



Safety and Operations Committee

Board Information Item III-A

June 10, 2021

**Metrorail
Safety Initiatives**

Washington Metropolitan Area Transit Authority

Board Action/Information Summary

☐ Action ☒ Information

MEAD Number:
202275

Resolution:
☐ Yes ☒ No

TITLE:

Rail Safety Initiatives

PRESENTATION SUMMARY:

The Department of Safety (SAFE) in collaboration with the Office of the Chief Operating Officer (COO) will provide a status of efforts to reduce customer and employee injuries with a focus on Rail Services.

PURPOSE:

Staff will inform the Board of recent initiatives designed to improve safety utilizing a proactive risk management approach based on the principles of Safety Management Systems (SMS).

DESCRIPTION:

SAFE and COO often collaborate to improve Rail services by analyzing data, promoting accountability, and problem solving to systematically reduce customer and employee injuries as well as operational incidents.

There are no interested parties in this matter.

Key Highlights:

- Revised training and rail maintenance techniques have improved safety on board trains and on the right-of-way and improved reliability.
- Initiatives to reduce station manager operator assaults mirror the successful bus operator assault reduction training programs.
- Station modernization and rehabilitation at 91 stations will improve safety for customers.
- Station escalators are the primary locations for customer slips and falls; several efforts designed to garner customers' attention to prevent incidence occurrence.

Background and History:

Utilizing data from the National Transit Database (NTD), the four metrics appropriate for comparison with peer rail agencies include collision rate, derailment rate, employee injury rate, and customer injury rate.

Rail collisions include any contact between two rail transit vehicles or any collision that causes substantial damage to Class I or Class II vehicles. For the time period of comparison, the majority of WMATA's Rail Collisions involved maintenance equipment in yards or within work zones, resulting in damage to wayside equipment. When compared to our peers (Chicago Transit Authority, Southeastern Pennsylvania Transportation Authority, Metropolitan Atlanta Rapid Transit Authority, San Francisco Bay Area Rapid Transit, and Massachusetts Bay Transportation Authority), Metro had the third lowest overall rate, at 1.0 rail collisions per million train revenue miles. Additionally, year-over-year rail collisions have decreased from 10 in CY2019 to seven in CY2020. In 2020, all of the collisions occurred within the rail yards. The majority of these collisions involved various pieces of maintenance equipment moving within the storage tracks or during maintenance activity.

In CY2019, WMATA experienced a total of five derailments. All of these incidents involved Class II vehicles, such as pickup trucks with rail wheels and flat cars used in yards and construction areas. When compared to our peers, Metro was the second lowest rate with 0.2 derailments per million train revenue miles. Additionally, year-over-year derailments have decreased from five in CY2019 to three in CY2020.

The NTD rail employee injury rate is a representation of WMATA employees injured and requiring immediate medical transportation from the scene of the incident. When compared to our peers, Metro tied for the lowest rate, with 0.3 injuries per million unlinked passenger trips. Note: This injury criteria is different than the OSHA-recordable injury rate that WMATA uses for internal performance metrics. The OSHA rail system employee injury rate decreased by 26% from 3.5 injuries per 100 employees in CY2019 to 2.6 in CY2020. Overall, the most common injuries involved slips, trips, and falls and incidents where employees struck a body part against an object (e.g., a door, train operator's train window).

The NTD customer injury rate was 1.3 injuries per million passenger trips in CY19. When compared to our peers, Metro was the lowest per million unlinked trips. Note: Unlinked trips measure a trip as every time a person boards and alights a vehicle; Linked trips capture the entire journey as one trip, even if there is a transfer in the middle. Additionally, the NTD customer injury rate was 2.0 in CY2020, a 54% increase compared to CY2019. Nearly 90% of the customer injuries were related to slips and falls on escalators or within rail stations. The most frequently noted factors contributing to slip and fall injuries were inattention or distraction and perceived intoxication.

Discussion:

Past Initiative

Many customer injuries occur upon station entry. Therefore, an initiative was developed to focus on escalator injuries where customers often slip and fall. Automated safety announcement devices that reminded customers to hold on to the handrail were installed at the Gallery Place/Chinatown, National Airport and Capitol South escalators. There was a small decrease in slip/trip/fall injuries when initially installed, but the decrease was not substantial to warrant full implementation. However, the installed devices will remain active.

