



Metropolitan Transportation Authority

Safety Committee Meeting July 2016

Safety Committee Meeting

**2 Broadway, 20th Floor Board Room
New York, NY 10004**

Wednesday, 7/27/2016

8:30 - 9:30 AM ET

1. Public Comments

2. Approval of Minutes - April 20, 2016

Safety Committee Minutes - Page 3

3. 2016 Safety Committee Work Plan

Safety Committee Work Plan - Page 6

4. Report of Fire Safety Inspections

MTA Fire Safety Inspections Presentations - Page 9

5. Safety Promotion: Bus Safety Symposium

MTA Bus Safety Symposium Presentation - Page 14

MTA Bus Safety Symposium White Paper - 2016 - Page 29

6. Safety Metrics

B & T Safety Metrics - Page 37

NYCT Safety Metrics - Page 38

MNR Safety Metrics - Page 39

LIRR Safety Metrics - Page 40

MTACC Metrics - Page 41

7. Safety Assurance: Customer and Employee Safety

Customer and Employee Safety Presentation - Page 42

Date of next meeting: September 28, 2016

**Metropolitan Transportation Authority
Minutes of
Safety Committee Meeting
2 Broadway, 20th Floor
New York, NY 10004**

**Wednesday, April 20, 2016
8:30 AM**

The following members were present:

**Hon. Thomas Prendergast, Chair
Hon. Fernando Ferrer, Vice Chairman
Hon. Mitchell Pally
Hon. John Molloy
Hon. Ira Greenberg
Hon. Susan Metzger
Hon. Norman Brown
Hon. Vincent Tessitore
Hon. James Sedore, Jr.
Hon. Andrew Albert
Hon. Robert Bickford
Hon. Neal Zuckerman
Hon. Jon Ballan**

The following safety officers were present:

David Mayer - MTAHQ
Cheryl Kennedy - NYCT
Loretta Ebbighausen - LIRR
Pashko Camaj – B&T
Peter Kohner – MTA CC
Justin Vonashek – MNR
Anne Kirsch - MTAHQ

Ronnie Hakim, President, New York City Transit (“NYCT”), Joseph J. Giuliatti, President, Metro-North Railroad (“MNR”), Patrick Nowakowski, President, Long Island Rail Road (“LIRR”), Donald Spero, President, Triborough Bridge and Tunnel Authority (“TBTA”), and Anthony D’Amico, Executive Vice President, MTA Capital Construction (“MTA-CC”), Darryl Irick, President, MTA Bus also attended the meeting.

Chairman Prendergast called the meeting to order.

PUBLIC SPEAKERS

There were no public speakers.

APPROVAL OF MINUTES – FEBRUARY 24, 2016

Upon motion duly made and seconded, the minutes of the February 2016 Safety Committee were approved.

2016 COMMITTEE WORK PLAN

Chairman Prendergast asked Mr. Mayer if there were any changes to the work plan. Mr. Mayer stated there were no changes.

REMARKS OF THE CHIEF SAFETY OFFICER

Mr. Mayer made the Board aware of the MTA and NYCT plan to hold a Bus Safety Symposium on May 10th with experts to discuss improving bus operations with respect to pedestrian safety.

Mr. Mayer then updated the Board on the MTA's intention to expand Sleep Apnea Screening.

He also made the Board aware of MTA's intent to implement an All Agency Safety Hotline to give employees across the agencies the opportunity to report safety concerns.

SAFETY METRICS

Mr. Mayer stated that the Metrics included in the Safety Committee book were the same metrics reported in the Agency Committee books. Mr. Mayer reminded the Board that a more in depth presentation on Metrics would be presented at the July Safety Committee.

OVERVIEW OF RAILROAD CONFIDENTIAL CLOSE CALL REPORTING SYSTEMS (C3RS)

Mr. Mayer then introduced Rob Castiglione of the Federal Railroad Administration and Linda Connell of NASA to report on Railroad Confidential Close Call Reporting Systems. Please refer to the video recording of the meeting produced by the MTA and maintained in MTA records for the content of the speaker's remarks.

Mr. Zuckerman asked what is expected of the Board with the data gathered from C3RS. Ms. Connell responded that with the information gathered from the Close Call Reporting System trends can be determined therefore gaps in training can be filled.

Mr. Albert asked why a rail agency might not join C3RS. Mr. Castiglione answered that the program is still very new but it is hopeful other rail agencies will join after they discover the benefit of the precursory information gathered.

Mr. Albert then asked about operational reporting. Ms. Connell explained that C3RS is meant to allow employees to report incidents without consequence and subsequently builds trust after they've seen corrective measures taken within their organization.

Mr. Tessitore asked if at a later date the Safety Chiefs can give the Board examples of operational changes made as a result of C3RS.

Mr. Greenberg asked if recommendations are made by NASA after incidents are reported through C3RS. Ms. Connell responded that NASA only collects the data submitted but does not make recommendations. Mr. Greenberg then asked if close calls and/or corrective actions from other transportation agencies are shared for peer review. Mr. Castiglione answered that a website is being constructed to share information across transportation agencies.

Chairman Prendergast asked if a representative of C3RS would review MTA's processes after implementation. Mr. Castiglione answered that once C3RS has been implemented and staff trained, the FRA implementation team pulls back but is always available for refresher training and follow-up.

ACTION ITEM

Mr. Mayer asked the Board to vote on a Safety Management Policy Directive updated to include suggested standards by the FTA that will ultimately become requirements. Those standards include: best practices, roles and responsibilities, accountabilities for safety and making resources available where necessary to manage safety appropriately.

The Committee voted to recommend the action before the Board for approval.

ADJOURNMENT

Upon motion duly made and seconded, the Board voted to adjourn the meeting at 9:31 am.

2016 Safety Committee Work Plan

I. RECURRING AGENDA ITEMS

| <u>Topic</u> | <u>Responsibility</u> |
|---------------------|---------------------------|
| Public Comments | Committee Chair & Members |
| Approval of Minutes | Committee Chair & Members |
| Committee Work Plan | Committee Chair & Members |

II. SPECIFIC AGENDA ITEMS

January 2016

| | <u>Responsibility</u> |
|---|---------------------------|
| Safety Policy – Committee Charter Proposed Revision | Committee Chair & Members |
| SMS Framework & Safety Metrics | MTA Chief Safety Officer |

February 2016

| | <u>Responsibility</u> |
|---------------------------|-----------------------|
| Effectiveness of Training | Agency Safety Leads |
| Safety Metrics | Agency Safety Leads |

April 2016

| | <u>Responsibility</u> |
|-----------------------------------|--------------------------|
| Safety Policy – Specific item TBD | MTA Chief Safety Officer |
| Safety Risk Management | Safety Staff |

July 2016

| | <u>Responsibility</u> |
|---|-----------------------|
| Safety Assurance – Review of Safety Performance | Agency Safety Leads |
| Safety Promotion – Specific item TBD | Safety Staff |

September 2016

| | <u>Responsibility</u> |
|--|--------------------------|
| Safety Promotion – Specific item TBD | MTA Chief Safety Officer |
| Safety Risk Management – Specific item TBD | Safety Staff |

December 2016

| | <u>Responsibility</u> |
|--|---------------------------|
| Safety Policy – Evaluation of Safety Committee Charter | Committee Chair & Members |
| Safety Assurance – Review of Safety Performance | Agency Safety Leads |

January 2017

| | <u>Responsibility</u> |
|--|---------------------------|
| Safety Policy – Approval of 2016 Work Plan | Committee Chair & Members |
| Safety Risk Management – Specific item TBD | Safety Staff |

Detailed Summary

I. RECURRING AGENDA ITEMS

Approval of Minutes

The Committee Chair will request a motion to approve the minutes of the prior meeting of the Safety Committee.

Committee Work Plan

The Work Plan will list, by meeting, the topics scheduled for review. The Committee will be advised if any changes have been made to the plan.

II. SPECIFIC AGENDA ITEMS

Note: The SMS framework has four pillars: Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. To facilitate general oversight of SMS activities at the MTA and its agencies, each agenda items will generally pertain to one of these pillars.

January 2016

Safety Policy – Committee Charter Proposed Revision

The MTA Chief Safety Officer will discuss revising the Safety Committee charter to include specific reference to SMS and invite the Committee to vote to recommend that the Governance Committee make such a change.

SMS Framework & Safety Metrics

The MTA Chief Safety Officer will review SMS principles and the importance of leading indicators.

February 2016

Effectiveness of Training

Follow-up discussion regarding the measures used to assess the effectiveness of training at the agencies.

Safety Metrics

A review of updated leading and lagging indicators consistent with the development and implementation of SMS at the MTA.

April 2016

Safety Policy

The committee will receive a briefing and/or an action item pertaining to a specific aspect of the Safety Policy SMS pillar.

Safety Risk Management

The committee will receive a briefing and discussion will be invited pertaining to a specific aspect of the Safety Risk Management SMS pillar.

July 2016

Safety Assurance – Review of Safety Performance

The committee will receive a briefing and discussion will be invited pertaining to the safety performance of the agencies. This relates to the Safety Assurance SMS pillar, and provides an opportunity for deeper exploration of “lagging” indicators of safety.

Safety Promotion

The committee will receive a briefing and/or an action item pertaining to a specific aspect of the Safety Promotion SMS pillar.

September 2016

Safety Promotion

The committee will receive a briefing and/or an action item pertaining to a specific aspect of the Safety Promotion SMS pillar.

Safety Risk Management

The committee will receive a briefing and discussion will be invited pertaining to a specific aspect of the Safety Risk Management SMS pillar.

December 2016

Safety Policy – Evaluation of Safety Committee Charter

The Safety Committee Charter specifies that the Committee Chair & Members will review the charter annually. This relates to the Safety Policy SMS pillar.

Safety Assurance – Review of Safety Performance

The committee will receive a briefing and discussion will be invited pertaining to the safety performance of the agencies. This relates to the Safety Assurance SMS pillar, and provides an opportunity for deeper exploration of “lagging” indicators of safety.

January 2017

Safety Policy – Approval of 2016 Work Plan

The committee will be presented with and discuss the 2016 work plan and asked to approve the same. As the work plan governs the activities of the committee, this pertains to the Safety Policy SMS pillar.

Safety Risk Management

The committee will receive a briefing and discussion will be invited pertaining to a specific aspect of the Safety Risk Management SMS pillar.

