



Metro

**OPERATIONS COMMITTEE
JANUARY 20, 2005**

SUBJECT: ACCIDENT REDUCTION PROGRAM

ACTION: RECEIVE AND FILE

RECOMMENDATION

Receive and file report on accident reduction strategies under consideration for implementation in fiscal year 2006.

ISSUE

This report updates the board on specific strategies under consideration for implementation by FY2006 to reduce bus accidents.

DISCUSSION

In July 2004, the Chief Executive Officer presented his top ten directives to staff, the first being, "We will continue our safety efforts, reducing accidents and lowering costs." The Safety's First program is MTA's principal means to achieving this objective through training, creating management systems, business processes, and staff skills focused on safety.

Since the Safety's First kick off in the first quarter of FY 2002, substantive progress has been made toward improving safety and achieving the workers' compensation and accident reduction goals.

- Quarterly reported new workers' compensation claims have fallen from 791 during the first quarter of fiscal year 2002 to 348 during the last quarter of fiscal year 2004, a 56% reduction.
- Bus accidents claims reported have fallen from 241 in October of 2001 to 187 by June of 2004, a 22% reduction.
- Bus vehicle accidents have been reduced from 3.91 per 100,000 hub miles in FY02 to 3.41 in FY05 (Year to Date), a 13% reduction.

To continue driving down bus vehicle and passenger accident rates, staff has identified a series of seven new strategies, as outlined in the following sections of this report. These strategies were developed and refined based upon a series of meetings with transportation and maintenance managers, Vehicle Technology, Communications,

Corporate Safety, and bus operators with outstanding accident records. In addition, the strategies include best practices of existing accident reporting systems, accident review processes, and reward and recognition programs from various transit agencies, including New York City, Orange County, San Diego, Houston, and Minneapolis.

Attachment A provides a cost-benefit summary of these recommended strategies.

At an average cost of accident claims of \$9,621 per vehicle accident plus repair costs, staff estimates that any costs associated with this program will be more than offset by the savings achieved.

RECOMMENDATIONS

Establish a Points-Based Accident Reporting System

Such systems are used by many transit agencies to identify training needs and to determine discipline for avoidable accidents. Staff reviewed four points-based accident reporting systems to determine the benefits of implementing this type of system at Metro. While implementation of this system alone will not have an impact on the rate of accidents, implementation of a points-based accident reporting system will provide management with a better tool to analyze accidents and more specifically focus training based upon accident severity, injury severity, and violation of vehicle codes or defensive driving techniques. Since discipline for accidents is administered in accordance with the collective bargaining agreement, the points-based accident reporting system is not currently being considered for discipline.

Transportation and Maintenance managers reviewed the points systems currently being used at other transit agencies. Based upon their input, staff developed a points-based accident reporting system incorporating the best features of other systems and capable of identifying training needs of operators involved in both avoidable and unavoidable accidents. The four parameters of the new Metro bus accident reporting system will be programmed into the current Transit Safe injury and accident reporting system. A summary of the Metro bus accident reporting system is shown in **Attachment B**.

Enhance the Accident Review Board (ARB) Process

The accident review board is part of a contractual process used to determine whether accidents are avoidable or unavoidable. With a large percentage of accidents being coded as unavoidable, the current ARB process was reviewed and it was found that the employees assigned to the ARB panels were not always consistently trained in accident avoidance techniques. Management determined that the current ARB procedure manual should be revised to require the Senior Safety Specialists to participate in the first level of ARB review panels and for a centralized group of Transit Operations Supervisors to participate in the second level ARB panels.

The Senior Safety Specialists and the Transit Operations Supervisors assigned to the ARB panels will receive extensive training on accident investigation and avoidability prior to being

assigned to the panels. Labor Relations employees participating in the ARB process will also be provided with extensive training on accident investigation and avoidance.

Line Instructors are also contractually required to participate in the first and second levels of the ARB process. To ensure that Line Instructors are properly qualified and trained to participate in the ARB process, the minimum qualifications for line instructors were enhanced and both existing and new line instructors will be required to go through a two-week training program to certify them to instruct new operators. In addition, operators selected to participate in the ARB process will be required to attend an additional a one-week TSI collision investigation course on accident investigation and avoidance.

