



# U.S. Department of Transportation **Motorcoach Safety Action Plan**







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# Executive Summary

**M**otorcoach travel is a very safe mode of highway transportation in the United States, transporting 750 million passengers per year. Despite this, over the past 10 years, motorcoach crashes have resulted in an average of 19 motorcoach occupant fatalities per year. Additional fatalities result each year among the pedestrians, drivers, and passengers of other vehicles involved in these crashes. Each of these fatalities is a tragedy that the Department strives to prevent. The transportation of passengers is the highest safety priority in the Department, requiring added vigilance.

On April 30, 2009, Secretary Ray LaHood directed the heads of the agencies with responsibility for highway, vehicle, and transit safety within the Department of Transportation to develop an integrated Motorcoach Safety Action Plan. The Secretary directed the agencies to take a fresh look at motorcoach safety issues, identify actions to address outstanding safety problems, and develop an aggressive multi-agency schedule to implement those actions.

Based on analysis of the safety data, the Department assessed causes and contributing factors for motorcoach crashes, fatalities, and injuries, and identified opportunities to enhance motorcoach safety. As described in this action plan, DOT will pursue an integrated strategy addressing a range of issues. These include driver errors resulting from fatigue, distraction, medical condition, and experience; crash avoidance technologies; vehicle maintenance and safety; carrier compliance; and measures to protect occupants in the event of a crash such as seat belts, roof strength, fire safety, and emergency egress. DOT expects this strategy to result in a reduction in the number of motorcoach crashes and fatalities and injuries resulting from those crashes.

The data show that driver fatigue, vehicle rollover, occupant ejection, and operator maintenance issues contribute to the majority of motorcoach crashes, fatalities, and injuries. From this, DOT has identified seven priority action items that will have the greatest impact on reducing motorcoach crashes, fatalities, and injuries. The priority action items are:

- **Initiate rulemaking to require electronic on-board recording devices on all motorcoaches to better monitor drivers' duty hours and manage fatigue.**
- **Initiate rulemaking to propose prohibiting texting and limiting the use of cellular telephones and other devices by motorcoach drivers.**
- **Initiate rulemaking to require the installation of seat belts on motorcoaches to improve occupant protection.**
- **Evaluate and develop roof crush performance requirements to enhance structural integrity.**

- **Develop performance requirements and assess the safety benefits for stability control systems on motorcoaches to reduce rollover events.**
- **Enhance oversight of carriers attempting to evade sanctions and of other unsafe motorcoach companies.**
- **Establish minimum knowledge requirements for people applying for authority to transport passengers.**

Following is the complete list of the motorcoach safety action items, with target dates. The above priority items are included and shown in bold. Agencies charged with responsibility for the items are shown in parentheses.

Agencies and terms and their acronyms:

FMCSA: Federal Motor Carrier Safety Administration

NHTSA: National Highway Traffic Safety Administration

FHWA: Federal Highway Administration

PHMSA: Pipeline and Hazardous Materials Safety Administration

FTA: Federal Transit Administration

ANPRM: Advance Notice of Proposed Rulemaking

NPRM: Notice of Proposed Rulemaking



# Actions to Address Root Causes of Crashes

## Driver Fatigue (FMCSA)

- Accelerate research into fatigue issues relating to motorcoach drivers, including hours of service and technologies to detect driver fatigue – 2008-2010<sup>1</sup>
- **Initiate rulemaking to require electronic on-board recording devices on all motorcoaches – 2009-2011**
- Complete multifaceted strategy to address sleep disorders – 2009-2011

## Driver Behavior (FMCSA)

- **Initiate rulemaking to propose prohibiting texting and limiting the use of cellular telephones and other devices by motorcoach drivers – 2009-2010**
- Implement driver safety history pre-employment screening program – 2009-2011
- Develop national drug and alcohol testing database to assist carriers to identify a driver with a history of drug or alcohol abuse – August 2010 (NPRM)
- Accelerate research on driver distraction – 2009-2010
- Increase outreach and enforcement activities emphasizing improving driver behavior – Ongoing

## Medical Qualification of Drivers (FMCSA)

- Conduct research on driver risk factors – 2009-2010
- Enhance driver medical oversight programs – April 2010 (NPRM)

## Vehicle Maintenance (FMCSA)

- Strengthen State bus inspection programs – September 2010 (ANPRM)
- Complete strengthening of the new entrant safety audit guidance on motorcoach companies – December 2009
- Initiate rulemaking to support the development and implementation of the new enforcement model to better identify and address high-risk carriers and drivers – March 2010 (NPRM)

<sup>1</sup> All dates are calendar year and could change subject to other Department priorities.



## **Operator Oversight (FMCSA)**

- **Enhance oversight of carriers attempting to evade sanctions (i.e., chameleons) and of other unsafe motorcoach companies – 2009-2010**
- **Establish minimum knowledge requirements for people applying for authority to transport passengers – August 2009 (ANPRM)**
- **Ensure compliance with the Americans With Disabilities Act (ADA) – Ongoing**
- **Design and deploy a consumer complaint database that will allow the public to file complaints about specific bus companies with FMCSA – March 2010**
- **Request statutory authority to regulate companies that lease buses and drivers – DOT Reauthorization Process**

## **Crash Avoidance Measures (NHTSA and FHWA)**

- **Develop performance requirements and assess the safety benefits of stability control systems on motorcoaches – Q4 2009 (NHTSA)**
- **Expand research on crash-avoidance warning systems – 2010 (NHTSA)**
- **Initiate rulemaking to improve tire performance – Q2 2010 (NHTSA)**
- **Enhance signage to guide vehicles safely through highway entrances and exits – December 2009 (FHWA)**



# Actions to Address Root Causes of Fatalities and Injuries

## Occupant Protection – Seat Belts (NHTSA)

- Initiate rulemaking for the installation of seat belts – Q1 2010 (NPRM)

## Occupant Protection – Fire Safety (NHTSA and FMCSA)

- Evaluate the feasibility of more stringent motorcoach flammability requirements – 2008-2011 (NHTSA)
- Evaluate the need for and performance of fire detection and protection systems – 2008-2011 (NHTSA)
- Assess the effectiveness of various fire prevention and mitigation strategies – Q2 2011 (FMCSA)

## Occupant Protection – Vehicle Integrity (NHTSA)

- Evaluate and develop roof crush performance requirements – Q4 2009
- Accelerate research on improved glazing and window retention techniques – 2009-2010

## Occupant Protection – Emergency Egress (NHTSA and FMCSA)

- Examine ways to convey safety information to passengers and improve evacuation for a diverse population – 2009-2010 (FMCSA)
- Develop enhanced emergency egress requirements, with special attention to children, older people, and people with disabilities – 2010 (NHTSA)

## Data Collection And Analysis (NHTSA and FMCSA)

- Make agency decision on installation and performance characteristics of heavy vehicle event data recorders (HVEDRs) on motorcoaches – Q2 2010 (NHTSA)
- Supplement FMCSA motorcoach data to improve performance monitoring of carriers – 2009-2010 (FMCSA)



# Introduction

Motorcoach travel is a very safe mode of passenger transportation in the United States, transporting 750 million people per year. Despite this, over the past 10 years, crashes involving motorcoaches have resulted in an average of 19 motorcoach occupant fatalities per year. Additional fatalities result each year among the pedestrians, drivers, and passengers of other vehicles involved in these crashes. Each of these fatalities is a tragedy that the Department strives to prevent.

The Federal Motor Carrier Safety Administration (FMCSA) and the National Highway Traffic Safety Administration (NHTSA) each has principal safety roles within the Department for motorcoach safety and each developed programs to improve motorcoach safety. To ensure a broad, systems-oriented safety strategy for enhancing motorcoach safety, on April 30, 2009, U.S. Department of Transportation (DOT) Secretary Ray LaHood directed the Acting Deputy Administrators of FMCSA, NHTSA, the Federal Highway Administration (FHWA), Pipeline and Hazardous Materials Safety Administration (PHMSA), and the Federal Transit Administration (FTA) to develop an integrated, Departmental Motorcoach Safety Action Plan. The Secretary directed the agencies to take a fresh look at motorcoach safety issues, identify actions to address outstanding safety problems, and develop an aggressive schedule to implement those actions.

FMCSA, NHTSA, FHWA, PHMSA, and FTA, with the participation of representatives of the DOT Offices of the General Counsel and Assistant Secretary for Transportation Policy, completed the following steps in developing this Motorcoach Safety Action Plan:

- Conducted a comprehensive review of existing motorcoach data, analyses, research, and safety information.
- Reviewed root causes, contributing factors, and fatality/injury patterns for all motorcoach crashes investigated by the National Transportation Safety Board and resulting safety recommendations (Appendix A).
- Identified areas that need to be addressed and reviewed current motorcoach efforts within the Department to identify any gaps.
- Gathered and incorporated input from stakeholder groups.<sup>2</sup>
- Prioritized areas of concern based on the above and reviewed or established timeframes for implementation plans.



*Motorcoach travel is a very safe mode of passenger transportation in the United States, transporting 750 million people per year.*

<sup>2</sup> See Appendix C for a complete list of stakeholders consulted.

