



**Safety and Operations Committee**

**Board Information Item IV-A**

**October 8, 2020**

**Metro Performance Report  
FY2020**

Washington Metropolitan Area Transit Authority

## Board Action/Information Summary

☐ Action ☒ Information

MEAD Number:  
202199

Resolution:  
☐ Yes ☒ No

### TITLE:

FY2020 Metro Performance Report - Pre-Pandemic

### PRESENTATION SUMMARY:

Highlights from the Fiscal Year (FY) 2020 Metro Performance Report for the pre-pandemic period. The presentation includes operational performance prior to the COVID-19 global pandemic, from July 1, 2019- March 15, 2020. No Board action required.

### PURPOSE:

Inform the Board of Metro's Pre-Pandemic FY2020 Performance.

### DESCRIPTION:

Presentation to inform the Board of Metro's Pre-Pandemic FY2020 Performance.

#### Key Highlights:

- Prior to the pandemic, Metro met target for 16 out of 21 measures—including ridership, customer injury rate, MyTripTime, and both rail and bus reliability.
- Metro did not meet target for five measures: available track, red signal overruns, derailments, fires, and the bus employee injury rate.

#### Background and History:

Metro has publicly reported performance for key operational measures since 2010. The FY20 Metro Performance Report highlights Metro's system-wide performance for the pre-pandemic period, focusing on our goals of quality service, safety and security, financial responsibility. It compares performance for the period of July 2019 – March 15, 2020 to the targets that Metro set for the fiscal year. Since March, Metro has shifted focus to deliver the Pandemic Recovery Plan, with goals of protecting employees, protecting customers, staying ahead of demand, and communicating effectively. Given the dramatic impact the pandemic has had on Metro's operations, Metro leadership is

reassessing performance reporting for FY21 to identify measures that align with the current operating environment and priorities.

### **Discussion:**

Prior to the pandemic, **Metro met target for 16 out of 21 measures**, including: ridership, eight out of 12 safety and security measures, and six out of seven quality service measures.

- Ridership across all three modes had a budget forecast of 208.8 million passengers and Metro has 218.1 million, favorable to the target.
- Metro met its targets for safety measures related to crime, customer injuries, Metrorail employee injuries, serious bus collisions and pedestrian strikes. Metro was favorable to the target on Customer Injury Rate across all modes, with an overall result of 1.86 injuries per million passengers and a target of 2.17 injuries per million passengers.
- Metro met its targets for on-time performance, fleet reliability, and elevator and escalator availability. Rail On-Time Performance consistently surpassed the target through all months this fiscal year, delivering the highest performance since the launch of this measure in fiscal year 2016. MetroAccess on-time performance was also better than target. Metrobus did not have a fiscal year 2020 On-Time Performance target due to a recent change in the measure calculation.
- Both Rail Fleet Reliability and Bus Reliability exceeded fiscal year 2020 targets prior to the pandemic.

Metro missed target for one quality service measure: Available Track. It also missed target for four safety measures: Metrorail fire events, Metrorail derailments, Metrorail red signal overruns, and Metrobus employee injury rate. Additional details for measures that missed targets (before the pandemic) are as follows:

### **Available Track (Guideway Restrictions)**

- Key takeaways
  - Based on the FTA requirement, guideway restrictions include any time the track is unavailable or has a speed restriction. This can occur due to track out of service for planned track work, weather, and unplanned issues that degrade track condition.
  - Through March, on average 4.0% of track was unavailable, slightly above the target of 3.8%.
  - Planned track work was the main reason track was unavailable, driven by the 2019 summer Platform Improvement Project.
- Root causes

- Planned work is the main reason track was unavailable. On average, only 0.6% of track was restricted due to condition.
- Actions to improve
  - Continue preventive maintenance and capital programs to keep unplanned restrictions low.
  - Install heat tape to eliminate seasonal, weather-related restrictions at four stations.