MTA Fire Safety Inspections Safety Committee July 27, 2016



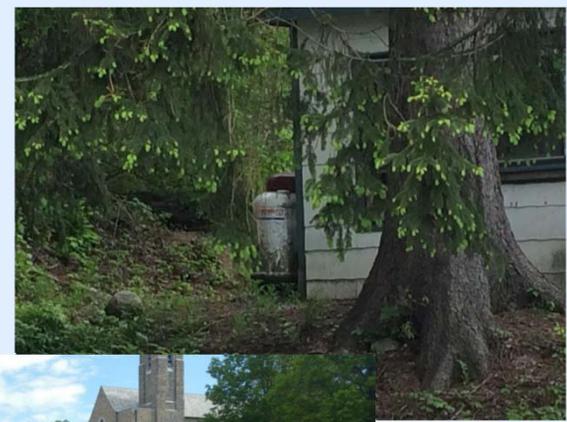
Activities Prior to Park Avenue Fire

- Robust Fire Prevention Units
- Semi-annual inspections of all tenant spaces
- Fire life safety Inspections at MTA and non-MTA locations
- Fire vulnerability assessments and mitigation plans



Fire Prevention Activities Across Agencies in response to Park Avenue Fire

- Inspections of MTA properties
 - MNR - 98 tenant spaces and 52 stations
 - NYCT - 55 miles of elevated structure
 - Greystone - 154 occupancies
- Coordination and development of best practices
- Focus on areas representing potential risk to MTA operations



Ongoing Activities

- Continued coordination
- Database development
- Establish inspection schedules
- Tenant lease review underway – current and new
- Employee awareness



Fire Vulnerability, Risk Assessment and SMS

Ensuring continuous improvement

- Formalize processes
 - Checklists (worksheet)
 - Schedules for inspections
 - Consistency across MTA Agencies
- Cyclical review
 - Set schedules for process review
 - Ensure processes are followed
 - Identify lessons learned
 - Implement changes
 - Incorporate into process (SMS)

ROW Fire Hazard Assessment and Inspection Form Structure ID: _____

Location/Address: _____
Cross Street: _____
Branch Line: _____

Land Occupant No Fire Load (No Combustibles)
 LIRR Owned/Occupied MTA Leased Tenant Third Party-Non-MTA Trespasser

Land Use Type
 Retail Parking Easement Other
 Storage

Type of Storage
 Structures (permanent buildings)
 Accessory Structures (Trailers, sheds)
 Motor Vehicles
 Commercial Vehicles (oil truck, utility truck, etc.)
Type: _____
 Combustible Storage (wood, paper, plastics, wood or plastic fencing, etc.)
Type(s): _____
 Flammable Compressed Gases (propane, acetylene, etc.)
Type(s): _____
 Flammable/Combustible Liquids (gasoline, diesel, etc.)
Type(s): _____
 Combustible Waste accumulation (>100sq. ft., i.e. 10' x 10')
Type(s): _____
 Hazardous Materials
Type(s): _____

Possible Effect to LIRR in the Event of Fire
 Negligible
The impact of loss will be so minor that it would have no discernible effect on the facility, its operations, or the environment.
 Marginal
The loss will have impact on the structure, or which may have to suspend some operations briefly. Some monetary investments may be necessary to restore the facility to full operations. Minor personal injury may be involved. The fire could cause localized environmental damage.
 Critical
The loss will have a high impact on the facility which may have to suspend operations. Significant monetary investments may be necessary to restore to full operations. Personal injury and possibly deaths may be involved. The fire could cause significant reversible environmental damage.
 Catastrophic
The fire will produce death or multiple deaths or injuries, or the impact on operations will be disastrous, resulting in long-term or permanent closing. The facility would cease to operate immediately after the fire occurred. The fire could cause significant irreversible environmental damage.



MTA Bus Safety Symposium



LET'S SEE THE BIG PICTURE



Summary

- May 10, 2016: MTA hosted more than 100 representatives from transportation and transit agencies around North America to discuss bus and pedestrian safety
- Expectation of pedestrian and cyclist on roadways continues on an upward trajectory as millennials increasingly reject vehicle ownership.





NHTSA Administrator's Remarks

- 32,675 roadway fatalities in 2014
- Goal is zero
- Old approach: react, mitigate, punish
- New approach:
 - Prevent crashes
 - Help drivers make better decisions
 - Automated vehicle technology



NHTSA Administrator's Remarks

- New York City traffic fatalities declining
- Opportunity to build upon this success
- Particular concern for unprotected road users
- Large vehicles pose challenges
- Encourage bus improvements and technological innovation



NHTSA Administrator's Remarks

“Bus operators need to be commended for the incredibly important work they do. They provide mobility to millions who might not otherwise have it, and they are focused on the safety of their passengers and the people around them.”





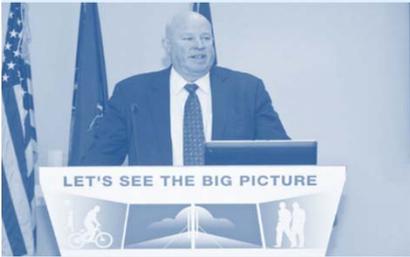


Summary

- National Highway Traffic Safety Administration (NHTSA) shows roadway fatalities a national epidemic
- According to Fatality Analysis Reporting System (FARS) from 2010-2014 averages 35 pedestrians and 7 bicyclist fatalities annually involving transit buses.
- Most fatalities occur when bus is travelling in a straight line



Data Analysis Finding Pedestrian & Bicyclist Fatalities



| Pedestrian | Bicyclist |
|---|--|
| 48% the bus was going straight | 67% the bus was going straight |
| 26% involved a left turn | 15% involved a left turn |
| 11% involved a right turn | 10% involved a right turn |
| 15% of incidents involved pre-crash maneuvers | 8% of incidents involved pre-crash maneuvers |





Current Studies/Solutions



- FTA studying safety standards for transit buses and will be examining the issue of obstructed visibility.
- MTA is pilot testing two safety technologies on some buses (pedestrian warning system, collision avoidance system).
- Transit agencies have added technology (e.g., front-view cameras to analyze collisions and flashing lights to curbside mirrors).
- New Flyer has made recent design changes offering a high visibility window, which reduces the size of the A-pillar. NYCT will be evaluating this window in September 2016 on the pilot bus for the next procurement of 138 CN6 buses.



Future Action

- FTA assemble a cross-functional team to determine what a bus operator should be able to see in each mirror.
- Conduct studies to recommend, establish performance standards for bus side view mirrors as it relates to placement.
- FTA and/or NHTSA should review the school bus visibility standards for possible application for transit bus design.
- Standardized transit bus operator safety training.
- Examine A-pillar design to determine if possible to reduce size of the A-Pillar and the windshield retaining seal.
- Include transit agencies in traffic engineering decisions.



Future Actions

- Bus operators should participate in operator compartment reviews.
- Exchange data and ideas with Europe and Asia on bus safety innovation, design, and statistics on incidents, injuries, and fatalities.
- Educational and personal responsibility campaign for pedestrian and bicyclist. Bus safety success depends on a partnership with alert pedestrians, bicyclists, bus riders and bus operators.

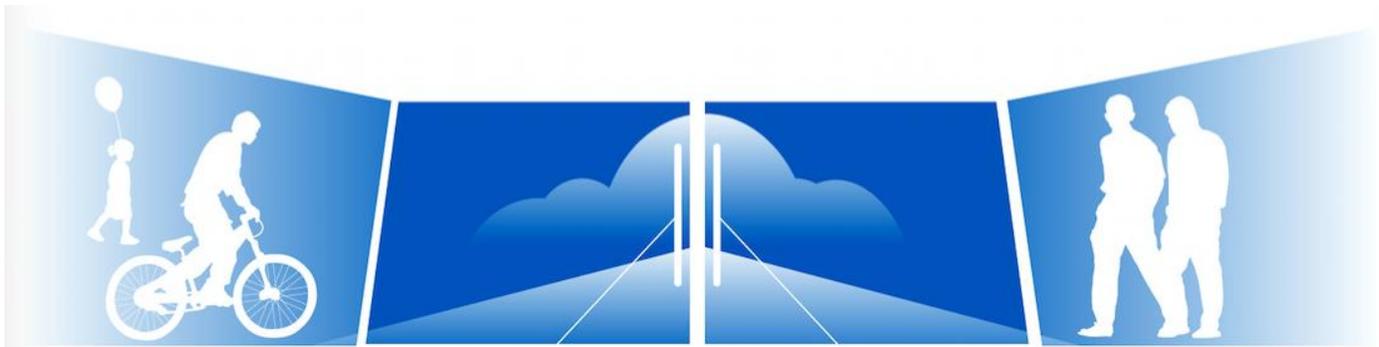
(just a sample of the recommendations)



For more information...

<http://web.mta.info/safety/2016-bus-symposium.htm>





LET'S SEE THE BIG PICTURE

MTA Bus Safety Symposium

Executive Summary

The number of pedestrians and cyclists on our roadways is expected to continue in an upward trajectory as millennials increasingly reject vehicle ownership. Combined with the continued increase in transit ridership, more pedestrians and cyclists on roadways will lead to increasing challenges, especially in larger metropolitan areas. The recipe for increasing numbers of incidents and fatalities is obvious. The most recent statistics from the National Highway Traffic Safety Administration (NHTSA) show that roadway fatalities continue to be a national epidemic.

In 2014, 32,657 people lost their lives on U.S. roads. And annually there are 35 pedestrian fatalities and seven bicyclist fatalities involving transit buses. While these numbers may appear relatively small, just one fatality is too many. NHTSA believes that innovation and technology can save more lives.

Statistics soon to be released by NHTSA indicate that the number of lives lost was higher still in 2015.

And while the transit industry is working with bus manufacturers to constantly make adjustments and improvements through bus design, it is not being done as a concerted effort.

For example, there is much debate in the industry about the safety of high- vs. low-mounted mirrors, flat vs. convex mirrors, A-Pillar construction, bus operator training, pedestrian/cyclist responsibility, etc., but little scientific research and few studies are being conducted to arrive at universal conclusions that could be applied across the country.

Additionally traffic engineering in major metropolitan areas often takes place without collaboration with transit agencies. More standardization and cooperation is needed.

Background

Driving a city bus in a major metropolitan area may be among the most stressful, difficult jobs in the country. Bus operators are responsible for maneuvering a 30,000-pound machine around multiple obstacles, managing riders and their sometimes erratic behavior, taking bus fare, responding to questions, keeping passengers safe and staying on schedule – all while remaining keenly aware of other road users around them. Their work has become more challenging in recent years due to the explosion of motorists, cyclists and pedestrians who are distracted by smart phones and other amenities and pay more attention to them than the traffic they navigate.

Added to this new dynamic, ironically, are complicated multi-modal street designs that accommodate bike lanes, but make travel patterns less predictable and add to the complexity of bus lanes and curbside boarding. Traffic engineering in major metropolitan areas is often conducted without transit agency collaboration and bus operators' needs are not considered. Bikes and buses are sometimes expected to share lanes.

Finally, reliance on public transit, biking and walking is only expected to increase as app-based ride-sharing services and other options make it easier than ever to live without a car. Indeed, trends show that millennials are not interested in driving or even obtaining a driver's license.

An early 2014 study by The Rockefeller Foundation and Transportation for America¹ found that many millennials want access to better transit options such as buses and trains, better walking and biking opportunities, and the ability to be less reliant on a car.

