TORONTO TRANSIT COMMISSION
REPORT NO.

MEETING DATE: January 21, 2015

SUBJECT: **Safe Service Action Plan**

INFORMATION ITEM

RECOMMENDATION

The Board receive this report for information.

FUNDING

There are no budgetary impacts associated with this report. Future expenditures associated with the action plan will be brought to the Board for information or approval as necessary.

BACKGROUND

TTC Senior Management takes a proactive approach to safety. Every four weeks, the "Safety Executive" (SX) meeting chaired by the TTC CEO reviews actual safety performance including trend data with a view to correcting adverse performance and to implementing improvements where necessary.

This approach not only covers the direct safety risks of TTC operations, it also considers the risks that TTC operations present to vehicles and the impact of at-risk behaviour by other road users and pedestrians on ever-more-crowded streets.

An example of this approach is that TTC staff have been reviewing the locations of transit stops on all bus routes throughout the city, with two main objectives. First, in order to increase the safety of everyone who uses transit, we want to locate stops, whenever possible, at traffic signals, pedestrian crossovers, or pedestrian refuge islands, so that customers will be able to cross with the benefit of such protection, instead of having to cross busy streets with no protection. This is part of a larger cooperative effort between the TTC and the City of Toronto, to improve overall pedestrian safety on Toronto's streets.

Similarly, the TTC reviews "hotspot" locations for vehicle accidents and/or pedestrian accidents to identify what more can be done to control external risks.

Clearly, a prime task is to drive down the risk of our own operations. During 2014, two pedestrians died after being struck by streetcars. Then, in the latter half of 2014 several video recordings were made public of TTC bus operators running red lights. In response to these incidents, the CEO initiated a review of operator training, supervision and relicensing as well as a communications campaign to reinforce the need for operators to drive defensively and to adhere to the rules of the Highway Traffic Act.

Towards the end of 2014, an adult woman and a 14 year old girl died as a result of injuries in

separate incidents after being struck by a TTC bus making a turn. Given the very serious nature of these tragic events, the CEO directed that the review already under way be expedited and that it include consultation with other operators for comparison and to seek out best practice.

The TTC's safety record needs to be seen in context. TTC Ridership has been growing annually for many years and reached 534 million in 2014. To support this growth, the TTC budgeted 133 million km (83M miles) of bus and 14 million km (9M miles) of streetcar service last year. The TTC's rate of bus collisions has remained stable year-over-year, currently 33 collisions per million miles. (Note: we use imperial measures to facilitate comparison with U.S. properties.) Of these, about one-third have been found to be preventable. Based on an initial survey of other North American transit systems, this rate is comparable to large urban transit agencies. In addition our Commercial Vehicle Operator's Registration status has improved in each of the past four quarters, indicating that TTC's safety performance is satisfactory as evaluated by the Ontario Ministry of Transportation.

The Customer Injury Incident Rate is one of the measures reviewed by the SX meeting to gauge the number of injury incidents per 1 million vehicle boardings. This rate has shown sustained improvement for the past 20 months to a period 1 (2015) figure of 0.86 injuries per million miles. This data and graphs that depict preventable collision rates by mode are attached as appendix 2, with 5 year data depicted at appendix 3.

That said, the number of fatal collisions involving TTC buses and streetcars is of concern. From 2010 to 2014, there were eight fatal bus collisions with pedestrians and six fatal bus collisions with automobiles. In addition, there were seven fatalities involving streetcars with either pedestrians or cyclists during this period. It should be noted that these were not all deemed to be preventable upon investigation. When expressed as a rate, there was a decline in total fatalities due to bus collisions from .06 deaths per million miles in 2010 to .04 in 2014. Preventable deaths were .01 per million miles in 2014. For streetcars, the rate climbed from .25 in 2010 to .37 in 2014. Over the five year period there were no preventable fatalities.

Management views any fatality as unacceptable, regardless of culpability and has begun a comprehensive program to reverse this trend effective immediately.

DISCUSSION

A number of factors affect vehicle operating safety, including recruitment, training and supervision of operators, management and scheduling of routes, design and maintenance of equipment, advanced technology for warning and detection systems among others.

Management has developed a framework for improvement that addresses a wide range of safety strategies and this framework (the "12 point action plan") is attached to this report as appendix 1. The goal of this plan is to reinforce good safety behaviours with a heavy emphasis on communications while at the same time, taking an holistic approach to safety improvement. For that reason, the plan considers ways to strengthen the full recruitment-training-supervision-recertification cycle.

Most of these initiatives are conceptual at this time and will be detailed in future reports to the Board to assure our customers, the public and fellow road users, that the TTC is meeting and exceeding industry best practices and embracing new programs and proven technology to meet the highest standard of road safety.

JUSTIFICATION

Management and the Board have a duty of care to take every precaution reasonable in the circumstances for the protection of our customers and other road users. The number of fatalities involving TTC vehicles is receiving attention at the highest level within the TTC in order to ensure the safety of the people of Toronto.

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Attachments: Appendix 1 - Twelve Point Action Plan
Appendix 2 - Collision Rates by Mode
Appendix 3 - Five Year Accident Summary

Safe Service Action Plan

Twelve Point Action Plan

The following matrix summarizes the actions being taken to improve our bus and streetcar safety performance.

#	Action	Description	Dept.
1	Issue Corporate Notice to reinforce adherence to the Highway Traffic Act	• TTC Corporate Notice" # 642 was produced and distributed system wide on November 14, 2014 speaking to the need for Operator diligence in the area of obeying the Highway Traffic Act (HTA) and red signal light violations. The posting period commenced November 14, 2014 and is scheduled to run through to March 31, 2015. • The notices were posted on the Divisional "Must Read" boards and all departmental notice boards on delivery.	Bus Trans.
2	Initiate a Communication Campaign with Operators	• A poster campaign was initiated and distributed on November 14, 2014, highlighting areas of concern in regards to Operator diligence in regards to obeying the HTA and red signal light violations. • The posters were posted on the Divisional "Must Read" boards and in high visibility areas of the divisions. • A campaign to have a manager or supervisor talk to each operator using a standard set of talking points to emphasize defensive driving, turning techniques and the need to drive to conditions was launched on January 5, 2015 and scheduled for substantial completion on January 16, 2015.	Bus Trans.

