

Flooding source(s)	Location of referenced elevation	* Elevation in feet (NGVD) + Elevation in feet (NAVD) # Depth in feet above ground ^ Elevation in meters (MSL)		Communities affected
		Effective	Modified	

Maps are available for inspection at the Town Hall, 21 Main Street, North Berwick, ME 03906.

**Town of Ogunquit**

Maps are available for inspection at the Town Hall, 23 School Street, Ogunquit, ME 03907.

**Town of Old Orchard Beach**

Maps are available for inspection at the Town Hall, 1 Portland Avenue, Old Orchard Beach, ME 04064.

**Town of Parsonsfield**

Maps are available for inspection at the Town Hall, 62 Federal Road, Parsonsfield, ME 04047.

**Town of South Berwick**

Maps are available for inspection at the Town Hall, 180 Main Street, South Berwick, ME 03908.

**Town of Wells**

Maps are available for inspection at the Town Hall, 208 Sanford Road, Wells, ME 04090.

**Town of York**

Maps are available for inspection at the Town Hall, 186 York Street, York, ME 03909.

(Catalog of Federal Domestic Assistance No. 97.022, "Flood Insurance.")

Dated: August 10, 2010.

**Sandra K. Knight,**

*Deputy Federal Insurance and Mitigation Administrator, Mitigation, Department of Homeland Security, Federal Emergency Management Agency.*

[FR Doc. 2010-20410 Filed 8-17-10; 8:45 am]

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**DEPARTMENT OF TRANSPORTATION**

**National Highway Traffic Safety Administration**

**49 CFR Part 571**

[Docket No. NHTSA-2010-0112]

RIN 2127-AK56

**Federal Motor Vehicle Safety Standards; Motorcoach Definition; Occupant Crash Protection**

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** In accordance with NHTSA's 2007 Motorcoach Safety Plan and DOT's 2009 Departmental Motorcoach Safety Action Plan, NHTSA is issuing this NPRM to propose to amend the Federal motor vehicle safety standard (FMVSS) on occupant crash protection (FMVSS No. 208) to require lap/shoulder seat belts for each passenger seating position in new motorcoaches. This NPRM also proposes to require a lap/shoulder belt for the motorcoach and large school bus driver's seating positions, which currently are required to have either a

lap or a lap/shoulder belt. Although motorcoach transportation overall is a safe form of transportation in the United States, several motorcoach crashes in 2008 have illustrated that motorcoach rollover crashes, while a relatively rare event, can cause a significant number of fatal or serious injuries in a single event. NHTSA's safety research on motorcoach seat belts, completed in 2009, shows that the installation of lap/shoulder belts on motorcoaches is practicable and effective. We believe that the seat belt assemblies that would be installed on motorcoach passenger seats pursuant to this rulemaking could reduce the risk of fatal injuries in rollover crashes by 77 percent, primarily by preventing occupant ejection in a crash.

**DATES:** Comments must be received on or before October 18, 2010. Proposed compliance date: 3 years after publication of a final rule.

**ADDRESSES:** You may submit comments to the docket number identified in the heading of this document by any of the following methods:

- *Federal eRulemaking Portal:* go to <http://www.regulations.gov>. Follow the online instructions for submitting comments.
- *Mail:* Docket Management Facility, M-30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590.
- *Hand Delivery or Courier:* West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE., between 9 am and 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.
- *Fax:* (202) 493-2251.

Regardless of how you submit your comments, you should mention the docket number of this document.

You may call the Docket at 202-366-9324.

**Instructions:** For detailed instructions on submitting comments and additional information on the rulemaking process, see the Public Participation heading of the Supplementary Information section of this document. Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided.

**Privacy Act:** Please see the Privacy Act heading under Rulemaking Analyses and Notices.

**FOR FURTHER INFORMATION CONTACT:** For non-legal issues, Mr. David Sutula, Office of Crashworthiness Standards (*telephone:* 202-366-0247) (*fax:* 202-366-4921). Mr. Sutula's mailing address is National Highway Traffic Safety Administration, NVS-112, 1200 New Jersey Avenue, SE., Washington, DC 20590.

For legal issues, Ms. Dorothy Nakama, Office of the Chief Counsel (*telephone:* 202-366-2992) (*fax:* 202-366-3820). Ms. Nakama's mailing address is National Highway Traffic Safety Administration, NCC-112, 1200 New Jersey Avenue, SE., Washington, DC 20590.

**SUPPLEMENTARY INFORMATION:**

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## I. Executive Summary

One of the guiding principles NHTSA considers in determining the priorities of our rulemaking projects is to ensure the protection of passengers in high-occupancy vehicles. In 2007, NHTSA published a comprehensive plan to research improvements to motorcoach safety.<sup>1</sup> This plan was developed in direct response to several National Transportation Safety Board (NTSB) recommendations and also to address several crashes that occurred since the recommendations were issued. NHTSA's motorcoach safety plan identified as our highest priorities four specific areas where we can most effectively address open NTSB recommendations over the next few years, and also improve motorcoach safety most expeditiously. The four priority areas are requiring seat belts (minimizing passenger and driver ejection from the motorcoach), improved roof strength, emergency evacuation, and fire safety.

This NPRM addresses the first priority area of minimizing passenger and driver ejection by proposing the installation of lap/shoulder belts for all motorcoach occupants. It results from an extensive test program completed in 2009 involving a full-scale frontal 48 kilometers per hour (km/h) (30 miles per hour (mph)) barrier crash test with instrumented test dummies representing a 50th percentile adult male, a 5th percentile adult female, and a 95th percentile adult male, sled testing under a range of belted and unbelted conditions, and seat anchorage strength testing. In the crash test, NHTSA analyzed the head accelerations (head injury criterion, HIC), neck injury (Nij)

values, and other injury criteria measured by the test dummies, the kinematics of the dummies during the crash, and the structural integrity of the seats, floor and bus. The sled tests (crash simulations) were conducted using a representation of the crash pulse from the barrier test, and using a crash pulse from Economic Commission for Europe (ECE) Regulation 80. In the sled tests, we evaluated motorcoach seats without seat belts, motorcoach seats with lap/shoulder seat belts, and motorcoach seats with lap only belts. We tested the seats with different size dummies and in frontal and oblique (15°) impact configurations and with and without loading by unrestrained occupants in the rear seat. The results showed that lap/shoulder belts prevented critical head and neck injury values in almost all configurations using the crash pulse from the motorcoach barrier test.

Motorcoach transportation is an overall safe form of transportation. Over the ten year period between 1999 and 2008, there were 54 fatal motorcoach crashes resulting in 186 fatalities. During this period, on average, 16 fatalities have occurred annually to occupants of motorcoaches in crash and rollover events, with about 2 of these fatalities being drivers and 14 being passengers. However, while motorcoach transportation overall is safe, given the high-occupancy of motorcoaches, when serious crashes do occur of this vehicle type, they can cause a significant number of fatal or serious injuries during a single event, particularly when occupants are ejected.

The goal of this rulemaking is to reduce occupant ejections. Data from NHTSA's Fatal Analysis Reporting System (FARS) from 1999–2008 show that most (63 percent) fatal motorcoach crashes are single vehicle roadside events (e.g., run off the road or hitting roadside objects) or rollovers. Ejections account for seventy-eight percent of the fatalities in motorcoach rollover crashes and twenty-eight percent of the fatalities in non-rollover crashes.

The risk of ejection can be reduced by seat belts, a simple and effective countermeasure. Seat belts are estimated to be 77 percent effective<sup>2</sup> in preventing fatal injuries in rollover crashes, primarily by preventing ejection.<sup>3</sup> This

<sup>2</sup> Estimated based on Kahane, "Fatality Reduction by Safety Belts for Front-Seat Occupants of Cars and Light Trucks," December 2000, Washington, DC, National Highway Traffic Safety Administration.

<sup>3</sup> We estimate that even at a minimum seat belt usage rate of only 21 percent, the proposed rule will remain cost effective for motorcoach passengers. Comments are requested regarding whether States would consider adopting mandatory belt use laws

NPRM proposes to require passenger seating positions on new motorcoaches to be equipped with seat belts. As for the type of seat belt that we should require, we are proposing that lap/shoulder belts be installed.<sup>4</sup> Our test program showed that lap/shoulder belts were effective at preventing critical head and neck injury values, whereas dummies in lap only belts measured HIC and Nij values surpassing critical thresholds. The performance of the belts and anchorages would be assessed by testing to FMVSS Nos. 209 and 210.

The main proposals of this NPRM are to:

- Add a definition of "motorcoach" to 49 CFR Part 571.3;
- Amend FMVSS No. 208, "Occupant crash protection" (49 CFR 571.208) to:
  - Require lap/shoulder belts at all passenger seating positions on new motorcoaches;
  - Require lap/shoulder belts at all driver's seating positions on new motorcoaches and large school buses;<sup>5</sup>
  - Require lap/shoulder belt anchorage and attachment hardware at all locations for new motorcoaches to meet FMVSS No. 210, "Seat belt assembly anchorages," which specifies that they withstand a force of 13,345 N (3,000 pounds) applied simultaneously to the lap and torso portions of the belt assembly; and,
  - Require the belt system to meet current provisions for seat belt adjustment and fit, so that the seat belts can accommodate a 6-year-old child to a 95th-percentile adult male, be lockable for use with a child restraint system, and be releasable at a single point and by a pushbutton action.<sup>7</sup>

for motorcoach passengers. Also, should motorcoaches be equipped with "buckle up" signs reminding passengers to use their belts?