All of this adds up to the potential for increasing bus/pedestrian and bus/cyclist collisions, which transit and transportation agencies across the country are concerned about and proactively investigating.

While serious injuries and fatalities from traffic collisions (involving all vehicle types) have been decreasing nationally over the past decade or more (notwithstanding an expected increase to be recorded soon for 2015), pedestrians and bicyclists still account for a disproportionate number of traffic fatalities².

¹ The Rockefeller Foundation and Transportation for America 2014 Study; <https://www.rockefellerfoundation.org/about-us/news-media/access-public-transportation-top/>

² Brookshire, K., Sandt, L., Sundstrom, C., Thomas, L., & Blomberg, R. (2016, April). *Advancing pedestrian and bicyclist safety: A primer for highway safety professionals* (Report No. DOT HS 812 258). Washington, DC: National Highway Traffic Safety Administration. A Primer for Highway Safety Professionals, NHTSA

According to the Fatality Analysis Reporting System (FARS) – a census of fatal motor vehicle crashes in the United States– from 2010-2014, there were an average of 35 pedestrian and seven bicyclist fatalities annually involving transit buses.

Also, according to FARS data, the majority of pedestrians and bicyclists killed by being hit by a bus occurred when the vehicle was traveling in a straight line. Here are the findings:

- In 48 percent of pedestrian fatalities nationwide, the bus was going straight
- 26 percent involved a left turn
- 11 percent involved a right turn
- 15 percent of incidents involved pre-crash maneuvers

- For bicyclist fatalities:
 - 67 percent of the buses were going straight
 - 15 percent were making a left turn
 - 10 percent were making a right turn
 - 8 percent of incidents involved pre-crash maneuvers

This data is relevant because as we continue to gather data and explore bus travel patterns as well as behaviors of bus operators, passengers, motorists, pedestrians and cyclists at the time of an incident, we can better determine needed changes to avoid these outcomes in the future.

The Challenge

While 42 pedestrian/cyclist deaths across the U.S. per year due to collisions with transit buses doesn't seem like an overwhelming number compared to transit miles traveled, the National Highway Traffic Safety Administration (NHTSA) and the Federal Transit Authority (FTA) remains convinced that they are preventable.

The only acceptable goal, according to NHTSA, is zero fatalities.

“At the current rate, it would take decades and decades to reach that goal,” said NHTSA Administrator Mark Rosekind, Ph.D.³ “We will never reach zero fatalities if we [the transit and transportation industry and manufacturers] continue doing what we are doing, working on solutions in a vacuum and hoping the cumulative effect works. So we know the answer is not just doubling down on what we've already done.”

Instead, Rosekind said, we need to take a new approach to the problem that consists of:

- 1) Preventing crashes altogether

³ <http://www.nhtsa.gov/About+NHTSA/Speeches,+Press+Events+&+Testimonies/mr-mta-forum-05102016>

- 2) Focusing on helping motorists make the right choices
- 3) Embracing the potential of automated vehicle technology

“We should be looking at changes in bus manufacturing that make operator visibility a priority, and look at cross-view mirrors that give bus operators the best forward visibility,” he said. “But we should also be looking at advanced technologies, like cameras and Pedestrian Crash Avoidance Mitigation systems that have the potential for exponentially increasing pedestrian protection.

“There is no silver bullet,” Rosekind said. “Road safety takes a community to solve.”

In keeping with the Vision Zero national effort to eliminate traffic fatalities, NHTSA and the FTA have tasked bus manufacturers, transit and transportation agencies to find new ways to counteract the number of bus/pedestrian/cyclist incidents with the goal of reaching zero fatalities.

The Metropolitan Transportation Authority (MTA) recently took the lead in exploring ways to achieve that goal by hosting a Bus Safety Symposium for more than 100 researchers, representatives from major bus manufacturers and safety experts from federal transportation agencies and transit agencies around North America to discuss bus and pedestrian safety issues. Held at MTA’s New York City headquarters on May 10th, the Symposium delved into critical bus/pedestrian safety issues and participants made collective recommendations for next steps needed to improve bus/pedestrian safety around the world.

Officials from MTA New York City Transit, New York State and City Departments of Transportation, transit unions, and bus agencies for metro areas such as Philadelphia, Chicago, Toronto, Miami, Washington, D.C., Montreal and Los Angeles weighed in on best practices, new bus design, operator training, pedestrian/cyclist education and technology – all with the common goal of getting to zero.

Outlining Opportunities

Here are some examples of new bus design and technology that is currently underway as presented and discussed at the Symposium:

- **The Federal Transit Authority** is conducting a study to review all safety standards for transit buses and will be examining the issue of blind spots (FAST Act).
- **NYC Transit’s** safety goals rely on critical data on vehicular and pedestrian usage, flow and traffic as well as other research provided by NYC DOT. Safety initiatives and changes that have been implemented following data shared between the two agencies include the introduction of bus-only lanes, relocations of bus stops, bulbs and traffic islands, directional changes on major streets and installations of pedestrian plazas.

- **NYC Transit** is currently testing new safety technology on a small group of buses, with the goal of gathering operations and efficiency data for larger pilot programs next year. The first is a collision avoidance system, which uses smart cameras to pro-actively warn bus operators, audibly and visually, of a potential collision happening in the front or the sides of the bus. This will be available on 100 buses by the end of 2017. The second technology, a pedestrian turn warning system, automatically alerts pedestrians audibly at a crosswalk when buses nearby are making right or left hand turns. It will be installed on 200 buses within the same time period.
- **New Flyer** is examining a high visibility window on their Xcelsior buses that they believe provides greater line of sight for the operator, which is only available as a non-egress option. Some agency specifications require egress-type operator windows.
- **Société de transport de Montréal (STM)** added front-view cameras, which gives a wide angle forward that can be recorded and downloaded. This will allow STM to analyze collisions in an effort to reduce future incidents. They've introduced different changes to the bus design by adding a high visibility driver window to reduce the B pillar width, and increasing the height of the right-hand side mirror. In 2016, they will continue conducting pedestrian collision simulations to better understand pedestrian trajectory and the impact to the field of view, while introducing a pilot project for collision avoidance technology.
- **Connecticut Transit's BRT – CTfastrak** – opened in 2015, and seven stations had basic side platforms where potential collisions with passengers waiting at the platform for at-level boarding could occur. In response, CT added flashing lights to their curbside mirrors.

Recommended Next Steps

Following presentations, panel discussions and question and answer sessions, Bus Safety Symposium leaders and participants compiled this list of collective recommendations to continue to stimulate meaningful dialogue and make changes to ultimately improve bus/pedestrian safety around the world:

- The Federal Transit Administration should assemble a cross-functional team to determine what a bus operator should be able to see in each mirror. The FTA should then conduct a study to recommend and establish performance standards (ie., ECE R46) for bus side view mirrors as it relates to their placement (high or low mount) and type of mirrors (flat vs. convex).
- The Federal Transit Administration should conduct a study to establish performance guidelines for pedestrian collision warning systems based on the circumstances surrounding conflicts, technology validation, bus operator feedback, bus vehicle control reaction, and unintended consequences of technology.

- A study also should be conducted on Leading Pedestrian Interval (LPI) and the overlap with the crossing light. In the LPI scenario, pedestrians are given a seven-second head start to cross the street, then the traffic light changes for buses and other vehicles to turn. With most current crossing designs, vehicles and pedestrians get the green light and walk signal simultaneously.
- The industry must re-examine the definition of a blind spot as an object that “cannot be seen with the naked eye or the equipment provided” (i.e., directly behind the bus.) A-pillars provide temporary obstructions, but bus operators are required to “move around” these obstructions.
- A-Pillar design should be examined to find if it’s possible to reduce the size of the A-Pillar and the seal holding the windshield to reduce bus operator sight obstructions, while maintaining bus structural integrity. Consistent vehicle visibility measurement guidelines should be applied, which are relevant to bus operator seating position, for example SAE J941 (Appendix E) and SAE J1050 (Appendix C).
- FTA and/or NHTSA should review the stringent school bus visibility, (referenced in FMVSS 111), specifications for possible application of similar standards for transit bus design.
- Chief Training Officers and lead bus operator instructors along with bus design engineers should be given the opportunity to sit behind the wheel and drive a bus during the bus design development and testing phases. This could be provided via funding from the American Public Transportation Association (APTA) or through the Transportation Research Board’s IDEAS program, which funds research into promising but unproven innovations for highways, transportation safety, and transit.
- Transit bus operators should be encouraged to provide feedback and should be invited to participate in the operator compartment review. Their unique perspectives can offer solutions on perceived bus operating challenges. Some transit agencies already are soliciting feedback from a select group of bus operators when considering new equipment and technology.
- Standardized transit bus operator safety training is needed with a set number of days established for a candidate to either qualify or be dismissed from the program. By starting with “behind the wheel training,” unqualified drivers are quickly identified. The industry needs a more uniform curriculum that offers an opportunity for trainers and instructors to be tracked. Transit companies also need to be discerning in their hiring process.
- Transit properties should be invited to participate when traffic engineering decisions are being made or when groups are advocating for streetscaping changes. Bus operators’ needs must be taken into consideration and standardization is needed.
- The United States is the preeminent leader on traffic incident data collection, but there can still be impediments. Past experience has demonstrated that a wealth of

information can be collected at a transit/pedestrian/bicycle accident site when a transit safety expert is on site at the accident. The industry in conjunction with NHSTA and FTA should develop a standardized data collection model for all agencies to follow. Operators also need to understand “standard operating procedure,” when an incident occurs and document the scene immediately with fresh recollection to assist investigators.

- Efforts should be made to exchange data and ideas with Europe and Asia on bus safety innovations, bus design guidelines as well as statistics on incidents, injuries and fatalities.
- The industry should explore the possibility of creating a strategic partnership with Google or other technology companies to explore funding for demonstration projects, on how technology can be used to improve transit/pedestrian and bike safety.
- An educational and personal responsibility campaign is needed so pedestrians and bicyclists are encouraged to pay attention to their surroundings as they navigate the sidewalks/bike paths and especially at the intersection with roadways. Bus safety success depends on a partnership with pedestrians, bicyclists, bus riders and bus operators.
- Strategic partnerships with Apple/Android hardware and operating system manufacturers should be explored to create early warning system alerts for pedestrians and bicyclists who are in imminent danger of approaching buses or at-grade crossings. This would not only have application to transit safety, but would improve overall pedestrian and bicycle safety as well.
- Mobile apps that provide these traffic alerts to pedestrians and cyclists entering roadways should be developed and deployed.
- This symposium focused on bus safety issues, but BRT, light rail and other transit options have separate concerns such as at-grade crossings, warning systems, etc., and should be examined in future explorations of transit safety.

