references and procedures as necessary.	January 2021
FTA-RED-16-003-B	WMATA has not fully implemented sufficient protections against the unauthorized movement of trains with zero speed commands. WMATA must complete and perform a hazard analysis regarding the positive stop option and any other options currently under review to prevent trains from operating with zero speed commands without authorization from the ROCC system wide.	July 2020
FTA-RED-16-004-A	WMATA does not ensure consistent understanding among train and equipment operators and ROCC or Interlocking Controllers. WMATA must develop and implement a procedure for auditing radio protocol, radio communications, and for ensuring conformance.	January 2021
FTA-16-4-T-6-A	WMATA must establish a clear process for imposing and removing speed restrictions.	January 2020
FTA-17-1-7	<b>FTA-TPE-17-007-a:</b> WMATA must establish new insulator design specifications for composite (fiberglass) and porcelain insulators, including the two-piece insulator discussed to facilitate more efficient and economical insulator replacement activities. <b>FTA-TPE-17-007-b:</b> WMATA must revise the current insulator replacement work instruction to include proper storage, transportation, and handling of insulators to reduce damage to new insulators before and during installation. <b>FTA-TPE-17-007-c:</b> WMATA must establish insulator mortality rates and implement cyclical replacement program for each type of insulator used. <b>FTA-TPE-17-007-d:</b> WMATA must develop and implement a formal program for cleaning insulators, including work instructions to ensure the safety of WMATA employees. <b>FTA-TPE-17-007-e:</b> WMATA must establish a formal quality testing and inspection program to ensure conformance of the delivered insulators with WMATA's specifications. <b>FTA-TPE-17-007-f:</b> WMATA must ensure new insulator anchors are installed to WMATA standards, including providing epoxy insulating dielectric material to ensure that the anchor bolts do not provide an electrical path to structural ground. <b>FTA-TPE-17-007-g:</b> WMATA must develop a plan to identify and correct the installation of insulator anchors without appropriate epoxy insulating dielectric material.	October 2019

Corrective Action Plan (CAP) ID	Findings/Required Action	Approved WMATA Planned Completion Date
FTA-17-1-10	<p><b>FTA-TPE-17-004-a:</b> WMATA must implement its program to secure traction power cables off the ground. <b>FTA-TPE-17-009-a:</b> WMATA must conduct an assessment and implement additional methods to provide improved dielectric insulation in the area of cable terminations, such as non-tracking heat shrink, utilizing alternative products for cable transitions at duct lines, and providing additional physical barriers where there is close clearance to metallic structures. <b>FTA-TPE-17-017-a:</b> WMATA must reinstate its program for cable replacement to support 100 percent 8-car train operations, including the replacement of all primary and secondary TPE system cables, and must provide a timeline and project plan. <b>FTA-TPE-17-018-a:</b> WMATA must revisit its cable upgrade program for 50 percent and 100 percent 8-car operational plan and develop a capital cable replacement program for substation negative return and wayside cross bonding. <b>FTA-TPE-17-019a:</b> WMATA must provide a written explanation regarding the suspension of the contact rail expansion joint elimination program.</p>	June 2021
FTA-17-1-13	<p><b>FTA-TPE-17-010-a:</b> WMATA must evaluate the traction power direct current feeder breaker settings at substations and tie breakers to determine the optimal settings for various track side conditions, including instantaneous short circuit ratings, time over current settings, and rate of rise settings. <b>FTA-TPE-17-010-b:</b> WMATA must provide criteria and test results for circuit breaker relay settings. <b>FTA-TPE-17-010-c:</b> WMATA must develop and submit its program plan for installing, testing, and evaluating the effectiveness of the use of multi-protection relays for detecting low level faults. <b>FTA-TPE-17-010-d:</b> WMATA must evaluate the addition of transfer trip circuitry for de-energizing feeds from adjacent power stations during troubled conditions and implement results. <b>FTA-TPE-17-015-a:</b> WMATA must re-evaluate previous current draw and load calculations to include field surveys to ensure that the actual condition of the cables and bonds are considered in the requirements analysis for 100 percent 8-car train operation. <b>FTA-TPE-17-016-a:</b> WMATA must develop and implement a program for assessing the condition of relays at traction power substations to prioritize upgrades, replacements, and/or repairs. <b>FTA-TPE-17-020-b:</b> WMATA must review fault detection relay settings and determine if adjustments are required due to the new electrical properties for composite third rail.</p>	July 2020