<sup>4</sup> FMVSS No. 209 uses the term "Type 2 seat belt assembly" to refer to a lap/shoulder belt system. As defined in that standard, a Type 2 seat belt assembly is "a combination of pelvic and upper torso restraints." In this preamble, we use the term "lap/shoulder" belt system rather than "Type 2 seat belt assembly" for plain language purposes. Documents may occasionally refer to lap/shoulder belts as 3-point belts. Under FMVSS No. 209, a "Type 1" seat belt assembly is "a lap belt for pelvic restraint." This preamble refers to Type 1 belts as "lap only belts."

<sup>5</sup> This is proposed for the driver's seating position of large school buses (buses with a gross vehicle weight rating (GVWR) of over 4,635 kilograms (kg) (10,000 pounds (lb)). Small school buses (GVWR less or equal to 4,536 kg) are already required to be equipped with lap/shoulder belts for the driver's seating position.

<sup>6</sup> This proposal addresses NTSB Safety Recommendation H-90-75 from 1990.

<sup>7</sup> FMVSS No. 209 (49 CFR 571.209) already applies to "seat belt assemblies for use in passenger

<sup>1</sup> See Docket No. NHTSA-2007-28793, NHTSA's Approach to Motorcoach Safety.

We estimate that installing lap/shoulder seat belts on new motorcoaches would save approximately 1 to 8 lives and prevent 144 to 794 injuries per year, depending on the usage of lap/shoulder belts in motorcoaches (see Table 1 below).<sup>8</sup> The total cost of adding belts and making structural changes to the motorcoach floor would be approximately \$12,900 per vehicle, with the total cost being \$25 million for the 2,000 new motorcoaches sold per year. Lifetime fuel costs due to an increased weight of the motorcoach would be an additional cost (estimated below).

The cost of installing lap/shoulder belts on new motorcoaches is estimated as follows (see Table 2 below). The incremental cost of adding passenger seats with lap/shoulder belts on a 54 passenger motorcoach is approximately \$9,900. The cost to change the seat anchorages and to reinforce the floor is approximately \$3,000. We estimate that total cost of adding belts, changing the

anchorages and reinforcing the floor is approximately \$12,900. The agency has also estimated increased costs in fuel usage. The increased fuel costs depend on added weight (estimated to be 161 lbs or 269 lbs<sup>9</sup>) and the discount rate used. NHTSA estimates the increased costs in fuel usage for added weight and discounts the additional fuel used over the lifetime of the motorcoach using a 3 percent and 7 percent discount rate. See the PRIA for more details.

The cost per equivalent life saved is estimated to be \$1.3 million to \$9.9 million (see Table 3 below). Annualized costs and benefits are provided in Table 4.

TABLE 1—ESTIMATED BENEFITS

Fatalities .....	1 to 8.
AIS 1 injuries (Minor) .....	92 to 506.
AIS 2–5 (Moderate to Severe) ..	52 to 288.
Total Non-fatal Injuries .....	144 to 794.

TABLE 4—ANNUALIZED COSTS AND BENEFITS  
[In millions of \$2008 dollars]

	Annualized costs	Annualized benefits	Net benefits
3% Discount Rate .....	\$28.0 to 29.4 .....	\$23.4–129.7 .....	–\$4.6 to 100.3.
7% Discount Rate .....	\$27.4 to 28.5 .....	\$17.9–99.0 .....	–\$9.5 to 70.5.

We are not proposing at this time that used buses be required to be retrofitted with the lap/shoulder belt system. The service life of a motorcoach can be 20 years or longer. We estimate that the cost of retrofitting can vary substantially. We estimate it could cost between \$6,000<sup>10</sup>–\$34,000 per vehicle to retrofit the vehicle with lap belts and with sufficient structure to meet today’s proposal. We also estimate it could cost \$40,000 per vehicle to retrofit it with lap/shoulder belts and reinforced structure so as to meet FMVSS No. 210 to support the loads during a crash.<sup>11</sup> The existing fleet size is estimated to be 29,325 motorcoaches. Hence, the fleet cost of retrofitting lap belts is estimated to range from \$175,950,000 (\$6,000 × 29,325) to \$997,050,000 (\$34,000 ×

29,325), while the fleet cost of retrofitting lap/shoulder belts is estimated to be \$1,173,000,000 (\$40,000 × 29,325). These costs do not include increased remaining lifetime fuel costs incurred by adding weight to the motorcoach. Weight would vary depending upon the needed structural changes, and lifetime fuel cost would vary depending upon the age of motorcoaches that would be retrofitted.

Retrofitting used motorcoaches may not be structurally viable for many motorcoaches and may not be economically feasible for many motorcoach for-hire operators, many of which are small businesses. However, we have included a comprehensive set of questions about retrofit in this preamble. The answers to those

cars, multipurpose passenger vehicles, trucks, and buses.” Since motorcoaches are a type of bus, any seat belt assembly installed on the vehicle must meet FMVSS No. 209.

<sup>8</sup> NHTSA has developed a Preliminary Regulatory Impact Analysis (PRIA) that discusses issues relating to the potential costs, benefits and other impacts of this regulatory action. The PRIA is available in the docket for this NPRM and may be obtained by downloading it or by contacting Docket Management at the address or telephone number provided at the beginning of this document. The PRIA assumes that the seat belt use rate on

motorcoaches would be between 15 percent and the percent use in passenger vehicles, which was 83 percent in 2008. These annual benefits would accrue when all motorcoaches in the fleet have lap/shoulder belts.

<sup>9</sup> See PRIA for this NPRM. This estimate is based on preliminary results from a NHTSA contractor conducting cost/weight teardown studies of motorcoach seats. The weight added by 3-point lap/shoulder belts ranged from 5.96 to 9.95 pounds per 2-person seat. This is the weight only of the seat belt assembly itself and does not include changing the design of the seat, reinforcing the floor, walls

TABLE 2—ESTIMATED COSTS  
[2008 Economics]

Per Vehicle .....	\$12,900.
Total Fleet .....	\$25.8 million.
Fuel Costs per Vehicle @ 3% .....	\$1,085 to \$1,812.
Fuel Costs per Vehicle @ 7% .....	\$800 to \$1,336.

TABLE 3—COST PER EQUIVALENT LIFE SAVED

Cost per Equivalent Life Saved:	
15% Belt usage .....	\$7.4 to \$9.9 mill.
83% Belt usage .....	\$1.3 to \$1.8 mill.
Breakeven Point in belt usage	24%.

questions will aid us in determining whether the agency’s initial assessment of cost per equivalent lives saved is correct. The comments will help us determine whether we should issue a separate supplemental NPRM (SNPRM) to require retrofit. If we issue such an SNPRM, we will assess the impact of the proposed rule on small entities in accordance with the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) and will prepare and publish an initial regulatory flexibility analysis if appropriate.

**II. Background**

Each year, the motorcoach industry transports millions of people between cities, for long and short distance tours, school field trips, commuter, and

or other areas of the motorcoach. The final cost and weight results from the study will be placed in the docket for this NPRM.

<sup>10</sup> This assumes that the motorcoach structure is lap belt-ready, and can accommodate the loads set forth in this proposal.

<sup>11</sup> It is noted that, as discussed elsewhere in this preamble, NHTSA has determined that the FMVSS No. 210 loads that this NPRM proposes for new motorcoach belt anchorages appear to be more stringent than ECE R.80 loads and more representative of the imparted loads measured at the seat belt anchorages in a motorcoach.

entertainment-related trips. According to the American Bus Association (ABA), there were approximately 3,400 motorcoach carriers in the United States and Canada in 2007.<sup>12</sup> These motorcoach carriers operated over 33,000 motorcoaches, they logged nearly 750 million passenger trips, and they traveled over 1.8 billion miles yearly. Approximately 3,100 of the carriers were chartered U.S. carriers that operated about 29,000 motorcoaches.

The services provided by motorcoaches in 2007 included charter services (46.4 percent of the miles

driven), moving people between cities or between cities and rural areas (26.5 percent of the miles driven), transporting people between home and work (10.3 percent of the miles driven), and shuttle services to and from the airport (3.4 percent of the miles driven). In 2007, each motorcoach was driven an average of 56,000 miles. The majority of the motorcoach trips (65 percent) were made by children and senior citizens.

### III. Safety Need

NHTSA's Fatality Analysis Reporting System (FARS) data files were examined

to understand different aspects of motorcoach fatal crashes.<sup>13</sup> The FARS contains data on a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle traveling on a traffic way customarily open to the public, and must result in the death of an occupant of a vehicle or a non-occupant within 30 days of the crash. Motorcoaches are identified in FARS as "cross-country intercity buses" in the body type variable.