Summary

The 2016 Metropolitan Transportation Authority Bus Safety Symposium was intended to kick-start dialogue about the importance of continuous and concerted improvements in bus/pedestrian/bicyclist safety among key industry leaders. Because of the interest expressed during and after the forum, it likely will become an annual event and will include international participants in 2017. Additionally, a core working multi-disciplinary team will be assembled to continue the dialogue over the course of the next year. Dedicated and shared data, research, experience, safety, training and technology enhancements can only lead to better outcomes for transit agencies and the traveling public.

About the MTA:

The Metropolitan Transportation Authority is North America's largest transportation network, serving a population of 15.2 million people in the 5,000-square-mile area fanning out from New York City through Long Island, southeastern New York State, and Connecticut. MTA subways, buses, and railroads provide 2.73 billion trips each year to New Yorkers – the equivalent of about one in every three users of mass transit in the United States and two-thirds of the nation's rail riders. MTA bridges and tunnels carry more than 285 million vehicles a year – more than any bridge and tunnel authority in the nation.

About MTA Bus Company:

The MTA Bus Company was created in September 2004 to assume the operations of seven bus companies that operated under franchises granted by the New York City Department of Transportation. MTA Bus is responsible for local and express bus operations of the seven companies, consolidating operations, maintaining current buses, and purchasing new buses to replace the aging fleet currently in service. MTA Bus operates 47 local routes in the Bronx, Brooklyn, and Queens, and 35 express bus routes between Manhattan and the Bronx, Brooklyn, or Queens. It has a fleet of more than 1,200 buses, the 11th largest bus fleet in the United States and Canada.

Safety Report

Statistical results for the 12-Month period are shown below.

| Performance Indicator | | | |
|---|----------------------|----------------------|----------|
| Performance Indicator | 12-Month Average | | |
| | June 2014 - May 2015 | June 2015 - May 2016 | % Change |
| Customer Collisions Rate for Bridge Customers per Million Vehicles | 5.63 | 6.61 | 17.4% |
| Customer Injury Collisions Rate for Bridge Customers per Million Vehicles | 0.94 | 1.03 | 9.6% |
| Employee Accident Reports | 266 | 241 | -9.4% |
| Employee Lost Time Injuries Rate per 200,000 worker hours | 5.1 | 5.6 | 9.8% |
| Construction Injuries per 200,000 worker hours | 3.37 | 2.21 | -34.4% |

| Leading Indicators | | | | |
|---|------|----------|------|--------------|
| Roadway Safety | 2015 | | 2016 | |
| | May | Year End | May | Year to Date |
| Workforce Development (# of Participants) | 165 | 1687 | 150 | 364 |
| Fleet Preventative Maintenance Insp. | 83 | 1186 | 120 | 505 |
| Safety Taskforce Inspections | 0 | 12 | 1 | 3 |
| Construction Safety | May | Year End | May | Year to Date |
| Construction Safety Inspections | 249 | 3419 | 369 | 1656 |
| Fire Safety | May | Year End | May | Year to Date |
| Fire Code Audits Completed | 1 | 13 | 1 | 4 |
| FDNY Liaison Visits | 12 | 23 | 2 | 8 |

Definitions:

Workforce Development provides for focused safety and skills training to all operations, maintenance and staff personnel. Classes feature OSHA 10 and 30 Classes, operations mandatory safety and skills instruction and retraining and specialty training (TIMS, CDL, FDNY instruction, Wrecker Driver Instruction and Roadway Safety Rules).

Fleet Preventative Maintenance Inspections are conducted at each location to improve the customer and worker safety environment. Inspections identify potential hazardous roadway or facility conditions and prescribe corrective actions to eliminate hazards.

Safety Taskforce Inspections are conducted by the joint Labor and Management Committee at each facility throughout the year on a rotating basis. The inspections consist of reviewing past accident and incident experiences/reports and facility safety reports. The Taskforce meets with location management and union representatives and makes a complete tour of the facility. The Taskforce is comprised of representatives of the Safety and Operations groups and has representation from each of the represented unions.

Construction Safety Inspections are conducted by an independent safety monitor to ensure that the necessary components for a safe construction are present. Inspections include review of safety organization, job hazard analysis, safe work plans for specific high risk activities, personal protective equipment, fire protection, industrial hygiene, and training.

Fire Code Audits are required by the NYS Uniform Fire Prevention Code. They are conducted by the Safety and Health Department at each building and facility throughout the Agency. They feature a review of fire prevention activities and the condition of fire fighting and suppression equipment.

FDNY Liaison Visits are conducted on a regular basis (typically twice a year) whereby local fire companies visit and tour the facilities to become familiar with the structures and buildings and the fire equipment provided. This facilitates the development of strategies for fighting fires and responding to emergencies. Additionally, special drills and training exercises are conducted to drill on communications and special rescue operations should they be required.

Monthly Operations Report

Statistical results for the 12-Month period are shown below.

| Safety Report | | | | |
|--|--|------------------------|------------------------|------------------------|
| Performance Indicators | | 12-Month Average | | |
| | | Jun 2013 - May 2014 | Jun 2014 - May 2015 | Jun 2015 - May 2016 |
| Subways | | | | |
| Subway Customer Accidents per Million Customers ¹ | | 2.61 | 2.68 | 2.48 |
| Subway Collisions ^{2,3} | | 1 | 0 | 0 |
| Subway Derailments ^{2,3} | | 1 | 2 | 2 |
| Subway Fires ² | | 975 | 1,033 | 918 |
| Buses | | | | |
| Bus Collisions Per Million Miles Regional | | 49.85 | 50.16 | 54.99 |
| Bus Collision Injuries Per Million Miles Regional | | 7.21 | 6.33 | 6.36 |
| Bus Customer Accidents Per Million Customers Regional | | 1.07 | 1.07 | 1.20 |
| Total NYCT and MTA Bus Lost Time Accidents per 100 Employees | | 3.69 | 3.64 | 3.89 |

¹ 12-Month Average data from May through April.

² 12-month figures shown are totals rather than averages.

³ Data from July through June.

| Leading Indicators | | | | |
|--|-------|--------|--------|------------------|
| Subways | June | YTD | Goal | YTD as % of Goal |
| Roadway Worker Protection | | | | |
| Joint Track Safety Audits -- Actual Count | 34 | 191 | 336 | 56.8% |
| Joint Track Safety Audits -- Compliance Rate | 98.3% | 98.9% | 100.0% | 98.9% |
| Mainline Collision/Derailment Prevention | | | | |
| Continuous Welded Rail Initiative (# of Track Feet) | 6,516 | 30,945 | 61,178 | 50.6% |
| Station -- Emergency Communication | | | | |
| Help Point Installations | 12 | 55 | 130 | 42.3% |
| Buses | June | YTD | Goal | YTD as % of Goal |
| Collision Prevention | | | | |
| Audible Pedestrian Warning System Pilot ⁴ | N/A | N/A | 40 | N/A |
| Collision Avoidance System Pilot ⁵ | N/A | N/A | 20 | N/A |
| Vision Zero Employee Training | 551 | 2,941 | 6,000 | 49.0% |

⁴ Statement of Work has been reviewed, updated and resubmitted to the vendor to ensure that Bus Technology requirements are met. All NYC requirements have been accepted. In parallel, vendor has been in negotiations with Procurement with respect to finessing contract language, terms and conditions and pricing details. Installs slated to begin September. Target is to install at least 40 buses of 200 by end of year.

⁵ Statement of Work completed and being readied for publication as an IFB mid-July. IFB vendor bus surveys planned for July 26th. Target is to install at least 20 buses of 145 by end of year.

May 2016 Safety Report

Statistical results for the 12-Month period are shown below.

| Performance | | | |
|--|---------------------|---------------------|----------------------|
| Performance Indicator | 12-Month Average | | |
| | June 2013 -May 2014 | June 2014 -May 2015 | June 2015 - May 2016 |
| FRA Reportable Customer Accident Rate per Million Customers | 2.10 | 1.72 | 1.15 |
| FRA Reportable Employee Lost Time Injury Rate per 200,000 worker hours | 2.44 | 2.34 | 2.54 |
| Grade Crossing Incidents ¹ | 4 | 1 | 3 |
| Mainline FRA Reportable Train Derailments | 2 | 1 | 1 |
| Mainline FRA Reportable Train Collisions | 0 | 0 | 0 |

¹ Per FRA - Any impact between railroad on-track equipment and a highway user at a highway-rail grade crossing. The term "highway user" includes automobiles, buses, trucks, motorcycles, bicycles, farm vehicles, pedestrians, and all other modes of surface transportation motorized and un-motorized.

| Leading Indicators | | | | |
|--|------------------------------|--------------|-------|--------------|
| Employee: Focus on C3RS | 2015 | | 2016 | |
| | May | Year end | May | Year to Date |
| Total Reports Received | 0 | 574 | 4 | 196 |
| Total Reports Reviewed by PRT | 0 | 261 | 110 | 374 |
| Total Reports that Meet C3RS Program Criteria | 0 | 212 | 90 | 319 |
| Total Corrective Actions being Developed | 0 | 3 | 0 | 2 |
| Total Corrective Actions Implemented | 0 | 3 | 0 | 0 |
| Customer and Community: Focus on Grade Crossings | May | Year to Date | May | Year to Date |
| Broken Gates | 3 | 19 | 5 | 25 |
| MTA Police Details | 257 | 803 | 155 | 698 |
| Summons | 95 | 387 | 39 | 210 |
| Warnings | 60 | 118 | 5 | 65 |
| Community Education and Outreach | 0 | 0 | 2,000 | 2,000 |
| | | Completed | Total | % Complete |
| Cameras on Rolling Stock | Scheduled to Begin in August | | TBD | TBD |

Definitions:

Confidential Close Call Reporting System (C3RS) - Labor, Management, and Federal Railroad Administration (FRA) partnership designed to enhance safety through analysis of confidential reports of employee close calls. The Peer Review Team (PRT) meets to review reports and recommend corrective actions.

Broken Gates - The number of events at grade crossing locations where a vehicle broke a crossing gate.

MTA Police Detail - The number of details specifically for the purpose of monitoring behavior at Grade Crossings.

Summons for Grade Crossing Violation and other Infractions- The number of violations issued to a motorist for going around a crossing gate or due to behavior that put the motorist at risk (i.e. cell phone use, etc.).

Warnings - The number of warnings issued to motorists due to behavior that put the motorist at risk (i.e. cell phone use, etc.).

Community Education and Outreach - The number of participants who attended a TRACKS, Operation LifeSaver, or Railroad Safety Awareness Event.

Cameras on Rolling Stock - Number of complete inward/outward camera installations on rolling stock.

