Testimony of
Mark V. Rosenker, Acting Chairman
National Transportation Safety Board
Before the
Commerce, Science, and Transportation Committee
Surface Transportation and Merchant Marine Infrastructure,
Safety, and Security Subcommittee
U.S. Senate

Oversight Hearing on Bus Safety
September 18, 2008

Good morning Chairman Lautenberg, Ranking Member Smith, and Members of the Subcommittee. My name is Mark Rosenker, Acting Chairman of the National Transportation Safety Board. I would like to take this opportunity to thank you and the Members of the Subcommittee for inviting me to testify today on motorcoach safety and for your continued interest in furthering the safety of our Nation's highways.

As you know, the Safety Board is charged with investigating accidents in all the modes of transportation, including highways, to determine their probable cause, and make recommendations to prevent similar accidents from happening again. Over the years the Board has done important work in virtually all aspects of highway safety including highway or vehicle design; roadway environment; occupant protection; driver performance; driver training; emergency response; roadway, bridge, and tunnel construction; and oversight by regulatory agencies at the local, state, and federal levels.

Today, I would like to discuss the Safety Board recommendations in areas regarding several important issues that the Board believes will make a difference in motorcoach safety.

As you know, intercity motorcoach travel is one of the safest modes of transportation, with approximately 17 occupant fatalities in an average year. It is also one of the most popular forms of travel -- transporting more passengers than either commercial air or rail travel, according to industry estimates. However, when accidents occur, they typically involve substantial numbers of people traveling in a single vehicle.

These passengers are often students or elderly persons who rely on motorcoach travel and have placed their safety in the hands of a professional motorcoach operator. That factor demands that motorcoaches meet the highest level of safety.

When tragic accidents occur, the public turns to the Safety Board for answers. Because the Board ultimately determines the probable cause and makes safety recommendations to prevent future accidents from occurring again, the public's confidence is reassured.

My discussions today include 3 areas: motorcoach vehicle improvements, motorcoach oversight improvements, and motorcoach technology improvements.

Motorcoach Vehicle Improvements

For decades, the Safety Board has been concerned with injury causation mechanisms with regard to the occupants in motorcoach accidents. These areas include motorcoach passenger protection, event data recorders, and motorcoach fire protection.

Motorcoach Passenger Protection

One of the primary causes of passenger injury in motorcoach buses is passengers being thrown from their seats. An accident and the overall injury risk to occupants can be significantly reduced during an accident by keeping occupants in the seating compartment throughout the collision. In addition, we found that equipping motorcoach side windows with advanced glazing may decrease the number of ejections of unrestrained passengers and decrease the risk of serious injuries to restrained passengers during motorcoach accidents.

In the Bluffton University accident in Atlanta, 7 of the 35 motorcoach occupants were killed. Twelve occupants were ejected from the motorcoach and 2 more occupants were partially ejected.

From 2000 through 2006, 43 motorcoach accidents occurred in which at least one occupant was fatally injured. In these motorcoach accidents, which resulted in 122 total fatalities, 41 occupants were partially or fully ejected from the motorcoach. In 15 of the 43 accidents, the motorcoach rolled over and 38 ejected fatalities occurred during the rollovers.

The Federal Motor Vehicle Safety Standards (FMVSS) contain 22 crashworthiness standards. Most of these standards exempt motorcoaches with a gross vehicle weight over 10,000 pounds, and no Federal regulations require that motorcoaches in the United States be equipped with an occupant protection system. Although motorcoaches must comply with both FMVSS 217, which establishes minimum requirements for motorcoach window retention and release, and with FMVSS 302, which establish standards for the flammability of interior materials, they do not have to comply with the host of other FMVSS occupant protection standards that apply to school buses and passenger cars.

A well-designed vehicle will manage the energy of a crash through its structure and minimize that energy transfer to passengers through an occupant protection system (compartmentalization), which functions to restrain the passengers within the seating compartment throughout the accident sequence and minimize the risk of injury. One example of compartmentalization has been studied, tested, and required in school buses but not in motorcoaches.

Between 1968 and 1973, the Safety Board issued a series of recommendations to the Federal Highway Administration (FHA) and the National Highway Traffic Safety Administration (NHTSA) on occupant protection. Additionally, in 1999, the Safety Board

published two special investigation reports that addressed motorcoach occupant protection. The recommendations included the following to NHTSA. The first two were also added to the Board's Most Wanted List of Transportation Safety Improvements (Most Wanted) in 2000:

- In 2 years, develop performance standards for motorcoach occupant protection systems that account for frontal impact collisions, side impact collisions, and rollovers. H-99-47

- Once pertinent standards have been developed for motorcoach occupant protection systems, require newly manufactured motorcoaches to have an occupant crash protection system that meets the newly developed performance standards and restrains passengers, including those in child safety restraint systems, within the seating compartment throughout the accident sequence for all accident scenarios. H-99-48

- Expand your research on current advanced glazing to include its applicability to motorcoach occupant ejection prevention, and revise window-glazing requirements for newly manufactured motorcoaches based on the results of this research. H-99-49

NHTSA's initial response indicated that work had begun to develop a research plan to accomplish these recommendations. Two years later, NHTSA reported forming the Bus Manufacturer's Council and in 2002, the agency held a public forum on motorcoach safety with Transport Canada. In 2004, the Safety Board was informed that NHTSA was focusing on roof crush and window retention technology to keep occupants in the vehicle and had initiated a joint study with Transport Canada.