Develop a Proactive Training Program

Operations Central Instruction will initiate a program that more proactively identifies operators in need of training. With the current system, operators involved in one avoidable accident are assigned to a one-day defensive driving course, and operators involved in a second avoidable accident are assigned to a one-day, one-on-one training course. Operators involved in accidents that are coded as unavoidable do not receive any additional training.

The more proactive training program will require that operators with one avoidable accident be assigned to a two day training course which will include defensive driving, simulator driving training, training on the new Vigil system (described below), and will be required to take pretests and posttests to ensure comprehension of the defensive driving techniques. Operators with a second avoidable accident will be assigned to participate in a two day, one-on-one training course. Since a large number of unavoidable accidents may indicate a need for improved defensive driving skills, Operations Central Instruction will begin a one-day defensive driving course for operators with three or more accidents coded as unavoidable in addition to the training provided to operators with avoidable accidents.

The quality of the training programs is also being enhanced with the use of new operator training technology. The bus training simulator allows operators to practice standard driving techniques as well as more advanced training on avoiding hazards that cannot be provided on a standard bus, such as a person stepping off a curb, vehicles cutting off the bus, and emergencies on the bus. The new Vigil system also improves the quality of the training by videoing taping the operator's on-street training through the use of four cameras observing the area in front of the vehicle, right side of the vehicle, and the operator. The Vigil system also records vehicle speed, following distance, and braking force to identify unsafe driving habits. Instructors evaluate the training videos and operating data with the bus operators to identify unsafe operating behaviors, document the behaviors, and provide consistent and effective training to eliminate these unsafe behaviors and reduce accidents.

Develop a Rewards and Recognition Program

Rewards and recognition programs are used by many agencies in both the public and private sectors to promote and increase awareness of safety and performance measures. These rewards and recognition programs have proven effective in focusing employees on key performance issues and improving performance in these areas. Staff contacted several transit agencies to identify rewards and recognition programs used at other transit agencies

and to determine the effectiveness of these programs. These programs were discussed in meetings with the managers and best operators to identify the advantages and shortcomings of these programs.

Both the managers and best operators were in agreement that a personal rewards system focused on safety and accident reduction would result in improvements in performance in these areas if done properly. The managers and best operators felt that it was important to provide rewards that were substantial enough to be desired by employees, rather than certificates and pins that were considered low in value. Belt buckles identifying years of safe driving appeared to be valued by some operators, with one operator wearing an old belt buckle received from the Southern California Rapid Transit District several years ago, and some operators indicating no interest in receiving belt buckles.

Based upon comments from managers and best operators, staff developed a comprehensive rewards and recognition program that takes into account the most effective aspects of the rewards and recognition systems used by other transit agencies. The proposed rewards and recognition system incorporates a combination of personal and team rewards along with recognition for the operators with the best records for avoiding accidents.

To reduce the budget impact, staff is recommending that the rewards and recognition program be implemented over a two year period.

Enhance Bus Safety Features

Safety features on buses operated by Metro are some of the most advanced of transit buses operated across the country. However, the vehicle technology staff was tasked with reviewing several vehicle safety systems for potential safety enhancements. The following paragraphs identify the safety issues reviewed and associated recommendations.

- **Improve operator visibility** – To improve operator visibility, the engineering staff reviewed the installation of convex mirrors inside and outside of the buses. The installation of convex mirrors inside of buses is not recommended because they do not improve visibility beyond a few feet in front of the bus and could distract the operator during turning. Staff does recommend the installation of the larger, convex mirror on the street side of buses to improve the vision of the right side of the bus during turns. In addition, staff recommends that specifications for new buses require operator visibility to be maximized by limiting the size of windshield posts, installing exterior mirrors in locations that do not create blind spots, and installing larger, convex mirrors on the street side of buses.
- **Audible turn signal** – To increase awareness of pedestrians, an audible turn signal was considered for buses making right turns. San Francisco was the only transit agency found to have purchased buses with audible turn signals, but the audible turn signals were turned off in response to noise complaints. Staff recommends that the Vehicle Technology Department continue to evaluate audible turn signals with a distinctive, low decibel sound that does not disturb residents along bus routes.
- **Larger LED turn signal lights** – To increase awareness of pedestrians, the installation of additional and larger LED turn signal lights were considered for the street side of buses. Staff recommends the installation of the larger, LED light as a replacement for existing

turn signal lights on Metro buses. In addition, staff recommends that new bus specifications include larger, LED turn signal lights and consider adding additional turn signal and clearance lights to the right side of the bus.