*This plan emphasizes two major strategies the Department will use to improve motorcoach safety and achieve its goal – enhanced regulatory oversight and increased use of technologies.*

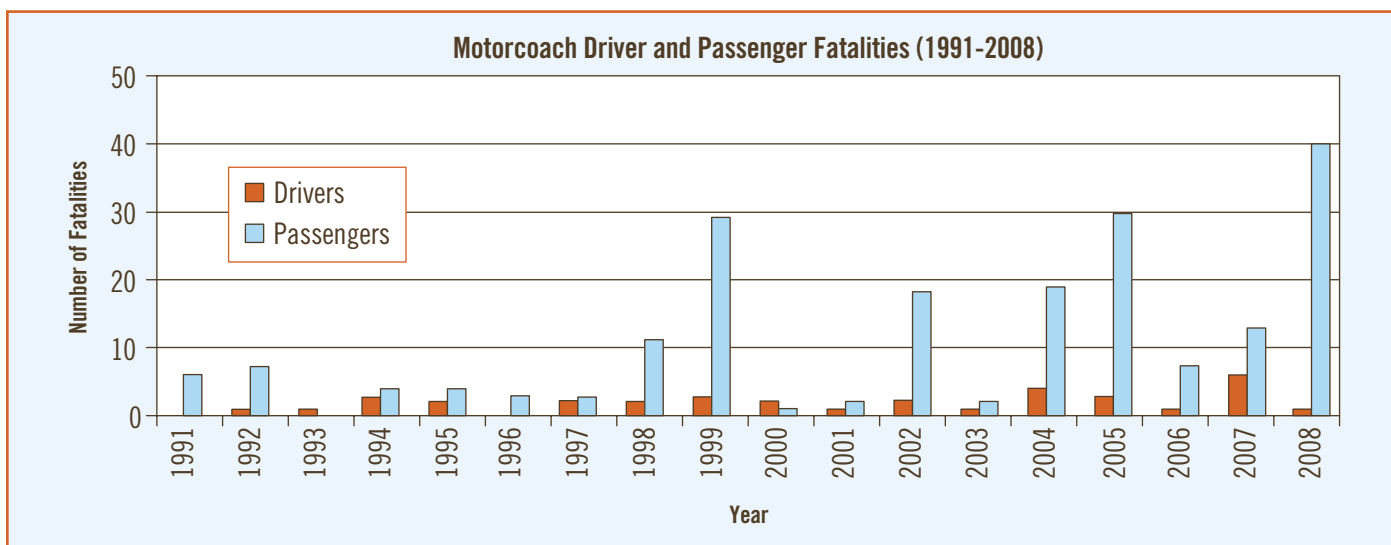
As described in the following sections of this report, DOT developed an integrated strategy addressing driver errors resulting from fatigue, distraction, medical conditions, and experience; vehicle maintenance and safety; carrier compliance; crash avoidance technologies; and measures to protect occupants in the event of a crash, such as seat belts, roof strength, fire safety, and emergency egress. DOT will also take action to improve data and information on motorcoach operators and drivers. These actions will reduce the number of motorcoach crashes and fatalities and injuries resulting from those crashes.

The Department is working toward a goal of safe, reliable transportation available to all transportation sector users. This plan emphasizes two major strategies the Department uses to improve motorcoach safety and achieve its goal – enhanced regulatory oversight and increased use of technologies. Establishing knowledge requirements for new motor carriers and investigating applicants for authority to ensure they do not represent safety risks are the initial steps to ensure that all providers of transportation services are qualified and able to operate safely. Likewise, the plan aims to improve safety with technologies such as electronic on-board recording devices and electronic stability control. These technologies and other initiatives such as Intellidrive (see Appendix B) demonstrate tremendous potential to improve safety on our highways.

# Background

The motorcoach industry in the United States today consists of approximately 3,900 companies operating nearly 34,000 vehicles. These companies provide charter, tour, sightseeing, airport shuttle, commuter, and scheduled intercity services, transporting 750 million passengers per year, moving individual passengers a total of 65 billion miles annually. While a few of these companies operate large fleets, the vast majority operate fleets of 10 or fewer vehicles. Nearly half of motorcoach service mileage was for charter service and about one-quarter was for scheduled service. Of the 750 million motorcoach passengers per year, 65 percent were students and senior citizens.<sup>3</sup>

Figure 1 shows motorcoach driver and passenger fatalities for the period 1991-2008. There were fewer than 10 motorcoach fatalities annually between 1991 and 1997 and more than 10 motorcoach fatalities for the years 1998, 1999, 2002, 2004, 2005, 2007, and 2008. The increased fatalities in 1999, 2004, and 2005 each resulted from a single event with a large number of fatalities. The 41 motorcoach passenger fatalities in 2008 included three tragic events that included a rollover crash at Mexican Hat, Utah, where 9 passengers were killed; a crash at Sherman, Texas, in August, where 17 passengers were killed; and a rollover incident near Williams, California, where 9 passengers were killed. These events show that while motorcoach crashes may be relatively rare, when they occur they can cause a significant number of fatalities or serious injuries for a single event.



**Figure 1: Motorcoach Driver and Passenger Fatalities (FARS<sup>4</sup> 1991 – 2008)**

<sup>3</sup> Nathan Associates Inc., (2008) submitted to The American Bus Association titled “Motorcoach Census 2008, A Benchmarking Study of the Size and Activity of the Motorcoach Industry in the United States and Canada in 2007.”

<sup>4</sup> NHTSA’s Fatality Analysis Reporting System (FARS) contains data on a census of fatal traffic crashes in the United States and Puerto Rico. Crashes in FARS involve a motor vehicle traveling on a road customarily open to the public resulting in a fatality within 30 days of the crash.

Nearly half of motorcoach service mileage was for charter service and about one-quarter was for scheduled service. Of the 750 million motorcoach passengers per year, 65 percent were students and senior citizens.

The NTSB investigated 16 fatal motorcoach crashes between June 1998 and January 2008. As illustrated by Figures 2 and 3, NTSB identified driver-related problems such as fatigue, medical condition, and inattention as the major root causes responsible for 56 percent of motorcoach crashes it investigated, and the condition of the vehicle as root cause for 13 percent of the crashes investigated. According to NTSB, driver-related problems were responsible for 60 percent of the fatalities occurring in the crashes investigated, and the condition of the vehicle for 20 percent of the fatalities. FARS data indicates that rollovers and roadside events including running off-road and striking roadside objects occurred in about 75 percent of all motorcoach fatalities. Ejection of motorcoach passengers due to a rollover event represents the highest percentage of passenger fatalities, as shown in Figures 4 and 5.

