Safety and Operations Committee

Board Information Item IV-A

March 12, 2020

Bus and MetroAccess Safety Initiatives

Washington Metropolitan Area Transit Authority

Board Action/Information Summary

○ Action ◉ Information	MEAD Number: 202157	Resolution: ○ Yes ◉ No

TITLE:

Bus & MetroAccess 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 specific focus on Bus Services and MetroAccess.

PURPOSE:

Staff will inform the Board of recent initiatives designed to improve safety utilizing a holistic hazard management approach. Initiatives are focused on bus hazard management technology improvements and strategies that focus on bus operator assault reduction. Staff will also provide a briefing on technology-based collision avoidance systems and floating bus stops. Additionally, MetroAccess initiatives to improve operator behavior will be discussed.

DESCRIPTION:

SAFE and COO often collaborate to improve bus services by using data, promoting accountability and problem solving that reduce customer and employee injuries.

Key Highlights:

- Initiatives to reduce bus operator assaults have resulted in the number of reported operator assaults and related injuries.
- Floating bus stops will be placed in incident hot spots, in collaboration with the DC Department of Transportation (DDOT), to reduce pedestrian strikes and rear end collisions.
- Collision avoidance technology typically used in passenger vehicle is being piloted for revenue fleet usage.

Background and History:

The four main metrics used to gauge bus safety performance are National Transit Database (NTD) pedestrian strikes, NTD collision rate, employee injury rate, and NTD customer injury rate.

The NTD pedestrian strike metric (i.e., pedestrians transported from the scene for medical care) has increased calendar year over year. There were 21 strikes in CY18 compared to 23 in CY19. Pedestrian strikes within crosswalks decreased year over year, meaning the majority of strikes occurred outside of traffic control devices. When compared to our peers (Chicago Transit Authority, Southeastern Pennsylvania Transportation Authority, Metropolitan Atlanta Rapid Transit Authority, and Massachusetts Bay Transportation Authority), Metro has the second highest pedestrian strike rate of 0.5 strikes per million revenue miles.

The NTD bus collision rate had a 5% year over year decrease, with a rate of 4.1 NTD collisions per million miles (i.e., revenue and nonrevenue), resulting in 16 fewer collisions. Collisions that occur while the bus is stopped and in intersections are the most frequent types. When compared to our peers, Metro is in the middle with 5.2 collisions per revenue miles (note: internal metrics use all miles; NTD uses revenue miles).

The employee injury rate decreased 10% year over year, with a rate of 10.8 employee injuries per 200,000 hours worked, resulting in 46 fewer injuries. Injury categories that decreased included stress/assaults, caught in/by, collision-related, and struck by/against. When compared to the most recent Bureau of Labor Statistics (BLS) industry benchmark, Metro is 40% percent higher than those agencies reporting to the BLS.

The NTD customer injury rate decreased 7% year over year, with a rate of 2.7 customer injuries per million linked trips, resulting in 26 fewer injuries. Collision-related and boarding/alighting injuries significantly decreased. When compared to our peers, Metro is in the middle with 2.9 customer injuries per million unlinked trips (note: internal metrics use linked trips).

The two metrics used to gauge MetroAcess safety performance are the collision rate and NTD customer injury rate.

The MetroAccess collision rate had a 12% year over year decrease, with a rate of 2.41 collisions per million miles (i.e., revenue and nonrevenue), resulting in 98 fewer collisions. The majority of collisions

were the result of a non-preventable collision, such as when the MetroAccess vehicle was rear-ended while stopped. When compared to our peers, Metro is in the lowest agency with 1.0 collisions per revenue miles (note: internal metrics use all miles; NTD uses revenue miles).

The NTD customer injury rate increased 11% year over year, with a rate of 2.3 customer injuries per one hundred thousand linked trips, resulting in five additional injuries. Injuries were primarily related to slip/trip/falls during door-to-door service and navigating the lift. When compared to our peers, Metro is in the middle with 2.3 customer injuries per one hundred thousand linked trips.

Discussion:

Past Initiatives

Many of the piloted safety initiatives from the last Board Bus Safety Initiatives brief have been fully implemented. All initiatives resulted in rate decreases during the pilot phase. By using this data driven approach, fleet-wide implementation was justified.

