

Washington Metropolitan Area Transit Authority
Board Action/Information Summary

Action Information

MEAD Number:
201894

Resolution:
 Yes No

TITLE:

Safety Report for Second Quarter 2017

PRESENTATION SUMMARY:

The Department of Safety & Environmental Management (SAFE) Quarterly Report publicly communicates safety-related information and statistics.

PURPOSE:

The Metro Safety Quarterly Report informs the Safety Committee regarding the ongoing safety culture in the Metro system and indicates performance measurement in accordance with the Authority goals. Further, the public report increases communication to enhance safety of WMATA's employees, customers and surrounding Washington metropolitan area community. The Quarterly Report will summarize and highlight progress in 2017 and other relevant safety actions.

DESCRIPTION:

Two measures of an improving safety culture are the customer and employee injury rates. As such, both performance measures are included as part of Metro's Strategic Plan. The 2017 target for the Customer Injury Rate (CIR) is less than 1.75 injuries per million passenger trips; the Employee Injury Rate (EIR) target is less than 5.1 injuries per 200,000 work hours. Additional metrics that will be reviewed for statistical purposes are highlighted below and actions taken will be covered in the discussion. These metrics include rail fires, derailments, red signal overruns, pedestrian strikes, rail collisions and bus collisions.

Key Highlights:

- Employee Injury Rate (EIR) – The EIR was 6.2; this is a 17% increase over last year's EIR of 5.3 injuries per 200,000 hours worked (equivalent to 100 employees working for a year) and 7% below the Bureau of Labor Statistics average for transit industries (i.e., 6.7). There have been 364 OSHA recordable employee injuries for January – June, 2017.
- Customer Injury Rate (CIR) – The CIR was 2.0; this is a 9% decrease over last year's CIR of 2.2. There were 308 NTD reportable customer injuries for for January – June, 2017.

- Fires – Through 2nd Quarter of 2017, there were 50 fires internally recorded; 39% lower than through 2nd Quarter of 2016. The area of greatest decline was in non-electrical fires (e.g., debris-related); however, the number of arcing insulators also declined, noting a nearly 28% decrease compared to last year.
- Derailments – Through 2nd Quarter of 2017, there were five derailments compared to four through 2nd Quarter of 2016. Four of the five derailments involved Roadway Maintenance Machines, traveling during non-revenue hours or in established work zones.
- Red Signal Overruns – Through 2nd Quarter of 2017, there were five red signal overruns; down from six through 2nd Quarter of 2016.
- Rail Collisions – Through 2nd Quarter of 2017, there were 23 rail collisions; up from 13 through 2nd Quarter of 2016.
- Bus pedestrian strikes – Through 2nd Quarter of 2017, there were eight incidents; one less than through 2nd Quarter of 2016.
- Bus Collision Rate – Through 2nd Quarter of 2017, there were 200 fewer collisions contributing to a rate of 56.4 collisions per million miles. This rate is 14% below last year's.

Background and History:

The Quarterly Safety Report is required by the Board of Directors system safety policy statement as part of the approved System Safety Program Plan (SSPP). The SSPP is required under FTA Final Rule Code of Federal Regulations 49, part 659; Rail Fixed Guideway Systems: State Safety Oversight.

The Department of Safety and Environmental Management utilizes multiple datasets to monitor safety activities that impact employees and the riding public. Daily review of incidents, systematic inspections of facilities and regulatory programs, and employee/contractor training are effective uses of resources which ensure a safer workplace and environment for our passengers. The following discussion highlights some of the metrics and incidents used to gauge system safety.

Discussion:

While EIR and CIR did not meet the established target, the CIR showed improvements compared to the first quarter and the EIR is trending downward from a spike in March. Through 2nd Quarter of 2017, the CIR is 2.0, which is above the target of <1.75 but below the CIR through 2nd Quarter of 2016. The primary drivers behind the CIR are hard braking and non-preventable sideswipe events for Bus and slip/trip/fall injuries on rail station platforms.

Through 2nd Quarter of 2017, the EIR is 6.2 which was above the target of <5.1. The primary drivers behind these injuries were non-preventable collisions, slips/trips/falls due to inattentiveness, crime-related mental stress injuries and struck by injuries related to failing to follow procedures (including PPE use).

MetroBus – CIR

Through 2nd Quarter of 2017, the MetroBus CIR was 2.3 per 1,000,000 passenger trips; down 20% through 2nd Quarter of 2017. There were 64 customer injuries for the quarter. The primary injury type was non-preventable collision-related which included an intersection collision that injured seven passengers. Hard braking events was another leading factor that contributed to customer falls.

MetroBus has several initiatives to reduce customer injuries. Bus Training is reviewing collision data with SAFE to update its defensive driving curriculum in an effort to decrease rear end collisions. This also includes using DriveCam to identify all hard braking events, regardless of injury, and coaching the impacted operator. Collision hot spots have been identified and management staff are routinely deployed to those areas. Service Operations Managers are also working with SAFE to develop more efficient reporting processes to further enhance the data quality in bus collision reports.

MetroAccess – CIR

Through 2nd Quarter of 2017, the CIR for MetroAccess (MACS) was 1.3 injuries per 100,000 passenger trips; 52% lower than through 2nd Quarter of 2016. There were 11 customer injuries for the quarter. As with MetroBus, the primary driver was non-preventable collision related injuries. Slip/trip/fall injuries also increased; these injuries occurring while the passenger was being escorted to/from the vehicle. As the Committee was briefed on May 25, 2017, MACS has formed a working group of contractors and MACS staff to work with the Occupational Therapist. This collaboration has already identified aspects of driver training that can be improved to reduce injuries. The group has been examining everything from the customer's disability profile and susceptibility to losing balance, to proper techniques for escorting customers to, from, into and out of the vehicle.

MetroRail – CIR

Through 2nd Quarter of 2017, the CIR for MetroRail was 1.6 injuries per 1,000,000 passenger trips; up 6% through 2nd Quarter of 2016. There were 65 customer injuries for the quarter. Slip/trip/fall injuries in the station is the leading injury type, followed by slips/trips/falls on escalators. These falls primarily occurred while passengers are running through the station, are intoxicated, or trip on uneven or wet platform surfaces.