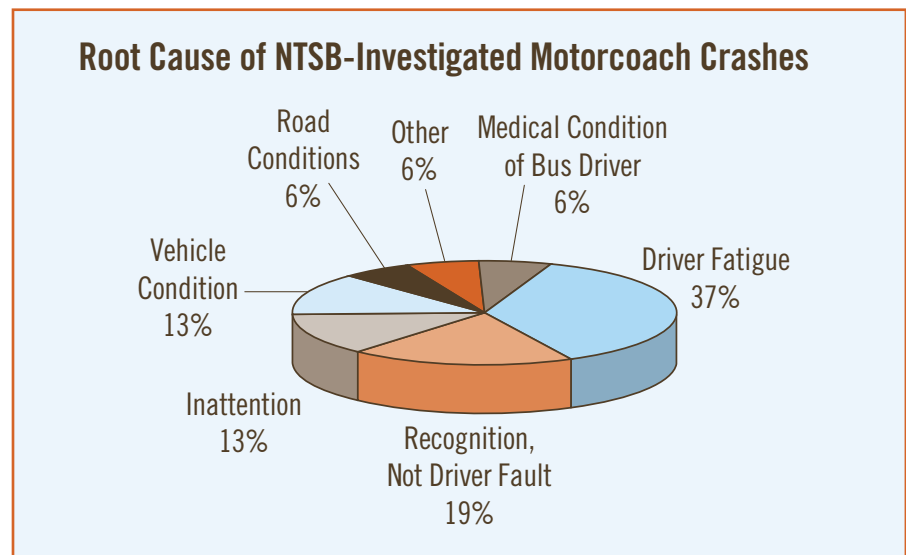


Figure 2: Root Cause of NTSB-Investigated Motorcoach Crashes

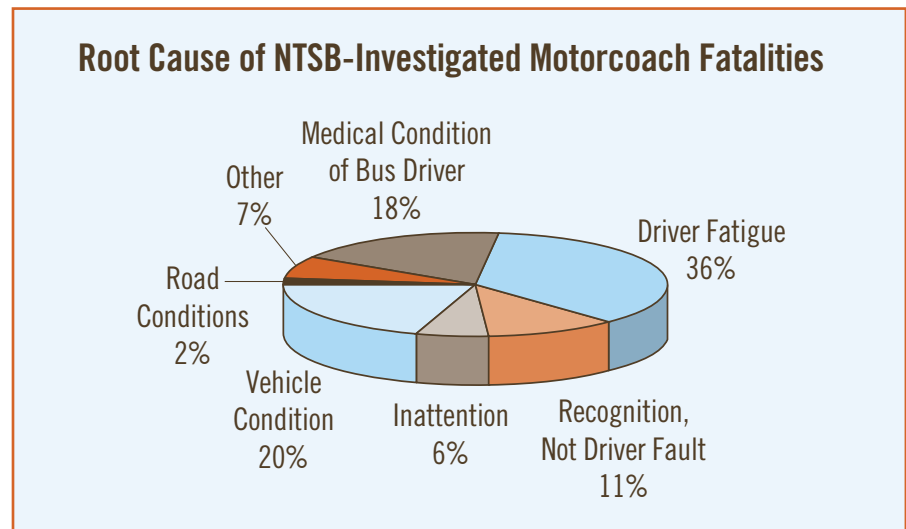


Figure 3: Root Cause of NTSB-Investigated Motorcoach Fatalities

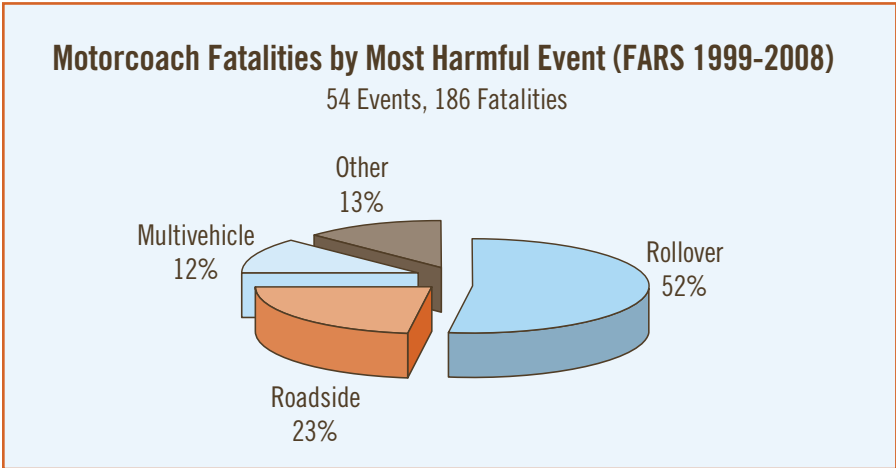


Figure 4: Motorcoach Fatalities by Most Harmful Event

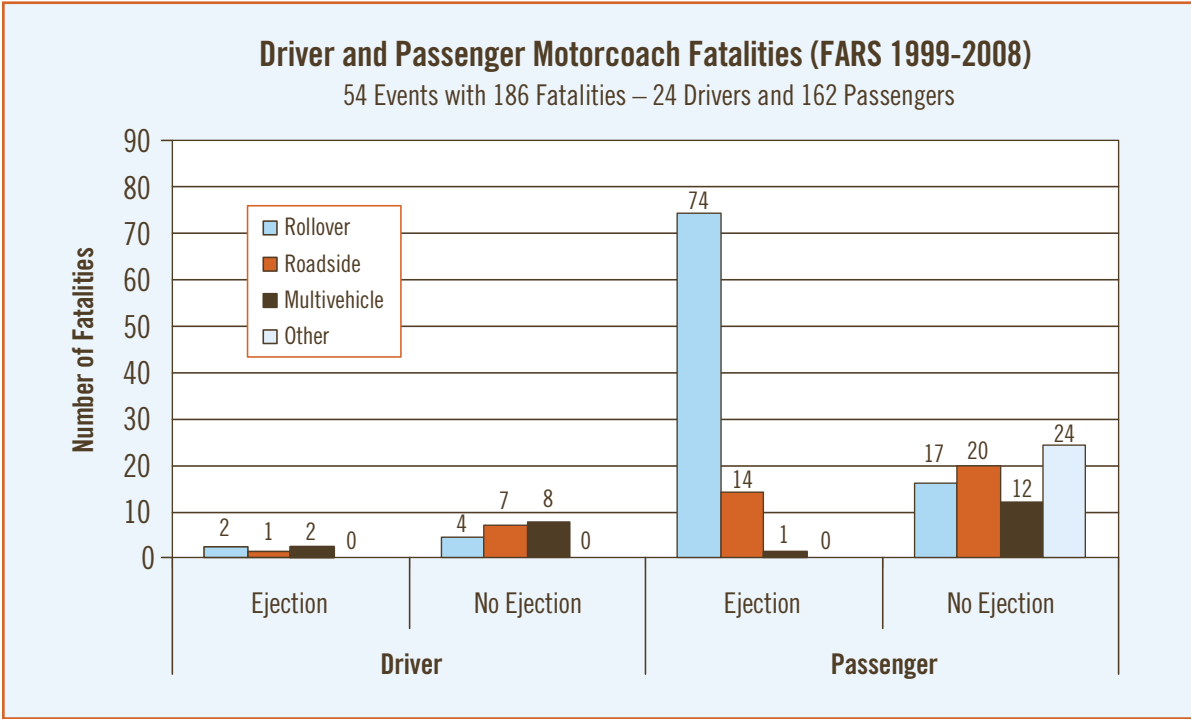


Figure 5: Driver and Passenger Fatalities by Ejection Mode and Type of Crash





# Action Plan

In developing this action plan, DOT took a two-pronged approach to identify strategies to address the most frequent causes of crashes and to address the most frequent causes of fatalities and injuries.

The most common causes of crashes, as determined by NTSB and supported by DOT's evaluation of available data and information, are driver condition and behavior. As noted above, NTSB identified driver-related problems as root causes responsible for 56 percent of the motorcoach crashes it investigated. Research from the University of Michigan Transportation Research Institute (UMTRI)<sup>5</sup> indicates that motorcoach driver error is a factor in 31 percent of all motorcoach crashes. FMCSA's Bus Crash Causation Study,<sup>6</sup> conducted during 2005 and 2006, investigated 39 fatal or serious injury bus crashes in New Jersey. About two-thirds of these bus crashes involved motorcoaches. The critical cause of the crash was attributed to the bus<sup>7</sup> in about one-half of the cases, and for those, driver error was the primary factor nearly 80 percent of the time. Thus, this action plan recognizes that increased focus must be placed on improving driver performance, and includes a number of initiatives to enhance driver performance by addressing distraction, fatigue, and medical issues.

In addition, NTSB identified the condition of the vehicle as a root cause in 13 percent of the crashes it investigated, and highlighted vehicle maintenance as a significant problem. Again, this finding is supported by DOT's analysis of available data and information. For example, the most frequently cited violations identified during vehicle inspections of motorcoaches including failure of the carrier to inspect and repair vehicle parts and accessories, accounting for 13 percent of all violations identified in motorcoach inspections in 2008. As a result, this action plan includes initiatives to improve carrier maintenance of motorcoaches and enhance motorcoach operator compliance with all applicable safety requirements.

The action plan also addresses crash avoidance technologies, identified by both DOT and NTSB as having the potential to significantly reduce the number of commercial motor vehicle crashes, including crashes involving motorcoaches.

DOT also identified strategies to address the most frequent causes of fatalities and injuries that result from motorcoach crashes. For example, FARS data indicates that ejections of passengers from the vehicle onto hard roadway or other environmental surfaces account for the majority of fatalities resulting

*This motorcoach action plan recognizes that increased focus must be placed on improving driver performance, and includes a number of initiatives to enhance driver performance by addressing distraction, fatigue and medical issues.*

<sup>5</sup> UMTRI, Bus Operator Types and Driver Factors in Fatal Bus Crashes: Results from the Buses Involved in Fatal Crashes Survey, June 2008

<sup>6</sup> The Bus Crash Causation Study Report To Congress (A Report Pursuant to Section 224 of the Motor Carrier Safety Improvement Act of 1999, Public Law 106-159), February 2009

<sup>7</sup> The critical cause in the remainder of the crashes investigated was attributed to other vehicles or pedestrians.

*This action plan includes initiatives to enhance the ability of a motorcoach to withstand crash condition, to protect passengers from ejection, and mitigate fire risks and to ensure that passengers are able to quickly evacuate a motorcoach after a crash or fire.*

from motorcoach crashes. Fatalities may also occur as a result of problems in evacuating a motorcoach in a crash or because of fires that trap passengers in the motorcoach. This action plan includes initiatives to enhance the ability of a motorcoach to withstand crash conditions, to protect passengers from ejection, and mitigate fire risks and to ensure that passengers are able to quickly evacuate a motorcoach after a crash or fire.

As it evaluated the safety of motorcoach operations, DOT determined that more complete and accurate data about motorcoach drivers and operations would improve future efforts to enhance the safety of motorcoach operations. Thus, DOT will also implement several initiatives to gather and assess detailed data on motorcoach drivers and carriers. Other gaps identified and addressed in the action plan are:

- There are no requirements that prohibit or limit use of cellular phones and other electronic communications devices by motorcoach drivers.
- Existing research on crash-avoidance warning systems for commercial motor vehicles does not focus on the unique requirements for motorcoaches.
- Proposed standards for the use of electronic on-board recording devices have targeted only those companies found to be in violation of the hours-of-service regulations, rather than all motorcoach companies.

The data shows that driver fatigue, vehicle rollover, occupant ejection, and operator maintenance issues contribute to the majority of motorcoach crashes, fatalities, and injuries. As a result, DOT has identified seven priority action items that will have the greatest impact on reducing motorcoach crashes, fatalities and injuries. The priority action items are:

- **Initiate rulemaking to propose requiring electronic on-board recording devices on all motorcoaches to better monitor drivers' duty hours and manage fatigue.**
- **Initiate rulemaking to propose prohibiting texting and limiting the use of cellular telephones and other devices by motorcoach drivers.**
- **Initiate rulemaking to propose requiring the installation of seat belts on motorcoaches to improve occupant protection.**
- **Evaluate and develop roof crush performance requirements to enhance structural integrity.**
- **Develop performance requirements and assess the safety benefits for stability control systems on motorcoaches to reduce rollover events.**
- **Enhance oversight of carriers attempting to evade sanctions and other unsafe motorcoach companies.**
- **Establish minimum knowledge requirements for persons applying for authority to transport passengers.**



The DOT action plan detailed in the following sections of this report is the complete list of the identified motorcoach safety action items, with target completion dates. DOT initiated a number of additional actions to enhance commercial motor vehicle safety that are not specifically within the scope of this Action Plan but will support and advance DOT's motorcoach safety programs. These additional actions are listed in Appendix B.