Since full implementation of the pedestrian strobe light initiative, there has been a 22% reduction in pedestrian crosswalk strikes. Although this decrease is at odds with the overall pedestrian strike increase, it can be attributed to attentive pedestrians that would use a crosswalk.

The deceleration lights installed on the fleet flash when the bus is decelerating while coming to a stop. The incident rate for ‘hit in rear’ has decreased 10% since full implementation.

The mirror retrofit, which moved high-mounted mirrors to a lower position, was also successful. This move was not only beneficial for a potential decrease in mirror strikes, but also improved the operator’s ability to adjust the mirror and potentially removed operator blind spots. Since full implementation, there has been a 13% decrease in mirror strike incidents.

MetroAccess incorporated an Occupational Therapist (**Willis Towers Watson**) and an operator training update as a reasult of a spike in assistance-related injuries in FY16. A work group was established and reviewed boarding and alighting, door-to-door, and securement operations. The work group identified ways to help prevent assistance-related injuries, including:

- Providing ongoing commentary during door-to-door assistance for customers;
- Offering an arm for ambulatory customers;
- Assisting customers from their weak side; and
- Having operators focus on the functional limitation of the customer rather than the disability.

Current Initiatives – Bus Operator Assaults

Bus operator reported assaults decreased 9% (from 92 to 84) and assault-related injuries decreased 21% (from 107 to 85), from CY18 to CY19. Efforts to protect employees will continue, including Metrobus Enforcement Division targeted deployments, a continuation of “Respect Your Ride” youth campaign, bus operator de-escalation and conflict resolution training, and continued use of the bus silent alarm and protective shields. Shields have been installed in all but 65 buses, which will be completed by June 2020.

Current Initiatives – Floating Bus Stops

Floating bus stops are being explored in collaboration with DDOT. Data demonstrates that service stop accidents contributed to the 16% increase in preventable accidents. Floating bus stops would help prevent blockage of the bus zones which creates hazards for bus operators in the approach to service stops, including pulling in and away from service stops.

Metro has partnered with DDOT in installing permanent floating bus stops near 14th and N Streets. Some issues related to wheelchair use are currently being resolved. Once the modifications are complete, the bus stops will be in use.

Additional temporary floating bus stops will be piloted in several identified hotspots throughout DC to reduce pedestrian strikes and collisions. These temporary stops have been used in New York, Baltimore, Pittsburg, and Oakland. All cities have reported an increase in on time performance, dwell time, traffic flow, and a reduction in pedestrian and rear end collisions.

The 12 month pilot will begin in FY21. Identified locations include: Bladensburg Road; Georgia Ave; Wisconsin Ave; H Street & 7 Street NW; and Pennsylvania Ave & 8th Street SE.

Current Initiatives – Bus Collision Avoidance System

Metro was awarded a Virginia Department of Transportation grant to test the effectiveness of the Mobile Eye Shield+ Collision Avoidance system on transit buses. In October 2019, the system was installed in five buses operating out of the Four Mile Run bus garage. The buses operated for five weeks in 'stealth mode' where only traffic data was collected by the systems. The system became fully active on November 24, 2019 providing notifications to bus operators when the system detects the possibility of a collision.

Operators using these buses have been trained on the variety of warnings the system will alert them to and what actions they can take to avoid an impending collision.

There are two main categories the collision warnings fall into:

1. Headway / forward collision warning – This alerts the operator to following distance between the bus and the vehicle immediately ahead is too close. Alerts change as the system detects an imminent collision with a vehicle.

2. Pedestrian collision warning / danger zone – This alerts the operator of pedestrians in the travel path of the bus. The alerts are specific to where the pedestrian is in relation to the bus (left front, left rear and right rear). Alerts are different from the vehicle collision warning and escalate based on the imminent danger of collision.

Initial data shows a decrease in the occurrences of near misses with pedestrians and an increase in the following distances. The overall improvement in operator behavior is reported as a 25% reduction in vehicular and pedestrian alerts.

The pilot is scheduled to run for six months. Once the pilot is complete, a full evaluation of all data will occur to determine the effectiveness of the system and determine next steps.