There has been an increase in station safety inspections in Calendar Year 2017 to reduce the number of facility issues that may result in customer injuries, such as loose floor tiles and poor housekeeping. In addition, WMATA is monitoring the effectiveness of the piloted automated precaution announcements which were installed at the escalators experiencing the most injuries. The announcements warn when the escalator is ending and remind passengers to hold onto the handrail. Overall station announcements are also in place which remind passengers to be aware of their surroundings and to be safe while using the system. Finally, a new customer safety communication campaign has begun and can be seen throughout the system.

Employee Injuries – EIR

The EIR was 6.2 per 200,000 hours worked through 2nd Quarter of 2017; up 17% last year. There were 364 OSHA-recordable employee injuries through 2nd Quarter of 2017; 46 more than through 2nd Quarter of 2016. The primary driver for the increase in EIR is Bus Transportation which accounts for more than half of the injuries overall. The main

injury types across all departments are: collision-related (25%); slip/trip/fall (22%); and stress (9%). The departments that have had the most injuries include: Bus Transportation (53%); Rail Transportation (11%); Metro Transit Police Department (9%); and Track/Structures (6%).

Lack of situational awareness was the leading contributing factor for employee injuries. WMATA has conducted Job Hazard Analysis (JHAs) training with supervisory and frontline personnel in multiple departments with the goal of reducing these types of injuries. As complacency contributes to injuries, focusing on the hazards present and having staff communicate how those hazards are mitigated will bring more safety awareness to day-to-day tasks.

Fires

There are three main types of fires that occur within the rail system: non-electrical (e.g., debris/rubbish), electrical cables, and arcing insulators.

Non-electrical fires typically consist of material on the roadway that ignites for various reasons, but the source is not electrically-related. This includes leaves or newspapers coming to rest on heated components (e.g., switch heaters or lighting equipment) or debris in street-accessible shafts that start due to discarded cigarettes. Through 2nd Quarter of 2017, there were 15 of these fires; 56% fewer than through 2nd Quarter of 2016. Efforts to reduce these fires include regular track cleaning and shaft debris/leaf cleaning.

Cable fires are generally the result of either unsecured cables or degraded insulation. In most cases, the cables involved are those that provide power to the third rail. Through 2nd Quarter of 2017, there was one incident; the same as through 2nd Quarter of 2016. Actions to reduce these fires include the cable replacement and securement program, which involves a team of inspectors whose primary role is to inspect and repair these cables. Additional efforts include tunnel cleaning, which includes unclogging drains, and tunnel leak repairs.

The final events reviewed are arcing insulators. These events occur when stray current from the third rail finds an alternative path to the ground, primarily as a result of wet conditions. Through 2nd Quarter of 2017, there were 34 of these events; 13 less than through 2nd Quarter of 2016. The main causes behind these events are wet/muddy conditions and insulator contamination and degradation. To resolve these aspects, proactive drain cleaning and mud/debris removal in at-risk areas (e.g., Red Line) is occurring and improvements to the insulator inspection process have been made, both in the field and prior to field replacement. In addition, WMATA is exploring alternative insulator designs that allow for more efficient insulator replacement.

Derailments

There were five derailments through 2nd Quarter of 2017; four of which were Roadway Maintenance Machines (RMMs). RMMs vary in size and weight but include some small and light pieces of equipment that are used to repair and/or build the railway. Pieces include quad drill, spike driver, spike puller, tie remover, tie crane, spot tamper and prime mover. Of the four RMM derailments, one was in a work zone and the other three occurred on the mainline after revenue hours. There were four derailments through 2nd Quarter of 2016. The main causal factor of these events are improper

operation/movement. As noted in the 1st Quarter of 2017 Safety Report, a positive (upward) correlation was noted of increased RMM usage and the frequency of derailments. As RMM usage decreases, WMATA will work to ensure that RMM operator certifications and refresher training remain in good order.

To reduce RMM derailments, the Track and Structures department documents supervisory observations of RMM operators to improve positive feedback for proper operation and to ensure that corrective actions are taken when equipment is used improperly.

Red Signal Overruns

There were five red signal overruns through 2nd Quarter of 2017; one less than through 2nd Quarter of 2016. Three of the five occurred on the mainline and two occurred in the yard. The primary cause is operator inattentive blindness where the operator does not recognize the red signal. An additional cause in several instances was miscommunication between the governing authority (e.g., interlocking/tower operator) and the train operator. Actions to reduce these incidents include retraining of train operators, replacing signal lights with light emitting diodes (LEDs) to improve conspicuity and rail vehicle modifications for stop and proceed modes (e.g., requiring the operator to perform several tactile functions to move the train when a red signal is encountered). The latest red signal overrun occurred on April 1, 2017.

Rail Collisions

Through 2nd Quarter of 2017, there have been nine incidents where rail vehicles, including RMMs, came in contact with other rail vehicles, tunnel walls, platform edges, and shop doors. This represents a decrease of one from the same period in 2016. Of the nine collisions, six involved RMMs and three involved rail cars.

Three collisions occurred while entering or exiting maintenance shops. An additional three incidents involved RMMs making contact with platform edges or parts of the tunnel due to unsecured equipment (e.g., low voltage cables and unsecured equipment on the RMM). One collision occurred while the RMM was travelling to a work zone and struck another RMM. The remaining two were slow speed collisions during yard movements (i.e., bump post and hard coupling). To combat rail vehicle collisions, WMATA is reviewing and updating its training programs for RMM operators and making improvements to its rail vehicle securement process.

Bus Pedestrian Strikes

There have been eight pedestrian strikes through 2nd Quarter of 2017; one less than through 2nd Quarter of 2016. Common factors around these incidents are individuals falling into the bus while the bus is departing, cyclists striking the bus, pedestrian impairment and operator inattention. With one exception where the pedestrian was crossing against the pedestrian signal, all incidents through 2nd Quarter of 2017 occurred outside the cross walk; 85% of strikes for the past four years have occurred outside the cross walk. To reduce these incidents, Bus Transportation hosts a "Pedestrian Summit" several times a year which involves management, operators, and Union representation. Aspects covered during the summit include training, root cause analysis and operator feedback. Lessons learned from these summits are then distributed to all bus operators. In addition, DriveCam is used to coach operators on the typical conditions surrounding pedestrian strikes (e.g., time of day, location).