## **Red Signal OVERRUNS**

- Key takeaways
  - Before the pandemic (July 1, 2019 to March 15, 2020) Metro had 12 red signal overruns, eight more than the same time in FY19.
  - Six of the overruns were due to operator error, the others due to personnel failing to follow procedure and miscommunication.
  - For context, Metro train operators encounter around 118,000 mainline signals every weekday, plus additional signals in the rail yards.
- Root causes
  - Ten red signal overruns involved trains, two involved roadway maintenance machines (RMM).
  - Five red signal overruns occurred in early morning hours (2-5:45 am).
- Actions to Improve
  - Convened a Corrective Action Committee to identify underlying root causes of vehicle movement violations and recommend mitigations.
  - Upgraded signal heads to improve visibility and continue to conduct regular sign maintenance (cleaning/replacement).
  - Updated the software on 7K railcars to reduce risk of accidental overruns.
  - Performed efficiency testing and spot checks, including 86 red signal observations in FY20.
  - Identified and addressed repeat offenders through retraining.
  - Conducted safety standowns for Rail operations and maintenance staff focusing on safety protocols and lessons learned.

## Derailments

- Key takeaways
  - Before the pandemic (July 1, 2019 – March 15, 2020), Metro had five derailments, three more than the same time in FY19.
  - The increase in derailments was due to the use of hi-rail vehicles to support the expanded construction work, especially the Platform Improvement Project summer of 2019.
  - All five derailments were contractor-owned hi-rail vehicles, and three of the five derailments were in the Platform Improvement Project's construction site.
- Root causes
  - Hi-rail vehicles present higher inherent risks for derailment due to wheel loading and non-articulating axels.
- Actions to Improve
  - Explored different equipment options to ensure the right equipment is available for the right task.
  - Improved the contractor equipment certification process with more structured and stringent inspections and stricter rules on disqualifying problematic units.
  - Conducted a safety stand down March 2020 to review recent incidents and procedures to prevent derailments.

## Fire Incidents

- Key takeaways
  - Before the pandemic (July 1, 2019 – March 15, 2020), there were 51 fires, one more than the same time during FY19.
    - The increase in fires (during the pre-pandemic period) was due to non-electrical fires. Non-electrical fires include fires caused by debris on the track, smoking cross-ties, and trash can fires on the platform.
- Root causes (before the pandemic)
  - **33 non-electrical events:** Ten events due to smoking or burning cross ties and 10 due to trash can fires.
  - **14 arcing insulator events:** Almost all occurring on the Red Line north of Dupont Circle caused by wet weather, active water leaks, and muck buildup.

- Actions to improve
  - Increased trackbed/drain cleaning frequency on the Red Line, while transitioning to condition-based monitoring.
  - Completed a cost/benefit analysis for insulator replacement and insulator cleaning to determine the most effective approach.
  - Installed 47 thermoplastic insulators at Friendship Heights as part of a 18-24 month pilot.

### **Bus Employee Injury Rate**

- Key takeaways
  - The rate decreased steadily throughout FY20, but still did not reach the annual target.
- Root causes (pre-pandemic results)
  - 319 Bus personnel injured before the pandemic resulting in an injury rate of 12.0 injuries per 200,000 hours worked.
  - The top injury types were collision-related (90), assault or stress (66), slips, trips, and falls (47), pushing or pulling (37) and struck by or against an object (32).
  - Metro is deemed not-at-fault for over half (57%) of all collisions that occur.
- Actions to Improve
  - To reduce collisions, the most common cause of injuries, Metro is piloting collision avoidance technologies, such as Blind Spot Warnings, object detection and floating bus stops as well as is evaluating the bus operator training program to improve driving techniques of new and existing operators.
  - Evaluate the bus operator training program to improve driving techniques of new and existing operators.
  - Continue de-escalation and conflict resolution training to address injuries related to assaults and stress.
  - Conduct safety observations and develop safety campaigns targeting specific injury types and known risky behaviors.

### **FUNDING IMPACT:**

No impact on funding. This presentation is to provide the Board with information on Metro's pre-pandemic FY2020 Performance.