In 2001, these recommendations were reiterated following a 1999 motorcoach accident in New Orleans in which 22 occupants were killed. Since 1998, the Safety Board has investigated 33 more motorcoach crashes involving 255 ejections and 123 fatalities. The majority of these rollover crashes clearly shows that passengers who remain in their seating compartments sustain fewer injuries and that ejected passengers are the most likely to be killed.

Unfortunately today, 9 years after the Safety Board concluded its bus crashworthiness special investigation, no Federal regulations or standards require that motorcoaches operated in the United States be equipped with occupant protection systems. Consequently, these motorcoach occupant protection recommendations were again reiterated in the Bluffton University accident in Atlanta.

However, NHTSA is making some progress. In December 2007, NHTSA performed a frontal motorcoach crash test and in February 2008, they performed two tests on motorcoach roof strength and occupant survivable space by the MGA Research Corporation, under contract to NHTSA, both of which were observed by Safety Board staff. The Board will carefully follow the analysis of those test results.

Another critical aspect of surviving a motorcoach accident is the ability of passengers to exit the vehicle in a timely manner. In the Safety Board's 1999 special crashworthiness report, we found that the emergency window exits need to be easily opened and that they need to remain open during an emergency evacuation. Consequently, the Board recommended that NHTSA:

- revise the Federal Motor Vehicle Safety Standard 217, "Bus Window Retention and Release," to require that other than floor-level emergency exits can be easily opened and remain open during an emergency evacuation when a motorcoach is upright or at unusual attitudes (H-99-9).

This recommendation was added to the Most Wanted list in 2000.

Motorcoaches must be strong enough to retain adequate survivable space for passengers during typical accident scenarios, and especially important regarding roof strength during rollovers. The recommendation to NHTSA in our 1999 special report was to develop performance standards within two years for motorcoach roof strength that provide maximum survival space for all seating positions and that take into account current typical motorcoach window dimensions (H-99-50). This recommendation was added to the Most Wanted list in 2000.

Finally, the Safety Board made recommendations to NHTSA as a result of the motorcoach accident investigation in Wilmer, Texas. These include:

- evaluate current emergency evacuation designs of motorcoaches and buses by conducting simulation studies and evacuation drills that take into account, at a minimum, acceptable egress times for various post-accident environments, including fire and smoke; unavailable exit situations; and the current above-ground height and design of window exits to be used in emergencies by all potential vehicle occupants (H-07-08), and

- require motorcoach operators to provide passengers with pretrip safety information (H-99-8).

Some progress has been made on these recommendations. In 2002, NHTSA met separately with motorcoach manufacturers and operators to address the issue of bus window retention and release; however, no research plan was agreed upon at those meetings. In the fall of 2004, NHTSA signed a Memorandum of Understanding with Transport Canada to carry out research in the areas of roof crush and window retention technology, with a goal of keeping occupants in the vehicle, because most motorcoach fatalities occur when passengers are ejected from the vehicle. NHTSA's research shows that in most accidents, the bus only rolls ¼ turn and comes to rest on its side; therefore installation of roof exits to serve as an alternate to window exits as a means of rapid emergency egress for bus passengers was also being examined.

On August 6, 2007, NHTSA issued their "Approach to Motorcoach Safety," which is a comprehensive review of motorcoach safety issues and the course of action that NHTSA will pursue to address them. In the course of its research, NHTSA will study its own regulations (such as FMVSS 217) which establishes minimum requirements for bus window retention and release to reduce the likelihood of passenger ejection in crashes—as well as international standards to determine the best way to proceed with the establishment of new requirements to better protect motorcoach passengers.

Event Data Recorders

Since motorcoach accidents are relatively rare events and motorcoach crash testing is prohibitively expensive, one way to collect crash data, evaluate crash pulses, and occupant protection issues is to equip motorcoaches with event data recorders. An event data recorder is a device or function that records a vehicle's dynamic, time-series data just before a crash (vehicle speed versus time) or during a crash (change in velocity versus time). Intended for retrieval after the crash event, EDR data can provide critical safety system performance information. To enhance crash testing with real-world data, it is important that data from motorcoach crashes be used for post-accident analysis, forensics, and design evaluation. At a recent SAE International symposium on highway EDRs, industry representatives presented the status of standards work, current system operating experience, and evidence that many operators currently use vehicle data recorders to improve operational control, to support insurance rates and claims, and to respond to litigation. The Board would like to see these devices on all motorcoaches.