# Enhance Driver Performance – **Fatigue**

(FMCSA)

## ACTION ITEMS

- Accelerate research into fatigue issues, including hours of service of drivers and technologies to detect driver fatigue.
- Establish requirements for electronic on-board recording devices.
- Complete multifaceted strategy to address sleep disorders.

In NTSB-investigated motorcoach crashes, driver fatigue was found to be the root cause in 37 percent of the crashes and for 36 percent of fatalities. DOT data on human factors and motorcoach crash causes are consistent with these findings. The University of Michigan Transportation Research Institute (UMTRI) analysis of the Buses Involved in Fatal Crashes Survey found that, in 83 intercity and 256 charter passenger carrier vehicle fatal crashes between 1999 and 2005, 4.8 percent of the intercity bus drivers and 2.7 percent of the charter bus drivers were coded by investigating law enforcement officials as “drowsy” or “asleep.” The UMTRI analysis noted that “fatigue and inattention are likely underreported, since, unlike alcohol or drug use, they are difficult to identify after the fact.”



In 2008, FMCSA conducted 1,399 motorcoach carrier compliance reviews. A compliance review is an in-depth examination of a motor carrier's operations and is used to rate unrated motor carriers and to review compliance of unsafe carriers. The most frequently cited violations were for improper or false driver records of duty status or violations of the hours of service regulations, amounting to 1,755 violations or 16 percent of all the violations cited during the compliance reviews. Electronic on-board recording (EOBR) devices monitor driver compliance with the hours of service requirements more accurately than written log books. FMCSA is finalizing regulations to establish standards for EOBRs and mandate the installation of EOBR devices on the trucks and buses of companies found to be in violation of the hours-of-service regulations. In addition, FMCSA is considering the encouragement of industry-wide use of EOBRs by providing incentives for motor carriers to voluntarily use EOBRs. FMCSA is also beginning a rulemaking that will propose a more wide-spread mandate of EOBRs including mandating that all motorcoaches be equipped with EOBRs. FMCSA is also

gathering empirical data on motorcoach driver schedules, operating practices, and fatigue and will use the data to determine whether additional regulations addressing driver fatigue are necessary.

FMCSA also initiated a multifaceted strategy to address sleep disorders that affect safe driving. FMCSA established a medical review board consisting of medical experts to review expert recommendations on sleep apnea and other medical conditions that impact safety. In addition, FMCSA expects to develop a notice of proposed rulemaking (NPRM) to address pulmonary disease, sleep disorders such as sleep apnea, and other conditions that affect driver medical fitness for duty. FMCSA is also developing driver and medical examiner Web-based educational material, as well as a sleep apnea information toolkit to educate drivers and companies about sleep disorders and provide guidance on recommended actions to comply with medical fitness for duty requirements and driver safety.

*In NTSB-investigated motorcoach crashes, driver fatigue was found to be the root cause in 37 percent of the crashes and for 36 percent of fatalities.*

### Milestones:

#### EOBR Rulemaking

Q1 2010	Publish EOBR final rule for companies violating hours-of-service regulations
Q3 2010	Publish NPRM to propose installation of EOBRs on all motorcoaches

#### Fatigue Research

July 2010	Complete study
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#### Sleep Disorders

April 2009	FMCSA report on sleep disorders affecting safe driving
2009-2011	Development and distribution of sleep disorder outreach material
TBD	Initiate rulemaking on sleep disorders

## Enhance Driver Performance – Behavior and Judgment

(FMCSA)

### ACTION ITEMS

- Implement pre-employment driver history screening program.
- Develop a national drug- and alcohol-testing database to enable motorcoach operators to determine if drivers have a history of violating DOT alcohol or drug rules.
- Accelerate research on driver distraction.
- Initiate rulemaking to prohibit texting and limit the use of cellular telephones and other electronic communication devices by motorcoach drivers.
- Increase outreach and enforcement activities emphasizing driver behavior.

**N**TSB identified drug and alcohol use by drivers as a potentially serious motorcoach safety problem. In four of the incidents it investigated, NTSB concluded that drug use by drivers, including both over-the-counter drugs such as antihistamines and illegal drugs such as cocaine and marijuana, was a causal factor. NTSB recommended that DOT develop a system to record all confirmed positive drug/alcohol test results and refusal determinations for commercial drivers to enable employers and enforcement authorities to verify and evaluate drug test histories.

*NTSB identified drug and alcohol use by drivers as a potentially serious motorcoach safety problem.*

FMCSA is taking a number of actions to address drug and alcohol issues, including: (1) implementation of a pre-employment screening program to provide carriers access to driver crash and inspection histories from the Motor Carrier Management Information System, the agency's database of performance information on motor carriers and drivers, for use in the hiring process; and (2) initiation of a rulemaking to create a centralized database of verified positive controlled substance and alcohol test results and refusals to submit to testing.

NTSB also identified driver inattention as a root cause in 13 percent of the crashes it investigated between 1998 and 2008, accounting for 6 percent of fatalities. FMCSA-sponsored research on commercial motor vehicle driver distraction provided insight into the risks associated with certain driver activities. The study found that drivers who were texting while driving were 23.2 times more likely to be involved in a safety-critical event (e.g., crashes, near-crashes, unintentional lane deviations) than if they were not texting. Dialing a cellular telephone made the driver 5.9 times more likely to be involved in a safety-critical event. Similarly, interacting with a dispatching device made

the driver 9.9 times more likely to be involved in a safety-critical event, and using or reaching for other types of electronic devices made the driver 6.7 times more likely to be involved in a safety-critical event.

FMCSA is initiating a study to collect data and information on the risks associated with the use of cellular telephones and personal digital assistants (PDAs) in commercial truck and bus operations; including a review of similar completed research for automobiles, an investigation of commercial vehicle driver behavior with such devices, and current industry policies regarding their use. In addition, FMCSA will initiate a rulemaking to prohibit the use of cellular telephones and/or PDAs by drivers of passenger-carrying commercial motor vehicles when operating such vehicles, except in emergencies.

The Commercial Vehicle Safety Alliance (CVSA), which includes the United States, Canada, and Mexico, in partnership with FMCSA, law enforcement agencies on the local, State and Province levels, and the industry, launched the Operation Safe Driver campaign in 2007 to combat the number of fatalities in crashes involving large trucks and passenger carrier vehicles. FMCSA continues to work with CVSA to implement a motorcoach driver focus to the activities conducted in the events planned for October 2009. Operation Safe Driver activities were held across North America to increase commercial vehicle and non-commercial vehicle traffic enforcement; safety belt enforcement; driver roadside inspections; driver regulatory compliance; implementation of commercial driver educational and awareness programs to the motor carrier population; and, awareness to the motoring public about safe operations around commercial motor vehicles.

Passenger Carrier Strike Force activities (significant outreach and enforcement efforts focused toward a specific industry segment or safety problem) are one part of the overall compliance review and inspection program for motorcoach companies. FMCSA works with its partners to conduct national and regional strike force activities focusing on motorcoach companies such as regional strike force operations to address charter motorcoach transportation to casinos, theme parks, and similar destinations.

*Dialing a cellular telephone made the commercial driver 5.9 times more likely to be involved in a safety-critical event.*

**Milestones:**

**Pre-Employment Screening**

- July 2009 Contract award
- September 2009 Program operational
- October 2010 Initiate impact study
- September 2011 Complete impact study

**Drug and Alcohol Testing**

- June 2010 Publish NPRM

**Cellular Telephone/PDA study**

- February 2010 Complete study

**Cellular Telephone/PDA Rulemaking**

March 2010      Publish NPRM

**Operation Safe Driver**

June-Sept 2009      With CVSA, plan Operation Safe Driver motor-coach driver activities were conducted

October 2009      Operation Safe Driver passenger carrier driver activities were conducted

**Motorcoach Strike Force Activities**

Ongoing      Conduct national motorcoach strike force activities annually and regional motorcoach strike force activities to address specific areas of concern.





## Enhance Driver Performance – Medical Condition (FMCSA)

- Conduct research on driver risk factors.
- Enhance medical oversight programs to ensure drivers are medically qualified to operate a motorcoach.

### ACTION ITEMS

NTSB identified driver medical issues as a potentially serious motorcoach safety problem. For motorcoach crashes it investigated between 1998 and 2008, NTSB identified the medical condition of the driver as the root cause in 6 percent of the crashes, accounting for 13 percent of fatalities. NTSB recommended that DOT develop a medical oversight program to prevent drivers from falsifying medical information or providing incomplete information, including qualification criteria for people performing medical exams.

FMCSA began addressing this issue in April 2009 by working with CVSA to revise the North American Standard Out-of-Service Criteria to include operating a motorcoach with expired, invalid, or non-existent medical certifications as an out-of-service violation. FMCSA is also taking a number of additional actions to address driver medical issues, including: (1) initiation of a study to identify safety risk factors, including driver age, medical condition, violation history, crash history, employment history, and years of experience; and (2) establishing training, testing and certification standards for medical examiners responsible for certifying that interstate commercial motor vehicle drivers meet established physical qualification standards and creating a database of medical examiners that meet prescribed standards and requiring use of these medical examiners by motor carriers and drivers.