Safety Report

Statistical results for the 12-Month period are shown below.

| Performance | | | |
|--|----------------------|----------------------|----------------------|
| Performance Indicator | 12-Month Average | | |
| | June 2013 - May 2014 | June 2014 - May 2015 | June 2015 - May 2016 |
| FRA Reportable Customer Accident Rate per Million Customers | 5.95 | 4.46 | 3.73 |
| FRA Reportable Employee Lost Time Injury Rate per 200,000 worker hours | 3.61 | 3.71 | 3.19 |
| Grade Crossing Incidents ¹ | 8 | 8 | 9 |
| Mainline FRA Reportable Train Derailments | 1 | 0 | 0 |
| Mainline FRA Reportable Train Collisions | 2 | 2 | 2 |

¹ Per FRA - Any impact between railroad on-track equipment and a highway user at a highway-rail grade crossing. The term "highway user" includes automobiles, buses, trucks, motorcycles, bicycles, farm vehicles, pedestrians, and all other modes of surface transportation motorized and un-motorized.

| Leading Indicators | | | | |
|--|--------------------------------|--------------|-------|--------------|
| Employee: Focus on C3RS | 2015 | | 2016 | |
| | May | Year to Date | May | Year to Date |
| Total Reports Received | 10 | 10 | 21 | 63 |
| Total Reports Reviewed by PRT | 5 | 5 | 10 | 57 |
| Total Reports that Meet C3RS Program Criteria | 5 | 5 | 21 | 57 |
| Total Corrective Actions being Developed | 0 | 0 | 0 | 7 |
| Total Corrective Actions Implemented | 0 | 0 | 0 | 0 |
| Customer and Community: Focus on Grade Crossings | May | Year to Date | May | Year to Date |
| Broken Gates | 13 | 59 | 8 | 50 |
| MTA Police Details | 112 | 417 | 40 | 235 |
| Summons | 133 | 503 | 183 | 740 |
| Warnings | 60 | 191 | 73 | 404 |
| Arrests | 0 | 0 | 0 | 3 |
| Community Education and Outreach | 7,754 | 36,834 | 9,832 | 50,024 |
| | | Completed | Total | % Complete |
| Cameras on Rolling Stock | Scheduled to Begin in December | | TBD | TBD |

Definitions:

Confidential Close Call Reporting System (C3RS) - Labor, Management, and Federal Railroad Administration (FRA) partnership designed to enhance safety through analysis of confidential reports of employee close calls. The Peer Review Team (PRT) meets to review reports and recommend corrective actions.

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Warnings - The number of warnings issued to motorists due to behavior that put the motorist at risk (i.e. cell phone use, etc.).

Community Education and Outreach - The number of participants who attended a TRACKS, Operation LifeSaver, or Railroad Safety Awareness Event.

Cameras on Rolling Stock - Number of complete inward/outward camera installations on rolling stock.

SAFETY OPERATIONS REPORT

For East Side Access - May 2016

| Performance | | |
|--|------|----------|
| Injury Rate | 2015 | 2016 YTD |
| Lost Time Injury Rate per 200,000 worker hours | 0.88 | 0.47 |
| Recordable Injury Rate | 2.36 | 2.05 |

| Performance Indicator - CM | May | YTD | Goal | YTD as % of Goal |
|---------------------------------|-----|-----|------|------------------|
| Daily Safety Walkthrough | 203 | 999 | 2510 | 40% |
| JHAT Audit | 11 | 63 | 240 | 26% |
| Quarterly Safety Audit | 0 | 7 | 40 | 18% |
| Bi Annual ACE Evaluation | 0 | 0 | 20 | 0% |
| Safety Monthly Meeting | 21 | 91 | 120 | 76% |
| Leading Indicators - Contractor | May | YTD | Goal | YTD as % of Goal |
| Training | 17 | 101 | 183 | 55% |
| Toolbox Talks | 47 | 281 | 480 | 59% |
| Site Inspections | 110 | 935 | 2510 | 37% |
| SWP Review/Audit | 25 | 147 | - | |
| New Employee Orientation | 120 | 909 | - | |
| Emergency Preparedness | 1 | 16 | 20 | 80% |

For Second Avenue Subway - May 2016

| Performance | | |
|--|------|----------|
| Injury Rate | 2015 | 2016 YTD |
| Lost Time Injury Rate per 200,000 worker hours | 0.98 | 0.57 |
| Recordable Injury Rate | 2.14 | 2.3 |

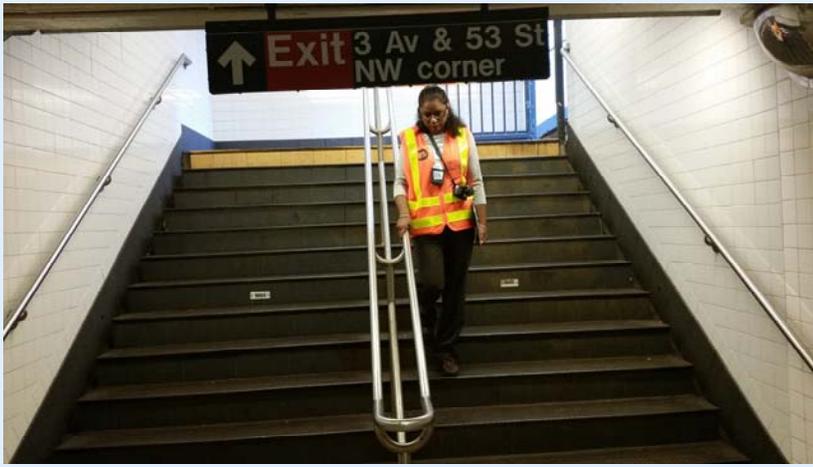
| Performance Indicator - CM | May | YTD | Goal | YTD as % of Goal |
|---------------------------------|-----|------|------|------------------|
| Daily Safety Walkthrough | 212 | 1055 | 1255 | 84% |
| JHAT Audit | 8 | 50 | 120 | 42% |
| Quarterly Safety Audit | 0 | 8 | 20 | 40% |
| Bi Annual ACE Evaluation | 0 | 3 | 10 | 30% |
| Safety Monthly Meeting | 4 | 29 | 60 | 48% |
| Leading Indicators - Contractor | May | YTD | Goal | YTD as % of Goal |
| Training | 247 | 638 | 158 | 404% |
| Toolbox Talks | 30 | 148 | 240 | 62% |
| Site Inspections | 358 | 1853 | 1255 | 148% |
| SWP Review/Audit | 29 | 126 | - | |
| New Employee Orientation | 128 | 822 | - | |
| Emergency Preparedness | 2 | 4 | 10 | 40% |

MTA Employee and Customer Safety Performance Review



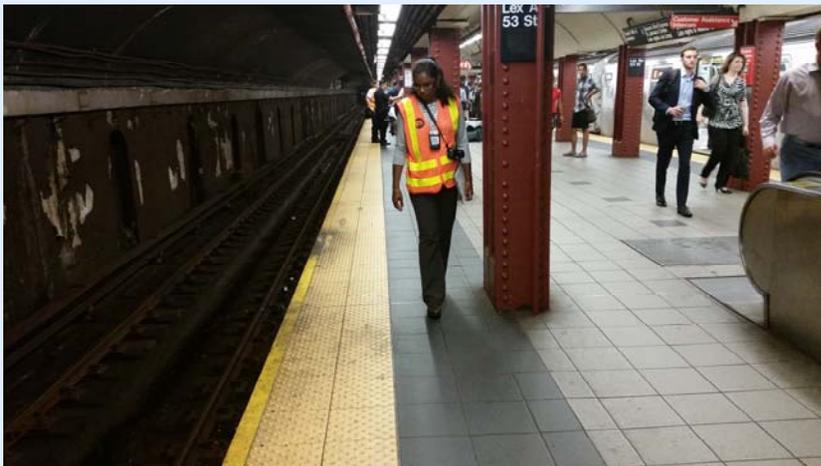
MTA NYCT & MTA Bus





Subway Customer Accidents

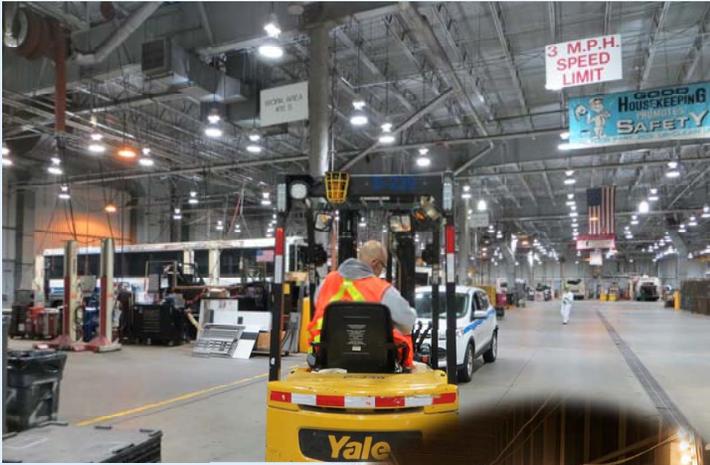
- 7.5% decrease in the last 12 month period.
- Slips, Trips, Falls accounted for 80% of accidents, approximately 90% were in stations.



Targeted Safety Programs

- Top 25 Slip, Trip, Fall Station Initiative and OSS Audit Program
- Public Awareness Campaign





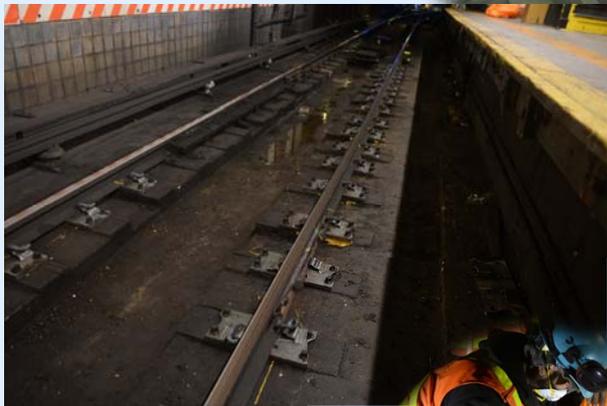
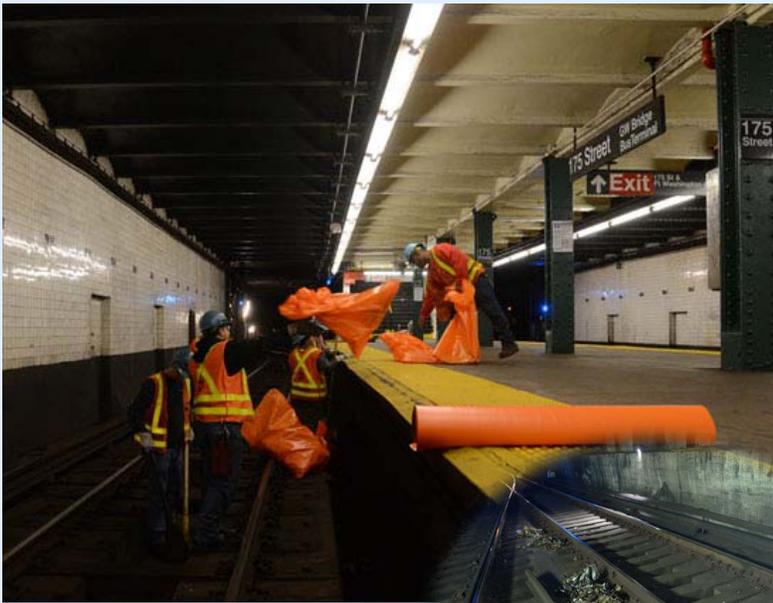
Key Employee Lost Time Accidents

- Overall experienced a 7% increase in last 12 month period.
- Over 20% were Slip, Trip, Falls.
- Overexertion up 6.3% in the last 12 month period.