Although crash forces can sometimes be estimated by comparing the accident vehicle's physical damage to instrumented crash test data, this method is not always reliable—particularly when crash test data are substantially limited as they are for motorcoaches, and when the accident involves a barrier collision or a collision with a hard paved surface. The ability to estimate crash pulses was also limited by the fact that some surfaces of the motorcoach may have undergone multiple collisions.

As a result of its 1996 safety study on child restraint systems and subsequent 1997 air bag forum, the Safety Board recommended that NHTSA address the on-board recording of crash data. About that time, the National Aeronautics and Space Administration and the Jet Propulsion Laboratory also recommended that NHTSA study the feasibility of obtaining crash data for safety analysis by installing crash recorders on vehicles. In response, NHTSA organized the EDR Working Group in October 1998. In 1999, the Board held a symposium on transportation recorders. Later that year, as a result of its special investigation on bus crashworthiness, the Safety Board made the following two EDR-related recommendations to NHTSA:

- require that all school buses and motorcoaches manufactured after January 1, 2003, be equipped with on-board recording systems that record vehicle parameters, including, at minimum, lateral acceleration, longitudinal acceleration, vertical acceleration, heading, vehicle speed, engine speed, driver's seat belt status, braking input, steering input, gear selection, turn signal status (left/right), brake light status (on/off), head/tail light status (on/off), passenger door status (open/closed), emergency door status (open/closed), hazard light status (on/off), brake system status (normal/warning), and flashing red light status (on/off) (school buses only). For those buses so equipped, the following should also be recorded: status of additional seat belts, airbag deployment criteria, airbag deployment time, and airbag deployment energy. The on-board recording system should record data at a sampling rate that is sufficient to define vehicle dynamics and should be capable of preserving data in the event of a vehicle crash or an electrical power loss. In addition, the on-board recording system should be mounted to the bus body, not the chassis, to ensure that the data necessary for defining bus body motion are recorded (H-99-53), and

- develop and implement, in cooperation with other government agencies and industry, standards for on-board recording of bus crash data that address, at a minimum, parameters to be recorded, data sampling rates, duration of recording, interface configurations, data storage format, incorporation of fleet management tools, fluid immersion survivability, impact shock survivability, crush and penetration survivability, fire survivability, independent power supply, and ability to accommodate future requirements and technological advances (H-99-54).

In October 2000, NHTSA organized the Truck and Bus Event Data Recorder Working Group to focus on data elements, survivability, and event definitions related to trucks, school buses, and motorcoaches. The group's results and findings were published in May 2002. In 2004, the NCHRP completed a project that examined current U.S. and international methods and practices for the collection, retrieval, archiving, and analysis of EDR data for roadside and vehicle safety. Both the IEEE and SAE have published voluntary industry motor vehicle EDR standards. A second SAE standards committee, J2728 -- Commercial Vehicle Event Data Recorders -- is specifically addressing data elements for medium- and heavy-duty trucks. Industry initiatives in standards development include the American Trucking Association's Technology and Maintenance Council's publication of a recommended practice to define the collection of event-related data on board commercial vehicles. The recommended practice outlines data elements, storage methodology, and the retrieval approach for event data recording on commercial vehicles.

In the meantime, the FMCSA's "Commercial Vehicle Safety Technology Diagnostics and Performance Enhancement Program" (also known as the "CV Sensor Study") has worked to define driver and vehicle assistance products and systems and, in particular, advanced sensor and signal processors in trucks and tractor-trailers, with an emphasis on on-board diagnostic and improved safety-related products. The program involves developing EDR requirements for the analysis of accident data from the FMCSA's Large Truck Crash Causation Study, with the goal of developing EDR functional specifications for both complete accident reconstruction and crash analyses. To date, this project has developed requirements for EDR components, hardware, software, sensors, and databases and has completed a cost-effectiveness analysis.

In recent years, NHTSA has made progress in developing EDR data standards for light vehicles, which include passenger cars, multipurpose passenger vehicles, light trucks, and vans with a gross vehicle weight rating of 3,855 kilograms (8,500 pounds) or less. In August 2006, NHTSA published a final rule that standardizes the information EDRs collect, but was amended in January 14, 2008, in response to numerous petitions for reconsideration. Based on this revised rule, compliance dates have been changed to September 1, 2012, for most light vehicles and to September 1, 2013, for vehicles manufactured in two or more stages. The new rule, however, does not address vehicles over 8,500 pounds and thus would not apply to buses or motorcoaches.

In its August 2007 "Approach to Motorcoach Safety," NHTSA included a discussion of EDRs, stating that the agency has recently defined mandatory data elements for the voluntary installation of EDRs in light passenger vehicles. However, crash characteristics and relevant measurements for motorcoaches are different, as supported by the 2001 NHTSA EDR Working Group final report's "Summary of Findings."

