

Washington Metropolitan Area Transit Authority  
**Board Action/Information Summary**

Action  Information

MEAD Number:  
201849

Resolution:  
 Yes  No

**TITLE:**

Annual Safety Report for Calendar Year 2016

**PRESENTATION SUMMARY:**

The Department of Safety & Environmental Management (SAFE) Annual Report (CY2016) publicly communicates safety-related information and statistics.

**PURPOSE:**

The Metro Safety Annual Report informs the Safety and Security 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 Annual Safety Report will summarize and highlight progress in 2016 and other relevant safety actions.

**DESCRIPTION:**

Two key 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 2016 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 4.5 injuries per 200,000 work hours.

**Key Highlights:**

- Employee Injury Rate (EIR) – For CY2016, the EIR is 5.40; this is a 1% increase over last year's rate of 5.30 injuries per 200,000 hours worked (equivalent to 100 employees working for a year) and 20% below the Bureau of Labor Statistics average for transit industries (i.e., 6.7). There were 647 OSHA recordable employee injuries in CY2016, 22 more injuries than CY2015.
- Customer Injury Rate (CIR) – For CY2016, the CIR was 2.06; this is a 1% increase over last year's rate of 2.05. There were 632 National Transit Database (NTD) reportable customer injuries for CY2016 or 48 fewer than CY2015. Even though there were fewer injuries, the rate increased due to lower ridership.

- The National Transportation Safety Board (NTSB) Recommendations are online and may be found at: <https://www.wmata.com/about/leadership/general-manager/upload/NTSB-Detailed-Tracker.pdf>.
- The Federal Transit Administration (FTA) Corrective Action Plan (CAP) Tracking Table is online and may be found at: <https://www.transit.dot.gov/regulations-and-guidance/safety/fta-wmata-corrective-actions>.

### **Background and History:**

The Annual 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 two KPIs, the CIR and EIR, as overall indicators of improvements in the safety culture among 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 EIR measures are based on the OSHA Recordable Injury Criteria and the CIR measures are based on NTD Reporting Criteria.

### **Discussion:**

The EIR and CIR did not meet the established targets. The CY2016 CIR was 2.06, which was above the target of <1.75. The primary driver behind this increase, aside from lower ridership, was an increase in non-preventable collisions for both Bus and MetroAccess, and slip/trip/fall injuries on rail station escalators. The CY2016 EIR was 5.40, which was above the target of <4.5. The primary drivers behind this increase were non-preventable collision related and stress related injuries; however, both rates did have decreases in some injury categories.

#### **MetroBus - CIR**

The CIR for MetroBus was 2.49 per 1,000,000 passenger trips, up 11% from CY2015. There were 311 customer injuries for the year. The primary injury type was non-preventable collision-related, specifically rear end collisions. Hard braking events was another leading factor that contributed to customer falls. There were 18 pedestrian/cyclist strikes, four fewer than CY2015. There was a 61% decrease in boarding/alighting injuries. Potential causal factors for the decrease include operator emphasis on bus berthing techniques, and operator assessments.

MetroBus has several initiatives to reduce customer injuries. Bus Training has bolstered its defensive driving curriculum in an effort to decrease rear end

collisions. This includes using Drive Cam to identify all hard braking events regardless of injury, and coach the impacted operator. Collision hot spots have been identified and management staff are routinely deployed to those areas. Bus berthing practices are being reviewed to determine if bus stop locations are contributing to rear end collisions. Deceleration lights are being installed at the back of the buses as a method to reduce rear end collisions. These lights will alert vehicles behind the bus that it is slowing down and coming to a stop. A pilot of 10 buses was concluded in CY16, and due to a marked decrease in rear end collisions for equipped buses, lights will be installed fleet-wide. The equipment has been identified and is currently moving through the procurement process.

Pedestrian strobe lights are also being installed on buses. This was historically prohibited in Virginia due to vehicular code restrictions. WMATA was able to demonstrate a strong correlation between strobed buses and a decrease in pedestrian strikes in the District. Through this effort, the Virginia legislation allowed strobe lights to be installed in transit vehicles. This allowance will enable all buses to have the strobes regardless of jurisdiction.