Current Initiatives – Signal and Station Overruns

A working group was established to improve both signal and station overruns. This working group revised train operator training in multiple areas to increase signal awareness through: defining station overruns; using master controller while braking in stations; red signal “point and call” process; 30/60/90-day refresher training; and conducting safety stand-downs.

In addition, the establishment of new rules for station approaches, the conduct of compliance audits, and targeted ride checks reinforce the training provided. Safety trifolds remind operators of procedures. A systemwide signal assessment has been conducted to reduce the possibility of infrastructure contributors to overruns. Finally, staff benchmarked industry engineering solutions to achieve the highest standards. The result of these initiatives is an eight percent decrease in red signal overruns and a 31 percent decrease in station overruns since July 2019-April 2020 versus July 2020-April 2021.

Current Initiatives – Maintenance

To improve safety and reliability within the rail system, a systematic effort has been placed on improving the right-of-way. Enhanced track bed cleanings have resulted in decreased fires wayside every year since 2016. Additionally, conducting thermal imaging three times annually along the right-of-way has prevented hotspots and flareups before incidents can impede service. Rail insulator cleanings have also contributed to the reduced number of fire incidents.

Ultrasonic testing on the rails has resulted in pre-incident identification and reduction in in-service rail breaks by 38 percent from FY2018 to FY2020, while the identification of the defects has decreased 43 percent during the same period as a result of earlier identification of issues. Cable meggering is nearly complete on the mainline and has yielded no high voltage cable fires since FY2017.

Current Initiatives – Station Modernization Improvements

A 10-phase project covering 91 stations is underway to modernize or rehabilitate stations. The projects are comprised of two groups: platform

improvement projects (20 stations) and station modernization (71 stations). Phase 1 will begin with a design-bid-build process of 18 stations with construction beginning in FY23-26.

These improvements are an opportunity to combine 57 station elements identified in line with Customer Experience Design Guidelines established in 2020. The goals of this program are to:

- Update fire/life safety systems to current codes and standards
- Define a new station standard that can be consistently applied for all station modernization efforts
- Minimize station construction to reduce re-work/save money/lessen customer impacts
- Enhance customer experience by upgrading station technology and improving state of good repair (SOGR) for various systems

Current Initiatives – Escalator Floor Warnings

Due to the pandemic, the escalator floor warnings initiative was postponed from 2020. Since most slip/trip/fall injuries occur on or near escalators, Metro will be piloting floor mats that remind customers to hold the handrail, among other safety messages. Dupont Circle and Potomac Ave have the highest slip incident counts and will be the first locations piloted.

Current Initiatives – Station Manager Training

Revised station manager and bus operator customer service training developed by a cross-functional team from Operations, Human Capital, and Customer Service, was piloted in August 2020. Industry experts and employee focus groups informed the pilot principles and content. This feedback encouraged the instruction be changed from a half day to a full day of de-escalation training by Metro Transit Police. Station managers are also taught to use the station surveillance systems to maximize their personal safety. New customer service training for station managers was implemented in October 2020.

Current Initiatives – Covid 19 Response

Requested adjustments to customer behavior have been accepted. To aid in the adoption of these adjustments, staff has implemented real-time crowding information, increased communication and face-mask requirements for personal safety. Physical safety is maintained by daily cleaning of stations and trains and a regular deep cleaning of stations. Upon report of a sick person, immediate disinfection of a train or station occurs. Additionally, air filtration in both stations and upon trains are using highly-rated MERV (minimum efficiency reporting values) filters. Even then, staff is piloting increased MERV filtration aboard trains and in stations with the assistance of Federal Transit Administration grants.