- **Mirrors with LED turn signal indicators** – The installation of mirrors with LED turn signal indicators on the existing fleet was considered to increase the awareness of buses making right turns. Mirrors with LED turn signal indicators are available for replacement; however, the existing buses are not wired to support the LED turn signal mirrors. Do to the extensive cost of adding the additional wiring, the mirrors with LED turn signal indicators are recommended for all new bus purchases but not for retrofit of existing buses.

Develop a Bus Safety Awareness Campaign

Presently, eighty-five percent of bus operator accidents are identified as unavoidable with most of these accidents being caused by drivers of other vehicles. The bus safety awareness campaign is being designed to reduce accidents by both promoting the public's safe behavior around buses and encouraging safe operation of Metro buses by Metro operators. The ongoing education campaign will educate the public on the various hazards when walking, biking, and driving near Metro buses. The safety awareness campaign will also provide regular communications to operators to increase their awareness of potential hazards and to encourage safe operation of Metro buses.

The objective of the safety awareness campaign is to reduce bus accidents involving pedestrians, bicyclists, and automobiles. Metro communications will target motorists, pedestrians, and bicyclists with a series of messages to increase awareness of bus "no zones" or potential blind spots, increase the awareness of right turn pivot areas, and inform pedestrians and bicyclists of the importance of being visible by wearing light colored or reflective clothing.

The safety messages will be included in several communication mediums, including

- Five-minute bus safety video to be shown in the Metro Experience, at community events, and at trade shows,
- Ten-second video spots to be shown at movie theaters to target young adults and bicyclists,
- Ten-second safety messages for Traffic Reports on local radio stations,
- Printed safety messages for inclusion in Metro Brief newspaper ads, and
- Safety messages included on bus take ones and interior bus car-cards.

Implement Accident Mapping Software

Police agencies have effectively used accident mapping software to identify traffic and accident problem areas. The software maps the coordinates of accidents and plots this information on Global Information System (GIS) maps to identify streets and highways with high accident rates. Clusters of accident points on the GIS maps can easily identify problem areas. The software will also analyze the types of accidents and provide a detailed breakdown showing the direction of travel, type of impact, and cause of accident.

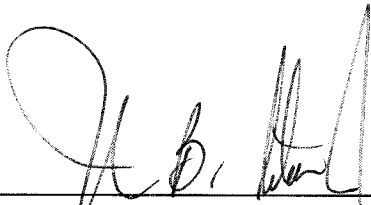
Transportation managers at the bus operating divisions are currently doing similar analysis but with a much more outdated and less effective system. The managers currently plot pins on large system maps to identify problem areas then manually review accident records to determine the direction of travel, type of impact, and cause of accident, which is very time-consuming and inefficient.

Operations Performance Analysis is currently working on mapping existing accident data to identify problem accident areas. The software will allow management to identify problem areas quickly and assign increased supervision, request additional law enforcement, or recommend reengineering of poorly designed intersections to resolve these problem areas.

NEXT STEPS

During the remainder of this fiscal year, staff will begin implementation of the accident reduction strategies with zero or limited budget impact. The programs outlined in this report with more significant budget impacts will be further advanced in preparation for inclusion in the FY06 budget, and will be brought back to the Board as part of the budget approval process for FY06 and future years.

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**ATTACHMENT A
COST / BENEFIT ANALYSIS
ACCIDENT REDUCTION STRATEGIES**

Accident Cost Summary	Annual Cost
Risk Management Accident Claims *	23,292,441
RRC Accident Repairs - FY04 Budgeted	1,181,229
Division Accident Repairs **	3,212,486
Total Accident Repair Cost	27,686,156

*Estimated accident claim costs based upon actual claims received through Nov. 2004

**Extrapolated based upon actual repair costs from Div. D equipment damage reports

	Savings per percentage reduction in accidents	Net Impact for FY07 and beyond
2%	553,723	(644,477)
4%	1,107,446	(90,754)
6%	1,661,169	462,969
8%	2,214,892	1,016,692
10%	2,768,616	1,570,416