Mobile Eye (collision avoidance) and **ZICLA** (pending, for floating bus stops) and **Lytx/DriveCam** are three private companies that Metro is partnering with for these pilots.

Current Initiatives - MetroAccess DriveCam Expansion

MetroAccess will be expanding its use of the DriveCam system. The current system is only triggered by g-force events (e.g., hard breaking, collision). The new MetroAccess units will provide for 24-hour recording

and has a search and save capability. This will aid in identifying incident root causes and enhance claim investigation capabilities.

FUNDING IMPACT:

There is no impact on funding for presenting this information. Initiatives discussed are included in the operating budget.	
Project Manager:	Theresa Impastato
Project Department/Office:	Safety and Environmental Management (SAFE)

TIMELINE:

Previous Actions	January 2018 – Safety and Service Delivery Committee meeting discussion

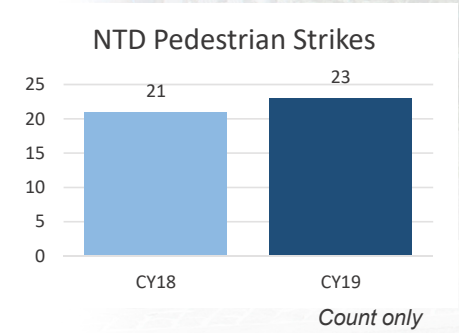
Bus & MetroAccess Safety Initiatives

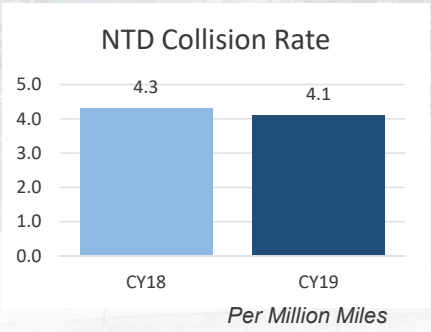
Safety and Operations Committee
March 12, 2020

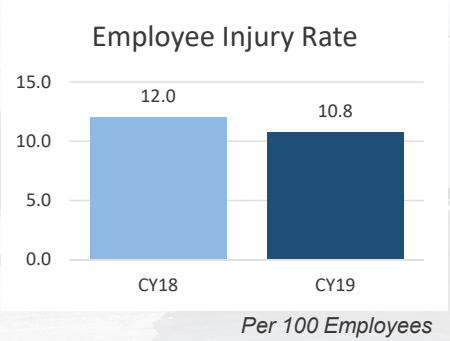
Purpose

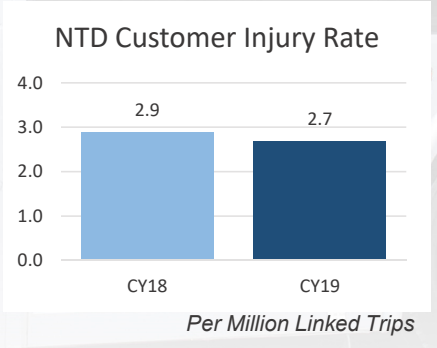
- Provide an update on recent hazard mitigation strategies that improve customer and employee safety