Targeted Safety Programs

- Employee Awareness Campaign
- Hazard Assessments on Job Tasks
- Short Instructional Videos on Targeted Job Tasks
- Use of Technology





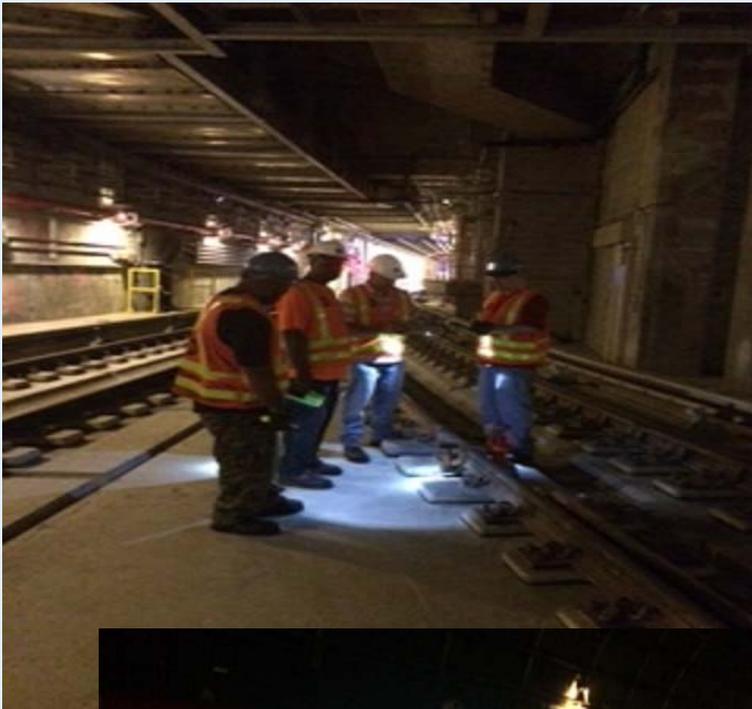
Subway Fires

- 11% decrease in the last 12 month period.
- All fires in last 12 month period were low or average severity.
- 72% occurred along the Right-of-Way.
- 64% of ROW fires attributed to debris.

Targeted Safety Programs

- Track cleaning schedule adjusted based on amount of debris and history of fires.
- Fixed Flagger Placards installed for station cleaning.
- Executive Committee on Track Fires meets monthly.





Leading Indicator Program

Roadway Worker Protection:

- Joint Track Safety Audits conducted are over 56% of the 2016 Goal.
- Prevent Serious Injury/Fatality Incidents along the Right-of-Way.
- Evaluate Critical Aspects of the Job, most notably:
 - ✓ Flagging Setup
 - ✓ 3rd Rail Safety
 - ✓ Lighting, Housekeeping and PPE
 - ✓ Pre-job Safety Briefing with Employees

Results:

- 98.9% audit compliance
- 0 Close Call/Near Miss incidents involving improper flagging/3rd Rail safety.





Bus Collisions & Collision Injuries Per Million Miles

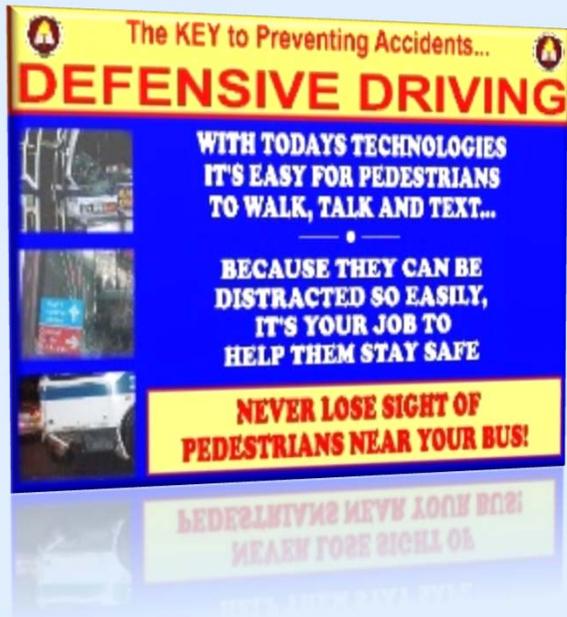
Over a 12-month period we have seen an increase in the Collisions Per Million Miles Rate, which contrasts the 25-year trend where it decreased by nearly 50%

- Collision Rate is up 9.6%
- Collision Injury Rate is up 0.5%
- Pedestrian Incidents are down 6.0%
- Non-Preventable Collisions are on the rise

Targeted Safety Programs

- AGM Oversight Committee
 - Rd Ops, BST and OSS
- Divisional Safety Committees
 - GM, Depot Ops, Rd Ops, Union and BST





The MTA's increase in Bus Collisions over the last two years reflects the growing trend in collisions citywide

- No control of "Right-of-way"
- NYPD reported citywide collisions are up 6%
- We continue to face ever-increasing challenges:
 - Adapting to a continually changing environment
 - Increased congestion
 - Distracted driving

Targeted Safety Programs

- Vision Zero Training
- Transitional Operator Training
- Expanded Random Observation Ride Program





Leading Indicators

New initiatives have been implemented to adapt to the changing environment

- Vision Zero Employee Training
 - ✓ January – June 2016 – 2,941
 - ✓ Since Implementation – 8,637
 - ✓ Evaluating impact of Vision Zero Training
- New Technologies
 - ✓ Pedestrian Turn Warning System Pilot
 - ✓ Collision Avoidance System Pilot
- Executive Safety Committee



Metro-North Railroad



Employee Injuries

| Performance Indicator | 12-Month Average | | |
|--|---------------------|---------------------|----------------------|
| | June 2013 -May 2014 | June 2014 -May 2015 | June 2015 - May 2016 |
| FRA Reportable Employee Lost Time Injury Rate per 200,000 worker hours | 2.44 | 2.34 | 2.54 |

- **Slip/Trip/Fall incidents accounted for 26% of Lost Time Reportable injuries.**
 - Quarterly Safety Focus Day
 - Yard clean up efforts
 - Enhanced focus on job safety briefings
 - Enhanced methods for reporting of unsafe conditions



Customer Injuries

| Performance Indicator | 12-Month Average | | |
|---|----------------------|----------------------|----------------------|
| | June 2013 - May 2014 | June 2014 - May 2015 | June 2015 - May 2016 |
| FRA Reportable Customer Accident Rate per Million Customers | 2.10 | 1.72 | 1.15 |

- **51% of Slip/Trip/Fall injuries occurred in Stations, on Stairs, or on Platforms.**
 - Daytime and evening inspections were conducted at all stations
 - 124 stations (248 inspections completed)
 - Repainting of platform “Watch the Gap”
 - Best Foot Forward campaign reinstated
 - Promotes a seasonal, targeted message to customers



Confidential Close Call Reporting System (C³RS) Corrective Actions Implemented



Temporary Speed Restriction Hangtag

Hangtag developed to act as a reminder for the Temporary Speed Restriction

Hangtag example



Hangtag applied



DTOBO Modification

Combine temporary speed restrictions within a half mile of each other:

Daily Train Operations Bulletin Order (DTOBO)

B. TEMPORARY SPEED RESTRICTIONS IN EFFECT (OLD): All speed restrictions in effect 0001 hours until 2400 hours, unless otherwise specified.

| Item | Line | Location | Track(s) | Between | | Psg |
|------|--------|--------------------|----------|---------|---------|-----|
| 1 | Harlem | CP 5 - CP 106 | 4 | MP 5.0 | MP 6.0 | 30 |
| 2 | Harlem | CP 106 - Tremont | 4 | MP 6.3 | MP 7.4 | 30 |
| 3 | Harlem | CP 112 - Wakefield | 3 | MP 11.9 | MP 12.0 | 30 |

OLD

B. TEMPORARY SPEED RESTRICTIONS IN EFFECT (NEW): All speed restrictions in effect 0001 hours until 2400 hours, unless otherwise specified.

| Item | Line | Location | Track(s) | Between | | Psg |
|------|--------|--------------------|----------|---------|---------|-----|
| 1 | Harlem | CP 5 - Tremont | 4 | MP 5.0 | MP 7.4 | 30 |
| 2 | Harlem | CP 112 - Wakefield | 3 | MP 11.9 | MP 12.0 | 30 |

NEW



Job Safety Briefing Aid

- Pocket Sized and Laminated
- Daily Task Related Topics

Orders

Train Movements

Working With a Student



C3RS J.S.B Aid

Discuss the following items during your Job Safety Briefing. Each time conditions change or other employees become involved in the task, there must be an additional Job Safety Briefing.

**COMMUNICATE! COMMUNICATE!
COMMUNICATE!**

ORDERS

- WORKING LIMITS STOP SIGNS
- NEW SPEED RESTRICTIONS
- T.S.R. WITHIN A STATION STOP
- M-FORMS IN EFFECT

TRAIN MOVEMENTS

- TRAIN SPOTTING
- BRIDGE PLATES
- THROUGH SWITCHES
- UTILIZE DOOR OVERRIDE
- RELAY TRACK CHANGES
- DESIGNATE KEY OUT PERSON BETWEEN CP1 AND GCT
- QUALIFIED CREW MEMBER ON THE HEAD END.
- CHECK SWITCH POINTS

WORKING WITH A STUDENT

- ESTABLISH CLEAR INSTRUCTIONS
- MAKE ENTIRE CREW AWARE YOU HAVE A STUDENT



Long Island Rail Road



Employee Injuries

Slip/Trip/Fall incidents accounted for 20% of Reportable Injuries

Sprains and Strains account for 65% of Injuries

- Corporate Quarterly Safety Focus Days
- Department Videos and Newsletters
- Department Chief Monthly Safety Meetings
- Labor Management Safety Walks
- Labor Management Safety Meetings
- Back School
- Training
- Focus on Housekeeping
- Toolbox Talks and Tailgate Meetings
- Seasonal Reminders and PPE

Safety Talk MEETING AGENDA
SLIP, TRIP, FALL PREVENTION

According to the statistics, approximately five percent of Engineering employees have reported an injury this year. On average, someone reports an injury once every three days. Which activity is the leading cause of injury? Walking! Slip, trip and falls make up 24% of Engineering injuries. Employees have been injured while stepping over 3rd rails, walking on ballast, stepping out of trucks and climbing stairs. Since walking is a normal every day activity, it tends to receive the least amount of attention. People often walk while distracted and most injuries occur when they are not focused on where they are stepping.