#	Action	Description	Dept.
3	Speed Audits Using GPS Data	The purpose of this initiative is to ensure Operators do not exceed the posted speed limits. GPS data obtained from revenue vehicles will be used to identify speeding infractions. When a violation is found, the Operator will be interviewed and counseled on: • unsafe driving practices and at risk behaviour; • the fact they have violated the HTA and TTC policy; When meeting with Division Managers, the Operators will learn they may be subject to regular checks of their GPS record. They will also be informed they could be subject to radar checks on their routes (see item 8). The purpose of the checks is to ensure compliance. Commencing the week of January 11, 2015, the GPS program will expand to all Divisions.	Bus Trans. & IT Svcs.
4	Improve Incident Investigation Process	The current process is that the Field Supervisor or Chief Supervisor attends and manages the scene, determines the need for Fit for Duty testing and then makes a determination of preventability at the scene and offers this opinion to Divisional Management. In most cases the Operator and the Supervisor are assigned to the same work location. In addition the incidents are co-investigated by Toronto Police Services and who may lay charges based on the rules outlined in the Highway Traffic Act. As a first step we will review the process to better ensure that Supervisors from the same location do not assess preventability to the Operator. The intent is to ensure that a non-biased review of the incident is conducted. In addition we will review the process to ensure that all relevant information, such as GPS technology, is used prior to determination of preventability. Violations of the Highway Traffic Act are the base level of standard. The Commission trains its Operators to a higher standard, training Operators to operate defensively and avoid collisions even when other	Streetcar Trans.

#	Action	Description	Dept.
		users of the road violate the Highway Traffic Act. New process to be developed by end of Q1. Collision Investigation – Chief Mobile Supervisors, who are to be dispatched to all major incidents, attend *At Scene Collision Investigation* training conducted by Toronto Police. As a result of this training, we are reviewing the criteria for 'major incident' with a view to dispatching Chief Mobile Supervisors to investigate less severe TTC / pedestrian collisions and other collisions with injuries. Decision on new criteria due end of Q1.	Subway Trans.
5	Eliminate The Deviation Display On The TRUMP Units	The purpose of this initiative is to increase operating safety. It involves removing the display that informs Operators of their current deviation from schedule. Operating safely requires driving to the conditions – road, lighting, traffic etc. Schedules do not take these conditions fully into account, so operating to schedule when the conditions are unfavorable places safety at risk. By removing the schedule deviation display: • Operators will be more focused on driving to the conditions; • The buses will move more safely and more consistently along the route. Beginning Sunday January 11, 2015, buses operating on East Mall (111) will have the deviation display covered. As a benchmark, the Trip Times and Average Speeds of the buses on East Mall (111) for the week of January 4th to 10th will be recorded. The results for subsequent weeks will be compared to this standard. Operator and customer feedback will be considered as will statistics on Departure Time punctuality, Arrival Time punctuality, and Short Turns for which the goal is zero. Once service on the East Mall is deemed safe, consistent and sustainable, removal of the schedule deviation displays will then expand to other routes.	Bus Trans.
6	Identify Best Practices	The TTC is reaching out to our global partners in public transit to investigate new and effective ways to prevent bus accidents. Organizations including the Canadian Urban Transit Association (CUTA), the	Safety & Env.

#	Action	Description	Dept.
		American Public Transit Association (APTA) the International Union for Public Transport (UITP) and the Transportation Research Board (TRB) provide valuable insight into how other transit companies prevent bus accidents. Industry best practices relating to driver selection, operator training, public awareness, bus technology safety improvements, and management of the operating environment are key areas of focus that the TTC is studying in order to reduce bus accidents. Blind spot camera systems, distraction avoidance policies, pedestrian/cyclist collision avoidance technologies and public outreach programs are some of the practices used by city transit organizations that the TTC is investigating. In addition to examining what other transit companies are doing to reduce accidents, the TTC is also looking at other organizations that operate in a city environment, including the City of Toronto and its fleet of large vehicles. By comparing the success of other organizations with their accident reduction policies and practices, the TTC can select practices and technologies that will have the greatest impact on improving safety for our customers, employees and the public. An evaluation of recommended practices to be complete by end of Q1. In addition, TTC has polled other transit agencies to determine how our accident rate compares to our peer group. As of January 7, 2015, the following data have been assembled.	

<table>
<tr><th>#</th><th>Action</th><th>Description</th><th>Dept.</th></tr>
<tr><td></td><td>Identify Best Practices</td><td>
Transit Agency Comparison – Annual Total Bus Collision Rate
(Number of Collisions per 1,000,000 Miles)
<table>
<tr><th>Agency</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014 *</th></tr>
<tr><td>King County Metro (Seattle)</td><td>26</td><td>26</td><td>28</td><td>26</td><td>27</td></tr>
<tr><td>Orange County (California)</td><td></td><td></td><td></td><td>39</td><td>34</td></tr>
<tr><td>MBTA (Boston)</td><td></td><td></td><td></td><td></td><td>67</td></tr>
<tr><td>SFMTA (San Francisco)</td><td></td><td></td><td>50</td><td>59</td><td>59</td></tr>
<tr><td>SEPTA (Philadelphia)</td><td>41</td><td>44</td><td>34</td><td>34</td><td></td></tr>
<tr><td>MTA (New York)</td><td>45</td><td>47</td><td>48</td><td>48</td><td>50</td></tr>
<tr><td>STM (Montreal)</td><td>70</td><td>65</td><td>58</td><td>55</td><td></td></tr>
<tr><td>TTC</td><td>32</td><td>31</td><td>31</td><td>33</td><td>32</td></tr>
</table>
*Most recent data available – data does not represent to the end of 2014
</td><td></td></tr>
<tr><td>7</td><td>Investigate New Technologies to Mitigate and Prevent Accidents</td><td>
Investigations are in the preliminary stages and are currently focused on forward facing dash cameras.

TTC buses are equipped with a vehicle surveillance camera system. This system captures patrons entering and exiting the vehicle in addition to footage of the passenger seating area. The system currently does not include forward facing dash cameras, however, can be expanded to include footage of the roadway in front of the vehicle. Forward facing cameras used by other agencies typically include a frame of three meters on either side of the vehicle to 10 meters directly in front. Potential uses for this video information include:

Establishing traffic signal indications as moving vehicles enter intersections.
Recording road surface and traffic conditions at the time of events of interest.
Recording contacts made with vehicles, objects and pedestrians in front of vehicles.
Recording unsafe actions by other vehicles immediately in front of TTC vehicles that require sudden hard brake applications, often causing on-board injuries to passengers.

</td><td>Bus Maint. & Shops, Tech. Svcs.