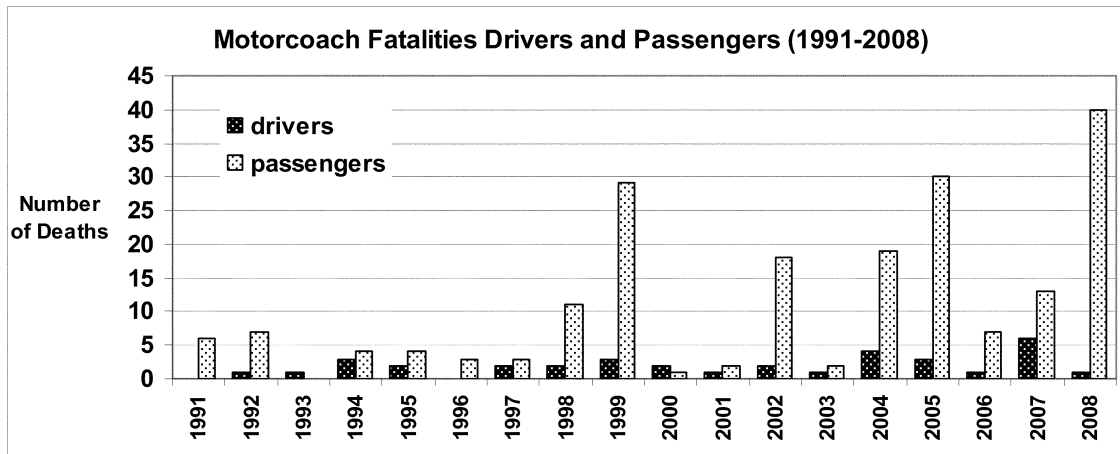


Figure 1: Motorcoach Driver and Passenger Fatalities (FARS 1991 – 2008)

FARS data of motorcoach driver and passenger fatalities for the period 1991–2008 show there were fewer than 10 motorcoach fatalities annually between 1991–1997 while there were more than 10 motorcoach fatalities for the years 1998, 1999, 2002, 2004, 2005, 2007, and 2008 (Figure 1).

The increased fatalities for the years 1999, 2004, and 2005 each resulted from a single event with a large number of fatalities. In 1999, the majority of fatalities resulted from a crash outside of New Orleans, Louisiana, in which a motorcoach struck a guardrail, jumped a ravine, and struck the embankment at a high speed. There was no rollover involved in this event. This crash resulted in 22 fatalities, all of which were passengers. The majority of fatalities in 2004 resulted from a crash

in Arkansas, which involved a motorcoach hitting a highway signpost and subsequently rolling over. This crash resulted in 15 fatalities, including the driver. All 14 passengers who died in this crash were ejected; the driver was not ejected. In 2005, the majority of the fatalities resulted from a motorcoach fire in Wilmer, Texas. This bus was carrying evacuees from a nursing home during the Hurricane Rita evacuation. The 23 fatalities, all of which were passengers, resulted from a tire fire that subsequently carried into the passenger compartment of the bus. The 41 motorcoach passenger fatalities in 2008 were mainly a result of 3 events which included a rollover crash in Mexican Hat, Utah, where 9 passengers were killed, a crash in Sherman, Texas, where 17 passengers were killed, and a

rollover crash near Williams, California, where 9 passengers were killed.

#### a. Rollovers and Ejection

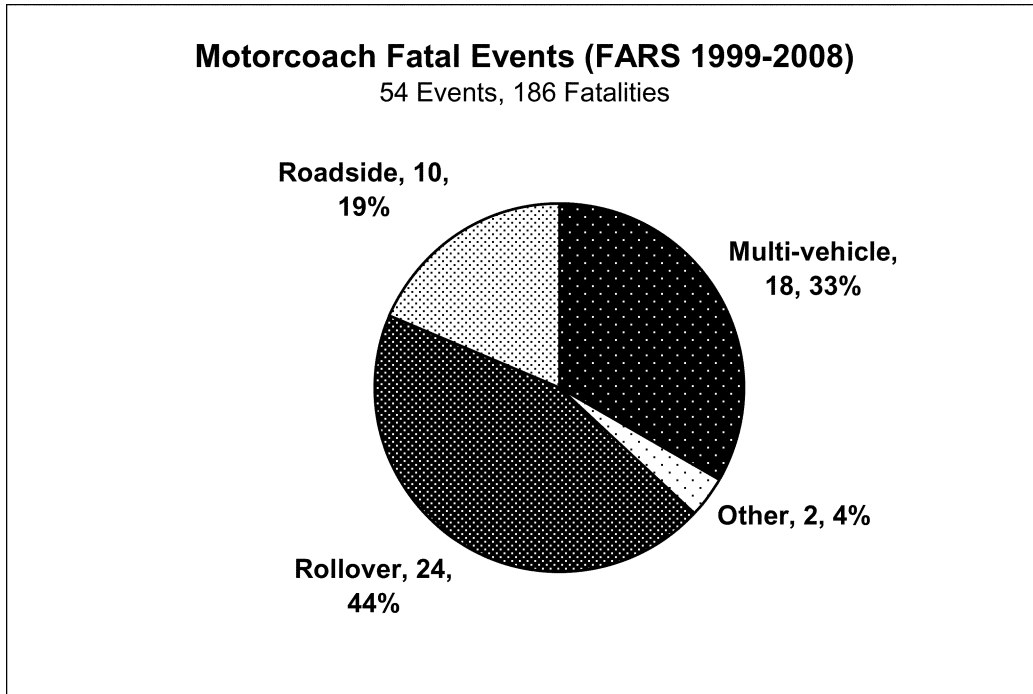
Over the ten-year period between 1999 and 2008, there were 54 fatal motorcoach crashes resulting in 186 fatalities. During this period, on average, 16 fatalities have occurred annually to occupants of motorcoaches in crash and rollover events, with about 2 of these fatalities being drivers and 14 being passengers.

Figure 2 shows motorcoach crashes by most harmful event for the period 1999–2008. Multi-vehicle crashes and impacts with roadside objects account for 33 percent and 19 percent of all motorcoach fatal events, respectively, while motorcoach rollovers account for 44 percent of motorcoach fatal events.

<sup>12</sup> "Motorcoach Census 2008, A Benchmarking Study of the Size and Activity of the Motorcoach Industry in the United States and Canada in 2007."

Paul Bourquin, Economist and Industry Analyst, December 18, 2008.

<sup>13</sup> The following discussion is also set forth in the DOT 2009 Motorcoach Action Plan, <http://www.nhtsa.gov/staticfiles/DOT/NHTSA/reports/HS811177.pdf>.

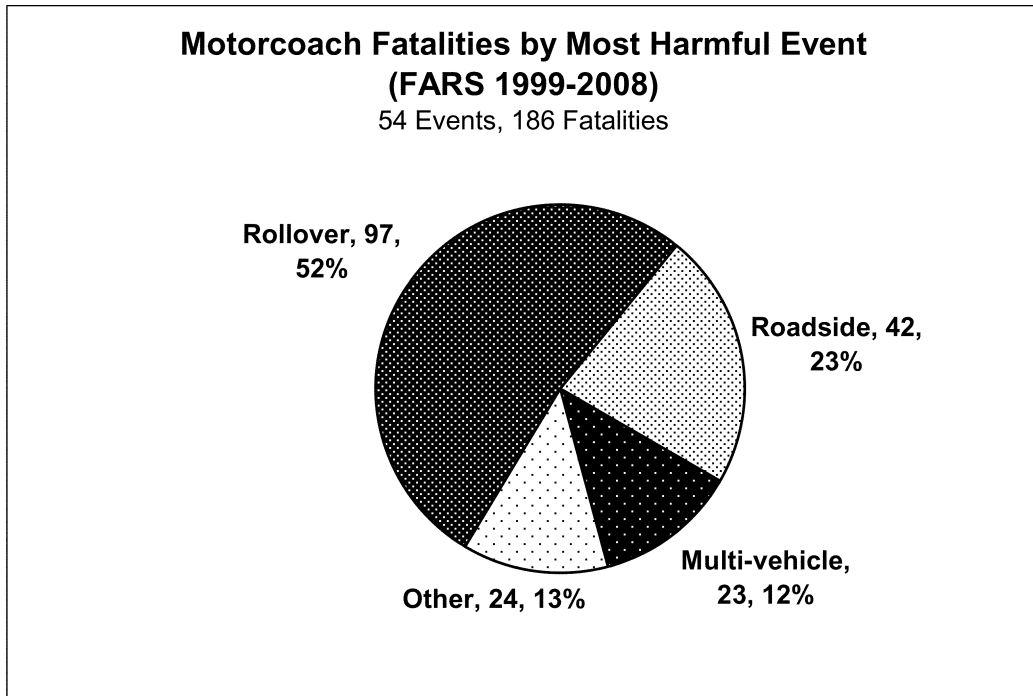


**Figure 2: Fatal Motorcoach Events by Most Harmful Event**

Figure 3 shows the motorcoach fatalities by most harmful event. Motorcoach rollover was the most

common “most harmful event,” accounting for 52 percent of the fatalities. Running off the road and

striking a roadside object was the second most common event, leading to 23 percent of the fatalities.