SAFETY RULE
 *Refer to 2015 Safety Calendar or Rule Book

SAFETY REMINDER
 Avoid tripping and slipping hazards, and remove or correct them when possible. If they cannot be corrected, promptly inform your supervisor of their type and location.

For more information, see Corporate Safety Rule 300.3.1—Slip, Trip and Fall Hazards.

YTD INJ = 92
 YTD MVA's = 67
 \$ Inj. Reported

| | Inj. 2015 | MVA's 2015 | Final 2014 |
|------------|-----------|------------|------------|
| Track | 30 | 21 | 31 |
| Signal | 24 | 15 | 26 |
| Power | 16 | 12 | 12 |
| Street | 13 | 10 | 8 |
| Comm. | 7 | 8 | 11 |
| Facilities | 2 | 1 | 1 |

* Attached is the Attendance Sheet, Injury Sign Update, and Walk the Talk poster for discussion & posting in all HQ's & report locations.

You can avoid a slip, trip, and fall injuries by:

- Always looking where you place your feet when stepping;
- If possible avoid obstacles like rail and overgrowth, but if you must, do it cautiously and know where you're placing your foot;
- Look for depressions in ballast and uneven ground;
- Climb up & down embankments with extra caution, walking slowly & deliberately;
- If climbing up or down ladders, remember to keep three points of contact;
- Make certain your view is unobstructed;
- Use handholds and railings where available;
- Job planning! When working in an area where you will be required to walk back and forth, take the time to clear the path of any debris or objects. If you cannot clear the path, choose a safer path;
- Avoid distractions such as talking on your cell phone; climbing down especially when steps are wet. Back down slowly while holding onto something secure;
- Take lighting into account. The chance of injury increases in poorly lit areas or at night;
- Anticipate seasonal impacts. Winter conditions such as snow and ice obviously increase slip hazards, but the autumn season also poses hidden dangers. Fallen leaves can hide hazards and wet leaves can make terrain slippery not only when driving but also walking.



Customer Injuries

Approximately 40% of all Reportable Customer Injuries Occur at Penn Station

Slips, Trips and Falls account for the majority of injuries system-wide

- Collaborative Customer Safety Awareness Days at Penn Station (NJT, Amtrak, NYCT) includes bubble people posters and animations



Confidential Close Call Reporting System (C³RS) Corrective Actions Implemented



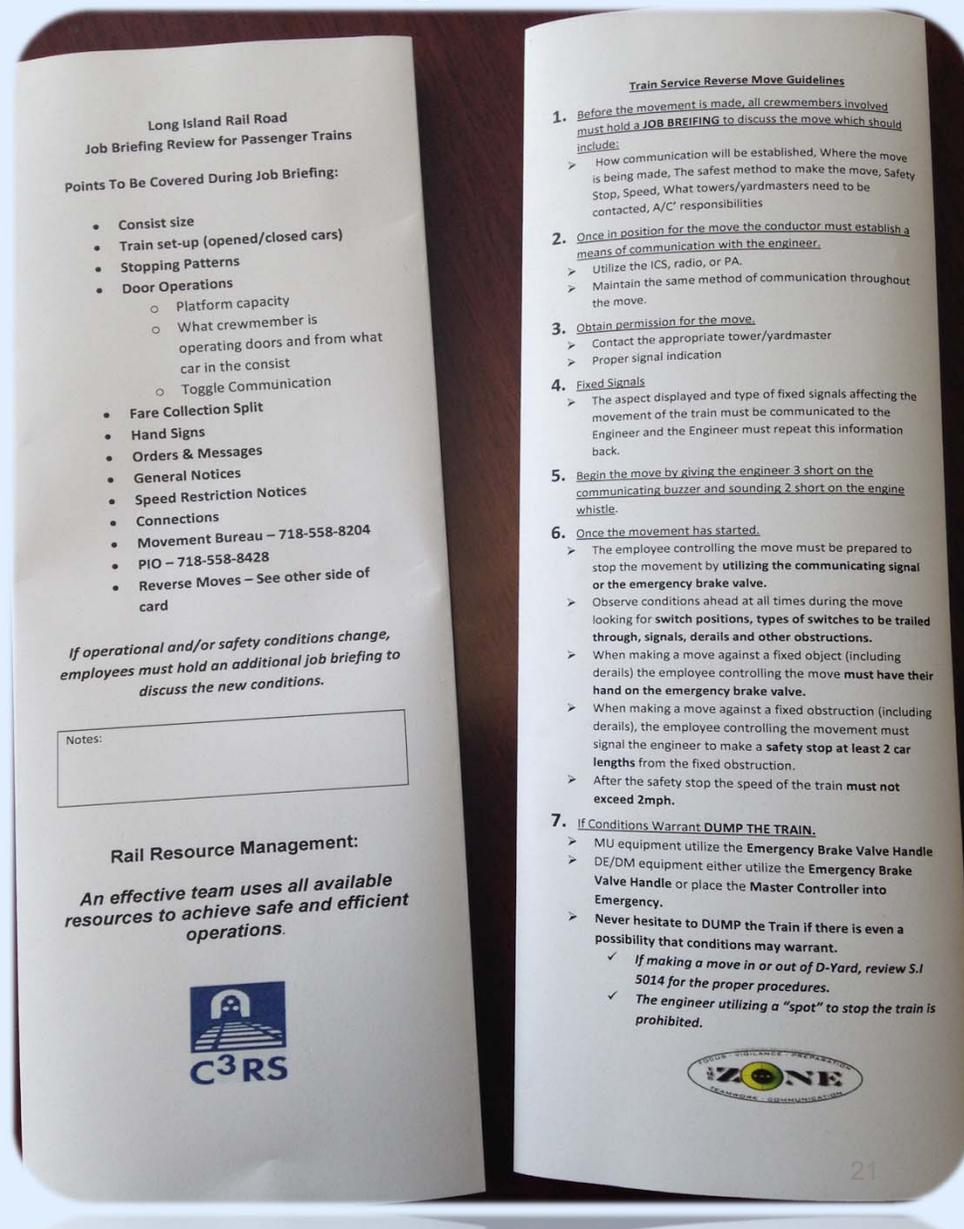
Stony Brook Crossing Improvement

Crossing Gate Key box controller installed at end of platform.



Passenger Train Briefing Guide

- Checklist for Conductor to review with crew
- Important phone numbers
- Reinforces importance of Rail Resource Management
- Provides guidelines for reverse moves



MTA Bridges & Tunnels



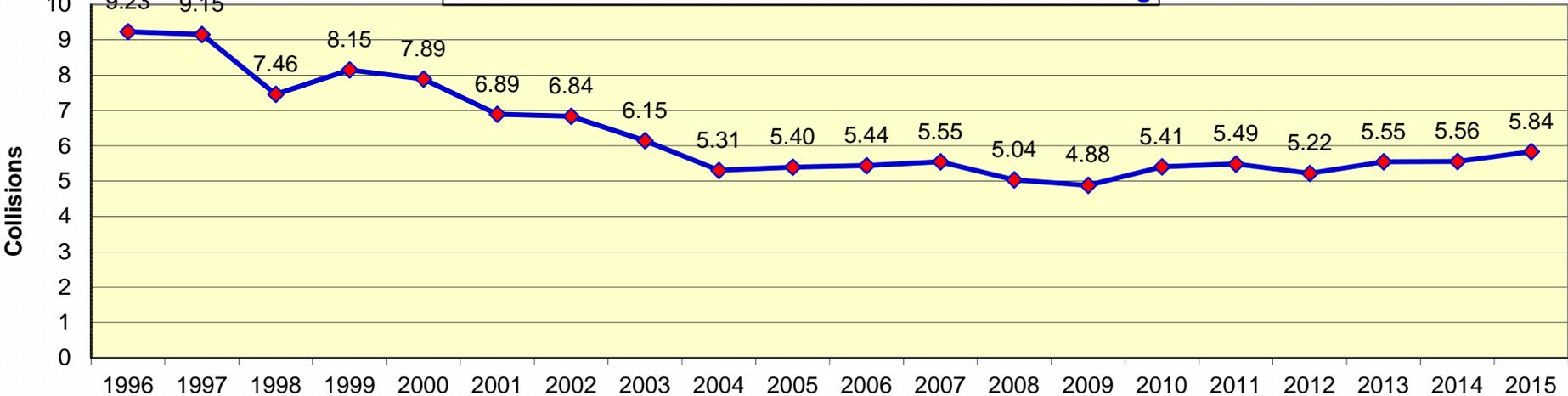
Performance (lagging) indicators:

- **Rates of Customer Collisions/Million Vehicle Crossings**
- **Rates of Employee Lost Time - Injuries/200,000 work hours**
- **Rates of Contractor Injuries on our Capital Construction Projects/200,000 work hours**