#### MetroAccess - CIR

The CIR for MetroAccess (MACS) was 2.75 injuries per 100,000 passenger trips, up 55% from CY2015. There were 64 customer injuries for the year. As with MetroBus, the primary driver was non-preventable collision related injuries. Slip/trip/fall injuries also increased; these injuries occurred while the passenger was being escorted to/from the vehicle. MACS has formed a working group of contractors and MACS staff to work with the Occupational Therapist, and the 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. It is MACS intention to incorporate the best practices generated from this group into a revision of the driver training curriculum for all MACS contractors. This process will be completed within the next few months.

#### MetroRail - CIR

The CIR for MetroRail was 1.43 injuries per 1,000,000 passenger trips, down 18% from CY2015. There were 257 customer injuries for the year. In addition to inattentive slip/trip/fall related injuries being the main injury type, slips/falls on escalators increased 13% from CY2015. These falls primarily occurred when the escalator was being used as a walker (i.e., not operating) and while the passengers were inattentive to their surroundings.

There will be additional station safety inspections in CY2017 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 piloting automated precaution announcements at the escalators that have experienced the most injuries. The announcements will 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.

#### Employee Injuries – EIR

The EIR was 5.40 per 200,000 hours worked, up 1% from CY2015. There were 647 OSHA recordable employee injuries in CY2016, 22 more injuries than CY2015. The main injury types were: collision-related (25%); slip/trip/fall (21%); struck by/against (14%); and stress (12%). The departments that had the most injuries include: Bus Transportation (48%); Rail Transportation (15%); MTPD (8%); and Track/Structures (6%).

Lack of employee situational awareness was the leading contributing factor for employee injuries, increasing 60% over CY2015. WMATA will be strengthening the implementation of job hazard analysis (JHAs) 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.

Non-preventable collisions are also a leading contributing factor of injuries, having a 50% increase over last year. This factor is also the leading cause for customer injuries. WMATA will be encouraging fleet vehicle operators to take a defensive driving class, which has been sanctioned by the National Safety Council. Bus Training has also bolstered its operator training defensive driving curriculum. Finally, non-preventable collision hot spots have been identified; bus and safety management will continue to monitor these areas to determine if other contributing factors are present, and to reinforce safe driving to bus operators. The bus deceleration lights mentioned earlier will also reduce the number of non preventable rear end collisions.

Stress-related incidents continue to impact employee injuries. There was a 39% increase in these injuries from CY2015 and a 245% increase from CY2014. These injuries are the result of an employee being verbally assaulted, witnessing crime on the street, or being involved with a suicide event, with the latter being the historic cause for stress. Bus shields and the involvement of MTPD in late night bus routes have decreased the number of physical assaults on employees, but has not impacted the number of verbal assaults. WMATA is piloting the use of automatic fare announcements on the bus which removes the operator from directly attempting to address fare evasion. This will reduce the number of negative passenger/ operator interactions that have been identified as leading to a verbal assault. Finally, WMATA's Employee Assistance Program will be proactively reaching out to divisions that have the highest number of stress injuries in an effort to support operators.

The accelerated SafeTrack work being conducted has not significantly contributed to employee injuries. There have been only 12 OSHA recordable injuries, five of which were non-preventable off property motor vehicle collisions where the crew was driving to the work site. The injuries that did occur on the roadway were slip/trip/fall and struck by/against. The majority of

these injuries occurred to the Track and Structures (TRST) group, which had an overall increase of 111% (i.e., 21 more injuries experienced). SAFE will be working closely with TRST in conducting thorough injury investigations and ensuring JHAs and job safety briefings are conducted prior to work being performed.

There were several injury types that experienced significant reductions. Caught in/by injuries were reduced by 61%. Causal factors for this are believed to be targeted JHAs in the car/bus maintenance groups; these groups historically had high hand tool-related injuries and intense focus was applied on preventing those injuries in CY16. Pursuit/Arrest related injuries saw a 21% decrease. The main factor behind this was the emphasis of officer defensive tactics. Finally, ice-related slips/trip/falls had a 56% decrease. This decrease can be attributed to employees using ice cleats in known icy areas, training videos that provided the proper technique in accessing a train from the yard in icy conditions, and favorable weather conditions.

In addition, various areas within the organization have been audited by both internal and external entities including the FTA, Office of Inspector General, American Public Transit Association (APTA) and environmental organizations. WMATA welcomes this scrutiny and intends to act upon the findings contained within the audits.