**Figure 3: Motorcoach Fatalities by Most Harmful Event**

Figure 4 shows driver and passenger fatality distribution by ejection mode

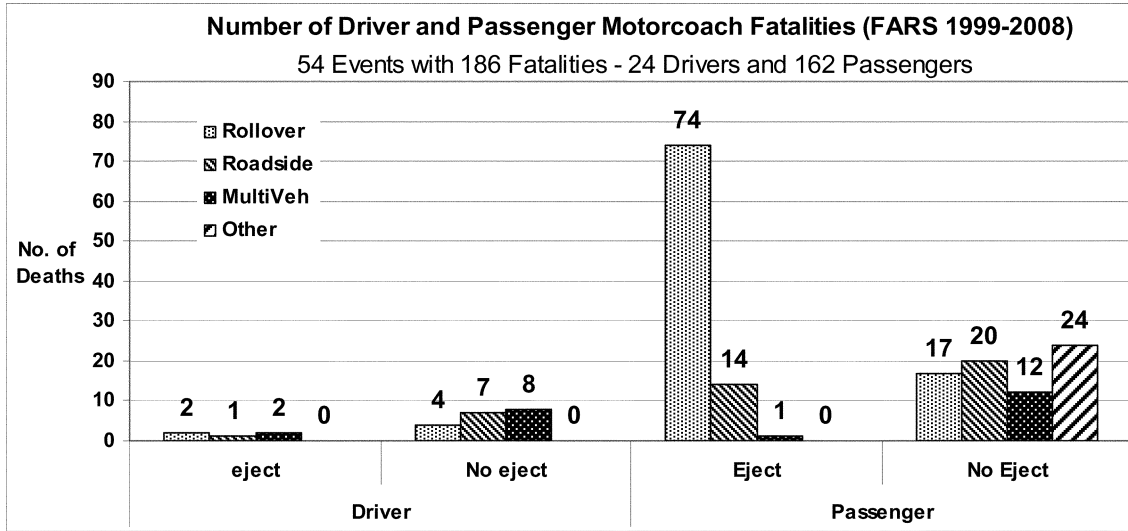
and type of harmful event. The highest fatality count (74) corresponds to

ejected motorcoach passengers due to a rollover event. Vehicles in road side

events (running off road, hitting roadside objects) account for 20 fatalities of non-ejected passengers. For the driver, the highest number of

fatalities occurs in multi-vehicle crashes. Driver fatalities without ejections are more common than those with ejections. This is likely because the

driver's seat is equipped with seat belts (lap or lap/shoulder belts) which help keep the driver in the seat.

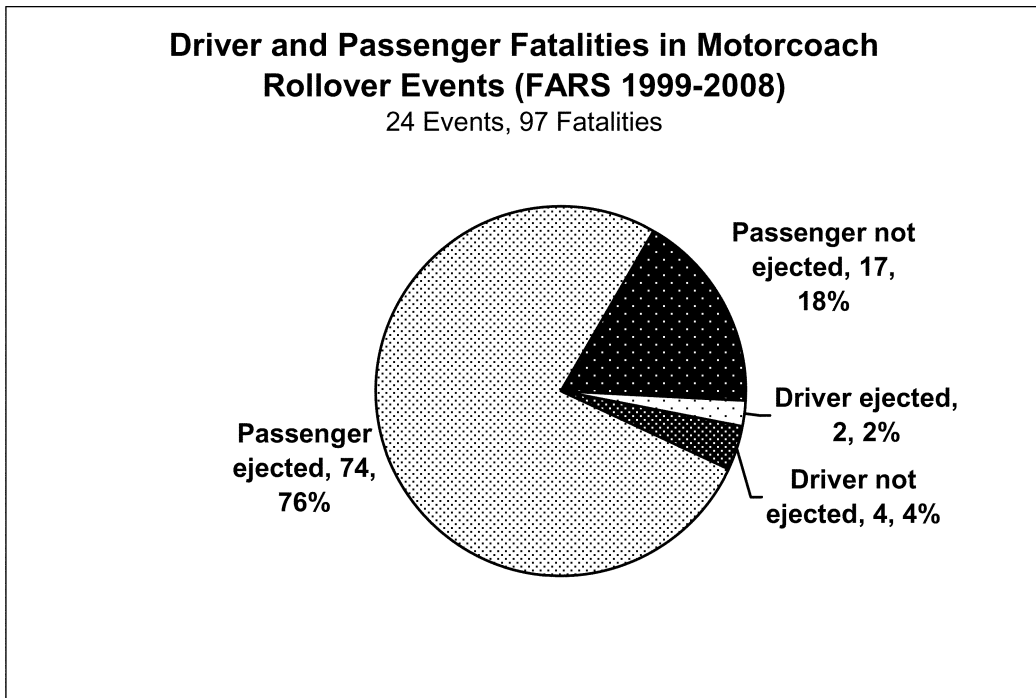


**Figure 4: Driver and Passenger Fatalities by Ejection mode and Most Harmful Event**

Figure 5 shows distribution of fatalities in motorcoach rollover crashes. For the ten year period from 1999 to 2008, there were 24 fatal motorcoach

rollover events resulting in 97 fatalities. In these rollover events, 76 percent of the fatalities were motorcoach passengers who were ejected. Two

drivers (2 percent) involved in rollover crashes were ejected.



**Figure 5: Distribution of driver and passenger fatalities in rollover events**

Figure 6 shows the distribution of driver and passenger fatalities in

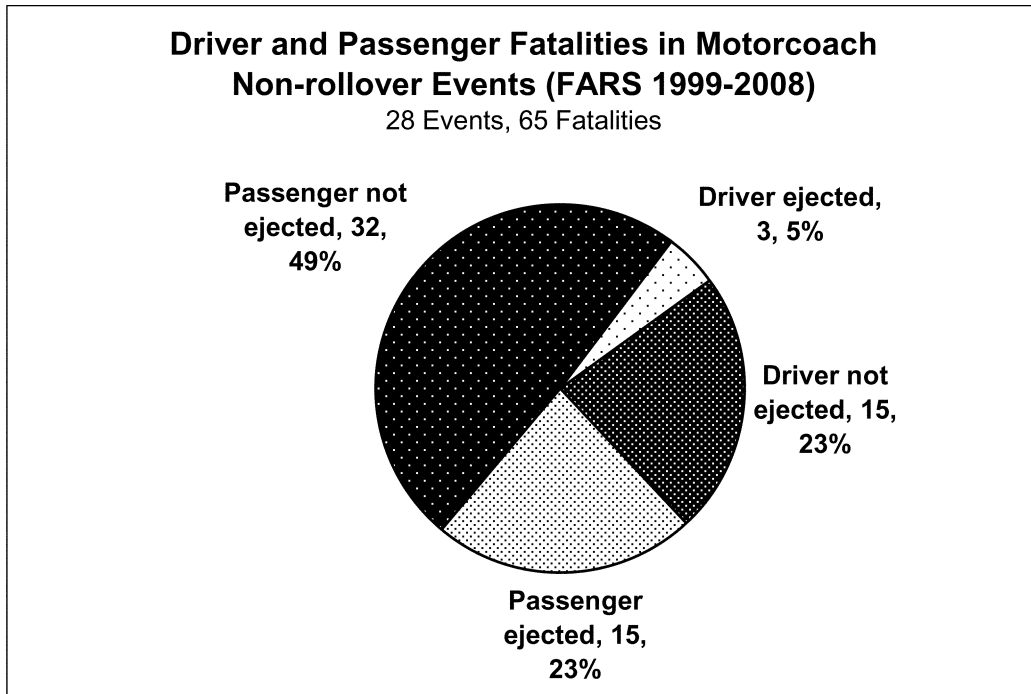
motorcoach non-rollover events by ejection status. Among non-rollover

events, 2 events (coded as "other" in Figure 2) were motorcoach fires that

resulted in 24 passenger fatalities. These 24 fatalities were not considered in the counts of fatalities in non-rollover crashes. Therefore, there were 28 non-

rollover motorcoach crashes (excluding the 2 fire events) that resulted in 65 driver and passenger fatalities. In these non-rollover events, the percentage of

passenger fatalities as a result of ejection is 23 percent, which is a significantly lower proportion than that observed in rollover events.



**Figure 6: Distribution Of Motorcoach Driver And Passenger Fatalities In Non-Rollover Crashes (Excluding Fire Events) By Ejection Status**

#### *b. Motorcoach Crash Backgrounds*

The following are summarized descriptions of the motorcoach crashes occurring in 1999, 2004, and 2008, and a rollover crash in 2009.

##### New Orleans, Louisiana

On May 9, 1999, a motorcoach carrying 44 occupants departed the right side of Interstate 610 outside of New Orleans, Louisiana. The motorcoach crossed the shoulder and went onto the grassy side slope alongside the shoulder. The motorcoach continued forward, struck the terminal end of a guardrail, traveled through a chain-link fence, vaulted over a paved golf cart path, and collided with the far side of a dirt embankment before coming to rest. There were 9 ejections, 22 fatalities and 16 serious injuries. The NTSB report found that use of three-point seat belts would have helped minimize the injuries sustained by the occupants.

##### Turrell, Arkansas

On October 9, 2004, a 47-passenger motorcoach was southbound on Interstate 55 (I-55) near Turrell, Arkansas, transporting 29 passengers to a casino in Tunica, Mississippi. At the exit interchange, the motorcoach veered

to the right and entered the grassy area between the exit ramp and the entrance ramp and rolled over. The rollover and partial detachment of the roof resulted in the ejection of all 30 occupants. The motorcoach driver was not wearing his seat belt. In total, 14 passengers and the driver were killed; 6 of the fatally injured occupants had been trapped under the roof. Thirteen passengers were seriously injured, one of whom had been trapped under the roof; and two passengers received minor injuries.