Bus Maint. & Shops, Tech. Svcs.</td></tr>
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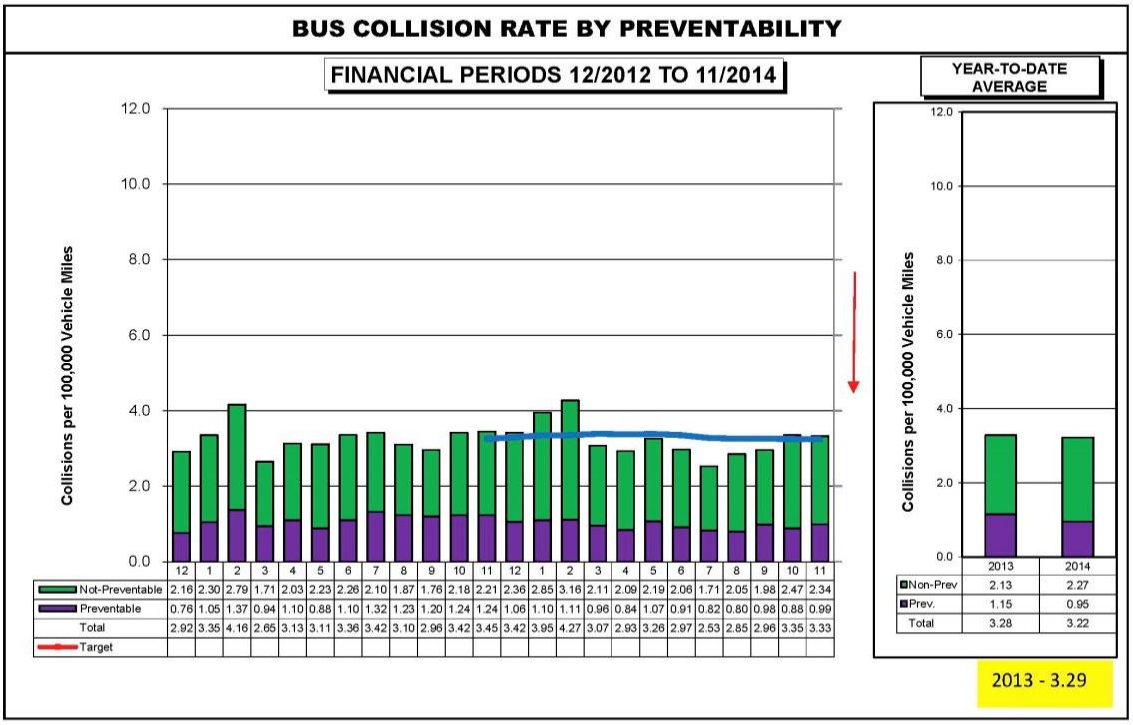
#	Action	Description	Dept.
		5. Collecting identification information on third parties involved to help with claim recovery. In addition to the above, forward facing dash cameras can also be used to help identify to help minimize risk. This information can then be used to counsel and train operators when needed. To further investigate forward facing dash cameras, materials are being purchased to prototype one bus. The installation of a prototype could commence by January 16, 2015. The evaluation will extend until February 28, 2015. Other technologies that are available on the market and that will be investigated include: • Collision Avoidance Systems • Operator Fatigue Detection Systems • Vehicle Turning Warning Systems Preliminary investigation and draft report on other technologies to be completed by March 3, 2015. The CAD/AVL systems that will be introduced onto TTC buses commencing in 2016 will also assist staff in the proactive management of safety. CAD/AVL systems provide staff with the ability to monitor in real time vehicle acceleration, speed and location. It will also provide the ability to live stream video footage from the vehicle including any video from forward and operating facing dash cameras. Real time information will assist staff to observe and assess traffic conditions, operator behaviours and immediately adjust routes, schedules or driver practices as necessary. While CAD/AVL is a budgeted project and prototyping will be commenced for forward facing cameras, the other technologies listed above will require more in-depth investigation to determine the benefits and costs for implementation. Cost impacts will not only be limited to the purchase and install of new technologies. Implications to training & increase to	

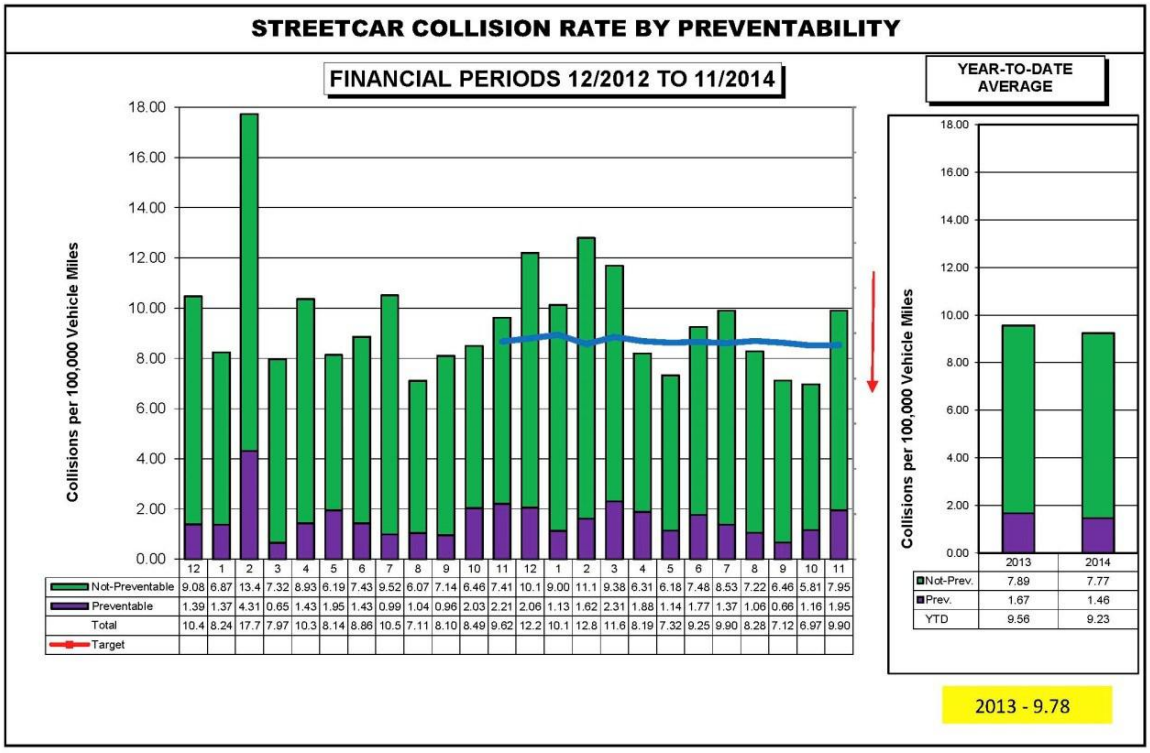
#	Action	Description	Dept.
		bus maintenance windows will also need to be considered. The above summary also applies to Streetcar Operations. Forward facing dash cameras already exist on the new Low Floor Light Rail Streetcars. Retrofit of the legacy fleet will be similar to that of the bus fleet. Bus Maintenance & Streetcars will collaborate on investigations of other technologies. Finally, the TTC will develop a standard for forward facing cameras that is consistent across all modes.	Streetcar Maint.
8	Radar Checks of Buses and Streetcars	The purpose of this program is to obtain voluntary compliance by Operators to obey speed limit laws thereby creating a safer driving environment. Transit Enforcement Unit (TEU) Special Constables will partner with Transportation Supervisors to measure the speed of TTC vehicles using Radar. The program will use GPS data from the vehicles to determine the routes and locations that have the highest incidents of speeding infractions. Operators found to be in violation of the speed limit will be informed of the infraction. The incident details will be entered into a report. The report will be used by Transportation Management to performance manage operators and to stress the need to operate safely at all times including abiding by the HTA and the speed limit laws. Implementation timing TBD.	Transit Enfrmt Unit & Bus Trans.
9	Five Year Review of Incident Data	We conducted an analysis of TTC incidents over the 2010-2014 time frame. Summary results are included as Attachment Two. Further action plans will be considered on the basis of trends or hot spots identified in this analysis. First action plan due end of Q1.	Bus Trans. + Safety & Env.