The following provides a summary of the top 2016 key safety initiatives:

- SafeTrack: The accelerated track rehabilitation program, which expanded maintenance windows, introduced extended single tracking and line shut-downs. The program is intended to complete three years' worth of work in one year. The work covers 73 miles of track, ~31% of the system.
- Roadway Worker Protection: A \$1.9M grant was received from the FTA to explore a bi-directional wayside alert system that would notify the train operator of the presence of wayside workers, and the wayside workers of the presence of an oncoming train. Additionally, the entire roadway is being resurveyed for hotspots, i.e. the dangerous areas in the system for employees to work.
- APTA Peer Review: A peer review was conducted that focused on track inspections, Traction Power System, and the Rail Operations Control Center. The reviews included a series of recommendations to improve performance.
- Safety Department Reorganization: SAFE created a dedicated accident investigation function and bolstered resources in F/L/S and Safety Certification areas.
- Red Signal Violation Reductions: An LED signal lighting program was developed for red signal overrun hot spots. Additionally, SAFE in conjunction with Rail Car Engineering are developing a technology solution to prevent train operator from violating red signals due to in attentional blindness.

- Traction Power: Third rail power cables are being elevated off the ground, and all porcelain third rail insulators at all underground stations have been replaced with fiberglass ones. In addition the orange boot program is 99% complete on all mainline tracks.
- Bus Technology: Pedestrian warning strobe lights and deceleration lights are being installed on buses to reduce incidents.
- MetroAccess Occupational Therapist: Training is being provided to MetroAccess operators to ensure at-risk customers are being properly transferred from home to bus.
- SafeWatch: A program was fully implemented that provided MTPD and Bus Operations Control Center support to operators during late night routes, resulting in a decrease of employee injuries.
- Retirement of 1K Series and 4K Series from the WMATA Railcar Fleet: Under the “Back2Good” program, WMATA has committed to having all 1000- and 4000-series cars out of passenger service by the end of this year to drive down vehicle related delays experienced by customers. Railcar mechanical issues accounted for nearly two-thirds of delays in 2016.
- Fatigue Risk Management: WMATA is continuing the development of the first Fatigue Risk Management System Program at a transit agency in the United States.

**FUNDING IMPACT:**

|   |               |
|---|---------------|
| Necessary funding within the approved operating and capital budget. |               |
| Project Manager:  | Patrick Lavin |
| Project Department/Office:  | SAFE          |

**TIMELINE:**

|   |   |
|---|---|
| <b>Previous Actions</b>                       | Continue to implement programs and processes that strengthen the safety culture.                          |
| <b>Anticipated actions after presentation</b> | Continue to build a premiere safety culture and system. Mitigate human factors as potential safety risks. |

**RECOMMENDATION:**

To inform the Board’s Safety and Security Committee of the positive and proactive safety foundation status being implemented and accomplishments for the calendar year 2016.