##### Mexican Hat, Utah

On January 2, 2008, a 56-passenger motorcoach with a driver and 52 passengers on board was descending a 5.6-percent grade leading to a curve to the left, on U.S. Route 163 near Mexican Hat, Utah. After entering the curve, the motorcoach departed the right side of the roadway at a shallow angle, striking the guardrail with the right-rear wheel and lower coach body. The motorcoach rotated in a counterclockwise direction as it descended an embankment, overturned, struck several rocks in a drainage ditch bed at the bottom of the embankment, and came to rest on its wheels. During the 360-degree rollover sequence, the roof of the motorcoach

separated from the body, and 50 of the 53 occupants were ejected. Nine passengers were fatally injured, and 43 passengers and the driver received minor to serious injuries. The NTSB found that, among other things, the absence of an adequate motorcoach occupant protection system contributed to the crash's severity.

##### Sherman, Texas

On August 8, 2008, a motorcoach carrying 54 passengers traveling on U.S. 75 near Sherman, Texas departed the right side of the roadway and smashed into a guard rail on a bridge about 15 feet above a creek. The motorcoach then rolled onto its side, killing 17 people and injuring 38 of the 54 passengers. According to the NTSB investigation,<sup>14</sup> a blown right front tire caused the bus to smash into the guard rail. The bus came to a rest on its right side, partly on the northbound lane of the freeway and partly on the grass. The NTSB found that the lack of an adequate occupant protection system contributed to the severity of the passenger injuries.

<sup>14</sup> <http://www.nts.gov/Publictn/2009/HAR0902.htm>.

### Williams, California

On October 5, 2008, a motorcoach heading from Sacramento to a rural Northern California casino flipped and rolled into a ditch, killing 10 people and injuring more than 30 others. According to a media report,<sup>15</sup> 30 to 38 people suffered critical injuries, while the rest of the passengers received moderate to minor injuries. About a dozen were ejected from the motorcoach. The NTSB has not completed its investigation of this crash.

### Dolan Springs, Arizona

On January 30, 2009, a 29-passenger tour bus returning from a visit to the Grand Canyon overturned on a highway near the Hoover Dam, killing seven occupants and injuring 10 others. The bus, occupied by the driver and 16 passengers, was traveling north on U.S. 93 when it moved left out of its lane. The driver steered sharply back to the right then overcorrected to the left across the median. The bus rolled 1.25 times before stopping. During the rollover, 15 of the 17 occupants were fully or partially ejected. The NTSB determined that the bus driver was distracted by the driver's side door, causing the vehicle to drift leftward, which triggered the subsequent accident sequence.

### c. NTSB Recommendations

The following NTSB recommendations pertain to this NPRM. They relate to seat belts on motorcoaches or to the seat anchorages. H-90-75, H-99-47, H-99-48, H-05-01

On August 22, 1990, the NTSB recommended that NHTSA mandate lap/shoulder belts for the driver position in all buses. This recommendation was based on a school bus crash in Alton, Texas. The Safety Board stated that it was unable to determine if a lap/shoulder belt would have prevented the minor injury<sup>16</sup> sustained by the driver; however, it believed that all buses should have lap/shoulder belts installed.

- H-90-75: Revise Federal Motor Vehicle Safety Standard 208, Occupant Crash Protection, to include a requirement that lap/shoulder belt systems for the driver position

<sup>15</sup> <http://www.kcra.com/news/17630435/detail.html>.

<sup>16</sup> The NTSB stated, "The school bus was not equipped with a lap/shoulder belt for the driver. The Safety Board is unable to determine if this type of restraint system, because of the low speed of the collision, would have prevented the minor injury sustained by the driver. However, the Safety Board believes that lap/shoulder belts are beneficial to drivers in higher speed accidents, and, therefore, school buses should be equipped with lap/shoulder belts at the driver position."

be installed in all newly manufactured buses, including city, intercity, small, and large. (Class II, Priority Action).

The following two safety recommendations were issued in conjunction with a 1999 NTSB Highway Special Investigation Report.<sup>17</sup> NTSB initiated this special investigation to determine whether additional measures should be taken to better protect bus occupants. It examined motorcoach crashworthiness issues through the analysis of 40 bus crashes and through information gathered at NTSB's August 12, 1998 public meeting on bus crashworthiness. Only the safety recommendations that deal with passenger crash protection in motorcoaches are included below.

- H-99-47 ("Most Wanted"): 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.

The next safety recommendation resulted from an October 13, 2003 crash outside of Tallulah, Louisiana. Eight motorcoach passengers sustained fatal injuries. The driver and six of the fourteen passengers received serious injuries. Failure of the motorcoach seat anchorages contributed to the severity of the injuries.

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

Response to H-90-75, H-99-47, H-99-48, H-05-01

Today's NPRM addresses the above NTSB recommendations. It should be noted that at the time the NTSB recommendations were issued, there were no crash test data or countermeasure studies available. Today, the testing NHTSA conducted as part of our 2007 Motorcoach Safety Plan provides extensive data upon which the agency has assessed the practicability of installing lap/shoulder belt systems on motorcoaches and the potential effectiveness of the belts at passenger seating positions.

<sup>17</sup> National Transportation Safety Board, 1999, *Bus Crashworthiness Issues*, Highway Special Investigation Report NTSB/SIR-99/04, Washington, DC.

Today's NPRM addresses H-90-75, which recommended that we amend FMVSS No. 208 to require that lap/shoulder belt systems for the driver position be installed in all newly manufactured buses. We explain in a later section of this preamble that we are proposing a lap/shoulder belt requirement for the driver's position of motorcoaches and of school buses. Comments are requested on whether the requirement should apply to other types of buses (e.g., transit buses), and the extent to which the shoulder belt portion of the belt system is already voluntarily installed in buses as a class.

Today's NPRM responds to H-99-47 and H-99-48, which requested us to develop performance standards for motorcoach occupant protection systems that account for frontal impact collisions, side impact collisions, rear impact collisions, and rollovers, and apply those standards to new motorcoaches. Today's NPRM would require lap/shoulder belts at each passenger seating position. In the NHTSA motorcoach test program that was conducted as part of the agency's motorcoach safety plan, lap/shoulder belts were found to prevent elevated head and neck injury values and provided enhanced occupant protection compared to lap belts.

We are applying the effectiveness of lap/shoulder belts in rear outboard seating positions of passenger cars as a proxy measure for the effectiveness of lap/shoulder belts in motorcoaches, since we have no experience with lap/shoulder belts in motorcoaches in our crash data. The lap/shoulder belt effectiveness estimates NHTSA is using for motorcoaches for fatalities is 29 percent in frontal crashes, 42 percent in side crashes, and 77 percent in rollovers; for injuries of AIS 2-5 severity level, it is 34 percent in frontal crashes, 47 percent in side crashes, and 82 percent in rollovers; and for all AIS 1 injuries, it is 10 percent.

Further, this NPRM would require the lap/shoulder belts on motorcoach passenger seating positions to meet FMVSS No. 208's "lockability" requirement (S7.1.1.5, 49 CFR 571.208) that currently applies to vehicles with a gross vehicle weight rating (GVWR) of 4,635 kg or less (10,000 pounds (lb) or less). The requirement is for the lap belt to be lockable so as to secure child restraint systems tightly, without the need to attach a clip or any other device to the vehicle's seat belt webbing. Child restraint systems are currently required to be capable of being installed on a vehicle seat using the vehicle's lap belt (49 CFR 571.213). This NPRM would thus ensure that child restraints would



be capable of being retained within the seating compartment of a passenger seating position in a motorcoach.

This NPRM also addresses H-05-01, which recommended that NHTSA develop performance standards for passenger seat anchorages in motorcoaches. This NPRM proposes that the seat belt anchorages, both torso and lap, be required to be integrated into the seat structure. NHTSA proposes such integration because if we do not, we are concerned that some manufacturers could incorporate some seat belt anchorages into the motorcoach floor, sidewall, or roof, which could potentially obstruct passengers during emergency egress. This NPRM also proposes that the seat belt anchorages on motorcoaches must meet the anchorage strength requirements for lap/shoulder belts in FMVSS No. 210. Those existing strength requirements specify that each lap/shoulder belt be tested with a load of 13,344 Newtons (N) (3,000 pounds) applied simultaneously to each belt loop. This proposal is based on test data from NHTSA's motorcoach safety research program. We believe that some motorcoach manufacturers may have to reinforce the passenger seat anchorages and the floor structure to withstand the loads from the FMVSS No. 210 test.

#### New June 2010 NTSB Recommendations

On June 22, 2010, NTSB issued recommendations to NHTSA resulting from NTSB's investigation of the 2009 Dolan Springs, AZ crash. The recommendations include ones to NHTSA to require new commercial vehicles exceeding 4,536 kg (10,000 lb) to be outfitted with lane departure warning systems, stability control systems, and data recording systems, and meet requirements for overhead luggage racks. NTSB also recommends that NHTSA develop regulatory "classifications and definitions for all bus body types," and include all buses above 10,000 lb, other than school buses, in rulemaking on occupant protection, roof strength and window glazing. <http://www.nts.gov/Publictn/2010/HAR1001.htm>.

NHTSA is in the process of evaluating the recommendations and will be responding to NTSB at a future time. However, this NPRM provides an opportunity to consider the NTSB recommendation to include all buses above 4,536 kg (10,000 lb) GVWR in this occupant protection rulemaking.