FTA-17-1-16	<p>WMATA does not implement a consistent program regarding the testing, inspection, and maintenance of its negative return system. WMATA must document negative return system defects in the maintenance and repair trouble ticket system (Maximo) and assign responsibility for timely repairs.</p>	January 2021
FTA-TSR-18-001	<p>WMATA does not consistently implement post-accident drug and alcohol programs. WMATA must ensure that employees are sent for post-accident testing in compliance with FTA Drug and Alcohol Testing Program requirements.</p>	May 2020
FTA-TSR-18-003	<p>WMATA does not consistently implement its Hazard Management Procedure. WMATA must evaluate the efficacy of its current Hazard Management Procedure, and revise, as appropriate, to ensure that hazards are identified and resolved.</p>	January 2022
WMSC 19-C0001	<p>Metrorail lacks sufficient capability to collect safety-related data from assets via telemetry sources and analyze that data for use to improve the safety of those assets, which is a critical element of SMS. Metrorail must design and test a strategy to improve the collection of safety-related telemetry data from its assets.</p>	January 2021
WMSC 19-C0002	<p>Metrorail lacks sufficient capability to collect safety-related data from assets via telemetry sources and analyze that data for use to improve the safety of those assets, which is a critical element of SMS. Metrorail must design and test a strategy that will correlate the improved safety data to each asset.</p>	January 2021
WMSC 19-C0003	<p>Metrorail lacks sufficient capability to collect safety-related data from assets via telemetry sources and analyze that data for use to improve the safety of those assets, which is a critical element of SMS. Metrorail must design and test a strategy to use existing software packages to analyze data for review and assessment by rail operations and maintenance personnel.</p>	January 2021
WMSC 19-C0004	<p>Metrorail lacks sufficient capability to collect safety-related data from assets via telemetry sources and analyze that data for use to improve the safety of those assets, which is a critical element of SMS. Metrorail must design and test a strategy to use the analyses to implement corrective action plans, work orders, and engineering test plans/engineering modification instructions.</p>	January 2021
WMSC 19-C0005	<p>Metrorail lacks sufficient capability to collect safety-related data from assets via telemetry sources and analyze that data for use to improve the safety of those assets, which is a critical element of SMS. At the conclusion of designing and testing a strategy to improve, analyze and act upon safety data, Metrorail must produce a lessons learned document, including a plan for a Metrorail enterprise rollout of the system.</p>	September 2022
WMSC 19-C0006	<p>The Rail Operations Control Center must be appropriately staffed to meet current operational needs. WMATA must determine the number of ROCC staff required given the current operational and maintenance activities and must provide details that support the staffing number.</p>	TBD based on approved plan which remains in development
WMSC 19-C0007	<p>The Rail Operations Control Center must be appropriately staffed to meet the current operational needs. WMATA must develop a plan to reach the required level of ROCC staffing under C0006 through innovation in recruitment, training, retention; and, achieve that staffing level.</p>	TBD based on approved plan which remains in development
WMSC 19-C0008	<p>Metrorail does not currently have an effective hours of service policy. Metrorail must develop and implement an effective hours of service policy as part of an overall fatigue management program.</p>	October 2020 (part), September 2022 (part)
WMSC 19-C0013	<p>Operator cab camera was blocked due to the intentional placement of a movable visor to block the camera view. WMATA shall develop an engineering fix to the 7000 Series to prevent visor and operator cab camera interference.</p>	TBD based on approved plan which remains in development