Washington Metropolitan Area Transit Authority

# Annual 2016 Safety Report

Safety Committee  
February 23, 2017



# How is SAFETY measured

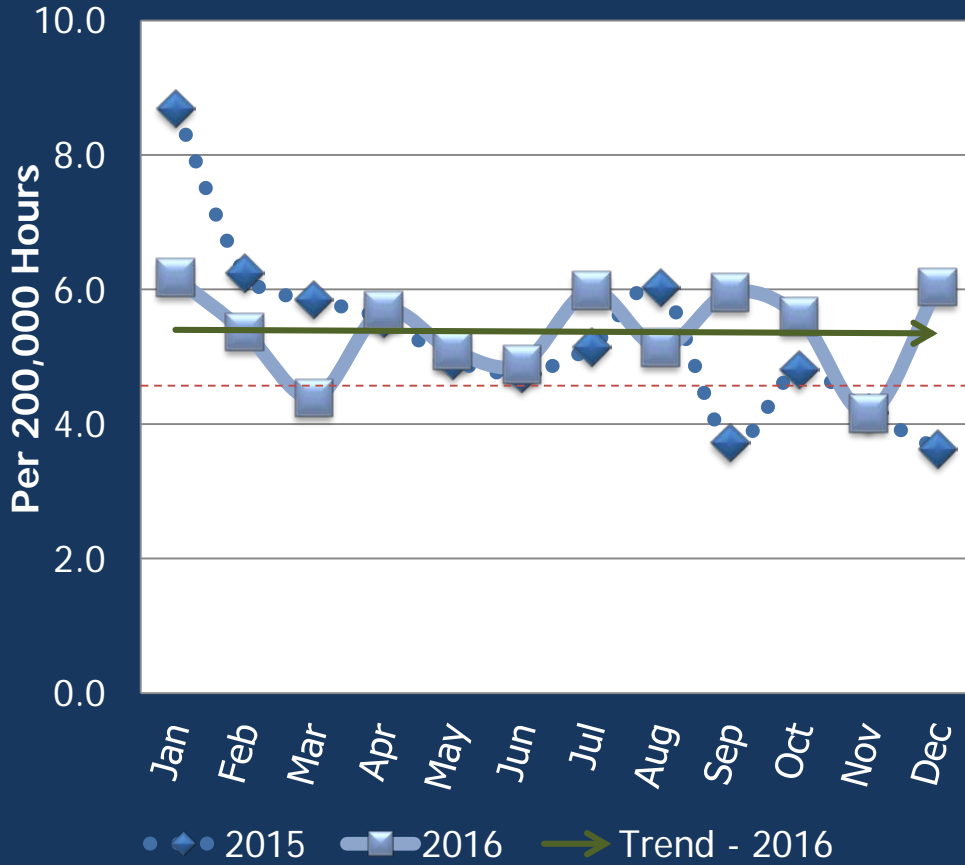
- Two Key Performance Indicators
  - Employee Injury Rate (EIR) per 200,000 Hours Worked
  - Customer Injury Rate (CIR) per 1,000,000 Passenger Trips
- FTA/NTSB Corrective Action Plans
- External / Internal Safety Audits
- Key Safety Initiatives





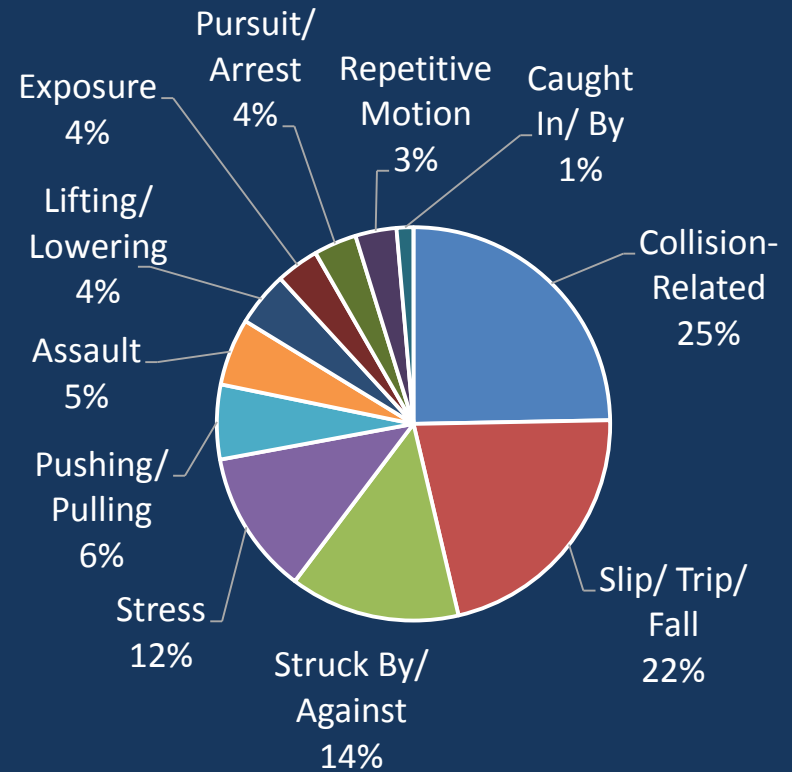
# Statistical Review

## Employee Injury Rate – *per 100 Employees*



| CYTD15 | CYTD16 | TARGET | BLS Avg |
|--------|--------|--------|---------|
| 5.3    | 5.4    | <4.5   | 6.7     |

### Injury Types



# Employee Injuries



- **Lack of Situational Awareness**

- Result: 60% increase (from 59 to 91)
- Actions: Job Hazard Analysis (JHA) & Safety Briefings, Outreach



- **Non Preventable Collisions**

- Result: 50% increase, (from 77 to 115)
- Actions: Defensive driving tactics, bus deceleration lights