In this NPRM, NHTSA is proposing a definition of "motorcoach" for purposes of determining the applicability of FMVSS requirements that would

specially apply to the vehicle type. Motorcoaches are already considered a type of "bus" to which the "bus" FMVSSs apply. As discussed in the agency's 2007 Motorcoach Safety Plan,<sup>18</sup> NHTSA is developing motor vehicle safety standards for motorcoaches to address unique safety risks posed by the high-occupancy vehicles that do not appear to be currently or sufficiently addressed by the bus FMVSSs. These risks include the risks of ejection, prolonged emergency egress from the vehicles, and structural vulnerability to torsional loading in a rollover event.

We have examined accident data and have been able to identify vehicle attributes nearly universally common to vehicles involved in motorcoach crashes over the last 10 years. We have proposed a definition of a "motorcoach" that incorporates these attributes to ensure that the FMVSS requirements for motorcoaches meet the need for motor vehicle safety<sup>19</sup> and are appropriate for that vehicle type.<sup>20</sup> Our proposed definition, discussed in Section VI of this preamble, uses a GVWR of 11,793 kg (26,000 lb) or more to define the "motorcoach" category. The NTSB recommends using a GVWR of 4,536 kg (10,000 lb) or more instead; in NTSB's view all buses (except school buses) with a GVWR of 4,536 kg (10,000 lb) or more should be subject to the FMVSSs under development for motorcoaches, including the requirements proposed today for passenger seat belts.

We are requesting comment on today's proposed motorcoach definition, including the aspect of the definition that would set the GVWR criterion at 11,793 kg (26,000 lb) or more. This issue is discussed in Section VI of this preamble. The agency seeks data (e.g., accident data and cost data) supporting commenters' views as to whether the proposed definition should be expanded to include more vehicles or narrowed to exclude vehicles that are included in the proposed definition.

#### IV. Motorcoach Safety Initiatives

##### a. NHTSA's 2007 Motorcoach Safety Plan

In 2002, NHTSA held a public meeting<sup>21</sup> to discuss potential areas for motorcoach safety improvement, and sought information from motorcoach manufacturers, users, and other interested parties, including the public, on improving motorcoach passenger

crash protection regulations. The meeting was widely attended by representatives from the motorcoach manufacturing industry, the motorcoach transportation community, consumer advocacy groups, and private citizens. From that meeting, NHTSA determined that although motorcoaches show extremely low injury and fatality rates from crashes, ejection of passengers was the biggest safety concern.

This public meeting led to a joint research program between NHTSA and Transport Canada to investigate improvements in ejection protection through the use of advanced glazing.<sup>22</sup> Although this study developed a realistic impact condition for window glazing tests, it was determined that considerable further research would be needed prior to development of safety regulations.

To focus the agency's efforts on safety initiatives that could be accomplished in a practical timeframe, NHTSA undertook a comprehensive review of motorcoach safety issues and the course of action that the agency could pursue to most expeditiously address them. The agency considered various prevention, mitigation, and evacuation approaches in developing the course of action. Many considerations were factored into determining the priorities, including: cost and duration of testing, development, and analysis required; likelihood that the effort would lead to the desired and successful conclusion; target population and possible benefits that might be realized; and anticipated cost of implementing the ensuing requirements into the motorcoach fleet.

The result was NHTSA's 2007 Motorcoach safety plan, *NHTSA's Approach to Motorcoach Safety*, *supra*, in which we identified the following areas as the highest priorities for possible near term regulatory action to enhance motorcoach safety: passenger ejection; roof strength; fire safety; and emergency egress.

For passenger ejection, we pursued the incorporation of seat belts as the most effective and expeditious way to mitigate ejection. To evaluate the effectiveness of seat belts in motorcoaches, NHTSA undertook a comprehensive test program (discussed in the next section, below). The agency has completed testing, has analyzed the

<sup>18</sup> "NHTSA's Approach to Motorcoach Safety," Docket No. NHTSA-2007-28793, *supra*.

<sup>19</sup> See 49 U.S.C. 30111(a).

<sup>20</sup> See 49 U.S.C. 30111(b)(3).

<sup>21</sup> See Docket No. NHTSA-2002-11876.

<sup>22</sup> Subsequent joint research between NHTSA and Transport Canada used computer simulation to determine the forces on windows and develop a rudimentary procedure to test the effectiveness of glazing materials towards prevention of passenger ejections. See Docket No. NHTSA-2002-11876-15, *Motorcoach Glazing Retention Test Development for Occupant Impact During a Rollover*, August 2006.

data provided by the program and has examined the costs, benefits, practicability, and other considerations of various considered rulemaking approaches. Today's proposal commences the agency's implementation of regulatory action to mitigate passenger ejection in motorcoach crashes.

*b. 2009 Departmental Task Force Action Plan*

On April 30, 2009, Transportation Secretary Ray LaHood announced a full Departmental review of motorcoach safety. The findings from this review resulted in a Departmental Motorcoach Safety Action Plan, which was released November 16, 2009 (<http://www.nhtsa.gov/staticfiles/DOT/NHTSA/reports/HS811177.pdf>). The plan outlined the additional steps needed to improve motorcoach safety. DOT agencies helping create the Action Plan include NHTSA, the Federal Motor Carrier Safety Administration (FMCSA), the Federal Highway Administration and the Pipeline and Hazardous Materials Safety Administration. The review also considered outstanding recommendations to DOT from the NTSB.

The plan described an integrated DOT strategy to enhance motorcoach safety. Accident 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 developed 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.

Today's NPRM implements the initiative to improve occupant protection in the event of a crash by proposing the installation of seat belts for passengers. In addition, NHTSA is actively continuing its work evaluating and developing strategies on improving roof strength, fire safety, emergency egress, and other areas.

## V. NHTSA Research Results

### *a. Overview*

Our research program evaluating the performance of lap and lap/shoulder belts on motorcoach passenger seats

consisted of several stages. In the first stage of the program, we conducted a full scale frontal 48 km/h (30 mph) barrier crash test of a 45-foot long, 2000 Model Year (MY) MCI 102EL3 Renaissance motorcoach (passenger capacity of 54 passenger seats). In the second stage, we conducted sled tests (crash simulations) of motorcoach seats with various test dummies under a range of belted and unbelted conditions, with and without loading from unbelted rear occupants, using a representation of the crash pulse from the barrier test, and using a crash pulse from ECE Regulation 80 (ECE R.80).<sup>23</sup> In the sled tests, we tested the seats with different size dummies and in frontal and oblique (15°) impact configurations. In the third stage, we evaluated different methods of assessing the strength of the seat belts and anchorages to determine how the performance of the seat belt system should be assessed. Seat belt anchorages currently are tested in a static pull test under FMVSS No. 210, "Seat belt assembly anchorages." In developing a performance standard for lap/shoulder belts, the agency considered the seat belt assembly anchorage requirements of FMVSS No. 210, those of ECE R.80 Amendment 1 (which specifies two test methods), as well as two other methods derived from the VRTC sled test data.

The results of the first and second stages of the test program are summarized below. The third stage of the program is summarized in this document in the section proposing requirements for seat and seat belt anchorage performance (section VI.d). NHTSA has prepared a detailed report discussing the motorcoach seat belt research program. A copy of this report can be found in the docket.

### *b. Stage 1: Full Scale Motorcoach Crash Test*

The primary objective of the motorcoach crash test was to simulate a severe crash condition that would produce realistic, yet high loads through the seat belt and seat anchorages. Another objective was to obtain the deceleration profile (crash pulse) for use in simulated sled tests. Since there have been motorcoach crashes into rigid appurtenances along the roadway at highway speeds, NHTSA decided to perform a full frontal crash test at 48

<sup>23</sup> UN ECE Regulation No. 80, "Seats of Large Passenger Vehicles and of These Vehicles with Regard to the Strength of the Seats and Their Anchorages," applies to motorcoaches with occupant seating locations for 8 or more passengers and vehicle weights in excess of 5 metric tons. The standard requires seat belts to be installed at all occupant locations, and specifies the performance requirements for both the seat belts and anchorages.

km/h (30 mph) into a rigid barrier because this speed has been shown to impart enough energy to properly assess crash protection and provide a thorough and repeatable assessment of the restraint system tested (see 49 CFR 571.208).

In December 2007, at NHTSA's Vehicle Research and Test Center (VRTC), we crash tested the MY 2000 MCI motorcoach at 48 km/h (30 mph). Twenty two test dummies were used during the test to generate preliminary data on injury risk in various seat types and restraint conditions. Test dummies included: the 5th percentile female Hybrid III dummy (3 dummies), the 50th percentile male Hybrid III dummy (17 dummies), and the 95th percentile male Hybrid III dummy (2 dummies). The dummies were seated in an upright configuration and were either restrained by a lap/shoulder belt, a lap belt, or were unbelted.

The crash test resulted in a peak deceleration (crash pulse) of 13  $g$ <sup>24</sup> at 125 milliseconds (msec). This crash pulse is called the "VRTC pulse."<sup>25</sup> The restraint performance of several seating types and dummy seating configurations were examined during the crash test.

Observations from the crash test indicated that all belted (restrained by lap belts or lap/shoulder belts) dummies remained securely fastened in their seats. The unbelted dummies did not stay within the seating row in which they were placed prior to the crash test, and came to rest in the aisle, on the floor, or in the seating row directly in front. The unbelted dummies seated next to the aisle ended up on the floor in the aisle.