#	Action	Description	Dept.
10	Review Operator Training	A wide ranging initiative is underway to review our approach to training new operators and recertifying operators throughout their career with TTC. The elements of this initiative are listed below. 1. Finalize the review of the Benchmarking of Operator training by mode (Bus, Streetcar, Subway, Accessible Transit) by end of Q1. 2. Implement the revised MTO Curriculum for Bus Initial Training by March 30,2015. 3. Revise the Recertification training to include more hard skills, and test for specific driving skills by February 6, 2015. 4. Review the potential to increase the frequency of the Recertification cycle for Bus from 5 years to every 3 years by February 27, 2015. 5. Include a separate module in Initial and Recertification training on elements of human behaviour, such as distracted drivers, pedestrians and cyclists to augment the current curriculum on this topic. For the Initial training by March 30, 2015 in line with the MTO Curriculum revision and by February 6, 2015 for the Recertification training. 6. Conduct more training in the evenings and/or off hours to enable the trainee to experience more night driving and extra driving time. 7. Conduct more training on the weekends to enable the trainee to experience more driving time. 8. Review the ability to provide a longer training period for new Instructors in the Department. To be further reviewed as this is impacted by the increasing number of new hires. 9. Evaluate the cost to secure dedicated training vehicles by April 30, 2015. 10. Review the potential to reinstate a formal structured assessment to monitor Operator performance post training by February 27, 2015. 11. Record completed Assessment of Defensive Driving (ADD's) by employee in our Learning Management System so that completion can by	Trng & Devel't

#	Action	Description	Dept.
		tracked, monitored and followed-up with those not completed by February 6, 2015. 12. Work with divisional management to formalize more structure for Divisional Training Days.	
11	Update process for Recruitment of Operators	The Operator recruitment drive regularly receives a large number of applicants. However during the last drive, which was open from April 2013 to May 2014, the Operator Recruitment Team received over 29,000 applicants. The overwhelming interest in operator roles resulted in a backlog in the recruitment process. To deal with the backlog the recruitment team is currently reviewing best practices with similar transportation organizations, in addition we are undertaking a process review to identify and address inefficiencies and bottlenecks. Further the team is reviewing our selection process to ensure it is aligned with our requirements. Updated process will be implemented before next operator recruitment program.	H.R.
12	Community Outreach	Customer behaviour, and the behaviour of pedestrians and other road users, is also critical input to safety on, and around, a TTC vehicle. Working with Transportation Services at the City of Toronto a number of interventions and channels will be evaluated to determine the most efficacious manner to influence and manage this behaviour. Given that only so many messages can be supported and communicated at any given time, a balance will need to be made between cost, effectiveness of approach and other competing priorities regarding customer behaviour. First campaign will be delivered in Q1 2015.	Cust. Comms

Appendix 2
Collision Rates by Mode





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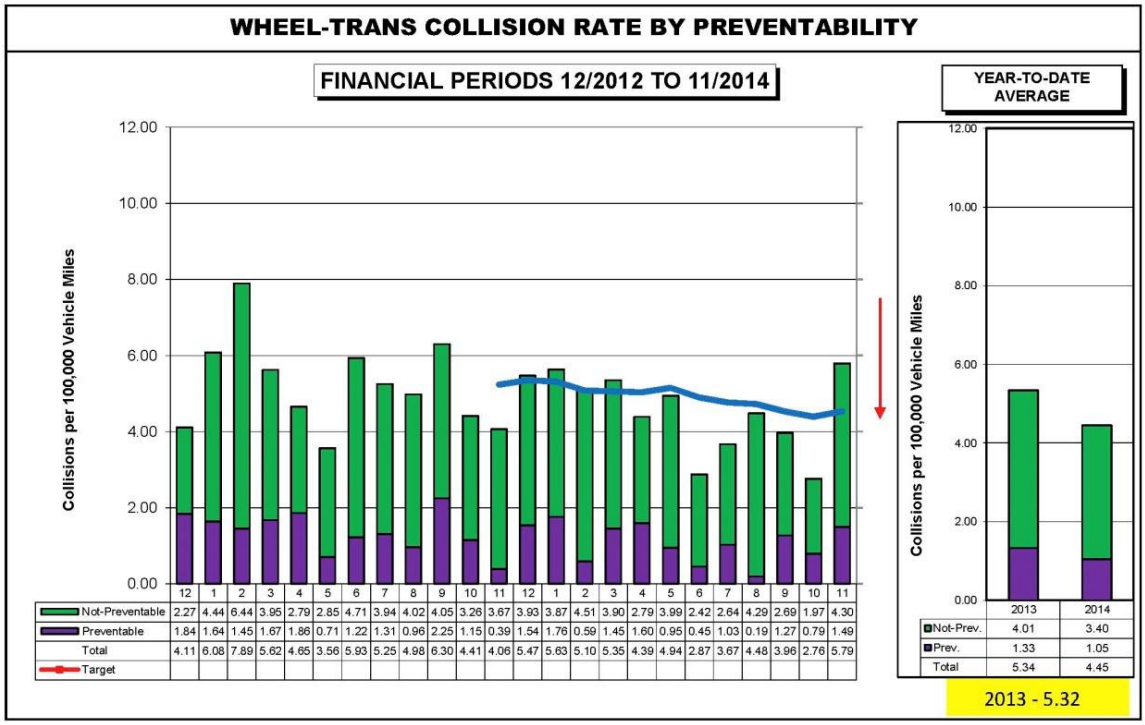