- **Stress-related Incidents**

- Result: 39% increase (from 54 to 75)
- Actions: Bus shields, Bus/MTPD partnership, Fare announcements

# Employee Injuries



- **Caught In / By**

- Result: 61% decrease (from 18 to 7)
- Actions: Targeted JHAs, Hand tool use safety briefings



- **Pursuit/Arrest-related Injuries**

- Result: 21% decrease (from 29 to 23)
- Actions: Defensive tactics



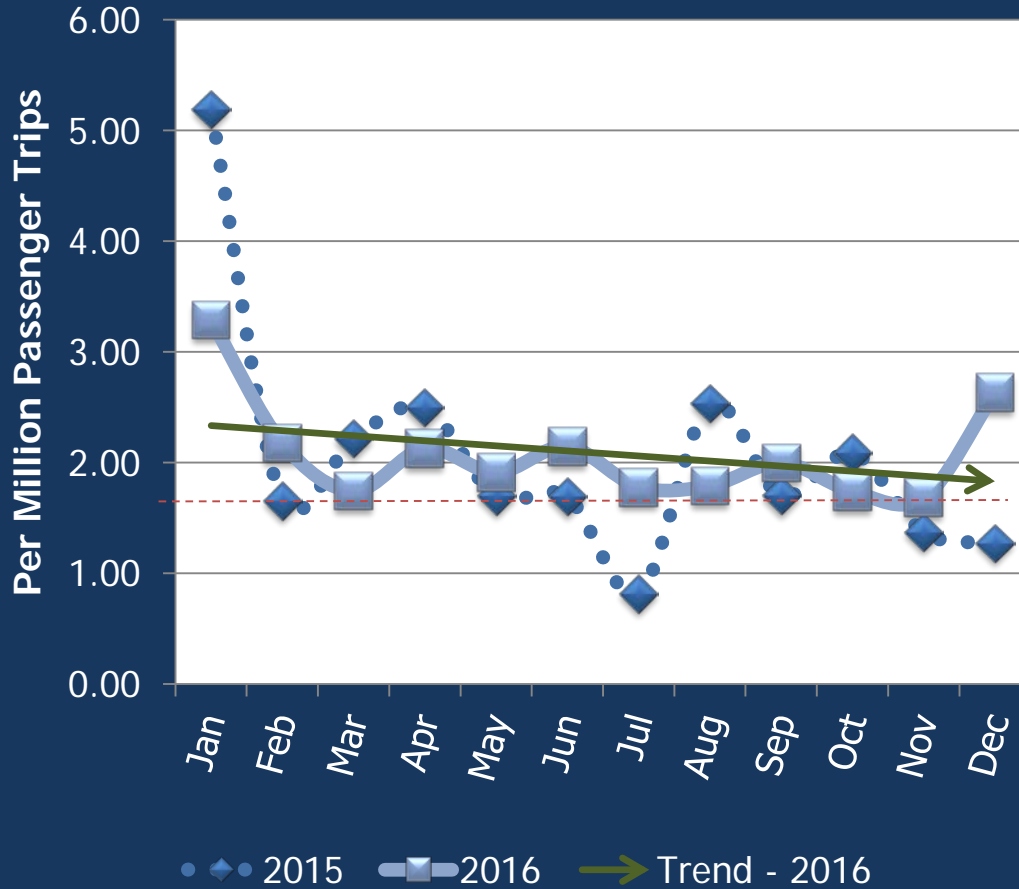
- **Ice-related Slip/Trip/Falls**

- Result: 56% decrease (from 39 to 17)
- Actions: Cleats, Training videos, favorable weather