**TIMELINE:**

NA

# FY2020 Pre-Pandemic Metro Performance Report

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**Safety and Operations Committee**  
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# Metro's Progress in FY20 Pre-Pandemic

Prior to the pandemic, Metro met or exceeded target for 16 out of 21 measures



## Ridership

**Total ridership exceeded budget forecast prior to the pandemic**



## Customer Satisfaction

**Increased prior to the pandemic**



## Safety & Security

**8 out of 12 measures met or approached target prior to the pandemic**

- Part I Crime
- Metrorail Customer Injury Rate
- Metrobus Customer Injury Rate
- MetroAccess Customer Injury Rate
- NTD Bus Collision Rate
- Bus Pedestrian Strikes



## Quality Service

**6 out of 7 measures met target prior to the pandemic**


- MyTripTime
- MetroAccess On-Time Performance
- Rail Fleet Reliability
- Bus Fleet Reliability
- Elevator Availability
- Escalator Availability

# FY20 Pre-Pandemic Performance | Ridership + Quality Service



## Ridership in millions

218.1

Before  Pandemic

Metrorail

128.2

Metrobus

88.3

MetroAccess

1.6




## Quality Service

**MyTripTime**

Target 88%


90%

Before  Pandemic

**Bus OTP**

Pilot KPI

77%

Before  Pandemic

**MetroAccess OTP**

Target 90%


90%

Before  Pandemic

**Rail Fleet Reliability**

Target 130,000


230,127

Before  Pandemic

**Bus Fleet Reliability**

Target 7,000


7,204

Before  Pandemic

**Escalator Availability**

Target 92%


95%

Before  Pandemic

**Elevator Availability**

Target 97%

97%

Before  Pandemic

## ● Available Track (Guideway Restrictions)

Target: 3.8% | Actual: 4.0%

Planned trackwork decreased availability

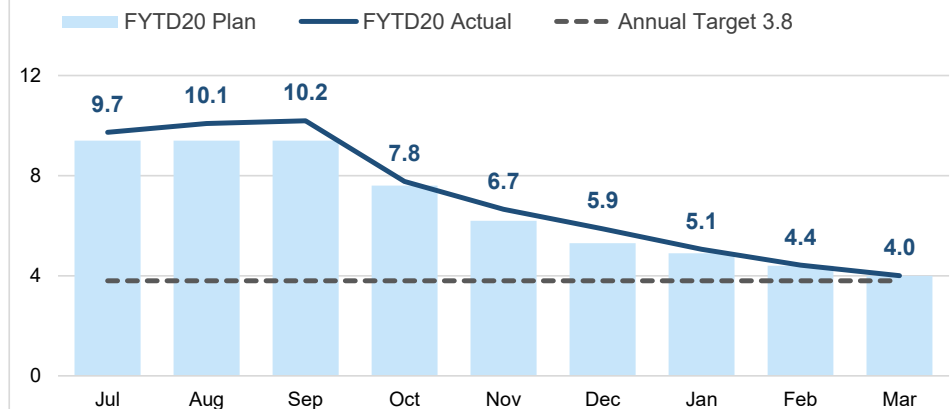
### Root Causes

- Guideway restrictions include planned track work and unplanned condition-related speed restrictions
- **Planned work is the main reason guideway was unavailable. On average, only 0.6% of track was restricted due to condition**

### Actions to Improve

- Continue preventative maintenance and capital programs
- Install heat tape to eliminate seasonal, weather-related restrictions at four stations