### Milestones:

#### Driver Characteristics Study

July 2009	Initiate study
January 2011	Final report

#### Medical Oversight

April 2010	Publish NPRM
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*For motorcoach crashes it investigated between 1998 and 2008, NTSB identified the medical condition of the motorcoach driver as the root cause in 6 percent of the crashes, accounting for 13 percent of fatalities.*

## Enhance Vehicle Safety – Maintenance

(FMCSA)

### ACTION ITEMS

- Strengthen State bus inspection programs.
- Review and strengthen new entrant safety audit guidance to address maintenance capabilities of new motorcoach companies.
- Develop new models to better identify high-risk carriers and drivers and interventions to correct high-risk behaviors.

As noted earlier in this report, NTSB identified the condition of the vehicle as a root cause in 13 percent of the crashes it investigated and highlighted vehicle maintenance as a significant problem.

FMCSA has a number of programs underway to ensure that motorcoaches are in suitable condition for transportation and that motorcoach operators comply with all applicable safety requirements. Specifically, FMCSA is focusing on effective maintenance programs. FMCSA will continue emphasizing the importance of passenger carrier vehicle maintenance and inspections as part of an effective State motorcoach safety program, including initiating a rulemaking to consider requiring States to conduct annual bus inspection programs, as has been proposed by Congress in bus safety legislation that was introduced in both the House and Senate. In addition, FMCSA is focusing its new entrant safety audit process to determine whether new carriers are capable of performing the routine maintenance required to keep the buses operating safely. Under its Comprehensive Safety Analysis 2010 program, FMCSA developed a new operational model to help FMCSA and its State partners contact more carriers and drivers, use improved data to better identify high-risk carriers and drivers, and apply a wider range of interventions to correct high-risk behavior. In support of this effort, FMCSA initiated rulemaking to revise its criteria for making safety fitness determinations.

*FMCSA is focusing its new entrant safety audit process to determine whether new carriers are capable of performing the routine maintenance required to keep the buses operating safely.*

## Milestones:

### State Bus Inspections Programs

September 2010      Publish ANPRM

### New Entrant Audit Guidance

November 2009      Review new entrant safety audit guidance for motorcoach company audits

December 2009      Revise new entrant safety audit guidance for motorcoach company audits

### Safety Fitness Determination NRPM

March 2010      Publish NPRM



# Enhance Motorcoach Operator Safety Oversight

(FMCSA)

## ACTION ITEMS

- Enhance oversight of carriers attempting to evade sanctions (i.e., chameleons) other unsafe motorcoach companies, and new entrants.
- Implement requirements of Over-the-Road Bus Transportation Accessibility Act of 2007 and ensure motorcoach operators are Americans with Disabilities Act-compliant.
- Request authority to regulate companies that lease buses and drivers.

A robust compliance and enforcement program is critical to ensuring that motorcoach carriers operate safely. To this end, FMCSA is working to enhance its oversight of high-risk carriers and new entrants. In response to concerns about unsafe motorcoach companies evading detection by shutting down one operation and starting another, FMCSA implemented and continues the Passenger Carrier Operating Authority Vetting Program to identify so-called chameleon carriers that reinvent themselves rather than correcting identified safety deficiencies or paying penalties assessed by FMCSA. To address concerns expressed by Congress, advocacy groups, the Motor Carrier Safety Advisory Committee, and others about the unsafe motorcoach companies, FMCSA initiated and continues vigorous new entrant audits, a compliance review, and inspection programs designed to identify and take action against such unsafe operations.

In addition, FMCSA issued an ANPRM in August 2009 to request comments on the methods the agency should use to ensure a new applicant carrier is knowledgeable about the applicable safety requirements before receiving operating authority. This notice responds to issues raised by safety advocates, the motorcoach industry, and others regarding new entrant applicant readiness.

FMCSA is also focused on ensuring that motorcoach operations are ADA-compliant by implementing the requirements of the Over-the-Road Bus Transportation Accessibility Act of 2007 (P. L. 110-291). This legislation clarifies the Agency's role in considering ADA compliance before operating authority is granted, and authorizes the Agency to revoke operating authority based on willful noncompliance with DOT's ADA regulations.

To address concerns expressed by advocacy groups and the Motor Carrier Advisory Committee, FMCSA is redesigning the passenger carrier information available on the FMCSA Web site. The redesign will aid consumers by

*A robust compliance and enforcement program is critical to ensuring that motorcoach carriers operate safely.*

assisting them to identify the motorcoach companies with safe operating histories and will provide an on-line process for reporting problems.

Finally, FMCSA is aware of bus rental companies that operate as leasing companies, and, in some cases, operate unsafely. This type of company could place an untrained/disqualified driver behind the wheel of a motorcoach transporting passengers. FMCSA is working with the reauthorization team to clarify and/or extend our authority to regulate this type of business to protect the public.

### Milestones:

#### Passenger Carrier Vetting

August 2008	Implement robust vetting process for passenger carrier operating authority applicants, including process to identify potential chameleon carriers
CY 2009	Improve and begin automating the vetting process
December 2010	Complete automating the vetting process

#### New Entrant Knowledge

August 2009	Publish ANPRM
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#### ADA Accessibility Compliance

February 2009	Developed and signed Memorandum of Understanding with the Department of Justice
March 2009	Trained staff and implemented ADA reviews on large, fixed-route OTRB companies
November 2009	Develop policy outlining conditions under which FMCSA will suspend or revoke operating authority based on ADA non-compliance.
December 2009 - July 2010	Train additional staff and implement ADA reviews on other types of OTRB companies; fully integrate the ADA reviews into the FMCSA enforcement software; implement the necessary changes to the operating authority application forms to address ADA compliance
December 2009	Implement ADA requirements into new entrant safety audits

#### Passenger Carrier Web Site

January 2010	Rollout Phase 1 of the redesigned passenger carrier Web site
March 2010	Design and deploy a consumer complaint database that will allow the public to file ADA and safety-related complaints with FMCSA

#### New Statutory Authority

DOT Reauthorization	Include language on regulating leasing companies in the FMCSA recommendations for the next highway reauthorization legislation.
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*FMCSA is redesigning the passenger carrier information available on the FMCSA Web site.*

## Enhance Crash Avoidance

(NHTSA and FHWA)

### ACTION ITEMS

- Improve tire performance. (NHTSA)
- Assess the safety benefits for stability control on motorcoaches. (NHTSA)
- Expand research on crash-avoidance warning systems to improve motorcoach safety. (NHTSA)
- Encourage uniform application of signage in the current Manual of Uniform Traffic Control Devices. (FHWA)

Preventing crashes before they occur is the goal of DOT's comprehensive vehicle safety programs, including motorcoach safety. In addition to improving the crash avoidance and handling capability of the vehicle through better brakes or improved tires, advances in vehicle technology now make it possible to rely on new, more advanced active safety technologies to help drivers avoid crashes. While these systems are just beginning to be deployed in the commercial motor vehicle fleet, mostly on truck tractors, it is anticipated that these systems will be available for other types of commercial motor vehicles, including motorcoaches in the future. These technologies include stability control systems that help mitigate rollovers and crashes caused by vehicle loss of control, forward collision warning systems that warn a driver when they are in danger of crashing into the rear of another vehicle and more advanced systems that provide the additional capability to brake the vehicle.

Vehicle tires are one of the most critical pieces of motor vehicle safety equipment and most often overlooked. NHTSA will issue a proposal to upgrade the Federal Motor Vehicle Safety Standard governing the performance of tires used on commercial vehicles, including motorcoaches. Following a comprehensive research program that involved extensive testing and analysis, NHTSA has tentatively decided that the standard be updated to include an enhanced endurance test and that a new high speed performance test be added.

To reduce rollovers and enhance the stability of commercial vehicles, DOT is conducting research to evaluate how stability control systems work for heavy trucks and motorcoaches, assess the potential safety benefits that can be achieved, and develop objective performance standards for these systems. Technology that can enhance the stability of the vehicle is particularly relevant, as indicated earlier, due to the fact that rollover crashes involving motorcoaches account for the largest portion of fatalities at 37 percent.

Rear-end collisions are also a key crash problem to be addressed. Between 1999 and 2000, NTSB investigated 9 rear-end collisions in which 20 people

*Advances in vehicle technology now make it possible to rely on new, more advanced active safety technologies to help drivers avoid crashes.*

died and 181 were injured. Common to all nine crashes was the vehicle driver's degraded perception of traffic conditions ahead. NTSB concluded that collision warning devices could have potentially helped alert the drivers to the vehicles ahead so that they could slow down their vehicles, thereby preventing the collisions or mitigating the consequences.

The Department believes that these technologies hold promise, and we have been evaluating them for truck tractors. Because these systems are now also becoming available on motorcoaches, we are expanding our research to encompass motorcoaches.

Improved traffic control measures also enhance the ability of a motorcoach operator to identify potentially hazardous road conditions and adapt behavior to safely navigate them. In one of the motorcoach crashes it investigated, NTSB identified the probable cause to be the driver's misidentification of a left exit ramp off the highway as a through-lane. NTSB concluded that the highway signage and road markings were not adequate to reliably alert drivers to the left exit ramp and to provide route guidance for interstate through traffic. To address this concern, FHWA is developing additions to the Manual on Uniform Traffic Control Devices (MUTCD) to add signs and plaques for guiding vehicles safely through highway entrances and exits, particularly those with limited sight distances, short ramps, or multiple or unique route choices. FHWA will encourage uniform use of the enhanced signage requirements and will consider their inclusion in the next edition of the MUTCD.