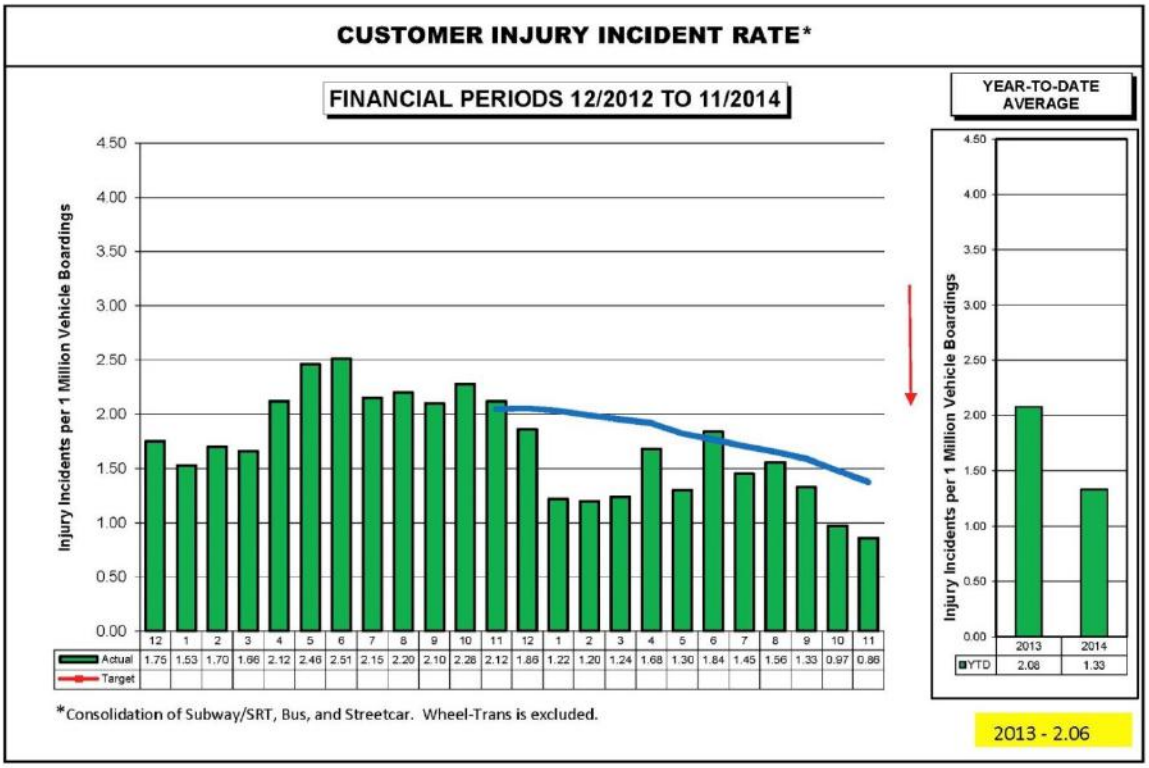

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