WMSC 19-C0014	<p>Operator cab camera was blocked due to the intentional placement of a movable visor to block the camera view. WMATA shall incorporate any operator cab camera engineering fix as a lesson learned into the 8000-series specifications and Certifiable Items List.</p>	TBD based on approved plan which remains in development
WMSC 19-C0015	<p>Metrorail must institute improvements to reduce station overruns, including, but not limited to, creating an official definition of what constitutes a station overrun, establishing a rule that governs train speeds on approach to stations, and creating a non-punitive labor/management incident review board.</p>	October 2020



Corrective Action Plan (CAP) ID	Findings/Required Action	Approved WMATA Planned Completion Date
WMSC 19-C0016	Metrorail must institute operational improvements such as monitoring and measuring compliance of its rail controllers and train operators with Rule 3.79, raising awareness through training, stand-downs, and similar activities, and, conducting non-punitive incident review boards consisting of train operators and controllers involved in Rule 3.79 incidents to better understand opportunities for improvement.	October 2020
WMSC 19-C0017	Metrorail must create a map or similar inventory of mainline locations in which train operators routinely lose speed commands, identify the reason for the loss of speed commands, and propose a work plan and timetable for permanently correcting these and any future defects.	February 2021
WMSC 19-C0018	Metrorail must amend its Personal Electronic Devices (PEDs) policy to require employees to turn over (or cause to be turned over) devices and records upon request.	July 2020
WMSC 19-C0019	Metrorail must develop a program to actively detect the unauthorized presence and use of electronic devices through video review, inspection, and efficiency testing; and raising awareness of the Personal Electronic Device (PED) policy and inspection activities through training, stand downs, and similar activities.	April 2020
WMSC 19-C0020	Metrorail must eliminate the dangerous dysfunction within the Rail Operations Control Center (ROCC) by taking actions that include, but are not limited to, requiring and allowing controllers to follow written protocols and checklists, improving communication and workflow, and avoiding oversaturating controllers and distracting them with conflicting instructions.	December 2020
WMSC 19-C0021	WMATA does not have a complete written set of current protocols governing maintenance practices for track and structures. WMATA must make the necessary document updates and revisions to create a complete set of protocols for track inspections and maintenance.	January 2021
WMSC 19-C0022	WMATA personnel responsible for conducting track maintenance activities follow no formal protocols to govern their repair and installation work. WMATA must finalize and issue all relevant procedure manuals, along with any supplementary instructions and/or refresher training to ensure that personnel have and follow proper procedures including complete procedures for tasks such as thermite welding, rail destressing, and continuous welded rail installation, in accordance with Section 10.4 of the APTA Standard RT-FS-S-002-02.	April 2021
WMSC 19-C0023	WMATA must assign a specific person (and an alternate) to record actual ambient temperatures every day of the late spring, summer, and early fall to ensure that the agency actually conducts and documents all required heat-ride inspections.	TBD based on approved plan which remains in development
WMSC 19-C0024	WMATA has disseminated inconsistent instructions to TRST and other personnel on whether heat-ride inspections and monitoring begin at 90 degrees Fahrenheit or above 90 degrees Fahrenheit. WMATA must clarify its written temperature thresholds for heat-ride inspections and monitoring.	TBD based on approved plan which remains in development
WMSC 19-C0025	WMATA had no records to indicate that TRST personnel are refilling rail lubricators consistent with the TRST-1000. WMATA must create a new recurring work order in Maximo for lubricators to be refilled on a fixed schedule and begin implementing the new schedule.	December 2021
WMSC 19-C0026	WMATA does not conduct annual culvert inspections as specified in Section 105.1 of the TRST-1000. WMATA must add culverts as an asset in Maximo and begin scheduling annual inspections as specified in Section 105.1 of the TRST-1000.	March 2022