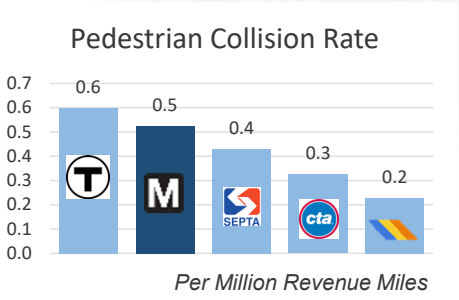
Bus Performance & Benchmarking

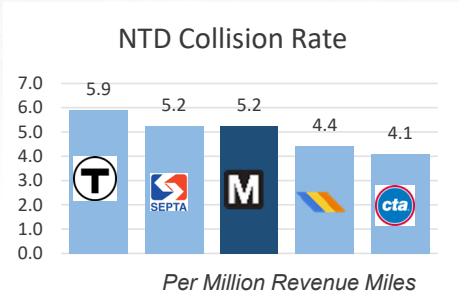


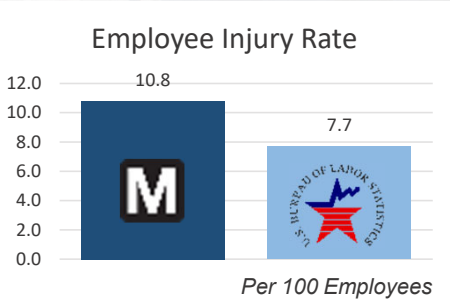


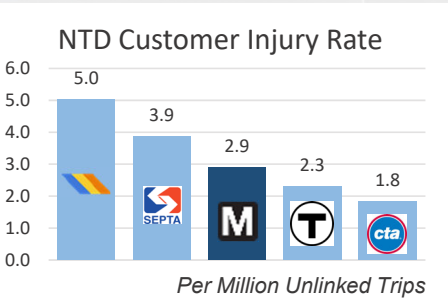










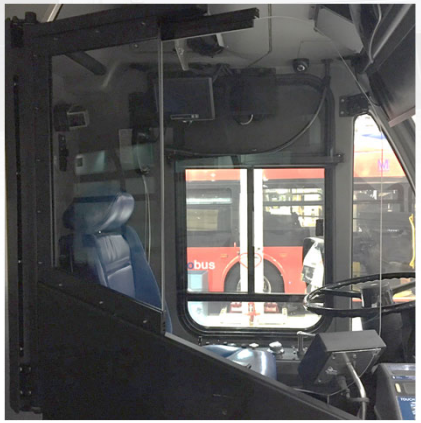


Past Initiatives - Bus

- Pedestrian strobe lights
  - Continuous flashing on top of bus
  - 22% reduction in crosswalk strikes
- Deceleration/servicing lights
  - Flashing lights while decelerating
  - 10% reduction in hit in rear incidents
- Mirror adjustment
  - Retrofit from high mounted mirrors
  - 13% reduction in preventable mirror strikes

Bus Operator Assaults

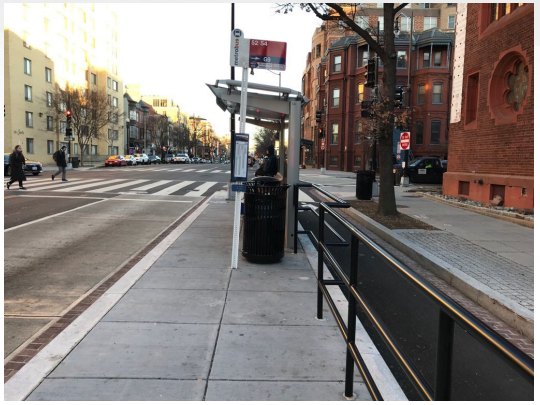
- Strategies to improve bus safety and security
  - Metrobus Enforcement Division targeted deployments
  - Continuation of “Respect Your Ride” youth campaign
  - Bus operator de-escalation & conflict resolution training
  - Bus silent alarm & protective shields



- Reduction in numbers
  - Reported assaults down 9%
  - 21% reduction in assault-related injuries

Pilot – Floating Bus Stops

- Original pilot near 14th and N Streets
- Permanent installation
- Currently not used due to ADA modifications
- Working with DDOT on modification schedule



Pilot – Floating Bus Stops

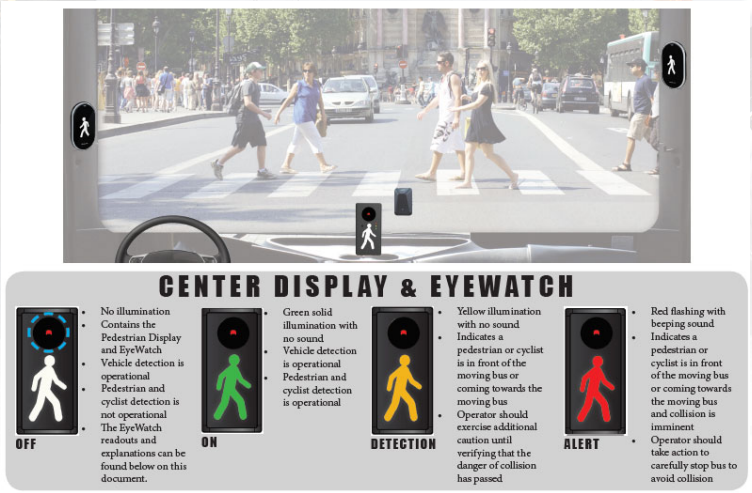
- Temporary dedicated boarding areas between curb and bus travel lanes
- Currently used in NYC, Baltimore, Pittsburgh, and Oakland
- Benefits:
  - Better on time performance
  - Reduced dwell time
  - Smoother traffic flow
  - Fewer pedestrian/cyclist accidents
  - Reduced rear end collisions