The EDR Working Group's final report also noted the following:

- EDRs can improve highway safety for all vehicle classes by providing more accurate data for accident reconstructions, and

- U.S. and European studies have shown that the number and severity of crashes is reduced when drivers know that an on-board EDR is in operation.

However, NHTSA's "Approach to Motorcoach Safety" also makes the seemingly contradictory statement that Safety Recommendations H-99-53 and -54 concerning EDRs do not specifically relate to changes that would have a direct or quantifiable safety benefit for motorcoach occupants. The Safety Board believes the lack of useful event data associated with accident motorcoaches represents a missed opportunity to better understand crash forces, ejection dynamics, and crashworthiness. The Board concludes that event data recorders would provide the accurate and detailed event data necessary to better understand crash causation and to establish design requirements for motorcoach crashworthiness and occupant protection systems. The need for such information is particularly significant as EDRs become more widely used in the truck and transit industry, as evidenced at the September 2007 EDR symposium sponsored by SAE. During the symposium, representatives from industry noted that EDR applications are being more widely used for motor carrier analysis of accidents and to support more accurate insurance underwriting and risk analysis.

Also in its "Approach to Motorcoach Safety," NHTSA states "Upon completion of SAE J2728, consideration of a requirement for heavy vehicle EDR installation into motorcoaches would be appropriate."

The Safety Board recognizes NHTSA's progress in developing EDR standards for light vehicles. Establishing EDR performance standards for motorcoaches and buses is necessary for the timely and efficient implementation of EDRs, which will provide the data needed to develop effective occupant protection systems. The Board urges NHTSA to actively push to complete standards work and require EDRs on all new motorcoaches. As a result, in July of 2008 the Board reiterated Safety Recommendations H-99-53 and –54 in its report on the Bluffton University accident in Atlanta.

Motorcoach Fire Protection

On September 23, 2005, a fire engulfed a motorcoach carrying elderly evacuees away from the predicted path of Hurricane Rita near Dallas, Texas. The 44 passengers were from an assisted-living facility in Bellaire, Texas; many needed to be carried or assisted onto the motorcoach by firefighters or nursing staff, and required almost 2 hours to board. When the fire occurred, 23 elderly passengers were unable to escape the blaze and perished. I would like to note that this accident involved very unusual circumstances, and many of the decisions to evacuate and the means to evacuate were made in the context of the devastation caused by Hurricane Katrina that occurred just one month earlier.

Fires on motorcoaches are not an unusual occurrence. In fact, some industry experts estimate that there is close to one motorcoach fire per day. However, to date, injuries and fatalities related to motorcoach fires are an extremely rare event. Still, this accident shows the potential for catastrophe when passengers are unable to exit a burning motorcoach quickly.

As a result of its investigation, the NTSB made the following recommendations:

- NHTSA should develop a standard to provide enhanced fire protection of the fuel systems in areas of the motorcoaches and buses where the system may be exposed to the effects of a fire. In addition we asked that fire-hardened materials be used in areas, such as those around wheel wells, to limit the potential for flame spread into motorcoach or bus passenger compartments. In the interim, while standards are being developed, we asked the motorcoach manufacturers to use currently available materials and designs for fuel system components that are known to provide fire protection for the system,

- since wheel well fires are so difficult to extinguish, we asked that NHTSA develop detection systems to monitor the temperature of wheel well compartments in motorcoaches and buses to provide early warning of malfunctions that could lead to fires so that passengers might have time to escape, and

- FMCSA continues to gather and evaluate information on the causes, frequency, and severity of bus and motorcoach fires, and conduct ongoing analysis of the fire data to measure the effectiveness of the fire prevention and mitigation techniques identified and instituted as a result of the Volpe National Transportation Systems Center fire safety analysis study.

Motorcoach Oversight Improvements

For decades the Board has been concerned with the safety of motorcoach operators and the oversight provided by local, state, and federal agencies. These areas include:

- Oversight of the Compliance Review Process,
- Oversight of Driver Medical Conditions,
- Electronic Onboard Recorders for Hours of Service (fatigue), and
- Cell Phone Use by Bus Drivers.

Oversight of the Compliance Review Process

The Wilmer, Texas motorcoach fire is an illustration of the potential consequences of poor oversight of motorcoach operations, especially concerning the vehicle. The fire in this accident would not have occurred had the motorcoach been properly maintained.

The Safety Board determined that the cause of the fire was insufficient lubrication in the right-side tag axle wheel bearing assembly of the motorcoach, which resulted in increased temperatures and subsequent failed wheel bearings. The high temperatures resulting from the friction led to the ignition of the tire and a catastrophic fire. This occurred because the

motorcoach operator, Global Limo, Inc., failed to maintain their vehicles and FMCSA failed to provide proper oversight of the motor carrier through its compliance review process.