### Milestones:

#### Tires

- Q2 2010 Publish NPRM
- 2011 to 2012 Develop a final rule

#### ESC

- Q4 2009 Regulatory decision for a motorcoach stability control requirement

#### Warning Systems

- 2010 Expand current research efforts to evaluate forward crash warning systems applications for motorcoaches

#### Signage Improvements

- December 2009 Assess conformance to MUTCD and recommended enhancements of signage to facilities using exits from preferential lane facilities
- December 2009 Verify inclusion of enhancements in Notice of Proposed Amendment for MUTCD

## Enhance Occupant Protection – **Seat Belts**

(NHTSA)

### ACTION ITEM

- Require installation of seat belts on motorcoaches.

**F**ARS data indicates that ejection due to a rollover crash causes the highest percentage of motorcoach passenger fatalities. NHTSA determined<sup>8</sup> that installing seat belts would be the most direct method of retaining passengers within the seating compartment and preventing ejection. Seat belts could also potentially provide protection in multiple crash modes, including frontal crashes, side crashes, and rollovers. NHTSA tentatively determined that installing seat belts on motorcoaches has potential to enhance motorcoach occupant protection.

*Ejection due to a rollover crash causes the highest percentage of motorcoach passenger fatalities. NHTSA determined that installing seat belts would be the most direct method of retaining passengers within the seating compartment and preventing ejection.*

### Milestones:

Q1 2010	Publish NPRM
2010 to 2011	Develop a final rule



<sup>8</sup> NHTSA's Approach to Motorcoach Safety, Docket NHTSA-2007-28793; August 6, 2007.



# Enhance Occupant Protection – Fire Safety

(NHTSA and FMCSA)

- Evaluate the feasibility of more-stringent flammability requirements for interior and exterior components. (NHTSA)
- Evaluate the need for regulations requiring the installation of fire detection and protection systems. (NHTSA)
- Conduct special crash investigations to evaluate fire incidents and conduct a detailed engineering root cause analysis. (FMCSA)

## ACTION ITEMS

Since 1995, there have been 24 motorcoach fatalities resulting from fires. Twenty-three of these fatalities occurred as a result of the catastrophic bus fire in Wilmer, Texas, in 2005.<sup>9</sup> The two most common origin locations of reported fires are the engine compartment and the wheel well. The most common ignition points of motorcoach fires are brakes (20% of all motorcoach fires), tires (16%), turbochargers (13%), wheel hub/bearings (10%), and electrical sources in the engine (7%).<sup>10</sup> In addition, over the past 10 years there have been several recalls conducted by bus manufacturers related to fire risks involving turbocharger failures, battery equalizers, electrical shorts, and auxiliary heaters. NTSB made a number of recommendations related to motorcoach fire safety covering enhanced fire protection standards and the need for fire detection and suppression systems on motorcoaches.

NHTSA identified upgrading motorcoach fire safety requirements as a priority safety area that can improve occupant protection and accident survivability, and initiated a study through the National Institutes for Standards and Technology in 2008. This effort is examining the feasibility of establishing requirements for fire hardening or fire resistance of motorcoach exterior components and approaches to prevent fire and smoke inhalation injuries to occupants in the event of a motorcoach fire. It will evaluate existing fire protection tests and standards to assess their relevance to fire and smoke emissions that originate from within and outside the vehicle cabin in motorcoaches, and will identify standards for testing vehicle interior compartment materials, to develop a flammability standard for motorcoaches and requirements for fire detection and protection systems on motorcoaches.

One of the conclusions from NTSB's investigation of the Wilmer, Texas, inci-

*NHTSA has identified upgrading motorcoach fire safety requirements as a priority safety area.*

<sup>9</sup> Report of Highway Accident Motorcoach Fire on Interstate 45 During Hurricane Rita Evacuation Near Wilmer, Texas, September 23, 2005, National Transportation Safety Board, Accident Report NTSB/HAR-07/01; PB2007-916202.

<sup>10</sup> Draft Volpe report on Motorcoach Fires, May 2009

dent was that continuing analysis of motorcoach and bus fire data is vital to understanding not only the trends in vehicle fires, but also the success or shortcomings of measures taken by the Government and private industry to address this problem. FMCSA entered into an interagency agreement with the NHTSA Special Crash Investigation Unit to evaluate motorcoach fire incidents, conduct detailed engineering root cause analyses, and help identify any particular areas of focus for maintenance monitoring that might be warranted.

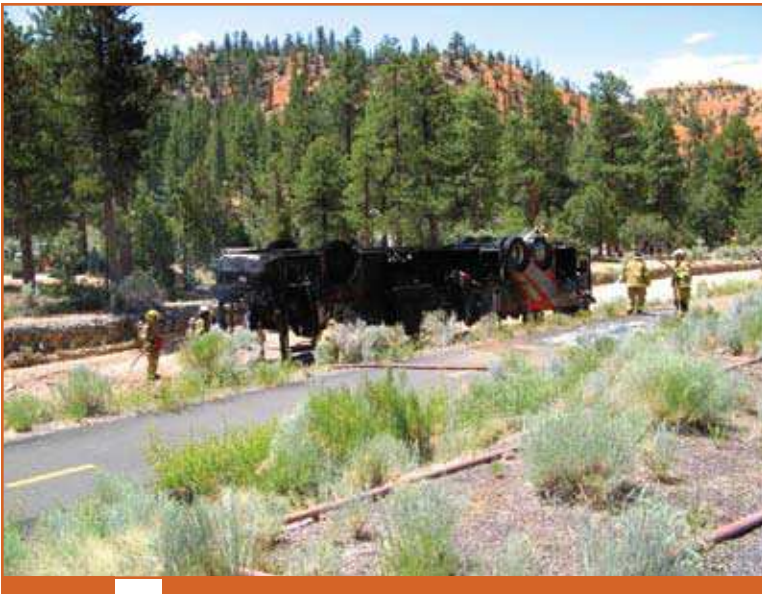
### Milestones:

#### Fire Protection

Q3 2011	Complete assessment on the feasibility of more stringent flammability requirements and the need for and performance of fire detection and protection systems
Q3 2011	Agency decision on regulatory action(s)

#### Fire Root Cause Analysis

Q2 2011	Complete study
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# Enhance Occupant Protection – Vehicle Integrity

(NHTSA)

- Evaluate and develop roof crush performance requirements.
- Re-establish research on improved window glazing and retention techniques.

## ACTION ITEMS

The NTSB designated the improvement of roof strength in motorcoaches as one of its “Most Wanted” safety recommendations. NHTSA identified improving motorcoach roof strength as a priority issue that can improve occupant protection and accident survivability. Improving motorcoach roof strength will enhance the structural integrity of the superstructure, ensure adequate survival space for passengers in the event of a rollover, and improve the structural integrity surrounding the windows that would improve their effectiveness in preventing occupant ejection.

In 2003, NHTSA initiated a joint research program with Transport Canada that focused on improving glazing<sup>11</sup> and window retention on motorcoaches to prevent ejections. The results of that research formed the basis for a dynamic test procedure that could potentially be used for testing glazing materials and bonding techniques to evaluate their effectiveness for prevention of ejections. However, the research program also concluded that significant improvement in roof strength and the structural integrity of windows was needed before the benefits of advanced glazing materials could be achieved. In addition, window retention requirements need to be balanced with emergency egress considerations. NHTSA will re-establish its research effort on window retention and advanced glazing performance requirements for motorcoaches.

### Milestones:

#### Roof Strength

- |         |   |
|---------|---|
| Q3 2009 | Research multiple roof crush test procedures and determine performance requirements |
| Q4 2009 | NHTSA decision on regulatory action   |

#### Windows

- |              |  |
|--------------|--|
| 2009 to 2010 | Research multiple performance requirements for window retention and advanced glazing |
| Q1 2011      | NHTSA decision on regulatory action  |



<sup>11</sup> Glazing is the clear part of a window that may be made of tempered glass, laminated glass, polycarbonate, or other materials. In a motorcoach rollover event, there is a high likelihood of occupant impact with the window glazing. If the glazing breaks or gets detached during this occupant interaction, it may result in occupant ejection through the window.

## Enhance Occupant Protection – Emergency Egress

(NHTSA and FMCSA)

### ACTION ITEMS

- Complete research on emergency egress requirements, with special attention to children, older people, and people with disabilities. (NHTSA)
- Examine ways to convey safety information and improve evacuation for a diverse population. (FMCSA)

In its investigations of fatal motorcoach crashes occurring between June 1998 and January 2008, NTSB identified difficulties in evacuating passengers as a major factor contributing to motorcoach passenger injuries and fatalities. NTSB cited difficulties with roof and window emergency exits, problems in finding emergency exits because of darkness or smoke, and the limited ability of passengers with special needs to evacuate a motorcoach. NTSB recommended that DOT revise its standards for bus emergency exits, require motorcoaches to be equipped with emergency lighting fixtures, and use luminescent retro-reflective material to mark emergency exits. In addition, NTSB recommended that DOT evaluate the current emergency evacuation designs of buses.