Bus Collision Rate

The bus collision rate through 2nd Quarter of 2017 is 56.4 collisions per million miles; 14% lower than 2016's rate and 200 fewer collisions. The primary collision causes are non-preventable rear-end collisions, improper bus positions and operator inattention. Efforts to reduce bus collisions include "Safety Blitzes" where management is deployed at accident hot spots to reinforce safe driving behavior, operators are evaluated via unannounced ride-alongs, and expanded divisional mentoring programs where novice operators are paired with vetted seasoned operators.

FUNDING IMPACT:

Necessary funding is within approved annual budget.	
Project Manager:	Patrick Lavin
Project Department/Office:	SAFE

TIMELINE:

Previous Actions	<ul style="list-style-type: none">• Safety Report for First Quarter on April 27, 2017
Anticipated actions after presentation	<ul style="list-style-type: none">• Continue to fully implement all NTSB and FTA CAPs• Continue to implement programs and activities to strengthen safety culture• Continue to fully investigate accidents and incidents

RECOMMENDATION:

To inform the Board's Safety Committee of the positive and proactive safety foundation status being implemented and accomplishments through the second quarter of 2017.



Washington Metropolitan Area Transit Authority

2nd Quarter Safety Review

Safety Committee
July 27, 2017



Injury Rates

Employee and Customer Injuries

Customer Injury Rate (Target: 1.75)

Year (Jan – June)	Rate (per 1million trips)	Injuries
2017	2.0	308
2016	2.2	344
2015	2.5	413
2014	1.9	331

Employee Injury Rate (Target: 5.1)

Year (Jan – June)	Rate (per 100 employees)	Injuries
2017	6.2	364
2016	5.3	318
2015	6.0	354
2014	4.4	258



Customer Injury Rate

Rail, per million passenger trips

Benchmark



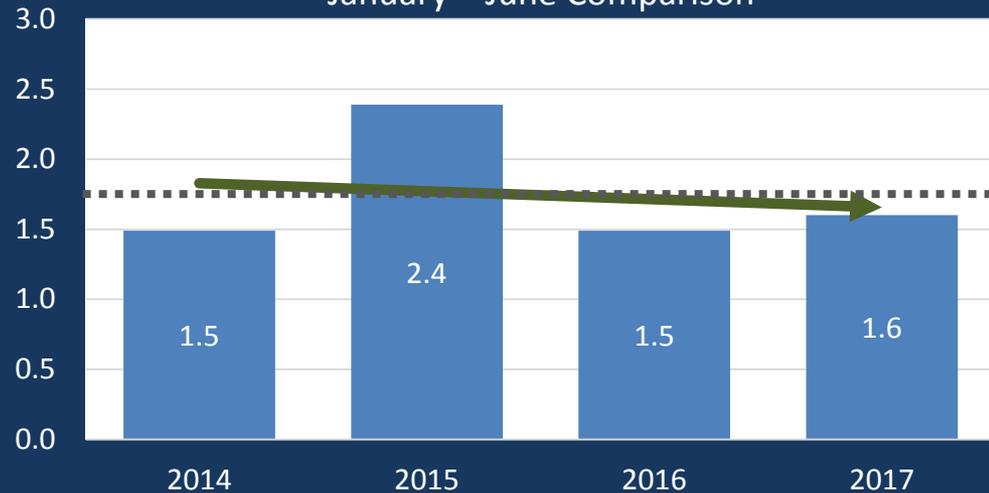
Status

- 6% increase, compared to 2016
- Primary injury types are Slips/Trips/Falls and Caught In/By
- Primary causal factors are customer inattention/distraction and intoxication
- Top Three Stations: Metro Center, Gallery Place, and Fort Totten

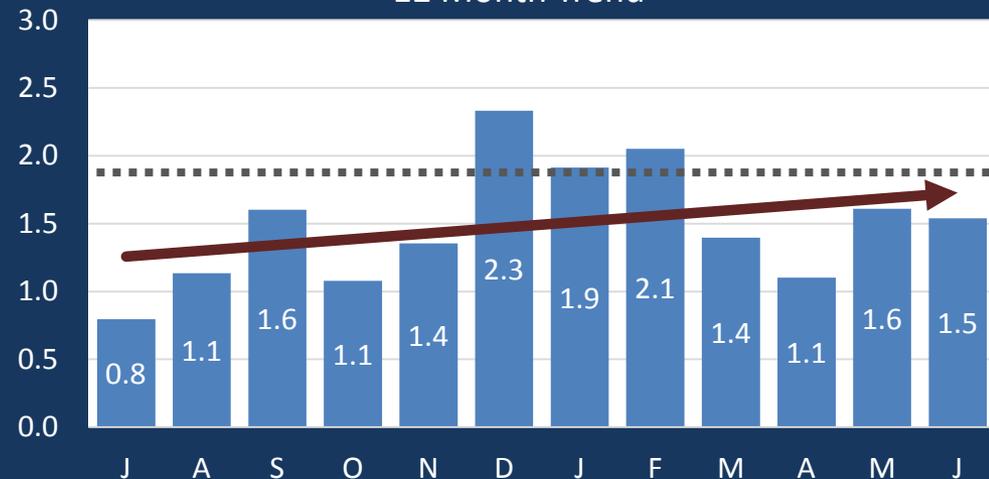
Mitigations include:

- Thorough station inspections by multiple departments
- Customer communication campaign