FUNDING IMPACT:

The costs of these initiatives are covered in the current budget.	
Project Manager:	Theresa Impastato and Joseph Leader
Project Department/Office:	Departments of Safety and Chief Operating Officer

TIMELINE:

Previous Actions	April 2018 – Safety & Service Delivery Committee (Rail Safety Initiatives Briefing) April 2020 – Safety & Operations Committee (Rail Safety Initiatives Briefing)
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Metrorail Safety Initiatives

Safety and Operations Committee
June 10, 2021

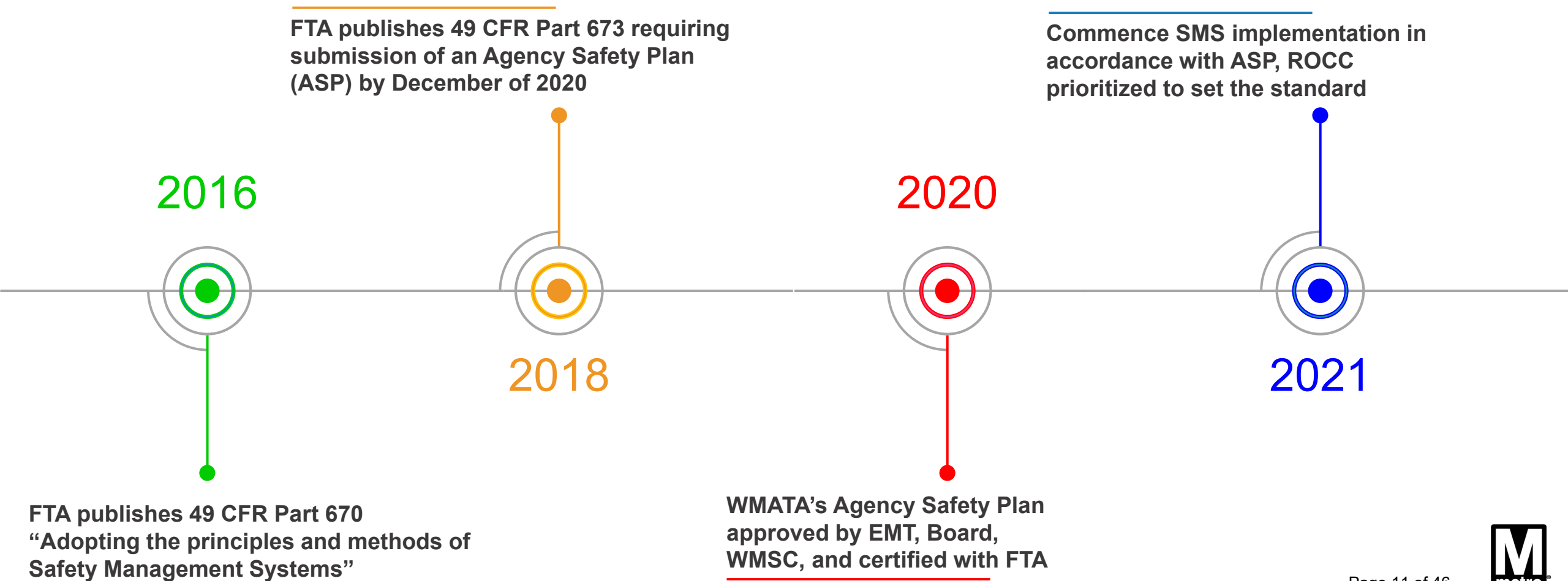


Purpose

- Provide an update on recent hazard mitigation strategies to improve customer and employee safety

Safety Management Systems (SMS) Background

SMS is a proactive approach to Safety Risk Management



What's Different About SMS?

Where safety has been and where it is going

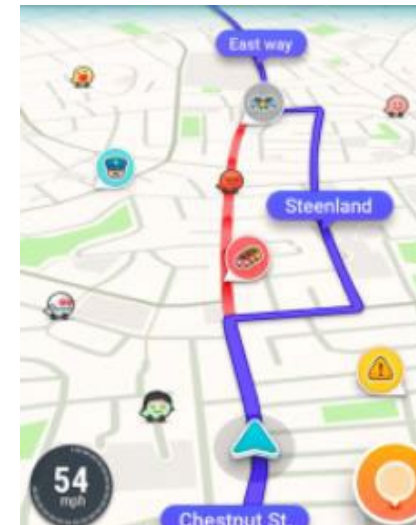
Reactive

- Compliance-focused
 - Followed the rule
 - Met regulatory requirement
 - Punitive culture