Unfortunately, FMCSA is only able to conduct compliance reviews for a small fraction of the almost 911,000 motor carriers in this country. However, in this particular accident, numerous driver and vehicle safety violations were uncovered in a review performed by the Texas Department of Public Safety (DPS) in April 2002. At the time, the Texas DPS had no authority to force Global to cease operations. In February 2004, FMCSA conducted a compliance review of Global in which it found similar violations pertaining to drivers and vehicles. However, FMCSA rated Global as "satisfactory." Nineteen months later, after the bus fire near Dallas, FMCSA went back to Global and conducted another compliance review in September 2005. In this review, FMCSA found many of the same violations as in its previous compliance review; however, this time FMCSA gave Global a safety rating of "unsatisfactory" and declared that Global's operations created an "imminent hazard" to public safety. FMCSA issued an order for Global to cease operations.

Concerned that motor carriers with significant regulatory violations for drivers and vehicles are still receiving satisfactory ratings, the Safety Board once more focused on Federal standards for determining the safety fitness of carriers. As we have done in several accident investigations over the past 8 years, the Board again concluded that the current FMCSA compliance review process does not effectively identify unsafe motor carriers and prevent them from operating, especially when violations are found in the areas of driver and vehicle safety. As a result, we reiterated our long-standing recommendation to FMCSA to change the safety fitness rating methodology so that adverse vehicle or driver performance-based data alone are sufficient to result in an overall unsatisfactory rating for a carrier (H-99-6). This recommendation was added to the Board's Most Wanted list in 2000.

The Safety Board originally issued this recommendation in 1999 in a Special Study on Selective Motorcoach Issues. We reiterated the recommendation in 2002 in our Mountainburg, Arkansas truck/school bus accident report and again in 2007. Our goal is to prevent motor carriers from putting vehicles with mechanical problems on the road and unqualified drivers behind the wheel.

The Motor Carrier Safety Act of 1984 directed the Department of Transportation (DOT) to establish a procedure to determine how safely motor carriers operate. Currently, the DOT, through the FMCSA, uses a system for determining how safely a motor carrier operates that does not place sufficient emphasis on driver or vehicle qualifications. Motor carriers are given safety ratings based on compliance reviews conducted by the FMCSA. Carriers are rated on six safety fitness factors:

1. general -- including financial responsibility, insurance coverage, drug and alcohol programs,
2. driver -- including qualifications and training,
3. operations -- including management controls, scheduling practices, allowing violations of rules, false reports, failing to maintain records,
4. vehicle -- including maintenance,

5. hazardous materials -- including failure to follow regulations, and
6. accident rate.

A motor carrier can receive an unsatisfactory overall rating if two elements are rated unsatisfactory. An overall unsatisfactory rating can lead to a carrier being ordered to cease operations.

The Safety Board's investigations have demonstrated that the two most important factors in safe motor carrier operations are the operational condition of the vehicles and the performance of the drivers who drive them. The Board believes that if the carrier receives an adverse rating (conditional or unsatisfactory) for either the vehicle or driver factor, the overall rating should be unsatisfactory. Since this recommendation was originally issued and later reiterated in two accident reports, the FMCSA has planned or carried out a variety of efforts to address our concerns. However, the same system is still in place and the recommendation has not yet been satisfied.

For the safety of all highway users, the Safety Board believes that a motor carrier that does not ensure either the safe operation of its vehicles or drivers should receive an overall unsatisfactory safety rating.

In June 2007, the FMCSA briefed the Safety Board on their "Comprehensive Safety Analysis (CSA) 2010 Initiative" which they indicated would include a complete evaluation of the compliance review process leading to the development of a new performance-based operational model for determining motor carrier safety, emphasizing preventative measures and early detection for unsafe driver and carrier conditions. Under CSA 2010, the FMCSA plans to decouple the safety fitness rating from the compliance review. They have started the process of developing a new safety fitness rating methodology that would be based on an objective measure of a driver's or carrier's safety performance data. These safety ratings would be issued to all drivers and carriers. FMCSA began pilot testing the new rating system in 2008.

The Safety Board believes FMCSA's current efforts represent a comprehensive review of the process of determining the safety of commercial motor carriers. Still, the Board continues to monitor FMCSA's actions and is concerned that accidents continue to occur involving motor carriers with poor oversight of their drivers and vehicles. Recognizing the importance of this issue to motor carrier safety, the Board added this recommendation to the Most Wanted list in 2000.

Related to this issue is the fact that, although FMCSA collects data on numerous safety violations when it conducts compliance reviews of motor carriers, approximately 85% of those violations are not included in the calculations of the motor carriers' rating. By not recognizing these violations in its calculations, FMCSA is allowing potentially unsafe carriers to continue to operate without consequence. Therefore the Safety Board recommended that FMCSA:

- issue an Interim Rule to include all Federal Motor Carrier Safety Regulations in the current compliance review process so that all violations of regulations are reflected in the calculation of a carrier's final rating (H-07-03) and

- revise the Federal Motor Carrier Safety Regulations to prohibit a commercial vehicle from operating with wheel seal or other hub lubrication leaks (H-07-02).