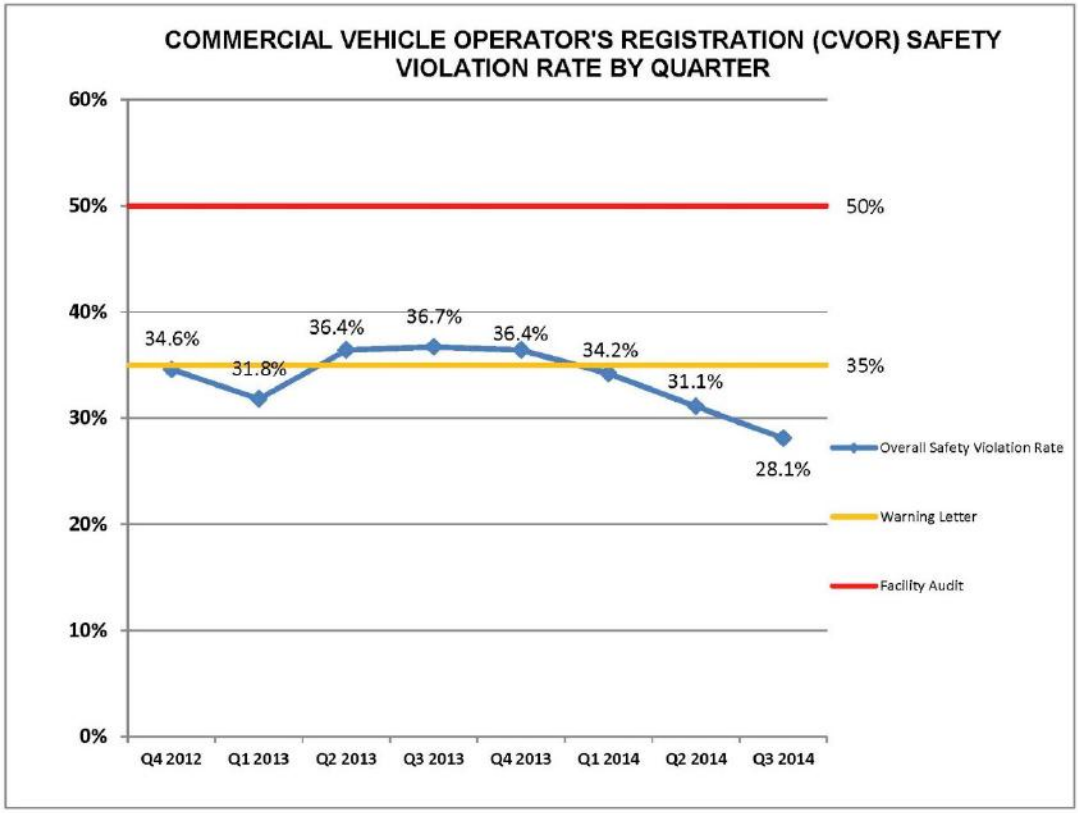
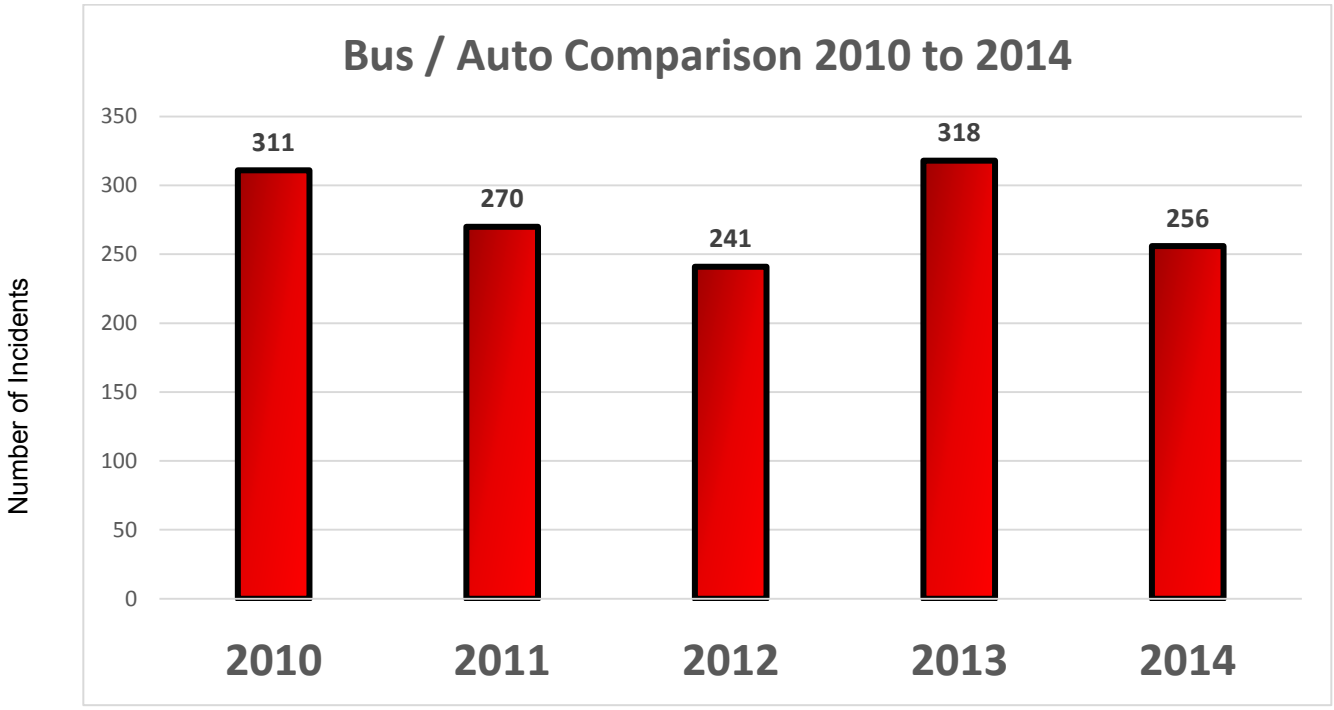
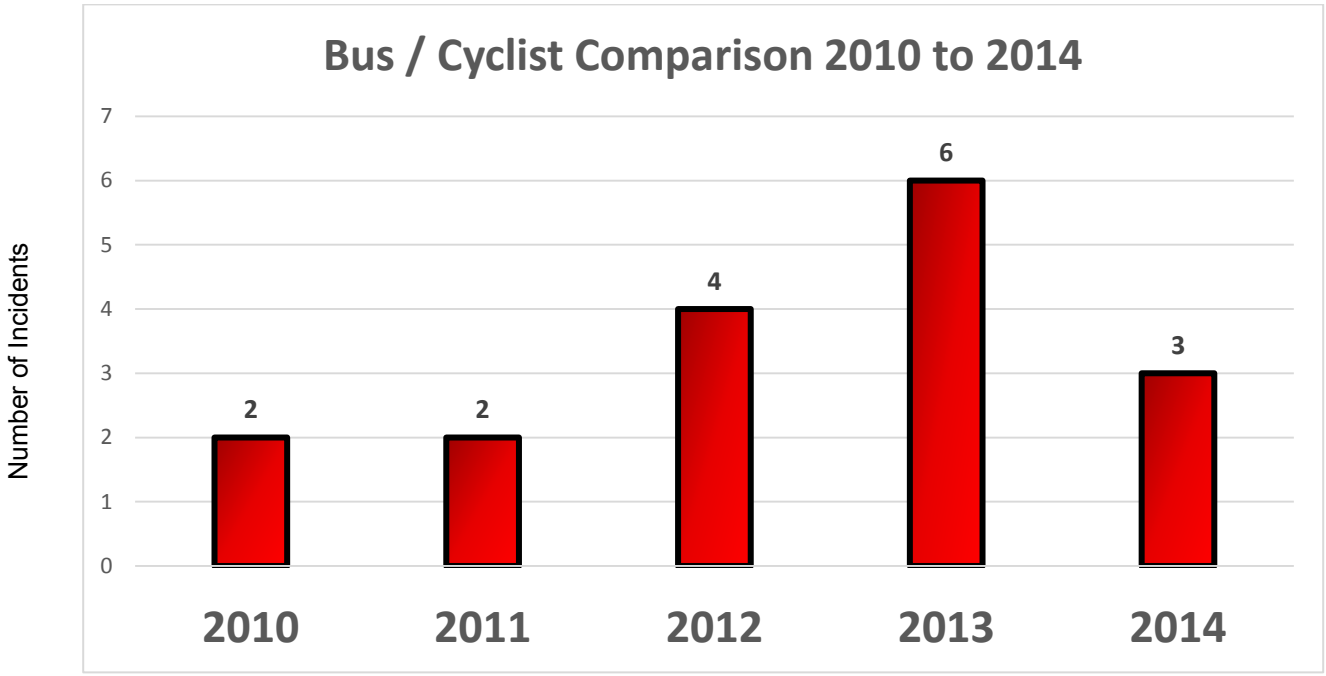