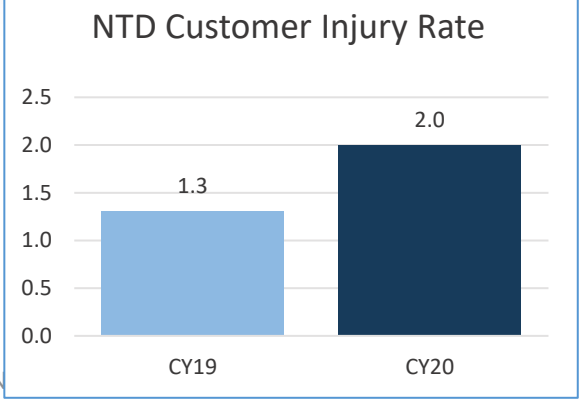
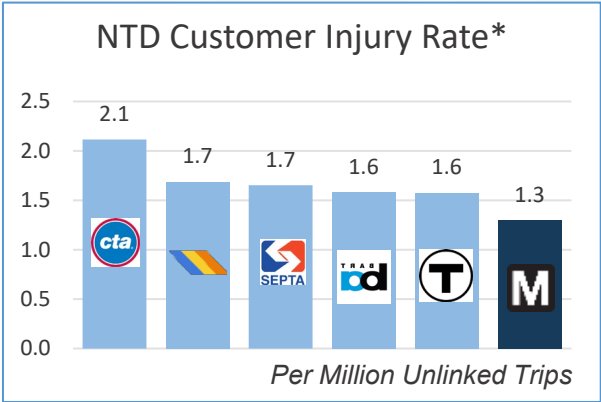
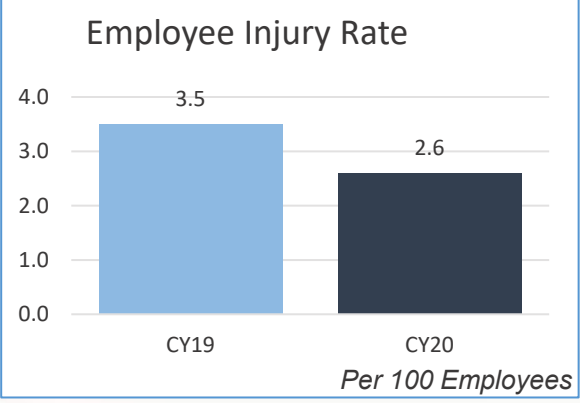
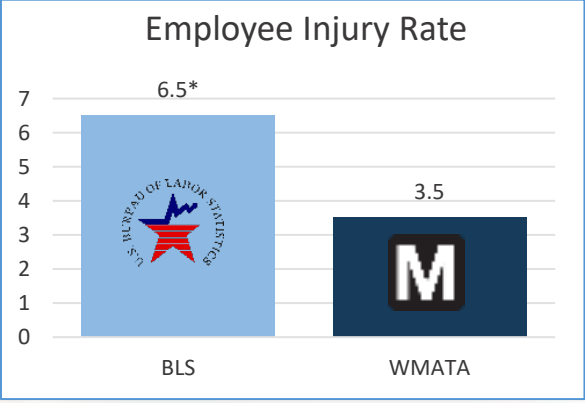
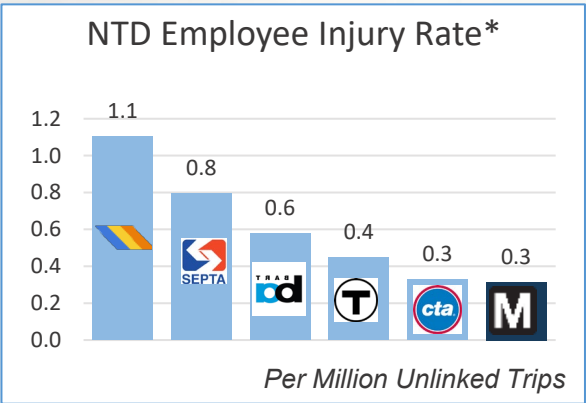