Oversight of Driver Medical Conditions

On May 9, 1999, on Mother's Day in New Orleans, a commercial driver lost consciousness while driving a motorcoach on an interstate highway, left the roadway, and crashed into an embankment, killing 22 passengers, and seriously injuring the driver and 15 additional passengers. The driver was found to have had multiple known serious medical conditions, including kidney failure and congestive heart failure and was receiving intravenous therapy for 3-4 hours a day, 6 days a week.

The Safety Board has investigated many other accidents involving commercial drivers with serious preexisting medical conditions that had not been adequately evaluated. These include:

- a nearly blind school bus driver in Montana who apparently did not see an oncoming train that struck the bus and killed 2 students,

- a New York City transit bus driver with a seizure history who experienced a seizure while driving the bus, seriously injuring a cyclist and killing a pedestrian,

- a tractor-trailer driver with unevaluated sleep apnea and untreated thyroid disease who ran over and killed a Tennessee State Trooper driving in his highway patrol vehicle with lights flashing; and

- an alcohol-dependent tractor-trailer driver whose excessive speed resulted in a load breaking free and striking a school activity bus in North Carolina, killing the school bus driver and a child.

It is unusual in our accident investigations to find a commercial driver for whom there are not at least some questions regarding medical certification. This is not to say that a driver's conditions always cause the accident, but finding these undocumented and unevaluated conditions in commercial drivers is concerning and often alarming. In many cases, these conditions are manageable if they are appropriately evaluated, treated, and monitored. Unfortunately, for a variety of reasons, no such evaluation, treatment, or monitoring occurred in many of the cases we investigated.

As a result of observing serious deficiencies in the oversight of commercial driver medical certification in several of our investigations including the New Orleans accident, the Safety Board issued recommendations to the FMCSA in 2001 to develop a comprehensive medical oversight program for interstate commercial drivers. The Board suggested that such a program include qualified and properly educated examiners, updated and available regulatory and non-regulatory guidance, review and tracking of medical exams, improved enforcement of certification requirements, and appropriate mechanisms for reporting unfit drivers. The Board's recommendations specify a comprehensive oversight program, because we feel that only by

addressing this issue in a systematic fashion can a truly effective program of oversight be developed. A piecemeal approach to the problem may result in gaping deficiencies that will continue to permit unqualified drivers to operate on the nation's highways. The specific recommendations are as follows:

- develop a comprehensive medical oversight program for interstate commercial drivers that contain the following program elements: individuals performing medical examinations for drivers are qualified to do so and are educated about occupational issues for drivers (H-01-17),

- develop a comprehensive medical oversight program for interstate commercial drivers that contain the following program elements: a tracking mechanism is established that ensures that every prior application by an individual for medical certification is recorded and reviewed (H-01-18),

- develop a comprehensive medical oversight program for interstate commercial drivers that contain the following program elements: medical certification regulations are updated periodically to permit trained examiners to clearly determine whether drivers with common medical conditions should be issued a medical certificate (H-01-19),

- develop a comprehensive medical oversight program for interstate commercial drivers that contain the following program elements: individuals performing examinations have specific guidance and a readily identifiable source of information for questions on such examinations (H-01-20),

- develop a comprehensive medical oversight program for interstate commercial drivers that contain the following program elements: the review process prevents, or identifies and corrects, the inappropriate issuance of medical certification (H-01-21),

- develop a comprehensive medical oversight program for interstate commercial drivers that contain the following program elements: enforcement authorities can identify invalid medical certification during safety inspections and routine stops (H-01-22),

- develop a comprehensive medical oversight program for interstate commercial drivers that contain the following program elements: enforcement authorities can prevent an uncertified driver from driving until an appropriate medical examination takes place (H-01-23), and

- develop a comprehensive medical oversight program for interstate commercial drivers that contains the following program elements: mechanisms for reporting medical conditions to the medical certification and reviewing authority and for evaluating these conditions between medical certification exams are in place; individuals, health care providers, and employers are aware of these mechanisms (H-01-24).

In 2003, because of the critical importance of this issue and the lack of substantive progress on the recommendations, this issue was placed on the Safety Board's Most Wanted list.

Although the FMCSA has put in place a Medical Review Board and taken certain other preliminary actions in response to Congressional mandates, there are still areas in which absolutely no measurable progress has been made. In general, most of our safety recommendations remain in an open – unacceptable response. The FMCSA does seem to be making limited progress toward the type of comprehensive oversight system envisioned by the Board, but it remains questionable whether such a system will in fact be completely developed.