WMSC 19-C0027	WMATA does not have a weed spraying program consistent with industry standards. TRST must conduct vegetation cutting and weed spraying using an acceptable chemical product.	TBD based on approved plan which remains in development
WMSC 19-C0028	WMATA has disseminated conflicting directions to TRST personnel about what procedures are appropriate for purposes of verifying speed restrictions. TRA and TRST must work together to ensure SOP #30, MSRP Chapter 5, and the TRST-1000 and any other governing documents are consistent regarding who verifies a speed restriction and by what method(s).	December 2020
WMSC 19-C0029	WMATA has not provided to all TRST personnel the documents that govern quality control activities. The documents that guide quality control activities are absent from the current version of the TRST-1000. WMATA must update the list of forms in Section 102.11 of the TRST-1000 and add examples (of blank and completed forms) to the manual.	TBD based on approved plan which remains in development
WMSC 19-C0030	TRST inspectors use outdated versions of the Secondary Yard Inspection Form guiding storage track inspections. TRST must institute version control on these and other forms in accordance with its TRST-2000. TRST should also ensure that the field for preventive maintenance (PM) work order number and any other missing fields is used on all these forms.	November 2020
WMSC 19-C0031	Quality control checks by TRST supervisors occur infrequently and inconsistently with TRST's protocols. TRST must institute a step for regular management review of the Supervisor quality control checks to ensure they are being completed as required.	April 2021
WMSC 19-C0032	WMATA uses equipment operators to perform track repairer duties without first providing such personnel with formal training. TRST must either prohibit equipment operators from conducting track repairer duties or require that equipment operators complete the track repairer courses before being assigned such work. TRST must also issue training cards or "licenses" indicating their qualification to operate specific types of track equipment.	February 2021
WMSC 19-C0033	WMATA cannot verify that defects identified during track geometry vehicle inspections are repaired. WMATA must adjust TGV data spreadsheets and/or Maximo to log the repair of any detected defects and open work orders for any outstanding defects that need to be repaired or monitored.	TBD based on approved plan which remains in development
WMSC 19-C0034	TRST lacks job-specific training for newly hired or promoted supervisors. WMATA must institute training for duties specific to TRST supervisors, including how to conduct and document quality control checks, ensuring assignment of work to qualified inspectors/equipment operators, and use of Maximo to prioritize and plan work.	TBD based on approved plan which remains in development

\*\* Note: This table includes all outstanding CAPs as of May 15, 2020. It does not include CAPs that Metrorail was not yet required to propose by that date. CAPs still in development beyond the required date frequently are undergoing revisions directed by the Commission to ensure that the final plans, when fully implemented, will address the finding or risk.

# APPENDIX B: FINAL INVESTIGATION REPORTS ADOPTED BY THE COMMISSION IN 2019

Report Number	Date of Adoption	Report Title	Findings/corrective actions
W-0001	April 8, 2019	<ul style="list-style-type: none"> <li>Collision, July 18, 2016</li> </ul>	<ul style="list-style-type: none"> <li>Tie crane likely damaged intrusion detection system.</li> </ul>
W-0002	April 8, 2019	<ul style="list-style-type: none"> <li>Incidents/occurrences involving individuals working in the transit agency-controlled right of way, July 17, 2017</li> </ul>	<ul style="list-style-type: none"> <li>Train passed track inspectors at speed greater than 10 mph.</li> <li>Metro rail has revised Roadway Worker Protection (RWP) Quick Access guide, safety stand down with newly revised RWP manual.</li> </ul>
W-0003	April 8, 2019	<ul style="list-style-type: none"> <li>Collision, July 8, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Additional communication and minimized rushing could have prevented collision of Class 2 (maintenance) vehicles.</li> </ul>
W-0004	April 8, 2019	<ul style="list-style-type: none"> <li>Red Signal Overrun Sept. 24, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Requirement to ensure all switches are in the desired position not adhered to, signal overrun not identified immediately.</li> </ul>