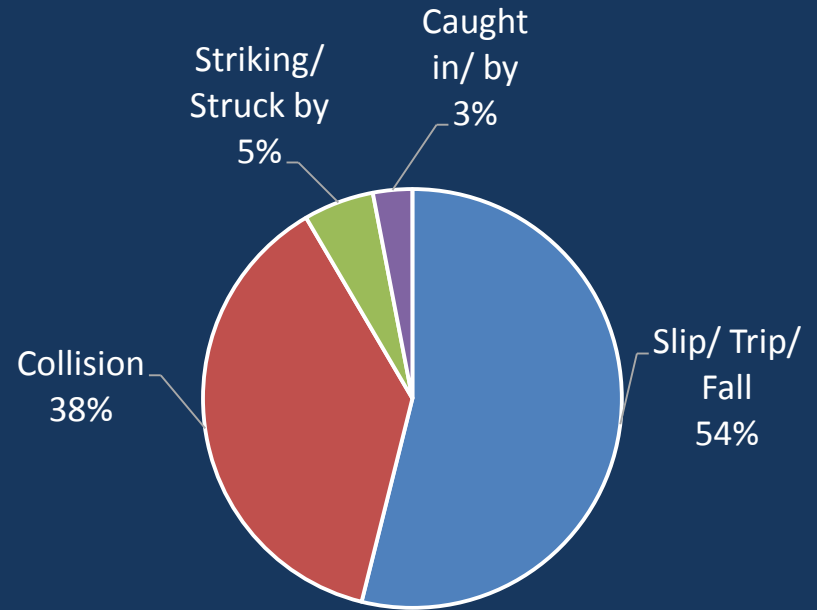
# Statistical Review

## Customer Injury Rate - *per million trips*



| CYTD15 | CYTD16 | TARGET |
|--------|--------|--------|
| 2.05   | 2.06   | <1.75  |

### Injury Types





# Customer Injuries

## Bus

- Non preventable Collisions: 30% increase (from 85 to 110)
  - Action: Deceleration lights; defensive driving
- Hard Braking Falls: 48% increase (from 23 to 34)
  - Action: Drive Cam operator coaching

## Rail

- Escalator Slips/Trips/Falls: 13% increase (111 to 113)
  - Action: Automated safety announcements



# Customer Injuries - MetroAccess

- Improvements
  - CY16 Rate: 2.75 (below contractual target of 3.0)
  - January 2017 Rate: 2.15
  - SMS integration resulted in improved data capture
- Non preventable Collisions: 79% increase (from 19 to 34)
  - Action: Defensive driver training; evaluating deceleration lights
- Slips/Trips/Falls: 200% increase (from 7 to 21)
  - Action: Occupational therapist; operator training



# Customer Injuries

## **Bus - Boarding/Alighting:**

Result: 61% decrease (from 18 to 7)

Actions: Operator emphasis on bus berthing techniques, operator assessments

## **Rail - Caught In/By Train Door:**

Result: 62% decrease (from 27 to 10)

Action: Increase focus on platform observations



# 2016 NTSB / FTA CAPs



## Open NTSB CAPs

| Hazard Risk Category |                          | Count |
|----------------------|--------------------------|-------|
| I                    | Unacceptable             | 1     |
| II                   | Undesirable              | 17    |
| III                  | Acceptable w/<br>Review  | 8     |
| IV                   | Acceptable w/o<br>Review | 5     |

## FTA CAPs Status

| Corrective Action Plans | Count |
|-------------------------|-------|
| Closed                  | 26    |
| Under FTA Review        | 57    |
| Under WMATA Development | 135   |
| Past Due                | 80*   |

A CAP may be past due because WMATA did not submit a closure request by the agreed-upon date, WMATA made a late submittal of the closure request after the agreed-upon date, or FTA rejected the closure request as insufficient and requires WMATA to take additional action.





# External / Internal Safety Audits

- Environmental Inspections (no NOVs cited)
  - 10 wastewater permit compliance inspections
  - 9 stormwater permit compliance inspections
  - 8 underground storage tank compliance inspections
  - 3 hazardous waste compliance inspections
  - 1 air emission permit compliance inspections
- OIG SMS Evaluation
- ISSR Internal Audits
  - 18 internal audits
  - 16 FTA/SMI audits



# External / Internal Safety Audits

*(continued)*

- FTA in-depth Reports
  - Traction Power Electrification System
  - Vehicle Securement Investigation
  - Stop Signal Overrun
  - Track Integrity
- APTA Peer Review
  - Track Inspections
  - Third Rail Power Infrastructure
  - Rail Operations Control Center



# 2016 Key Safety Initiatives

- SafeTrack
- Roadway Worker Protection
  - FTA Grant – \$1.9 million
  - Resurvey of hot spots
- Safety Department Reorganization
- MetroAccess Occupational Therapist
- MTPD/Bus Transportation Operator SafeWatch



# 2016 Key Safety Initiatives

*(continued)*

- Red Signal Violation Reductions
  - LED signal relamping
  - Carborne solutions
- Bus Safety Technology
  - Pedestrian Strobes
  - Deceleration Lights
- Approval of 4k railcar retirement