January – June Comparison



12 Month Trend

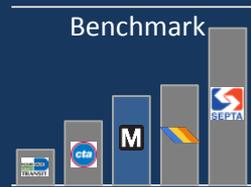


..... Target – 1.75



Customer Injury Rate

Bus, per million passenger trips



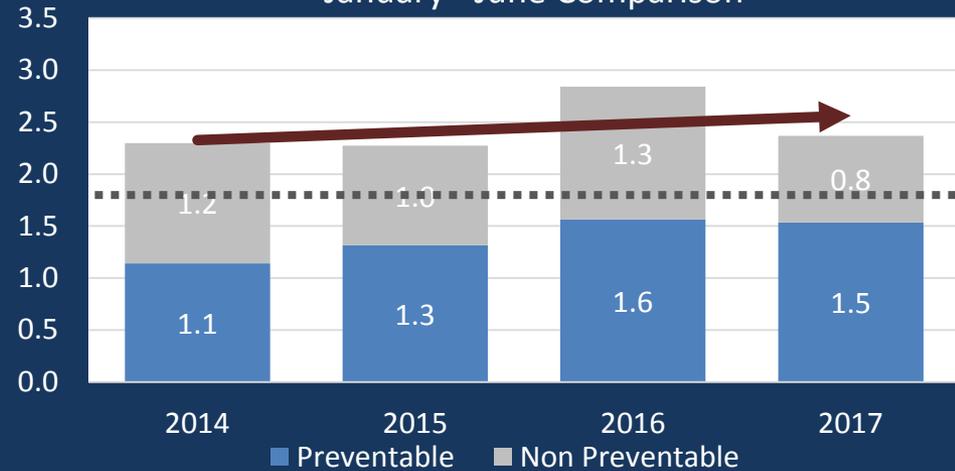
Status

- 20% decrease, compared to 2016
- Primary injury types are Vehicular Collision-related and Slips/Trips/Falls
- Primary causal factors are hard braking events, bus being sideswiped, and falling while bus is in motion
- Top Three Lines: P6 (Anacostia-Eckington), 79 (GA Ave), and 92 (U St – Garfield)

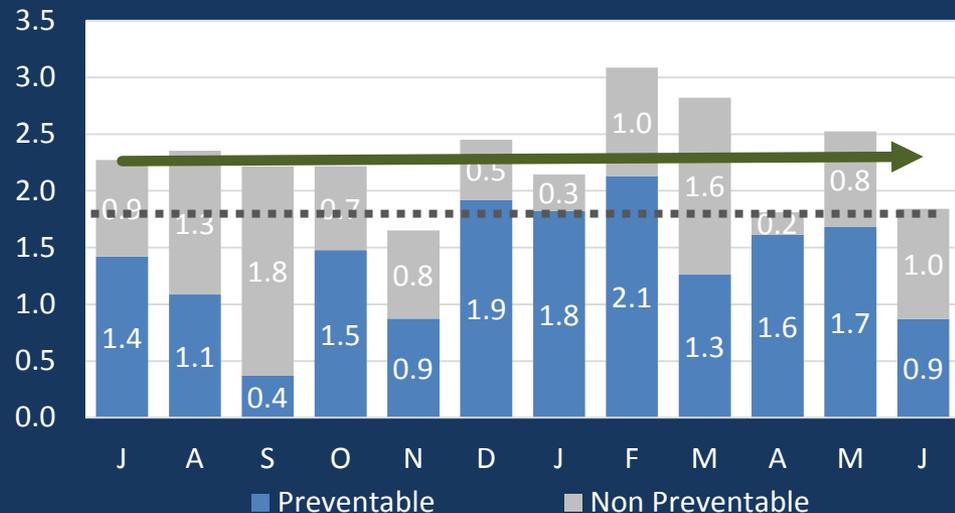
Mitigations include:

- Bus operator coaching
- Bus berthing review
- Customer communication campaign

January - June Comparison



12 Month Trend



Target – 1.75



Customer Injury Rate

MetroAccess, per 100k passenger trips

Benchmark



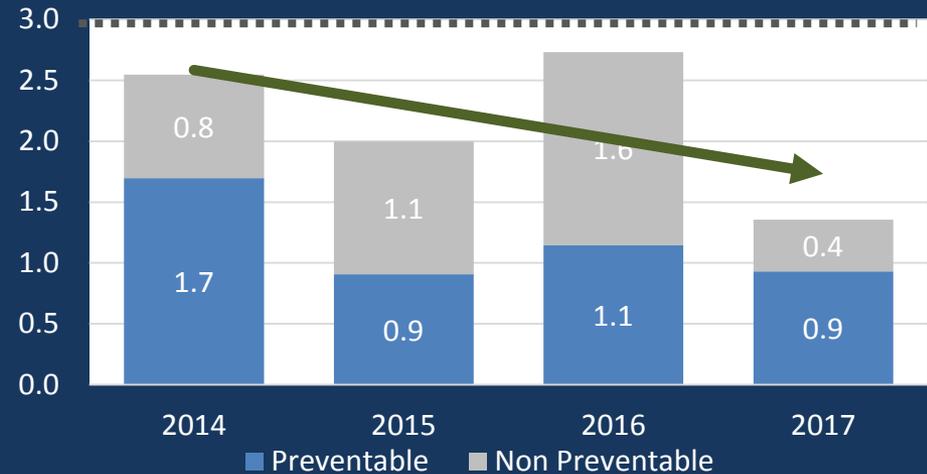
Status

- 52% decrease, compared to 2016
- Primary injury types are Vehicular Collision-related and Slips/Trips/Falls
- Primary causal factors are non preventable rear end collisions and falling while vehicle is in motion

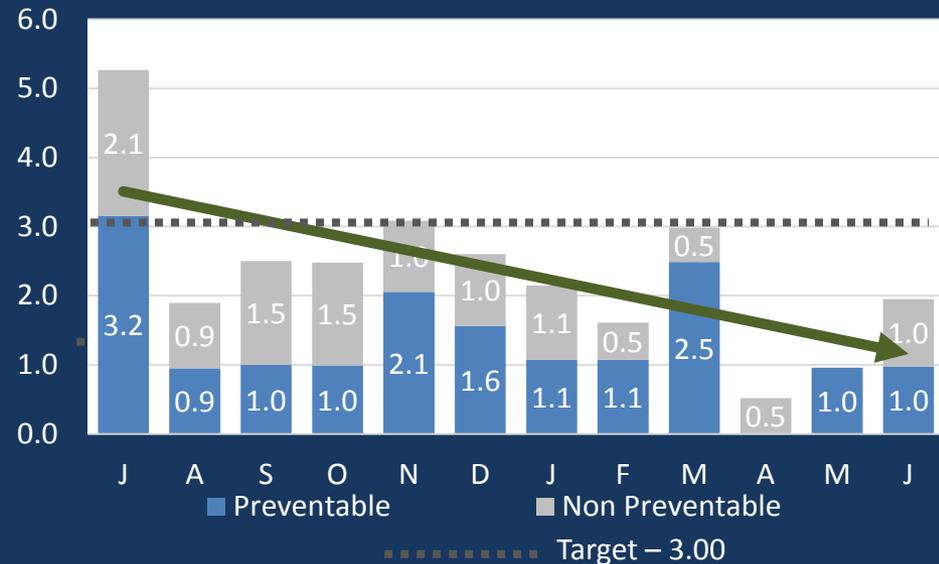
Mitigations include:

- Operator training
- Occupational Therapist

January - June Comparison



12 Month Trend





Employee Injury Rate

Rail, per 100 employees

Benchmark



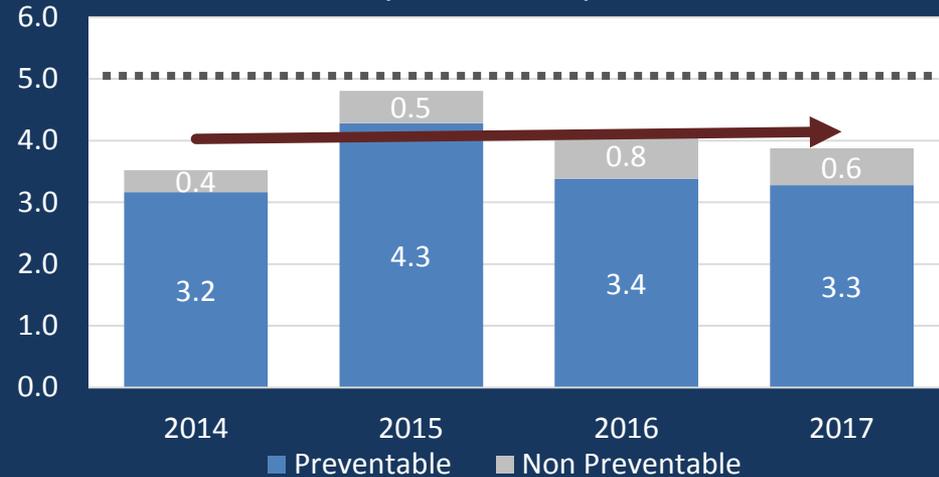
Status

- 15% of injuries were non preventable
- 7% reduction, compared to 2016
- Primary injury types are Slip/Trip/Falls and Lifting/Lowering
- Primary causal factors are employee inattention and body mechanics

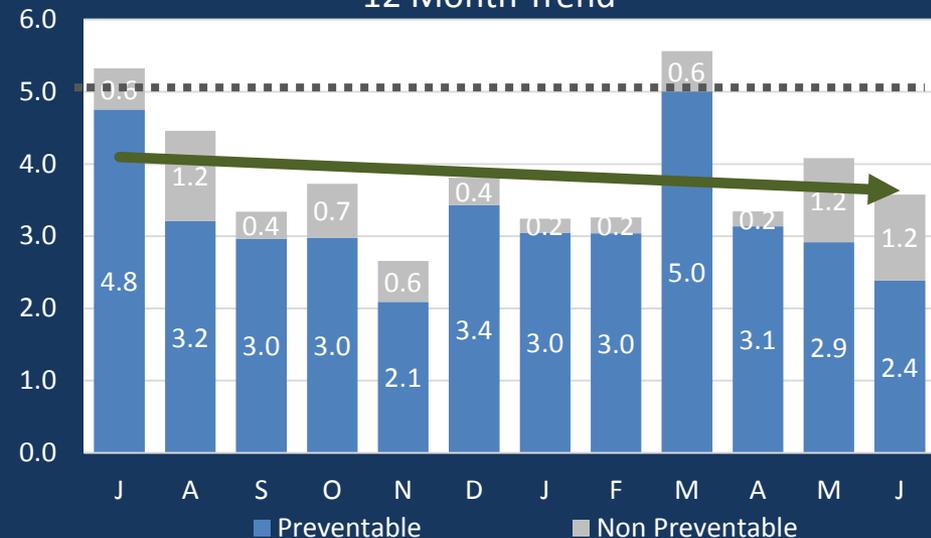
Mitigations include:

- Job Hazard Analyses are being conducted for the rail car and system maintenance groups
- Strong emphasis at monthly departmental statistical review meetings, focusing on injury investigations

January - June Comparison



12 Month Trend



..... Target – 5.1



Employee Injury Rate

Bus, per 100 employees

Benchmark



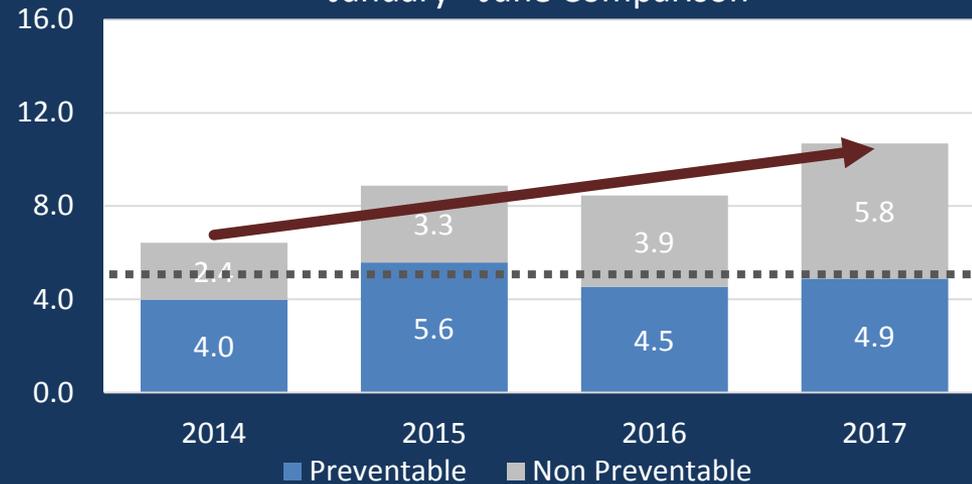
Status

- 54% of injuries were non preventable
- 27% increase, compared to 2016
- Primary injury types are Vehicular Collision-related, Slip/Trip/Falls, and Stress
- Primary causal factors are non preventable collisions and crime-related events (i.e., physical and verbal assaults, witnessing crime)