For most configurations, the dummies did not exhibit high femur or chest loading.<sup>26</sup> The lap belted dummies and some of the unbelted dummies exhibited elevated head and neck injury measures. However, the unbelted dummies were typically ejected from their seats. The lap/shoulder belted dummies exhibited the lowest injury measures and improved kinematics, with low head and neck injury measures and little movement outside the seating row.

### *c. Stage 2: Frontal Sled Tests*

Twenty sled tests using various sizes of test dummies were then conducted to further study the performance of various seating system configurations (*i.e.*, unbelted, lap belts, and lap/shoulder

<sup>24</sup> Data filtered to SAE J211 Class 60.

<sup>25</sup> Data filtered to 30 Hz to match the response of the test sled metering pin.

<sup>26</sup> In one case, the 5th percentile female dummy exhibited elevated femur loading.

belts) available for use on motorcoaches for different-sized occupants. The goal of the sled tests was to analyze the dummy injury measures to gain a better understanding of the effectiveness of the countermeasures, and to directly measure seat and seat belt loading that could not be assessed in the full scale crash test. The sled tests were also used to establish data for comparison with international standards. The sled tests were engineered to replicate the deceleration time history of the motorcoach full-scale frontal impact crash test performed at VRTC (*i.e.*, the VRTC pulse). In addition to injury measures, we analyzed dummy kinematics to identify the important factors contributing to the type, mechanism, and potential severity of any resulting injury.

Three types of seats were used in the sled tests. The first type was considered “baseline” seats, which did not have seat belts. The baseline seats were obtained from the MCI tested bus and the seat supplier, American Seating Company. The second and third types of seat had seat belts, and were supplied by Amaya/ Astron Seating of North America (Amaya). These seats were designed to meet ECE Regulation 14 (ECE R.14) and TRANS/WP.29/78/Rev.1/Amend2. The second type of seat was designed for vehicles in the M2 category (having more than eight seating positions and mass not exceeding 5 metric tons (11,023 lb)). The third type of seat was designed for vehicles in the M3 category

(having more than eight seating positions and mass exceeding 5 metric tons (11,023 lb)). The seats in vehicles of M2 and M3 categories are required to meet the seat and seat belt anchorage strength requirements in ECE R.14, which includes a 10 g inertial seat loading for M2 vehicles and 6.6 g seat loading for M3 vehicles. Accordingly, the second type of seats designed for M2 vehicles are referred to as “10 g seats” and the third type of seats designed for M3 vehicles are referred to as “7 g seats.”

In developing this rulemaking initiative on motorcoach seat belts, NHTSA sought to ensure that the requirements we adopt would reflect and be appropriate for the real-world use of motorcoaches. Thus, we set up our test program to obtain data on seat belt and seat anchorage loading reflecting the likelihood that in a frontal crash, a passenger seat in a motorcoach (“target seat”) could be loaded by the belted passenger occupying that target seat, the inertia load of the target seat itself, and unbelted passengers rearward of the target seat. Accordingly, the sled buck was constructed of three rows of motorcoach seats, each containing two seating positions. Each row had a seating configuration that represented an aisle and window position. The rows of seats were separated by a distance of 86 cm (34 inches), which corresponded to the average seat spacing measured on the full scale motorcoach that was crash-tested. The target seats were those in the second row. The front row seats

were left unoccupied in all the tests. In some tests, the third row seats were left unoccupied, while in others they were occupied by unrestrained dummies of different sizes to represent loading on the target seat by unrestrained occupants in the rear seat.

Fifteen of the twenty sled tests performed were conducted using the VRTC pulse. Five other crash tests used the crash pulse specified in ECE R.80 (referred to as the “EU pulse”). The EU pulse is specified in Europe for testing motorcoach seats and anchorages used in the European market. The EU pulse has a higher peak acceleration and a duration approximately half of that of the VRTC crash pulse.

Results of Sled Testing

The following observations were made for this frontal sled test environment. Belt performance in side, rear, or rollover crashes may be different. Similarly, restraint performance in frontal crashes of higher or lower severity might also differ from what was seen in this evaluation.<sup>27</sup> For these tests, the following dummy injury criteria were measured during the full scale crash tests: HIC<sub>15</sub>, Nij, Chest g<sub>s</sub>, Chest deflection, and Maximum Femur Compressive Force. Table 5 below shows the Injury Assessment Reference Values (IARVs) for each of the injury criteria measured.<sup>28</sup> For each dummy, the injury measures were calculated as specified in FMVSS No. 208 (49 CFR 571.208).

TABLE 5—INJURY ASSESSMENT REFERENCE VALUES (IARVs)

Dummy size	HIC <sub>15</sub>	Nij	Chest (g)	Chest (mm)	Femur (N)
5th Percentile Female .....	700	1.00	60	52	6,800
50th Percentile Male .....	700	1.00	60	63	10,000
95th Percentile Male .....	700	1.00	55	70	12,700

In the tests, HIC<sub>15</sub> and Nij injury measures varied depending on the type of restraint used, whereas Chest g<sub>s</sub>, chest deflection and femur forces were generally low for all dummies. However, high femur loads were observed in tests with the small female dummy. The unbelted dummies and lap belted dummies generally exhibited higher injury values than dummies secured with lap/shoulder belts. The

unbelted dummies seated next to the aisle ended up on the floor in the aisle. The dummies secured with lap/shoulder belts generally stayed in their seats and exhibited the lowest injury values.

1. Sled Test Results for Unbelted Dummies

- Unbelted dummies were typically ejected out of their seating position and

displaced into the aisle or adjacent seats. They were also more susceptible to hitting other hard structures.

- Average HIC and Nij measures were typically below 80 percent of the IARVs. However, it should be noted that the dummies used were frontal crash test dummies, and hence the injury measures may be limited in capturing the severity of loading during

<sup>27</sup> The performance of newer seats with stiffer seat backs could be different from that studied.

<sup>28</sup> For the 5th percentile female and the 50th percentile male dummies, the injury assessment reference values (IARVs) for these measurements are the thresholds used in FMVSS No. 208 to assess frontal occupant protection provided by new motor vehicles. (The 95th percentile male dummy is not

used in FMVSS No. 208.) HIC<sub>15</sub> is a measure of the risk of head injury, Chest g is a measure of chest injury risk, and Nij is a measure of neck injury risk. For HIC<sub>15</sub>, a score of 700 is equivalent to a 30 percent risk of a serious head injury (skull fracture and concussion onset), Chest g of 60 equates to a 60 percent risk of a serious chest injury and Nij of 1 equates to a 22 percent risk of a serious neck

injury. For all these measurements, higher scores indicate a higher likelihood of risk. More information regarding these injury measures can be found in NHTSA’s technical document, “Development of Improved Injury Criteria for the Assessment of Advanced Automotive Restraint Systems—II,” Docket No. NHTSA-1999-6407-0005, 1999.

interaction with interior components when the dummy falls off the seat.

- Elevated HIC values resulted in tests with the 5th percentile female dummy due to head contact with the lower, hard part of the seat back in front. This observation occurred both in the sled tests and full scale crash tests and occurred regardless of the seat types evaluated.

- Larger dummies provided more deformation to the seat backs positioned in front of them and were less sensitive to the seat back type (including stiffer belted seats).

- Injury measures did not appear to be adversely affected by rear occupant loading. Any interaction with rear seated dummies occurred after the forward dummies' motion was essentially complete.

## 2. Sled Test Results for Lap-Belted Dummies

- HIC and Nij measures exceeded the IARVs for all the dummies tested, except for a 50th percentile male dummy whose HIC was 696 (99 percent of the IARV limit).

- The poor performance of the lap belt restraint in the sled tests was consistent with the lap belt results from the full scale motorcoach crash test.

- Compared to the unbelted dummies, the dummy's head typically hit the seat back in front at an earlier point in time due to the lap belt restraining forward motion and the upper torso pivoting about the lap belt.

- Seats in front of lap-belted dummies were not deformed by the dummies' femur loading, and consequently, when struck by the upper body of the lap-belted dummies, did not yield as much when struck as seats in front of unbelted dummies.

- Lap belts were able to retain the dummies in their seating positions post-test.

## 3. Sled Test Results for Lap/Shoulder Belted Dummies

- Average HIC and Nij values were low for all dummy sizes and below those seen in unbelted and lap-belted sled tests. This was consistent with the lap/shoulder belt results from the full scale crash test.

- Lap/shoulder belts retained the dummies in their seating positions and were able to mitigate head contact with the seat in front.

- Although rear unbelted occupant loading resulted in additional forward excursion for the lap/shoulder belted dummies, and head contact was made with the seat in front in some cases, the resulting average injury measures were still relatively low in most cases.

- All of the unbelted dummies in the rear seats that impacted middle row seats that were "preloaded" by belted occupants had low average injury measures that were below 80 percent of the IARVs.

- Although test dummies restrained in both the 7 g and 10 g lap/shoulder belt-equipped seat types recorded relatively low IARVs, seat anchorage loads measured in the tests exceeded the anchorage strength requirements of ECE R.14 and ECE R.80.

- The EU pulse generated higher injury numbers in the larger dummies than the VRTC pulse due to contact with the seat back in front. We attributed the increased injury measures to the higher peak acceleration and shorter duration of the EU pulse. The VRTC pulse resulted in all average injury measures to be below 80 percent of the IARVs.