Pilot – Floating Bus Stops

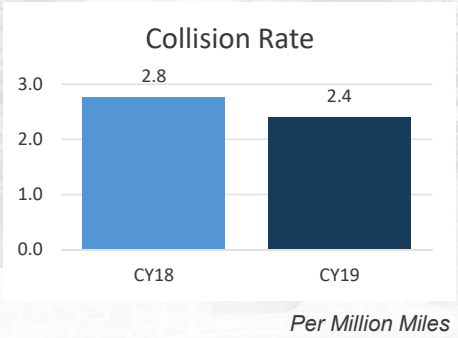
- Working with DDOT
  - Financial, permitting, design criteria
- Twelve month pilot
- Possible locations
  - Bladensburg Road
  - Georgia Ave
  - Wisconsin Ave
  - H Street & 7th Street NW
  - Pennsylvania Ave & 8th Street SE

Pilot – Collision Avoidance System

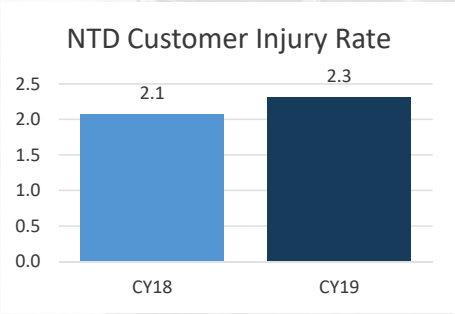
- Partially funded with Virginia Department of Transportation (DOT) grant
  - Mobile Eye Shield+ Collision Avoidance System
- Provides warnings to bus operators
  - Headway / forward collision warning
  - Pedestrian collision warning / danger zone
- Six month pilot
- Initial data - 25% warning reduction



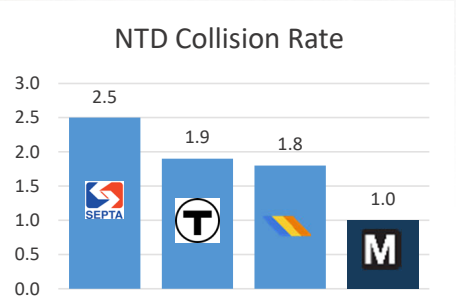
MetroAccess Performance & Benchmarking



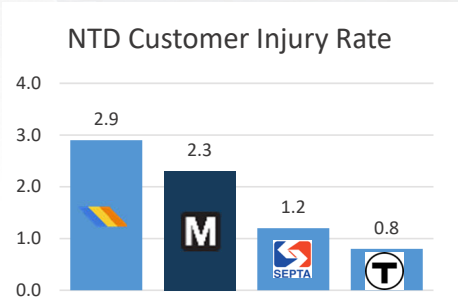
Per Million Miles



Per 100,000 Trips



Per Million Revenue Miles



Per 100,000 Trips

Past Initiatives – MetroAccess

- Occupational Therapist
  - Passenger safety during door-to-door service
  - 43% reduction in passenger-assistance related injuries

- Safety Campaign: Prevent the Unpreventable
  - Operator safety messages on adverse driver behavior
  - 21% reduction in preventable customer injury rate
  - 24% reduction in collision-related injury rate

Pilot – DriveCam & Safety Messaging

- Installing new units
  - Older units record “triggered” events only
  - 24-hour video recording with search & save capability
  - Expanded root cause analysis and claim investigation capability

- Distracted Driving Messaging
  - Enhancing current communication techniques
  - Message focused on driving habits

Summary

- Safety Management System provides a systematic way to control risk and assurance that controls are effective
- Safety Risk Management controls through hazard identification
- Initiatives are examples of data driven risk management strategies that support the Safety Risk Management