NHTSA identified enhancing the ability of passengers to evacuate a motorcoach in a crash as a priority safety initiative with the potential to reduce fatalities and injuries. NHTSA initiated a two-year research project to determine effective measures to facilitate passenger evacuations and assess the need for enhancements to current standards. NHTSA recognizes that the need must be balanced against the competing goals of preventing ejections while ensuring that emergency exits are easy to open. The research includes simulations to determine egress rates under various scenarios, examination of occupant strength requirements (including children and older people) for opening various emergency exits, and evaluation of the effect of exit lighting, signage, and markings on passenger egress rates.

In response to an NTSB recommendation, FMCSA published guidance on September 13, 2007, to the motorcoach industry for providing pre-trip safety information to motorcoach passengers. To assist motorcoach companies with such implementation, FMCSA distributed safety brochures, posters, and an audio compact disk based on the published guidance. The original audio compact disk contained safety announcements in the English language. In response to requests from the motorcoach industry, FMCSA translated the safety announcements into six other languages. FMCSA distributed a second audio compact disk that contains the safety announcements in all seven languages.

*NTSB identified difficulties in evacuating passengers as a major factor contributing to motorcoach passenger injuries and fatalities.*

## Milestones:

- Q4 2009 Printing and distribution of multi-language pre-trip safety information compact disk
- Q2 2010 Complete assessment and NHTSA decision on regulatory action



# Data Collection and Analysis

(NHTSA and FMCSA)

## ACTION ITEMS

- Develop requirements for event data recorders. (NHTSA)
- Supplement FMCSA motorcoach data. (FMCSA)

NHTSA recently established requirements for voluntarily installed event data recorders (EDRs)<sup>12</sup> in light passenger vehicles. However, the crash characteristics and relevant measurements that would be necessary for motorcoaches would be considerably different. For the past several years, NHTSA worked with the Society of Automotive Engineers (SAE) Truck and Bus Committee in the development of SAE Recommended Practice J2728, “Heavy Vehicle Event Data Recorder (HVEDR) – Base Standard.” This standard is being developed to define specifications and functional requirements for HVEDRs for the reliable and accurate recording of the crash parameters that are relevant to heavy vehicles.

Additionally, to augment the data it currently collects on motorcoach drivers and operators, FMCSA will explore other passenger carrier data sources, such as the Department of Defense Travel Management program or State data programs, to determine the feasibility of adding to FMCSA’s existing motorcoach data.

*To augment the data it currently collects on motorcoach drivers and operators, FMCSA will explore other passenger carrier data sources.*

### Milestones:

#### Event Data Recorders

- |         |   |
|---------|---|
| Q1 2010 | SAE expects to release Recommended Practice J2728   |
| Q2 2010 | Agency decision on installation and performance characteristics of HVEDRs on motorcoaches |

#### Supplemental Data

- |              |   |
|--------------|---|
| January 2010 | Compile and assess additional sources of passenger carrier safety data collected by Federal or State agencies |
| April 2010   | Determine data compatibility  |
| July 2010    | Assess costs and benefits of supplemental data  |

<sup>12</sup> In the event of a crash, the EDR stores certain crash parameters such as speed, throttle setting, brake application, crash acceleration, etc. It does not include audio or video recording.



## Next Steps

**T**he Department of Transportation recognizes that our focus on motorcoach safety must remain steady. As the agencies implement the identified action items, this plan will be updated annually to reflect our progress and any new information about this segment of the passenger transportation industry. FMCSA, NHTSA, FHWA, FTA, PHMSA, and OST are committed to continuing the partnership that was strengthened through the development of this plan. We will continue to share information and coordinate on these important initiatives. We remain dedicated to ensuring that motorcoach travel remains a very safe mode of highway transportation for the more than 500 million passengers each year.





# APPENDIX A

## Open Motorcoach Safety Recommendations From The National Transportation Safety Board

### DRIVER FATIGUE

**H-07-41:** *Require all interstate commercial vehicle carriers to use electronic on-board recorders that collect and maintain data concerning driver hours of service in a valid, accurate, and secure manner under all circumstances, including accident conditions, to enable the carriers and their regulators to monitor and assess hours-of-service compliance.*

**H-08-13:** *Develop and implement a plan to deploy technologies in commercial vehicles to reduce the occurrence of fatigue-related crashes.*

**H-08-14:** *Develop and use a methodology that will continually assess the effectiveness of the fatigue management plans implemented by motor carriers, including their ability to improve sleep and alertness, mitigate performance errors, and prevent incidents and crashes.*

### DRIVER BEHAVIOR

**H-01-25:** *Develop a system that records all positive drug/alcohol test results and refusal determinations.*

**H-06-27:** *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.*

### MEDICAL QUALIFICATION OF DRIVERS

**H-01-17:** *Develop medical oversight program to ensure only qualified individuals perform medical exams.*

**H-01-18:** *Develop medical oversight program to ensure all prior applications for medical certification are recorded and reviewed.*

**H-01-19:** *Develop medical oversight program to periodically update medical certifications regulations.*

**H-01-20:** *Develop medical oversight program to provide individuals performing medical exams with specific guidance and source of information for questions.*

**H-01-21:** *Develop medical oversight program to prevent or identify and correct inappropriate issuance of medical certificates.*

**H-01-22:** *Develop medical oversight program to ensure enforcement authorities can identify invalid medical certificates during inspections/routine stops.*

**H-01-23:** *Develop medical oversight program to ensure enforcement authorities can prevent uncertified driver from driving.*

**H-01-24:** *Develop medical oversight programs to include mechanisms for reporting medical conditions to authorities and for evaluating medical conditions between exams.*

## **VEHICLE MAINTENANCE**

**H-02-15:** *Amend 49 CFR 396.13 to require pre-trip brake adjustment inspection procedures.*

**H-05-03:** *Revise the FMCSR's appendix G to subchapter B, "Minimum Periodic Inspection Standards" part 10 "Tires", Sections A(5) and B(7), to address tire's speed rating.*

**H-05-04:** *Safety analysis on the effectiveness of the self inspection and certification process motor carriers use in order to comply with annual inspection requirements.*

**H-05-05:** *Revise FMCSR's appendix G to subchapter B, "Minimum Periodic Inspection Standards." Develop method of inspecting motorcoach seat anchorages.*

## **CRASH AVOIDANCE MEASURES**

### **Advanced Technologies**

**H-01-06:** *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-01-07:** *After promulgating performance standards for collision warning systems for commercial vehicles, require that all new commercial vehicles be equipped with a collision warning system.*

**H-01-09:** *Develop and implement, in cooperation with the Federal Highway Administration, the Intelligent Transportation Society of America, and the truck, motorcoach, and automobile manufacturers, a program to inform the public and commercial drivers on the benefits, use, and effectiveness of collision warning systems and adaptive cruise controls.*

**H-08-15:** Determine whether equipping commercial vehicles with collision warning systems with active braking and electronic stability control systems will reduce commercial vehicle crashes. If these technologies are determined to be effective in reducing crashes, require their use on commercial vehicles.

**H-09-11:** Require the installation of brake transmission shift interlock systems or equivalent in newly manufactured heavy vehicles with automatic transmissions and other transmissions susceptible to unintended acceleration associated with pedal misapplication when starting from a parked position.

**H-09-12:** Analyze pedal configurations in heavy vehicles, including innovative designs, to determine the effect of pedal design on the driving task, examining—among other things—pedal error, reaction time, driver acceptance, and driver adaptation.

**H-09-13:** Once the analysis of pedal configurations requested in Safety Recommendation H-09-12 is complete, publish pedal design guidelines for designers and manufacturers.

**H-09-17:** Require all new motor vehicles weighing over 10,000 pounds to be equipped with direct tire pressure monitoring systems to inform drivers of the actual tire pressures on their vehicles.

## **Traffic Control**

**H-08-3:** Include in a Manual on Uniform Traffic Control Devices standard the requirements for HOV-only left exits to have LEFT message plaques on all exit guide signs and for exit direction (arrow) signs to be positioned next to pull-through signs at exits with limited sight distance, short ramps, or multiple route choices.

**H-08-04:** Include in a Manual on Uniform Traffic Control Devices standard criteria for the use of advisory speed limit signs for all interstate exit ramps.

**H-08-5:** Evaluate the Manual on Uniform Traffic Control Devices standard for guide line marking requirements for interstate left exits.

**H-08-6:** Work with the National Committee on Uniform Traffic Control Devices to ensure that the next edition of the Manual on Uniform Traffic Control Devices is issued as scheduled in 2008 and that the revision comprehensively addresses the uniformity of HOV traffic control devices, including left exits.

**H-08-7:** Require a phase-in period of 5 years for supplemental LEFT message plaques in the standard proposed for the next edition of the Manual on Uniform Traffic Control Devices.