Cumulative guideway restrictions % | FY20 vs Target



# FY20 Pre-Pandemic Performance | Safety + Security



## Safety & Security

### Crime Rate

Target 5.3

**5.0**

Before ●  
Pandemic

### Metrorail Customer

Injury Rate Target 1.40

**1.38**

Before ●  
Pandemic

### Rail System Employee

Injury Rate Target 3.4

**3.5**

Before ●  
Pandemic

### NTD Bus Collisions

Target 3.7

**3.7**

Before ●  
Pandemic

### Metrobus Customer

Injury Rate Target 2.45

**2.36**

Before ●  
Pandemic

### Rail Collisions

Prior Year 8

**8**

Before ●  
Pandemic

### Pedestrian Strikes

Prior Year 21

**16**

Before ●  
Pandemic

### MetroAccess Customer

Injury Rate Target 2.85

**1.75**

Before ●  
Pandemic

# ● Red Signal Overruns

Operator error, failure to follow procedure and miscommunication

Target: 4 | Actual: 12

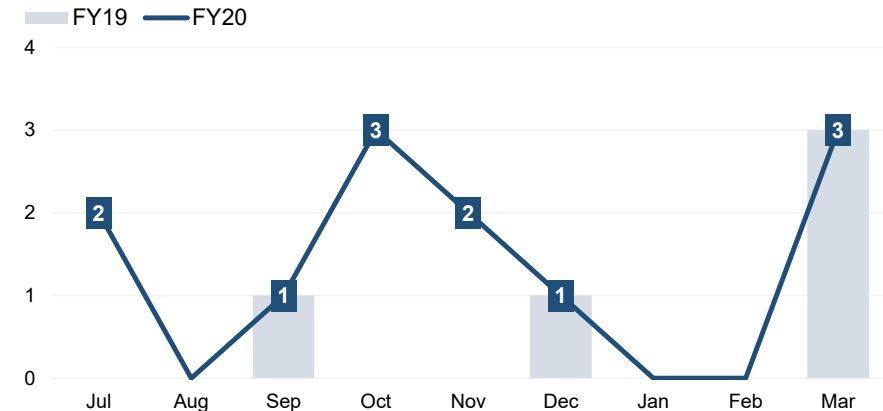
## Root Causes

- All but two involved **trains**
- Five occurred in **early morning hours** (2-5:45 am)

## Actions to Improve

- **Corrective Action Committee** continues to identify and address root causes
- Upgraded **signal heads** to improve visibility and conduct regular **sign maintenance**
- Updated software on 7K railcars to reduce risk of accidental overruns
- Verify and reinforce procedures through **efficiency testing and spot checks**
- Identify and address repeat offenders

Number of red signal overruns | FY20 vs FY19



# Derailments

All involved contractor owned hi-rail vehicles

Target: 2 | Actual: 5

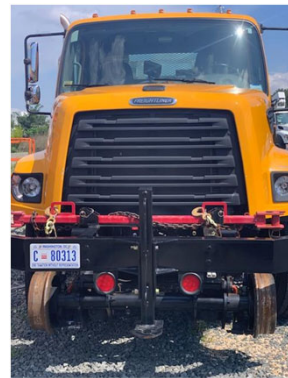
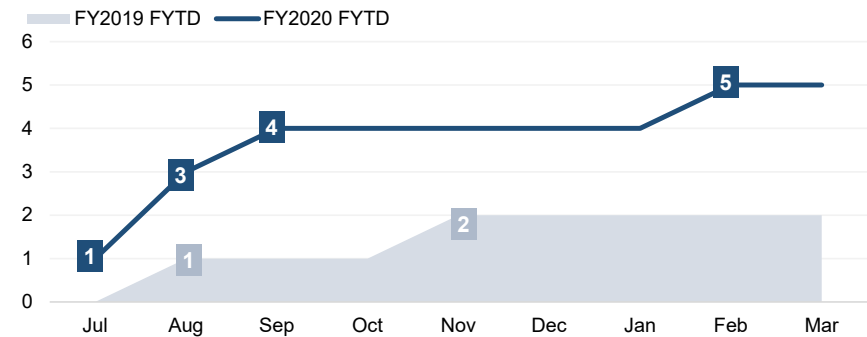
## Root Causes

- Hi-rail vehicles have higher inherent risk of derailment
- Three of the five hi-rail derailments in the **Platform Improvement Project's construction site**

## Actions to Improve

- Exploring different equipment to ensure the **right equipment is available for the right task**
- **Improving the contractor equipment process** with more structured and stringent inspections and stricter rules
- Metro conducted a **safety stand down** conducted in March 2020