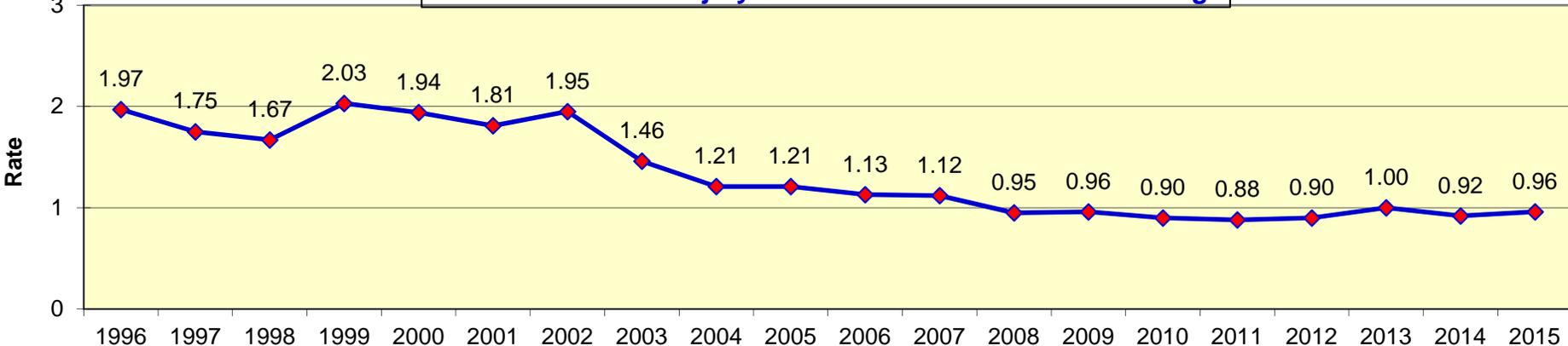


Vehicular Collisions

Rates of Customer Collision /Million Vehicles Crossing



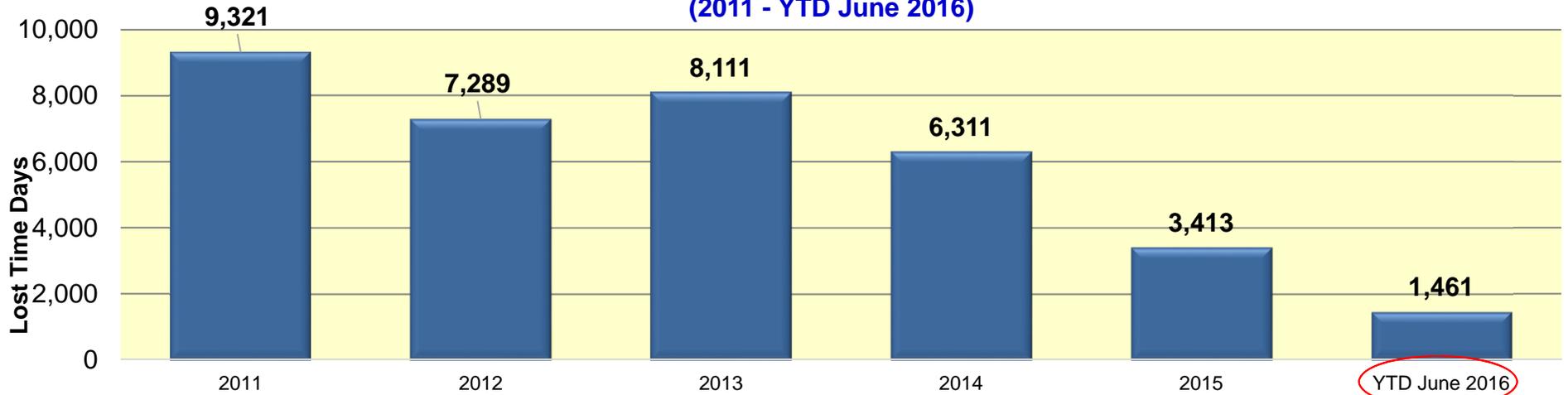
Rates of Customer Injury Collisions/Million Vehicle Crossings



Employee Injuries

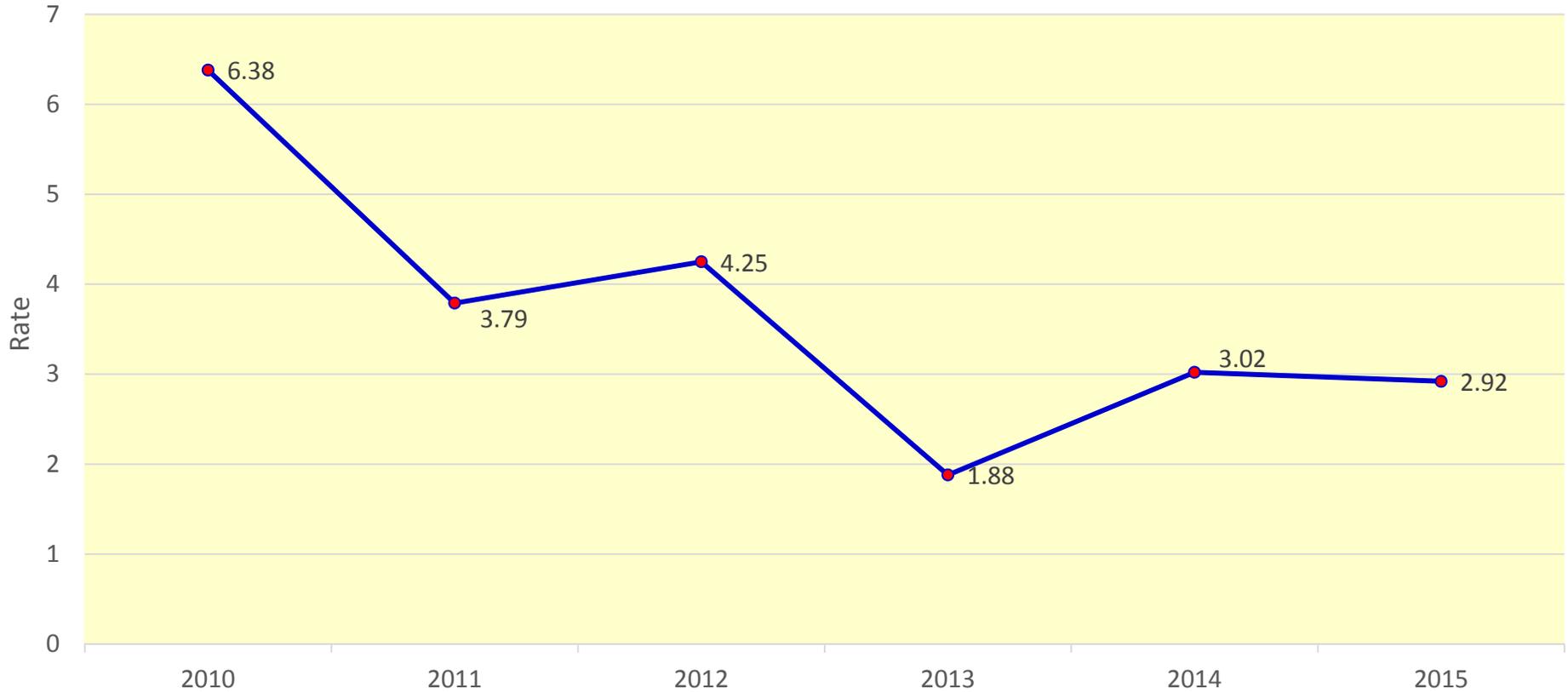


Total Lost Time Days by Year
(2011 - YTD June 2016)



Contractor Injuries

Rate of Contractor Lost Time Injuries/200,000 Hours Worked



Some Important Factors

- **Increased focus on safety (Top down approach)**
- **Use of leading indicators (Training, Inspections)**
- **Increased number of safety meetings and ‘stand-downs’**
- **Visibility/Presence (E&C Safety, S&H)**
- **Outreach**



MTACC

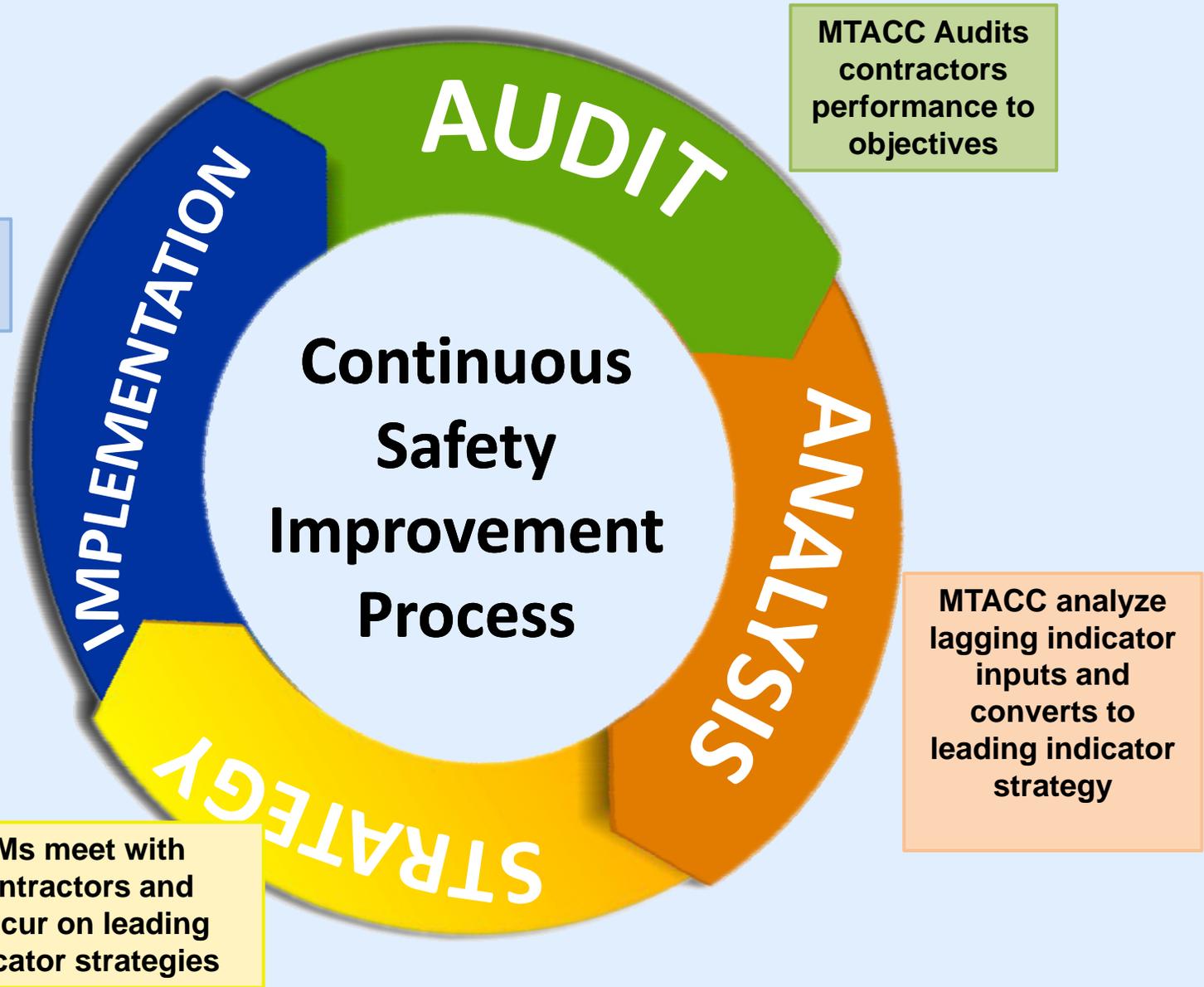


Lost Time Injury Rate - All projects

| January - December 2014 | Second Avenue Subway | #7 Line Extension | East Side Access | Fulton Center |
|-----------------------------------|----------------------|-------------------|------------------|--------------------------|
| Active Contracts | 8 | 3 | 14 | 5 |
| Hours Worked | 2,439,351 | 788,953 | 1,802,464 | 287,438 |
| LTA | 17 | 3 | 16 | 2 |
| LTA Rate | 1.39 | 0.76 | 1.78 | 1.39 |
| January - December 2015 | Second Avenue Subway | #7 Line Extension | East Side Access | Cortlandt Street Station |
| Active contracts | 5 | 3 | 10 | 1 |
| Hours Worked | 2,245,290 | 349,532 | 2,963,530 | 56,875 |
| LTA | 11 | 0 | 13 | 1 |
| LTA Rate | 0.98 | 0.00 | 0.88 | 3.52 |



MTACC Safety Process



Injury Trend Analysis

- Injuries are analyzed in 14 different categories to identify trends



Leading Indicators

- **New Employee Orientation**
- **Training**
- **Site Inspections**
- **Program – Contractor Strategies Meeting**
- **Toolbox Talks – Daily on site job review**
- **SWP-CWP Review**
- **JHAT Audits – Contractor Compliance**
- **Monthly, Quarterly Reports and Audits**



Leading to Lagging Indicators