W-0005	May 14, 2019	<ul style="list-style-type: none"> <li>RWP Event May 24, 2017</li> </ul>	<ul style="list-style-type: none"> <li>Train passed work crew at speed greater than 10 mph; Advance Mobile Flagger briefing not provided; Utility Line Platform Instructor had not been trained and left operating cab.</li> </ul>
W-0006	May 14, 2019	<ul style="list-style-type: none"> <li>RWP Event March 31, 2017</li> </ul>	<ul style="list-style-type: none"> <li>Train passed work crew at speed greater than 10 mph after not being notified personnel were on the roadway; The following month, Metro rail added Advance Mobile Flagger procedures.</li> </ul>
W-0007	June 11, 2019	<ul style="list-style-type: none"> <li>Collision with Object April 23, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Concrete batch plant unit on flat car made contact with Emergency Trip Station after dragging on platform edge and handrail; workers involved retrained.</li> </ul>
W-0008	June 11, 2019	<ul style="list-style-type: none"> <li>Serious Injury June 2, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Employee injured while thermite welding; welding torch broke and employee was not wearing proper gloves.</li> </ul>
W-0009	June 11, 2019	<ul style="list-style-type: none"> <li>Derailment August 23, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Contractor Roadway Maintenance Machine Hi-Rail Unit derailed due to front piston rod not being fully engaged.</li> </ul>



Report Number	Date of Adoption	Report Title	Findings/corrective actions
W-0010	June 11, 2019	<ul style="list-style-type: none"> <li>Customer fatality</li> <li>February 18, 2019</li> </ul>	<ul style="list-style-type: none"> <li>Customer fell into roadway, and did not appear to recover. Later, customer struck by train.</li> </ul>
W-0011	July 11, 2019	<ul style="list-style-type: none"> <li>Train Pull Apart</li> <li>August 25, 2018</li> </ul>	<ul style="list-style-type: none"> <li>No approved overhaul procedure, incorrect bolt used for semi-permanent drawbar rebuild, cross-threaded screw and bolt; no audit of overhaul process. Correct bolts arrived Jan. 25, 2019.</li> </ul>
W-0012	July 11, 2019	<ul style="list-style-type: none"> <li>Greenbelt Yard Collision</li> <li>October 15, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Out of service train made contact with a rail tie and torque wrench improperly left on track during prior maintenance work on adjacent track.</li> </ul>
W-0013	July 11, 2019	<ul style="list-style-type: none"> <li>Injured Employee</li> <li>December 4, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Employee performing chemical injection accidentally splashed in the face with chemical grout solution while repairing water leaks after injection port came out of tunnel wall; No general work procedure was in place.</li> </ul>
W-0014	July 11, 2019	<ul style="list-style-type: none"> <li>C99 (Alexandria) Yard Derailment</li> <li>May 6, 2019</li> </ul>	<ul style="list-style-type: none"> <li>Contractor Roadway Maintenance Machine Hi-Rail Unit derailed contacting third rail during certification acceptance testing; Adjustments had not been made after larger tires were put on vehicle.</li> </ul>
W-0015	October 8, 2019	<ul style="list-style-type: none"> <li>Columbia Heights Fatality</li> <li>October 10, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Customer in motorized wheelchair attempted to use escalator, fell backward. Man waited 15 seconds for elevator before leaving for escalator. Elevator arrived 52 seconds after he pushed button.</li> </ul>
W-0016	October 8, 2019	<ul style="list-style-type: none"> <li>Employee Injury</li> <li>November 1, 2018</li> </ul>	<ul style="list-style-type: none"> <li>Employee fell while climbing down from dumpster, fracturing left wrist. Step ladder rungs on dumpster were damaged prior to fall. Metrorail memorandum following event emphasized hazards of standing on dumpster container, Metrorail also moved to develop procedures for dumping trash from flat cars into dumpster.</li> </ul>
W-0017	October 8, 2019	Train Movement with Doors Open May 21, 2019	After notification via social media, Metrorail identified Orange Line train moving with doors open due to a short in the Master Controller. Train operator also did not ensure door indication lights were off prior to movement. Master Controller overhauls, inspection and maintenance required.