Electronic Onboard Recorders for Hours of Service (Fatigue)

Paper logbooks offer many opportunities to play fast and loose with the hours of service rules. In our investigations, we repeatedly find that some drivers falsify their books or keep two sets of books and some motor carriers do not closely monitor their drivers' compliance with the rules. Recognizing this lack of accountability with paper logbooks, the Safety Board has advocated the use of on-board data recorders for the past 30 years.

In 1977, the Safety Board issued its first recommendation on the use of on-board recording devices for hours of service compliance by asking the FHA to explore the merits of tachographs on reducing commercial vehicle accidents. Although the FHWA studied the issue, they did not make any changes.

During the 1980's, the technology for on-board recorders for hours of service improved dramatically and the European community began requiring tachographs and other similar devices. In 1990, as part of a study on heavy truck crashes, the Safety Board recommended that FHWA and the states require the use of automated/tamper-proof on-board recording devices. This recommendation was not acted upon by the FHWA. In 1995, the Board reiterated this same recommendation to the FHWA and the states. Both failed to act.

In 1998, the Safety Board tried a different approach, and made recommendations directly to industry, asking them to equip their commercial vehicle fleets with automated and tamper-proof on-board recording devices. This recommendation was opposed by the industry.

In 2001, when the FMCSA issued a Notice of Proposed Rulemaking on hours of service of drivers, the Safety Board reiterated its position that FMCSA strongly consider mandatory use of electronic onboard recorders by all motor carriers. FMCSA did not incorporate this suggestion into the NPRM. Finally, in 2007 the FMCSA issued a proposed rulemaking on on-board recorders; however, there are 2 primary reasons why the Board felt the NPRM fell short of its intended target.

First, the rule does not require EOBRs for hours of service for all commercial vehicles, but rather promotes voluntary installation and only requires installation for pattern violators. The Safety Board is concerned that pattern violators will be very difficult to identify without this technology and is convinced that the only effective way in which on-board recorders can help stem hours of service violations is to mandate their use by all operators.

Second, the Safety Board would like to see damage resistance and data survivability included in the standards for recorder hardware.

In summary, fatigue-related accidents continue to plague our Nations highways because, unlike alcohol or drugs, fatigue is extremely difficult to detect. In fact, fatigue is probably the most underreported causal factor in highway accidents. Electronic on-board recorders for hours of service hold the potential to efficiently and accurately collect and verify the hours of service for all drivers. They will also establish the proper incentives and create a level playing field for compliance with hours of service rules that will ultimately make our highways safer for all drivers.

Cell Phone Use by Bus Drivers

On November 14, 2004, during daylight hours, a 44-year-old bus driver was operating a motorcoach in the southbound right lane of the George Washington Memorial Parkway in Alexandria, Virginia, taking 27 high school students and a chaperone to Mount Vernon. This vehicle was the second one of a two-bus team. The motorcoach was traveling approximately 46 miles per hour as it approached the stone arched Alexandria Avenue overpass bridge, which passes over the GW Parkway. The bus driver passed warning signs indicating that the right lane had only a 10-foot, 2-inch clearance, while the center lane had a 13-foot 4-inch clearance. The bus was 12 feet tall. The lead bus moved into the center lane, but the accident bus driver remained in the right lane and drove the bus into the underside of the bridge. Witnesses and the bus driver reported he was talking on a hands-free cellular telephone at the time of the accident. Of the 27 student passengers, 10 received minor injuries and 1 sustained serious injuries. The bus driver and chaperone were uninjured. The bus's roof was destroyed.

The Safety Board determined that the probable cause of this accident was the bus driver's failure to notice and respond to posted low-clearance warning signs and to the bridge itself due to cognitive distraction resulting from conversing on a hands-free cellular telephone while driving.

As a result of this accident, the Safety Board made the following recommendations:

- FMCSA would publish regulations prohibiting cellular telephone use by commercial driver's license holders with a passenger-carrying or school bus endorsement, while driving under the authority of that endorsement, except in emergencies,

- the 50 States and the District of Columbia would enact legislation to accomplish the same result at the state level,

- the motorcoach associations, school bus organizations, and unions would develop formal policies prohibiting cellular telephone use by commercial driver's license holders with a passenger-carrying or school bus endorsement, while driving under the authority of that endorsement, except in emergencies,
- a previously issued safety recommendation, reiterated to the Safety Board, to 20 states to modify their traffic accident investigation forms to include driver distraction codes, including codes for interactive wireless communication device use.