Appendix 3
Five Year Accident Summary





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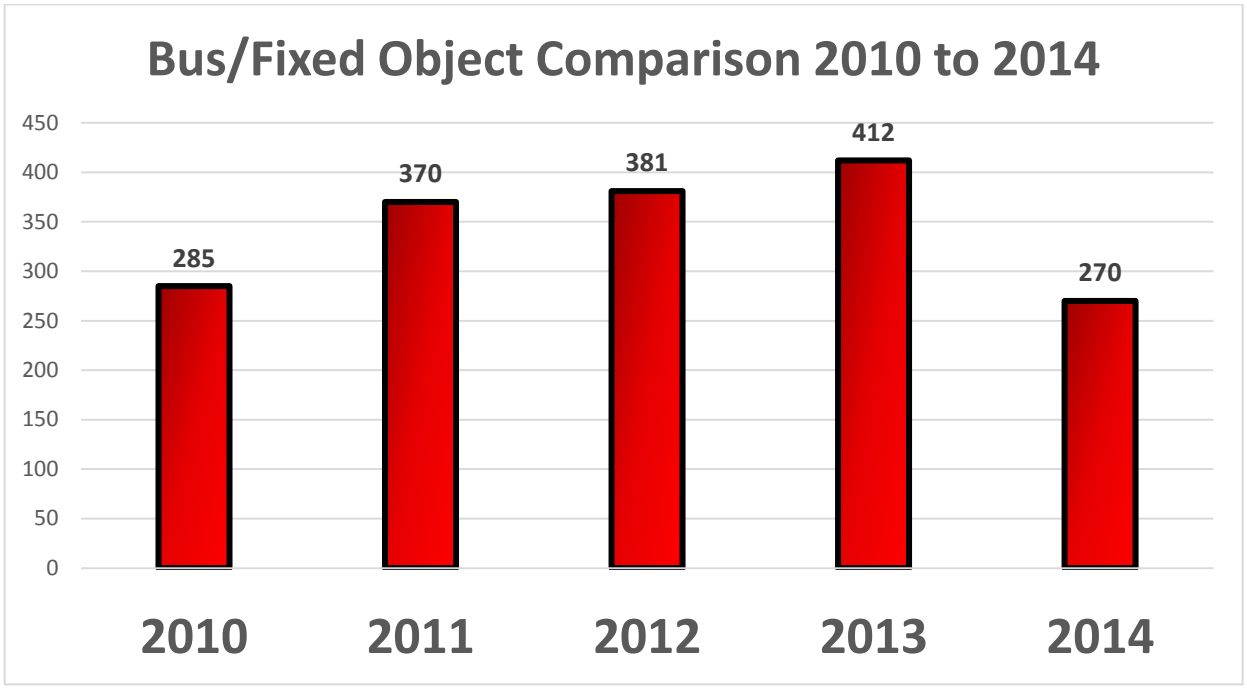