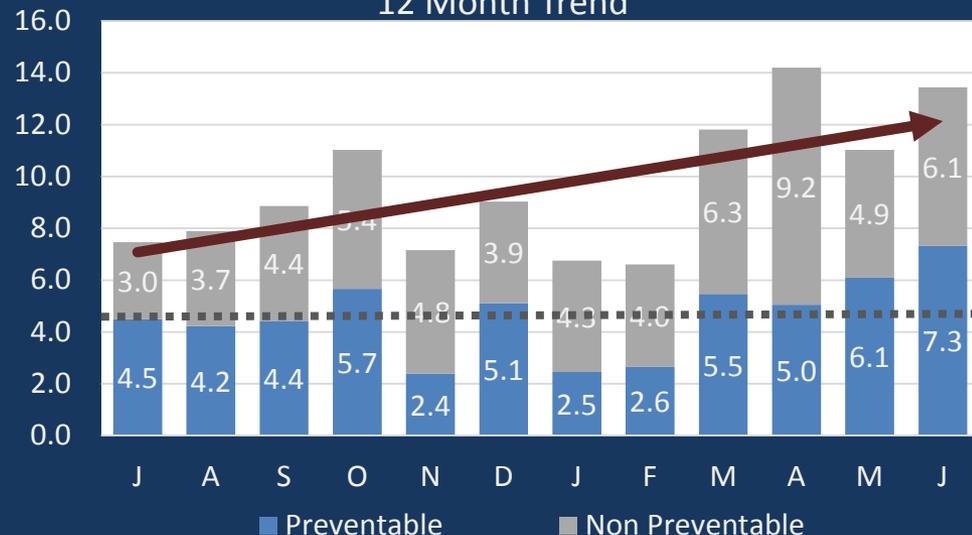
Mitigations include:

- Targeted safety outreach at departments that had injury increases
- Partnering with MTPD during late night service
- Job Hazard Analyses are being conducted for bus mechanics

January - June Comparison



12 Month Trend



..... Target – 5.1

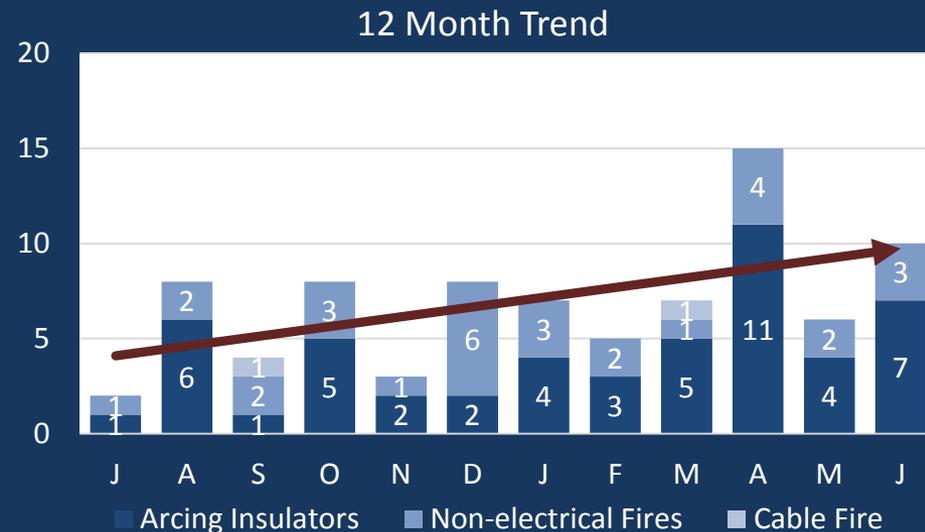
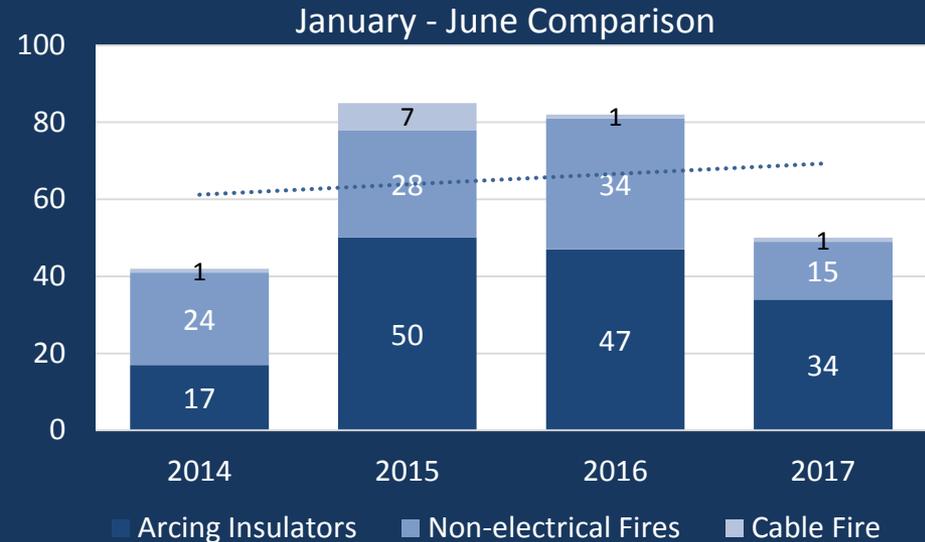


Status

- 39% reduction, compared to 2016
- Correlation between rainfall and arcing insulators
- Spike in April 2017 driven by a clogged drain incident on April 30 that resulted in multiple arcing insulators in the area of Van Ness and Woodley Park
- Zero cable fires in 2Q17

Mitigations include:

- Proactive drain and roadway debris cleaning
- Proactive replacing insulators in poor condition
- New insulator design being reviewed
- New tunnel grouting pilot
- Regular maintenance on power cables