Cumulative derailments | FY20 vs FY19



# ● Fire Incidents

Dominated by non-electrical fires

Target: 50 | Actual: 51

## Root Causes

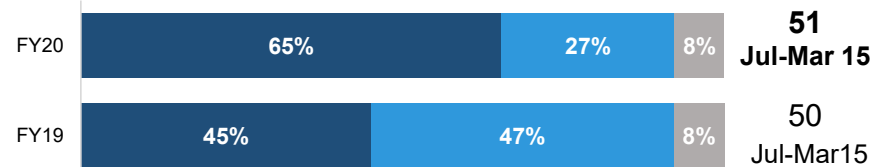
- **33 non-electrical:** Including smoking cross ties, trash cans
- **14 arcing insulator events:** Almost all on the Red Line north of Dupont Circle caused by wet weather, active water leaks, and muck buildup

## Actions to Improve

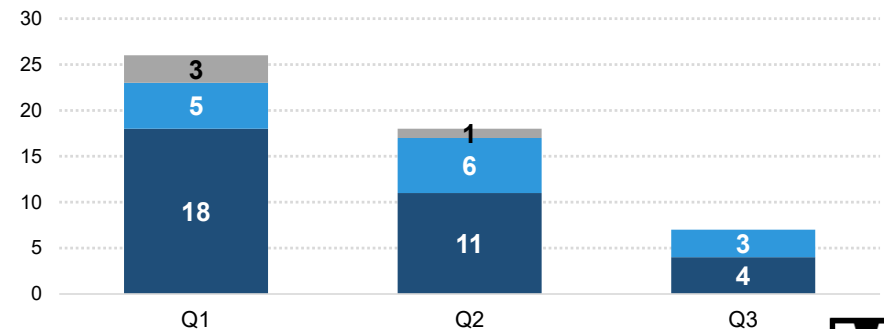
- More frequent **trackbed/drain cleaning on the Red Line**, while transitioning to condition-based monitoring
- Completed **cost/benefit analysis for insulator replacement and insulator cleaning**
- Installed **47 thermoplastic insulators at Friendship Heights as part of an 18-24 month pilot**



### Breakdown by type | FY20 vs FY19



### Breakdown by type and quarter | FY20



# ● Bus Employee Injury Rate

Target: 9.4 | Actual: 12.0

Rate decreased through the year, but remained above target

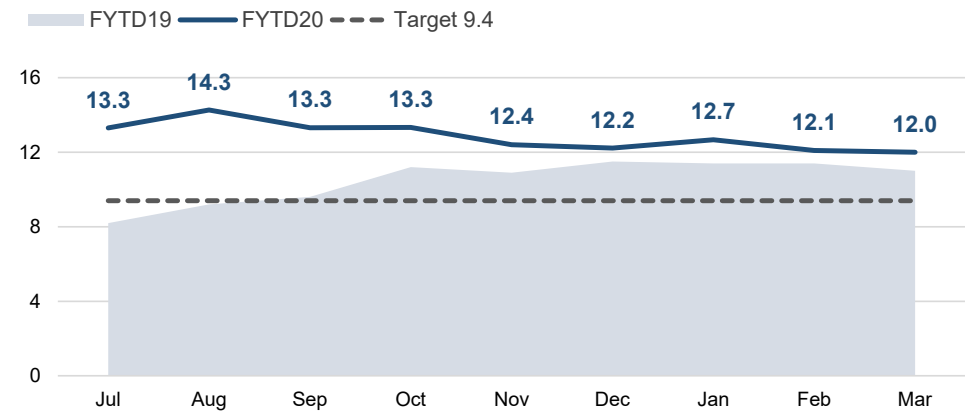
## Root Causes

- **319 bus personnel injuries before the pandemic**
  - 90 collision related with Metro not at fault for 57% of all collisions that occurred
  - 66 due to assault or stress
  - 47 slips, trips, or falls
  - 37 pushing or pulling
  - 32 struck by or against an object

## Actions to Improve

- **Pilot collision avoidance technologies**
- **Evaluate the bus operator training program**
- **Continue de-escalation and conflict resolution training**
- **Conduct safety observations and develop safety campaigns targeting specific injury types and known risky behaviors**

### Cumulative bus employee injury rate | FY20 vs Target



### Preventable vs. Non-Preventable | FY20 vs FY19