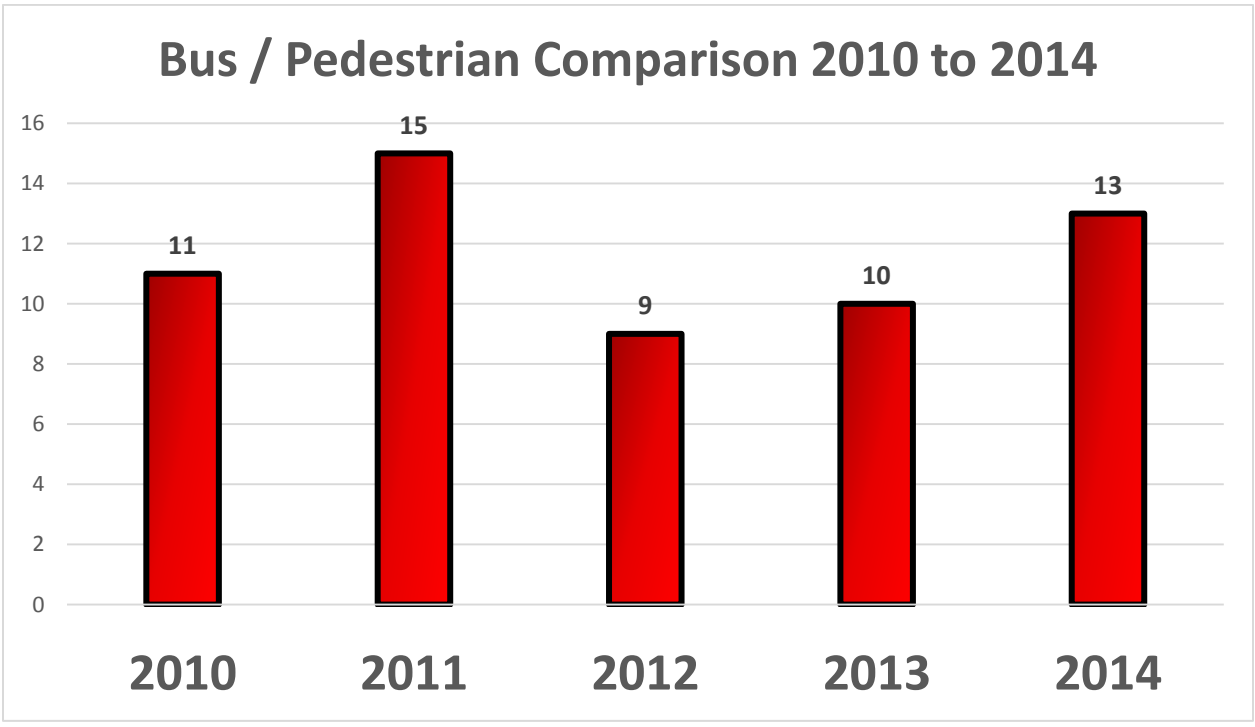

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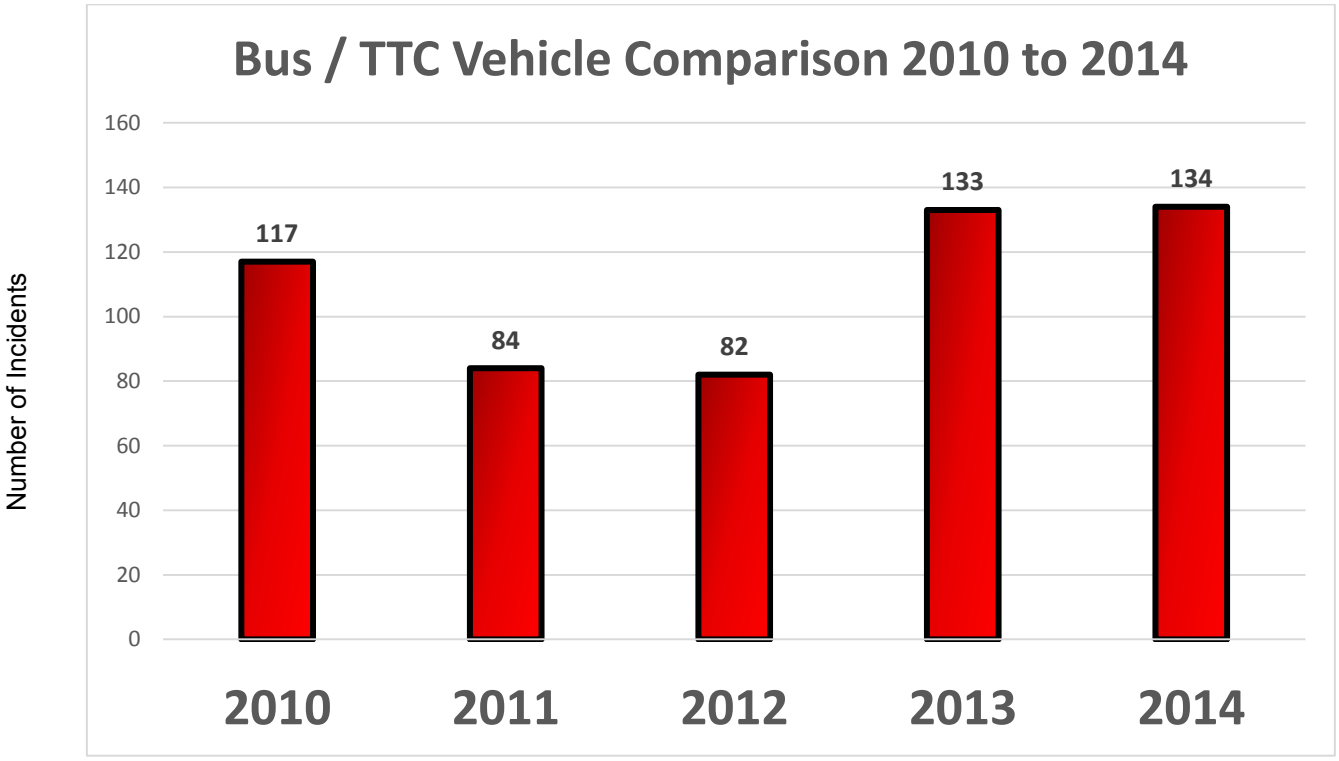

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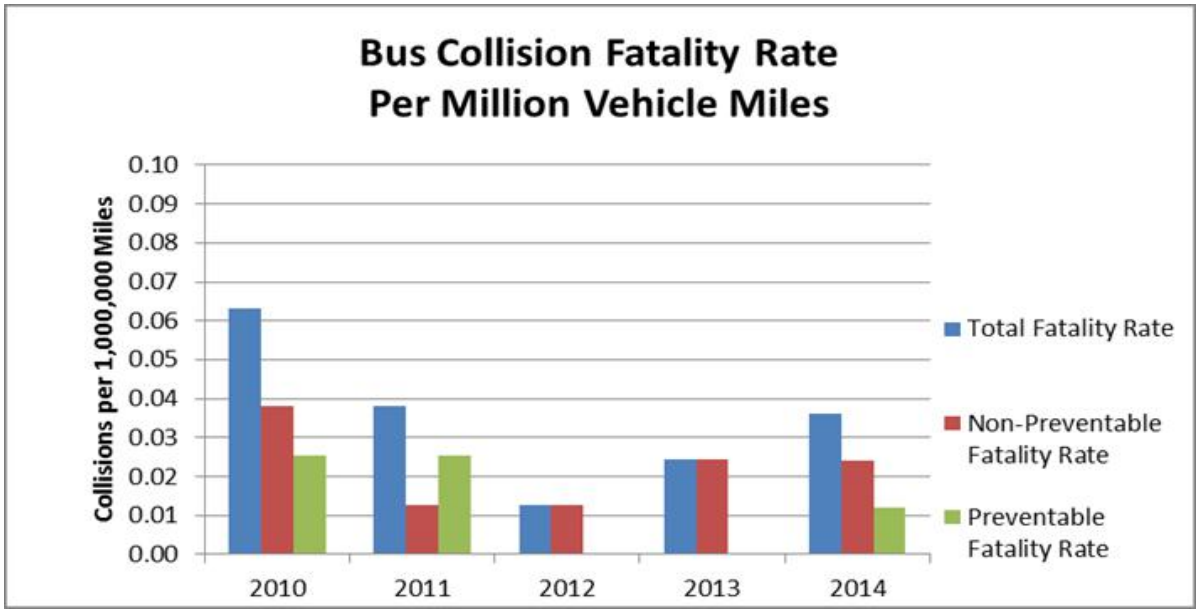

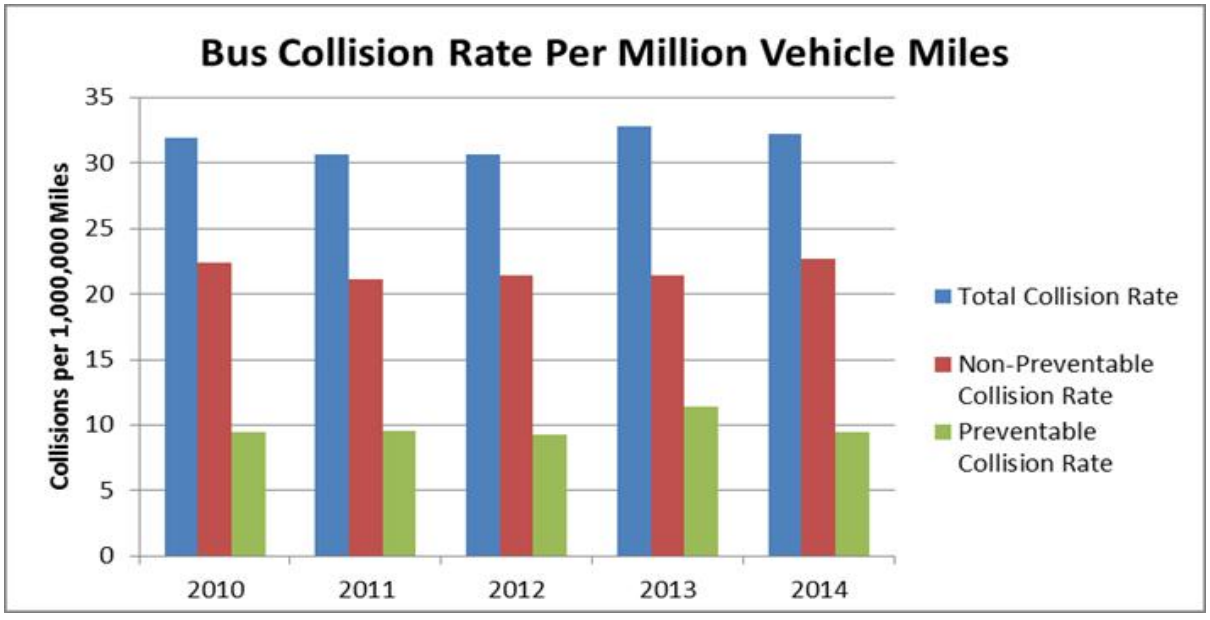

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