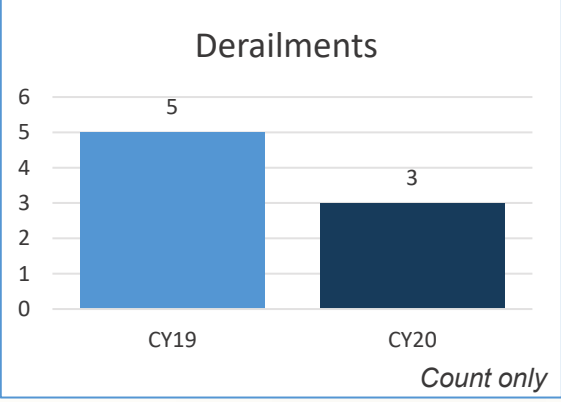
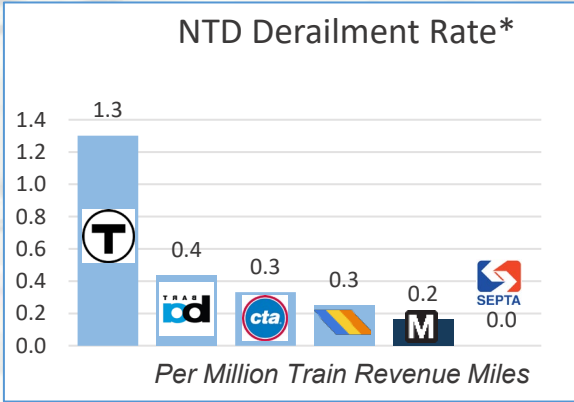
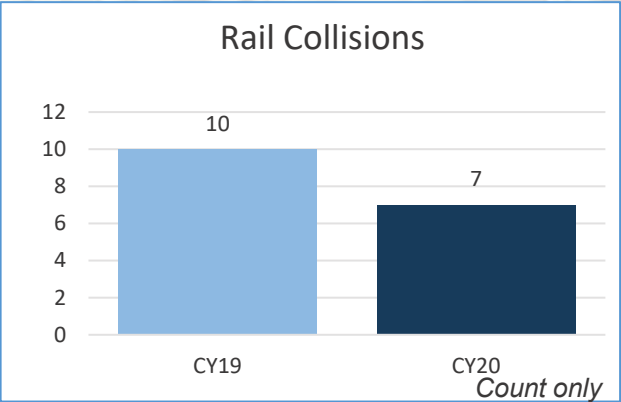
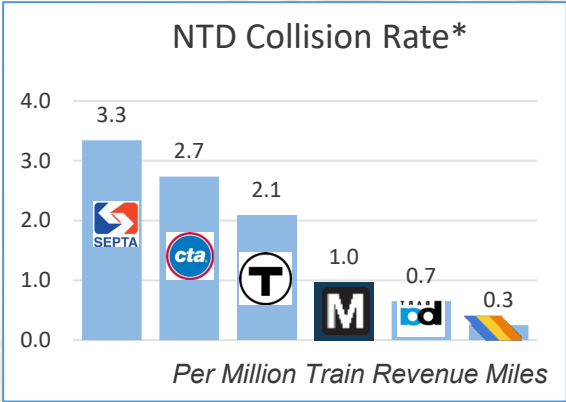