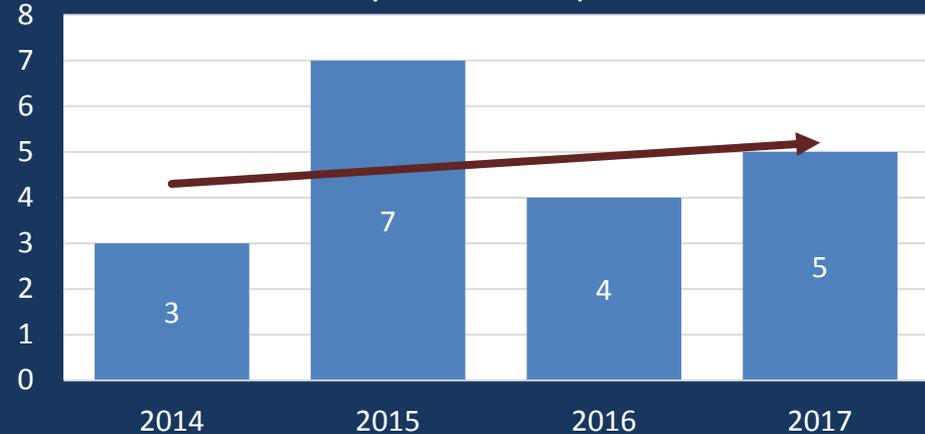
Status

- One additional incident than 2016
- Four of the five derailments involved roadway maintenance machines (RMMs)
- One 3000-series train derailed at Alexandria Yard while exiting the car shop

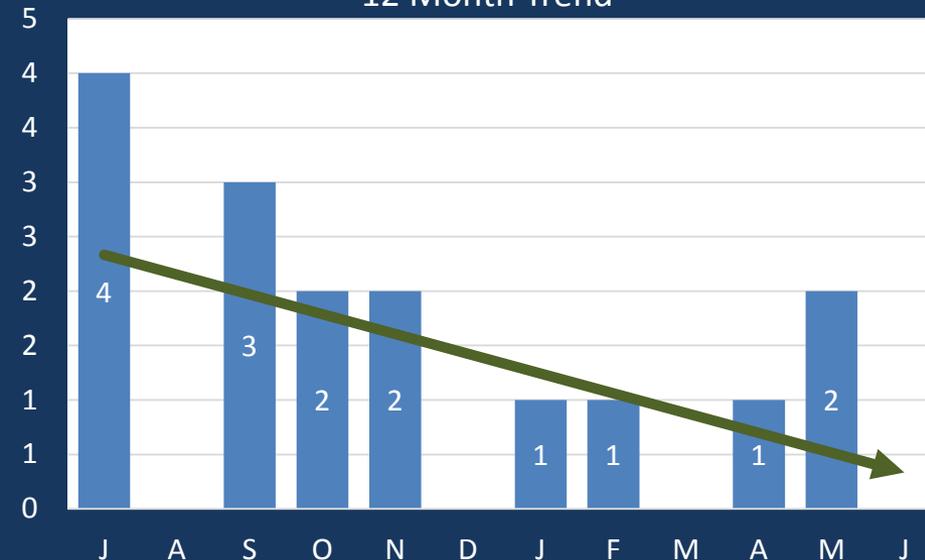
Mitigations include:

- Enhanced efforts related to training and certifying Equipment Operators on multiple pieces of equipment

January – June Comparison

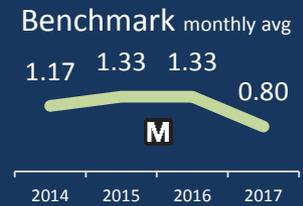


12 Month Trend





Red Signal Overruns



Status

- Lowest monthly average recorded (since 2012) at 0.80 per month
- 16% decrease, compared to 2016
- Three of the five violations occurred in rail yards and two occurred on the mainline
- Last overrun occurred April 1st

Mitigations include:

- Installation of LED bulbs at high frequency stations
- Root cause analysis of overruns
- Updated the MSRPH to include all current Permanent Orders, including restrictions on ATO operation when entering Pocket Tracks
- Developing multi-step “Stop and Proceed Operating Mode” requirements

January – June Comparison



12 Month Trend



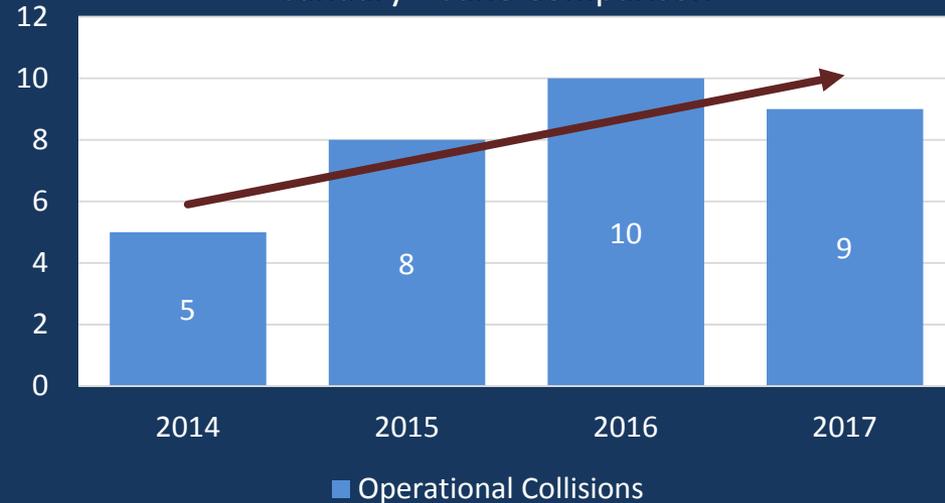
Status

- Six out of nine incidents involved RMMs
- 67% occurred in rail yards (5) or established work zones (1)
- Three collisions occurred while the vehicle was entering or exiting a maintenance shop
- Three mainline incidents occurred when unsecured equipment made contact with the tunnel wall or platform edge
- Operational collisions include minor bump post contact, hard couplings, and unsecured components of RMMs (e.g., arms) striking shop equipment and walls

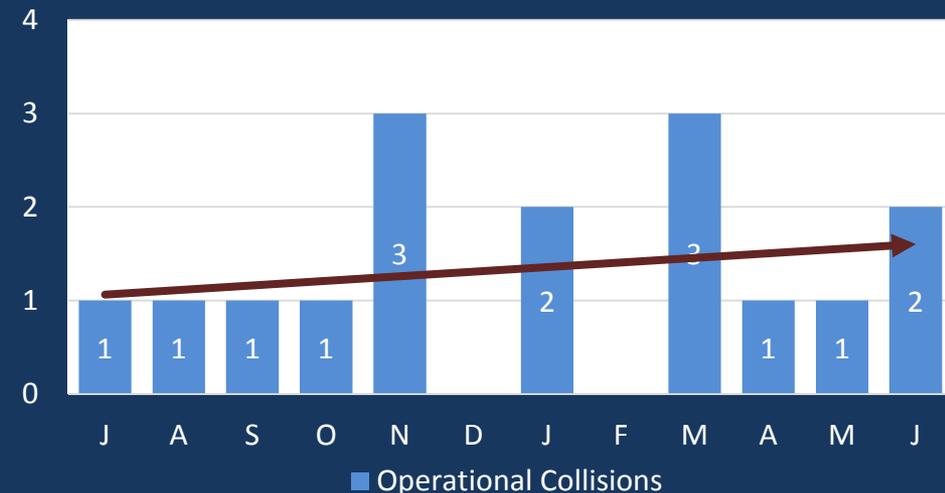
Mitigations include:

- Updating training programs for RMM operators
- Developing improvements to rail vehicle securement process

January – June Comparison



12 Month Trend



Status

- 11% reduction, compared to 2016
- Three were cyclist strikes
- Four pedestrian strike occurred outside a crosswalk
- One pedestrian strike occurred inside a cross walk

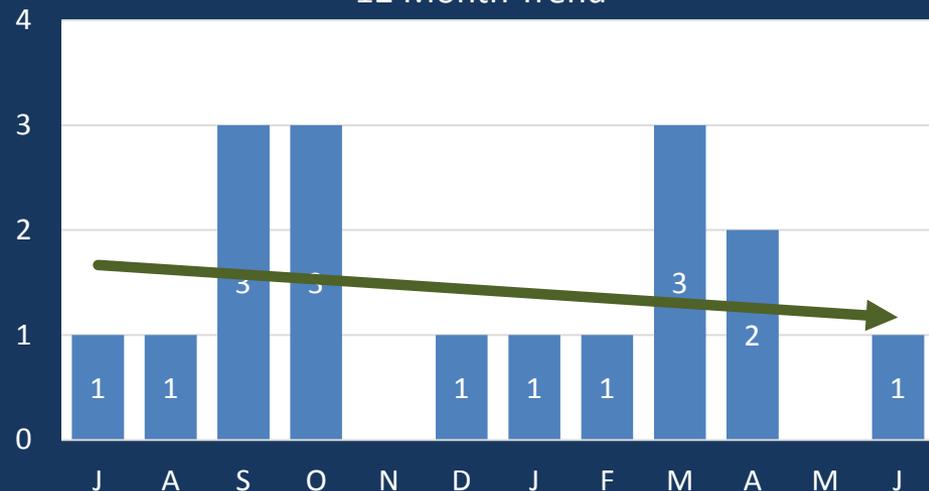
Mitigations include:

- Bus Operator Pedestrian Summit
- Bus management ride-along's
- DriveCam coaching

January – June Comparison



12 Month Trend





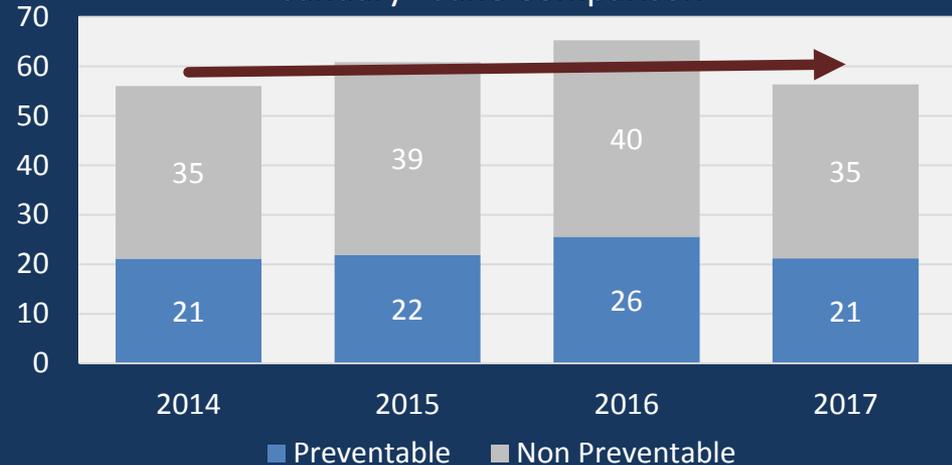
Status

- 63% of collisions were non preventable
- 14% decrease, compared to 2016
- Primary collision types are rear end collision and bus striking a fixed/moving object
- Primary causal factors are operator inattention and bus not in proper position

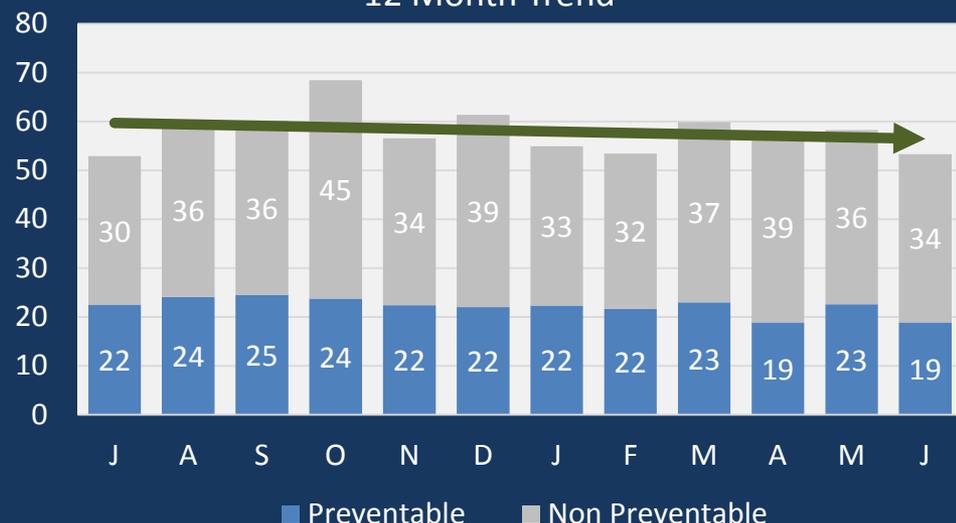
Mitigations include:

- Safety Blitzes / Safety Awareness programs
- Safe driving observations by management
- Expanding divisional mentoring programs

January - June Comparison



12 Month Trend



Questions