**H-09-7:** Develop and implement, in conjunction with the American Association of State Highway and Transportation Officials and the National Association of State

*Emergency Medical Services Officials, criteria based on traffic patterns, passenger volume, and bus types that can be used to assess the risks of rural travel by large buses. Use these criteria as part of the SAFETEA-LU requirement to identify and select Highway Safety Improvement Program projects.*

## **OCCUPANT PROTECTION**

### **General Occupant Protection**

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

**H-99-48:** *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 retains passengers, including those in child safety restraint systems, within the seating compartment throughout the accident sequence for all accident scenarios.*

**H-99-49:** *Expand research on current 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-99-50 (MW):** *In 2 years, issue performance standards for motorcoach roof strength that provide maximum survival space for all seating positions and that take into account current typical motorcoach window dimensions.*

**H-99-51:** *Once performance standards have been developed for motorcoach roof strength, require newly manufactured motorcoaches to meet those standards.*

**H-05-01:** *Develop performance standards for passenger seat anchorages in motorcoaches.*

**H-09-18:** *Develop performance standards for newly manufactured motorcoaches to require that overhead luggage racks remain anchored during an accident sequence.*

**H-09-19:** *Develop performance standards for newly manufactured motorcoaches that prevent head and neck injuries from overhead luggage racks.*

### **Fire Protection**

**H-07-04:** *Develop a Federal Motor Vehicle Safety Standard to provide enhanced fire protection of the fuel system in areas of motorcoaches and buses where the system may be exposed to the effects of a fire.*

**H-07-05:** *Develop a Federal Motor Vehicle Safety Standard to provide fire-hardening of exterior fire-prone materials, such as those in areas around wheel wells, to limit the potential for flame spread into a motorcoach or bus passenger compartment.*

**H-07-06:** *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.*

**H-07-07:** *Evaluate the need for a Federal Motor Vehicle Safety Standard that would require installation of fire detection and suppression systems on motorcoaches.*

### **Passenger Evacuations**

**H-99-9:** *Revise the Federal Motor Vehicle Safety Standard (FMVSS) No. 217, “Bus Emergency Exits and 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-00-01:** *Revise the FMVSS to require that all motorcoaches be equipped with emergency lighting fixtures that are outfitted with a self-contained independent power source.*

**H-00-02:** *Revise the FMVSS to require the use of interior luminescent or exterior retro-reflective material, or both, to mark all emergency exits in all motorcoaches.*

**H-07-08:** *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.*

## **OPERATOR OVERSIGHT**

**H-93-28:** *Develop systematic process to identify carriers subject to FMCSA’s jurisdiction, including immediate entry of new carriers into MCMIS.*

**H-99-06:** *Change the safety fitness rating methodology so that adverse vehicle/driver performance-based data alone are sufficient to result in overall unsatisfactory rating.*

**H-02-16:** *Require that vehicle inspections of a motor carrier’s fleet occur during compliance reviews.*

**H-02-18:** *During compliance reviews, rate companies Unsatisfactory in the vehicle factor category if brake inspectors are not qualified.*

**H-03-02:** *Require all new carriers seeking operating authority to demonstrate safety skills prior to obtaining new entrant authority.*

**H-06-17:** *Establish a program to verify that motor carriers have ceased operations after the effective date of revocation of operating authority.*

**H-07-03:** To protect the traveling public until completion of the Comprehensive Safety Analysis (CSA) 2010 Initiative, immediately 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.

**MH-07-062, B02:** Ensure that adequate space is available to conduct bus inspections by working on a site-specific basis with the U.S. Customs and Border Plan with respect to periodically determining the effectiveness of the bus inspection plan by surveying field personnel or through other methods.

## DATA COLLECTION AND ANALYSIS

**H-99-53:** 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 a minimum, lateral acceleration, longitudinal acceleration, virtual 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, air bag deployment criteria, air bag development time, and air bag 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 electric 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-99-54:** 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, fire survivability, independent power supply, and ability to accommodate future requirements and technological advances.

**H-07-01:** Establish a process to continuously gather and evaluate information on the causes, frequency, and severity of bus and motorcoach fires and conduct ongoing analysis of 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.

## MISCELLANEOUS AND OTHER

**H-99-07:** *Provide guidance on minimum information to be included in safety briefing material for motorcoach operations.*

**H-99-08:** *Require motorcoach operators to provide passengers with pretrip safety information.*

**H-99-43:** *In 1 year and in cooperation with the bus manufacturers, complete the development of standard definitions and classifications for each of the different bus body types, and include these definitions and classifications in the FMVSS.*

**H-02-18:** *Revise 49 CFR 396.25 (Qualifications of Brake Inspectors) to require formal training and certification as prerequisites for qualification.*

**H-04-18:** *Require posting of emergency phone number on interior of motorcoaches for passenger use in the event of an emergency with the driver.*

**H-05-17:** *Conduct testing on the effects of differing tread depths for the steer and drive axle tires.*

**H-05-18:** *Modify tread depth requirements after NHTSA completes research recommended by H-05-17.*

**H-09-4:** *Develop a plan that can be used by the States and public safety answering points to pursue funding for enhancements of wireless communications coverage that can facilitate prompt accident notification and emergency response along high-risk rural roads, as identified under SAFETEA-LU criteria, and along rural roads having substantial large bus traffic (as defined by the criteria established in Safety Recommendation H-09-7).*

**H-09-5:** *Evaluate the system of emergency care response to large-scale transportation related rural crashes and, once that evaluation is completed, develop guidelines for emergency medical service response and provide those guidelines to the States.*

# APPENDIX B

## Additional DOT Commercial Vehicle Actions That Will Further Improve Motorcoach Safety

### Related Research, Outreach, and Regulatory Areas

Operating Administration	Issue	Action	Comments
NHTSA	Heavy-Vehicle Forward Collision Avoidance and Mitigation	Research	Develop performance criteria and objective tests to support the identification of effective advanced safety technologies that provide a warning of an impending forward collision and/or automatically brake/slow the vehicle.
NHTSA, FMCSA, FHWA, RITA	ITS - Intellidrive (using wireless communication technology between vehicles and from vehicles to the infrastructure to enhance vehicle safety and mobility)	Research	An updated program plan and activity roadmap are being developed by NHTSA, FMCSA, RITA, and FHWA. As part of this, a new commercial vehicle (including motorcoach) research track is expected to be included.
FMCSA	Electronic On-Board Recorders	Final Rule	This rule will affect high-risk carriers. Agency is considering an additional rulemaking to expand the mandatory use of EOBRs.
FMCSA	Entry Level Driver Training	Final Rule	This rule will specify classroom and behind the wheel training requirements for truck and bus drivers.
FMCSA	CDL/Learner's Permits	Final Rule	This rule will establish new requirements for knowledge and skills tests and will require more uniformity among States regarding endorsements, renewals, and license information.
FMCSA	Safety Fitness Determination	NPRM	This rule will allow FMCSA to use crash and inspection data when determining the safety fitness rating of a carrier in lieu of a formal audit/investigation.



Operating Administration	Issue	Action	Comments
FMCSA	Employee Notification System	Research	This project has demonstrated the correlation between prompt notification of the carrier of a driver's violation and improved safety performance by the carrier. Using the information provided, the carriers are able to provide drivers safety counseling and/or remove them from the highways as appropriate.
FMCSA	Driver Information Resource	Information Technology	This system would allow drivers to give prospective employers access to their driving records so that carriers no longer have to rely on past employers for references.
FMCSA, NHTSA	Provide education and outreach on motorcoach crash avoidance systems	Technology	FMCSA held Webinars and other outreach meetings and forums to communicate the potential benefits of onboard safety technologies to the motor carrier industry. Additional work could focus more on motorcoach technologies such as Collision Warning Systems (CWS) and Electronic Stability Control (ESC).
Outreach	FMCSA has held Webinars and held other outreach meetings and forums to communicate the potential benefits of onboard safety technologies to the motor carrier industry. Additional work could focus more on motorcoach technologies such as CWS and ESC.	Technology	This program is examining how to best integrate three crash avoidance technologies (forward collision, lane change/merge, and run-off-road warning systems)
FMCSA	Integrated Vehicle-Based Safety Systems	Technology	This program is examining how to best integrate three crash avoidance technologies (forward collision, lane change/merge, and run-off-road warning systems)

Operating Administration	Issue	Action	Comments
FMCSA	Smart Infrared Inspection System	Technology	Purpose of research project is to demonstrate a smart infrared inspection system (SIRIS) that leverages state-of-the-art thermal imagery technology, integrated with signature recognition software, in order to provide a fully automated capability to identify faults and impending failures in tires, brakes, and bearings mounted on large trucks and motorcoaches and to alert roadside inspectors in real-time.
PHMSA	Guidance on safe transportation of hazardous materials on motorcoaches	Outreach	In 2005 and 2006, PHMSA worked with the motorcoach industry to develop guidance on how to safely transport oxygen cylinders for passenger use on buses and trains. PHMSA also developed and issued guidance for airline passengers on how to safely transport hazardous materials (e.g., batteries, toiletries, ammunition, camp supplies, etc.) in checked and carry-on baggage and will develop similar guidance for bus passengers. PHMSA will also issue guidance for shippers and motorcoach operators on the regulatory requirements applicable to hazardous materials transported as cargo on motorcoaches.



# APPENDIX C

## Stakeholder Consultations

Following is the list of stakeholders DOT consulted as it developed this action plan:

- Commercial Vehicle Safety Alliance (CVSA)
- Van Hool NV
- ABC Bus Companies Inc.
- American Bus Association (ABA)
- C&J Bus Company
- United Motorcoach Association (UMA)
- Motor Coach Industries Int'l, Inc. (MCI)
- FirstGroup plc
- Greyhound Lines, Inc.
- First Student Inc.
- National School Transportation Association (NSTA)
- National Association of State Directors of Pupil Transportation Services (NASDPTS)
- Daimler AG
- Prevost, a division of Volvo Bus Corporation
- Hogan & Hartson LLP
- National Transportation Safety Board (NTSB)











U.S. Department of Transportation  
**National Highway Traffic Safety**

**Federal Highway Administration**

**Federal Motor Carrier Safety  
Administration**

**Federal Transit Administration**

**Pipeline and Hazardous Materials  
Safety Administration**