Proactive

- Performance-focused
 - What are inherent risks?
 - What are we doing about them?
 - Collaborative culture



Rail Safety Initiatives – Performance and Benchmarking



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*Comparison Data is from CY2019



Past Rail Initiatives

- Customers: Automated safety announcements on escalators piloted at Gallery, National Airport, Capitol South
 - No further expansion



Current Rail Transportation Initiatives

- Signal and station overrun working group
 - Train operator training
 - Station overruns; master controller use while braking in station; red signal “point and call” process; 30/60/90 refresher; safety stand down
 - New rules for station approach
 - Compliance audits
 - Targeted ride checks
 - Safety trifold and campaigns
 - Systemwide signal assessment
 - Benchmarking industry engineering solutions



Trending down FYTD



8% decrease for
red signal overruns

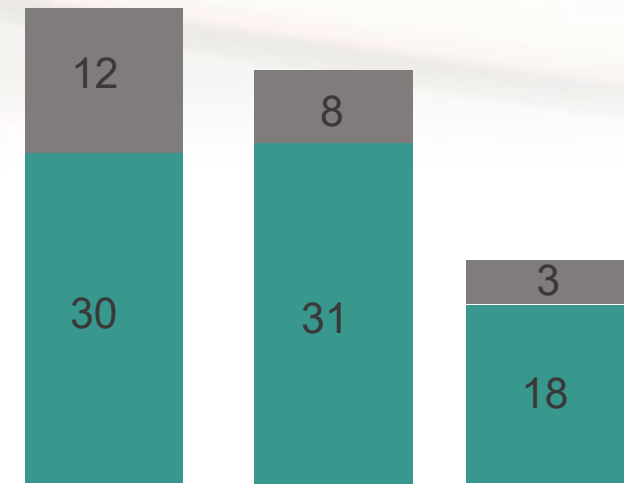
31% decrease for
station overruns

Current Rail Maintenance Initiatives

- Right-of-way fires decreased every year since 2016
 - Cleaning track bed
- Thermal imaging
 - Conducted 3x annually systemwide
 - Identifies hotspots before incidents



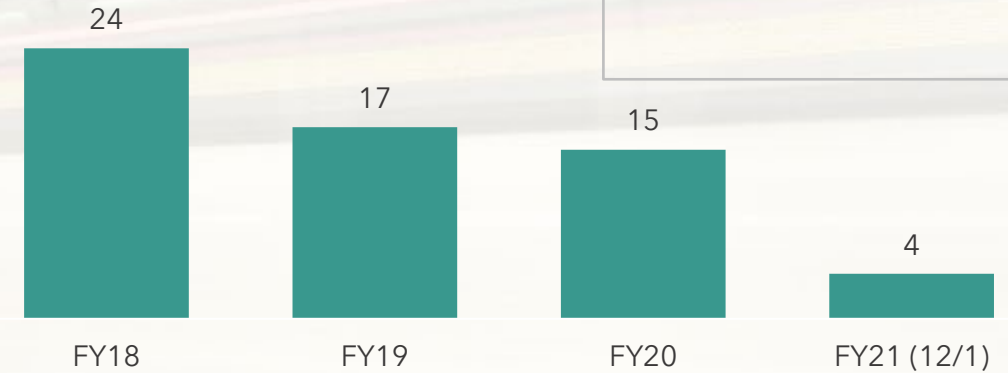
■ Arcing Insulator ■ Track Fire



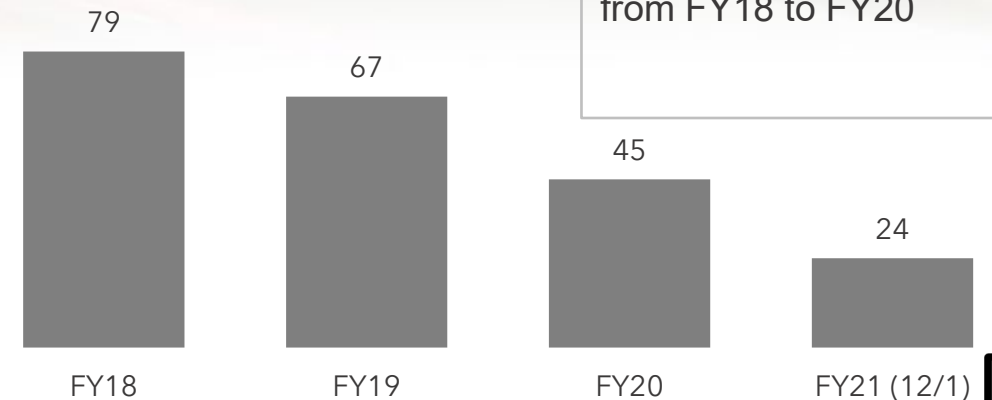
Current Rail Maintenance Initiatives

- Ultrasonic testing (UT)
- Cable meggering
 - 95% complete first four-year cycle on mainline
 - No high voltage cable fires since FY2017