Motorcoach Technology Improvements

The Safety Board believes that developing and installing new technologies—such as adaptive cruise control and collision warning systems in commercial trucks, buses, and passenger vehicles, will substantially reduce accidents. This assessment comes from numerous Board investigations. In a 2-year period, the Board investigated 9 rear-end collisions in which 20 people died and 181 were injured. Three of the accidents involved buses and one accident involved 24 vehicles. Common to all nine accidents was the rear-following vehicle driver's degraded perception of traffic conditions ahead before striking other vehicles. These accidents did not involve the use of drugs, alcohol, or vehicle mechanical defects. The investigation showed that sun glare, fog, smoke, fatigue, distractions, and work zones interfered with a driver's ability to detect slow-moving or stopped traffic ahead and resulted in rear-end collisions. According to the DOT, preliminary analyses have shown that 1,836,000 police-reported crashes, or about 48 percent of accidents, could be prevented by rear-end or run-off-the-road and lane change collision warning systems (CWS).

In 1995, the Board first made recommendations concerning collision-warning systems as part of its Special Investigation of Collision Warning Technology. The following recommendation was made to both the DOT and to the Intelligent Transportation Society of America:

- in cooperation with the Intelligent Transportation Society of America, sponsor fleet testing of collision warning technology through partnership projects with the commercial carrier industry. Incorporate testing results into demonstration and training programs to educate the potential end-users of the systems (H-95-44).

In 1999, the Safety Board held a public hearing on Advanced Safety Technologies for Commercial Vehicle Applications to discuss and highlight new and emerging technologies such as collision warning systems among others. In 2001, the Board issued the following recommendation to NHTSA as part of its 2001 Special Investigation On Technology To Prevention Rear-End Collisions.

- complete rulemaking on adaptive cruise control and collision warning system performance standards for new commercial vehicles. At a minimum, these standards should address obstacle detection distance, timing of alerts, and human factors guidelines, such as the mode and type of warning (H-01-6).

In 2007 this recommendation was added to the Board's Most Wanted list.

In 2001, the DOT established an Intelligent Vehicle Initiative (IVI)—the goal of which was to improve the safety and efficiency of motor vehicle operations by reducing the probability of motor vehicle crashes—as a major component of the Intelligent Transportation System (ITS) program. As part of the IVI, NHTSA evaluated the performance of CWS and adaptive cruise control (ACC) by participating in field operational tests of vehicles equipped with advanced safety systems. In May 2005, NHTSA released the results of its passenger vehicle testing, Automotive Collision Avoidance System Field Operational Test Final Program Report, showing

potential to reduce rear-end crashes by 10 percent and reporting positive user reaction to the systems. The final report on the commercial vehicle field-testing conducted for the DOT by Battelle and Volvo Trucks North America, Inc., was released in January 2007. The preliminary findings of the report indicate that a combined CWS and ACC bundled safety system account for a statistically significant reduction in rear-end crashes through reduced exposure to safety-critical driving scenarios.

NHTSA, along with the FHWA, the FMCSA, and RITA, appears to be working consistently on this important technological safety issue. The preliminary results of the testing on advanced safety systems are encouraging, but rulemaking is needed to ensure uniformity of system performance standards, such as obstacle detection, timing of alerts, and human factors guidelines, on new passenger and commercial vehicles.

Additionally, the Safety Board has made recommendations on electronic stability control to improve a vehicle's handling, particularly at the limits where the driver might lose control of the vehicle. In concert with ABS brakes, ESC senses when a vehicle is about to slide or yaw, and applies brakes to the proper wheels to regain control. The Board first made recommendations on this technology back when it was called "traction control" following a 1997 accident in Slinger, WI involving comercial vehicles operating under icy conditions. Eight fatalities occured when a truck lost contol, crossed a median and struck a van. In its report the Board made the following recommendations to NHTSA:

- work, together with FHWA, the American Trucking Associations, the International Brotherhood of Teamsters, and the Motor Freight Carrier Association to conduct laboratory and truck fleet testing to assess the safety benefits of adding traction control devices to antilock brake systems and report your findings to the NTSB (H-98-015),

- work, together with the FHWA, the American Trucking Association, the International Brotherhood of Teamsters, and the Motor Freight Carrier Association to encourage the trucking industry to gain experience with traction control devices through fleet tests (H-98-016).

To illustrate some successes the Safety Board has had in the passenger car area concerning electronic stability control, the Board made recommendations in its 2003 Largo, Maryland accident report for NHTSA to expand its current evaluation of electronic stability control systems and determine their potential for assisting drivers in maintaining control of passenger cars, light trucks, sport utility vehicles, and vans. Included in this evaluation was an accident data analysis of electronic stability control-equipped vehicles in the U.S. fleet (H-03-06).

In April of 2007, NHTSA announced that it would require ESC on all new cars and light trucks sold in the U.S. by September 1, 2011. Unfortunately, this rule only applies to passenger cars, multipurpose vehicles, trucks, and buses with a gross vehicle weight rating of 10,000 pounds or less.

In summary, the Safety Board believes that, although motorcoach travel is one of the safest modes of transportation, there are still many improvements that can be made to make it even safer.

Mr. Chairman, this completes my statement, and I will be happy to respond to any questions you may have.