Accident Reduction Strategy	Incremental Costs - FY06	Total Incremental Cost for FY06	Incremental Cost FY07 and beyond
<u>Points Based Reporting</u>			
- Programming	3,000	3,000	0
<u>Accident Review Boards</u>			
- Sr. Safety Specialist Participation			
- Labor	0		
- Training	0		
- Centralized TOS Participation			
- Labor	160,000		
- Training	0		
- Labor Relations			
- Training	0	160,000	160,000
<u>Proactive Training Program</u>			
- OCI instructor and material costs	0		
- Backfill for operators with 3 unavoidable	41,000		
- Backfill for operators in two day training	257,000	298,000	298,000
<u>Reward and Recognition Program</u>			
- Bus Operator	77,000		
- Rail Operator	4,000		
- Operations - ATU	37,000		
- Operations - TCU	6,000		
Scheduler	1,300		
AFSCME	10,800		
NC	7,500		
Security	1,600	145,200	145,200
<u>Bus Safety Features</u>			
- Larger convex mirrors	334,300		
- Audible turn signals	0		
- Larger LED turn signal lights	159,612		
- Mirrors with LED turn signal lights	0	493,912	0
<u>Safety Awareness Campaign</u>			
- Bus safety video	250,000		
- Movie theater ads	300,000		
- Safety materials for DAC	45,000		
- Metro Brief and radio ads	0		
- Metro Kids DAC presentation and safety game	0		
- Bus take-ones and interior car cards	0		
- Division safety posters	0	595,000	595,000
<u>Accident Mapping Software</u>			
	0	0	0
Total Cost of Accident Reduction Strategies		1,695,112	1,198,200

Metro Accident Points System

In Transit Safe, Supervisor has 4 pull-down menus that identify the severity of the incident. The supervisor will select from 5 options for damage severity, injury severity, vehicle code violation severity, and violations of company policy/defensive driving techniques. The supervisor will not assess points, as the system will automatically calculate points.

Damage Severity	Pts.
<u>Extensive</u> damage to Metro vehicle or extensive property damage (> \$10,000)	4
<u>Significant</u> damage to Metro vehicle or other property (\$3,000 to \$10,000)	3
<u>Moderate</u> damage to Metro vehicle or other property (\$1,000 to \$3,000)	2
<u>Minor</u> damage to Metro vehicle or other property (< \$1,000)	1
No damage to Metro vehicle and No other property damage	0

Injury severity	Pts.
Injury (ies) requiring extensive medical treatment, hospitalization, or resulting in death (s).	4
Injury (ies) requiring transit for treatment at a hospital.	3
Minor injury (ies) with treatment at the scene	2
Minor injury (ies) with no treatment required	1
No injury (ies)	0

Vehicle Code Violation Severity	Pts.
<u>Multiple</u> violations of the vehicle code and/or violations resulting in vehicle code points of 4 or more.	4
<u>Multiple</u> violations of the vehicle code and/or violations resulting in 3 vehicle code points.	3
<u>Moderate</u> violation of the vehicle code and/or violations resulting in 2 vehicle code points.	2
<u>Minimal</u> violation of the vehicle code and/or violations resulting in 1 vehicle code point.	1
No violation of the vehicle code.	0

Violation of Defensive Driving / Company Policy	Pts.
<u>Severe</u> disregard for company policy and/or multiple violations of defensive driving techniques (4 or more violations).	4
<u>Multiple</u> violations of company policies and/or <u>multiple</u> violations of defensive driving techniques (total of 3)	3
<u>Moderate</u> violation of company policies and/or <u>moderate</u> violation of the defensive driving techniques (total of 2).	2
<u>Minimal</u> violation of company policy and/or defensive driving techniques (one violation).	1
No violation of defensive driving techniques.	0

Point Table – Points are automatically calculated by summing points attached to the accident and injury severity along with the points assessed for violation of vehicle codes, company policy, and defensive driving techniques.

Points Table								
8	9	10	11	12	13	14	15	16
7	8	9	10	11	12	13	14	15
6	7	8	9	10	11	12	13	14
5	6	7	8	9	10	11	12	13
4	5	6	7	8	9	10	11	12
3	4	5	6	7	8	9	10	11
2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8

Sample of how the point system could be used to identify training needs. The point values and the flags for training could be adjusted based upon data analysis and training staff availability.

Critical Stage – One-on-one training

Warning Stage – SMART driving course