Rail breaks have decreased by 38 percent from FY18 to FY20



UT defects have decreased by 43 percent from FY18 to FY20



Station Modernization Improvements

- Fire/Life safety upgrades
- Station communications upgrades
 - Closed circuit television, intercom,
 - Public address system, customer information & digital displays
- Finishes
 - Slip Resistant Quarry Tiles
 - Painting
- Energy-efficient lighting
- 10-Phases covering 91 stations



Escalator Floor Warnings

- Large warning at egress points
- One-year pilot at highest incident count stations
 - Dupont and Potomac Ave
 - Summer 2021



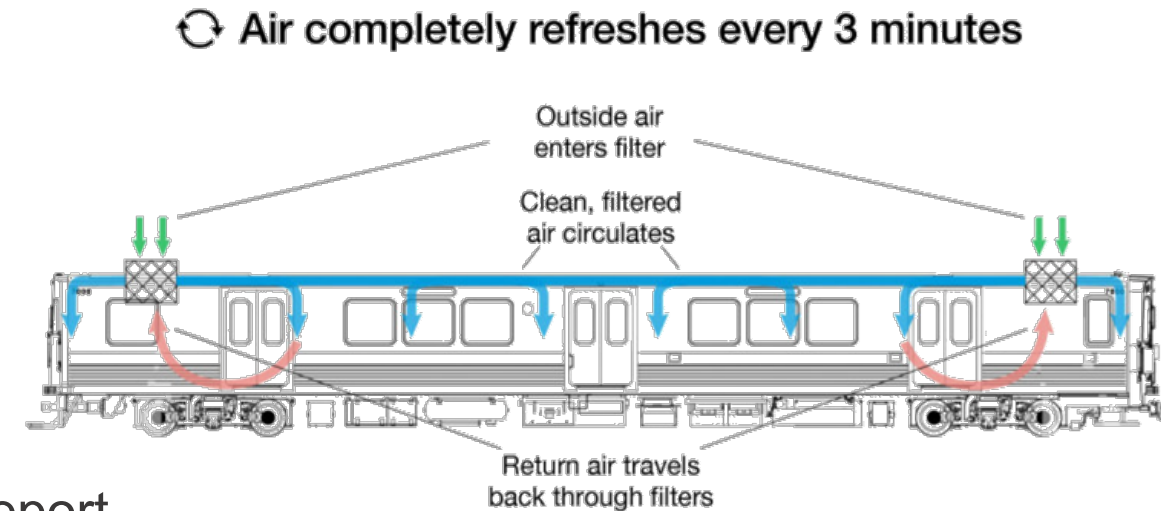
Station Manager Training

- Revised Station Manager and Bus Operator Customer Service Training in 2020 led by a cross-functional team
- Utilized industry expert and front-line employee focus group
- Piloted training August 2020
- Requested de-escalation and conflict resolution module expansion
 - Originally developed and implemented in 2019
 - Working with MTPD to expand module from half day to full day
- Implemented new Customer Service Training for station managers October 2020



Rail COVID-19 Response

- Customer behavior – real time crowding, communication, face mask requirement
- Daily cleaning and disinfecting of trains, stations
- Regular deep cleaning of stations
- Immediate disinfection of a train or station upon report
- On trains, upgraded to MERV 9 filters and piloting MERV 13 and UVC systems supported by FTA grant
 - Railcars complete full air change approximately every three minutes
- In stations and facilities, interior HVAC filters upgraded to CDC-recommended MERV 13 rating; piloting upgrades to MERV 15



* MERV = Minimum Efficiency Reporting Values, which measures the filter's "ability to capture larger particles between 0.3 and 10 microns." U.S. Environmental Protection Agency, <https://www.epa.gov/indoor-air-quality-iaq/what-merv-rating-1>

Summary

- Safety Management System reduces risk by driving action before incidents occur
- Safety Risk Management uses data and assurance methods to identify, assess, and mitigate proactively
- Safety Committees serve as the operating rhythm with targeted working groups established when required
- Initiatives are examples of data driven risk management strategies that support Safety Risk Management



**Executive
Safety
Committee**

ESC

**Department
Safety
Committee**

DSC

**Local Safety
Committee**

LSC