- Lap/shoulder-belted dummies performed better in the oblique sled tests conducted at a 15-degree angle. They had lower injury measures and were retained in their seats.

- In the one test where the front and middle row seat backs were reclined, the injury measures for the lap/shoulder-belted occupants and the unbelted rear row occupants were all below 80 percent of the IARVs.

## VI. Proposed Requirements

### *a. Adding a Definition of "Motorcoach" to 49 CFR 571.3*

Each FMVSS specifies the vehicle type to which it applies. Motorcoaches currently fall under the definition of "bus" for the purposes of applying the Federal motor vehicle safety standards (49 CFR 571.3) and must comply with all the FMVSSs that apply to buses. A "bus" is defined in § 571.3 as "a motor vehicle with motive power, except a trailer, designed for carrying more than 10 persons." Some FMVSSs (and requirements within those standards) apply to buses with a GVWR equal to or less than 4,536 kg (10,000 lb), others apply to buses with a GVWR greater than 4,536 kg (10,000 lb), and some apply to "buses" without distinguishing GVWR.

This NPRM proposes ejection-prevention countermeasures for motorcoaches to address the problem of occupant ejection in motorcoach rollover crashes. A definition of "motorcoach" is proposed, to define the vehicle type to which the proposed requirements apply and to distinguish motorcoaches from other bus types. The National Traffic and Motor Vehicle Safety Act, 49 U.S.C. Chapter 301 (Safety Act), requires the FMVSSs to be

appropriate for the vehicle type to which they apply. The agency does not believe that a seat belt requirement would be appropriate for all buses, (*e.g.*, urban transit buses) as discussed below. Comments are requested on whether other bus types should be considered motorcoaches for purposes of applying a passenger seat belt requirement.

When creating a vehicle type classification for the FMVSSs, NHTSA typically looks at the construction type and the purpose for which the vehicle is being built. NHTSA has a number of major categories of motor vehicle types: Passenger cars, multipurpose passenger vehicles (MPVs), trucks, buses, trailers, and motorcycles. There are two subcategories of buses in 571.3, school bus and multifunction school activity bus. For the most part, for purposes of objectivity, the agency defines vehicles by their visible attributes and construction features rather than by their intended use. The exception is the "school bus" definition, which is set forth in the Safety Act and in § 571.3, *Definitions*, and which refers to the intended purpose for which the vehicle is sold. To make the motorcoach definition as clear as possible, we prefer defining "motorcoach" using reference to relevant visible attributes and construction characteristics rather than by the intended use of the vehicles.

Currently, there is no common Departmental or industry definition of "motorcoach." We examined the definition of motorcoach used in other countries and the definition used in the Fatality Analysis Reporting System (FARS). For countries that have adopted the European regulations, including Australia, motorcoaches are defined as Class III, M3 vehicles. Class III, M3 vehicles are defined as having occupant seating locations for more than 8 passengers, vehicle weights in excess of 5 metric tons (11,023 lb) and are not designed to carry standing passengers. We consider this ECE definition too broad for us to use as a definition of motorcoach, as it captures vehicles that we have tentatively concluded ought not to be subject to the proposed motorcoach seat belt standards at this time.

The ECE definition applies to vehicles that are not defined as "buses" in the U.S. Federal motor vehicle safety standards. The ECE definition applies to smaller buses that are not normally used as motorcoaches. We are proposing a subset of the bus classifications used in the ECE regulations, but have only included buses with a seating capacity of 16 or more to remain consistent with other U.S. regulations (such as the commercial drivers' license

requirements administered by FMCSA). NHTSA's data indicate that buses with a seating capacity of 16 or more are typically used for motorcoach services in the U.S.

The FARS database uses the following description of a motorcoach, "Cross Country/Intercity Bus (*e.g.*, Greyhound)." Other descriptive information about bus use is also collected in a sub-category, *i.e.*, commuter, tour, scheduled service, shuttle, etc. For our purposes, this FARS definition lacks sufficient specificity and is of limited use in determining the applicability of the FMVSS.

NHTSA also reviewed some pending bills in Congress on motorcoach safety that defined the vehicles subject to their terms and the operating characteristics of those vehicles, *see* Transportation Equity Act for the 21st Century (Pub. L. 105-178) (TEA-21). Those definitions included the following:

- The term "intercity, fixed-route over-the-road bus service" means regularly scheduled bus service for the general public, using an over-the-road bus, that (a) operates with limited stops over fixed routes connecting 2 or more urban areas not in close proximity; (b) has the capacity for transporting baggage carried by passengers; and (c) makes meaningful connections with scheduled intercity bus service to more distant points.

- The term "other over-the-road bus service" means any other transportation using over-the-road buses including local fixed-route service, commuter service, and charter or tour service (including tour or excursion service that includes features in addition to bus transportation such as meals, lodging, admission to points of interest or special attractions or the services of a tour guide).

- The term "over-the-road bus" means a bus characterized by an elevated passenger deck located over a baggage compartment.

As explained below, these definitions were either too narrow for our purposes, as many motorcoaches lacked an elevated passenger deck over a baggage compartment, or were based on the intended use of the vehicle, which might not be known at the time of the manufacture of a particular vehicle.

FMCSA does not have a definition for motorcoach in its regulations. The agency's passenger carrier safety information simply states that a motorcoach (also called an over-the-road bus) can typically transport 40 to 50 passengers.

To develop a motorcoach definition, we examined the type of buses involved in motorcoach fatalities, including the

construction type and various attributes within the vehicle to determine if any one characteristic was common to all the buses. We found no such single characteristic for motorcoaches to distinguish those vehicles from other buses. An elevated passenger deck over a baggage compartment was not an element common to all buses involved in motorcoach fatalities. Some body-on-chassis models offered a storage compartment for baggage and other personal belongings in the rear of the bus. For other motorcoaches, the baggage compartment was offered as an option to the purchaser. We also determined that a separate storage location was not needed for tour services and most tour buses were equipped with an overhead location for passengers to store personal belongings.

We reviewed the underlying chassis structure of various motorcoaches. Some motorcoaches have a monocoque<sup>29</sup> structure with a luggage compartment under the passenger deck. We also found motorcoaches built on body-on-chassis configurations. These body-on-chassis configurations are believed to be newer entrants into the motorcoach services market and appear to be increasing in number. A cursory review of the types of buses being used in the Washington, DC area for motorcoach services show that traditional motorcoaches are generally used for fixed-route services between major metropolitan areas. However, for charter, tour, and commuter transportation from outlying areas, many bus types are used. Some are of monocoque structure, while others are of body-on-chassis structure.

Another distinguishing feature we considered was whether the bus included a self-contained toilet. We determined that a self-contained toilet was only prevalent on long distance travel buses and was not present in all tour or commuter buses. Other equipment such as reading lights, video displays, ventilation ports and adjustable seat backs were also not common to all motorcoach type buses. Accordingly, identifying a motorcoach by the presence of a self-contained toilet, or by reading lights, video displays and the like could exclude many of the buses that have been involved in rollover crashes resulting in ejections over the years. (We also wanted to avoid a definition that could be easily circumvented by persons seeking to have their buses excluded from the motorcoach category. Such a

<sup>29</sup> Monocoque means a type of vehicular construction in which the body is combined with the chassis as a single unit.

definition would be one that specified that a motorcoach is a vehicle with a feature that could be readily left off of the vehicle.)

#### Physical Characteristics Identified

Yet, we were able to identify some physical features which appear to be nearly universally common to all buses performing motorcoach services. In our search, we returned to the FARS data to analyze data files for the years 1999-2008, to determine the fatality counts in buses. We examined GVWR, body type, and how the buses were used (transit, school, other). The data available for this 10-year period for fatalities of occupants in buses other than transit buses and school buses show that only 12 percent of the passenger fatalities were in buses with a GVWR less than or equal to 11,793 kg (26,000 lb). We also found that among fatalities in these buses (buses other than school buses and transit buses) with GVWR greater than 11,793 kg (26,000 lb), 87 percent were in tour/intercity buses, 4 percent in commuter buses, 7 percent in shuttle buses, 1 percent in buses used for school transportation and 1 percent in buses modified for personal use.

Based on these data, we determined that one practically uniform attribute for motorcoaches was that their GVWR was greater than or equal to 11,793 kg (26,000 lb).

Upon further review of the FARS files, we identified characteristics that were nearly universally common to all buses performing motorcoach services: a GVWR of 11,793 kg (26,000 pounds) or greater, 16 or more designated seating positions, and two or more rows of forward facing seats that were rearward of the driver's seating position. We are thus proposing to define "motorcoach" using those characteristics. We are proposing to exclude school buses and urban transit buses (for reasons explained below) from the definition. We intend for the definition to include buses sold for intercity, tour, and commuter bus service. The intercity, tour, or commuter bus would be a "motorcoach" if it has a GVWR of 11,793 kg (26,000 lb) or greater, 16 or more designated seating positions, and two or more rows of forward facing seats that were rearward of the driver's seating position.

#### Exclusions

We propose excluding urban transit buses from the proposed definition of motorcoaches because fatality data for urban transit buses differ significantly from that of motorcoaches, and because of the stop-and-go manner in which urban transit buses are used. A review

of FARS data over a ten year period (1999–2008), shows that there were 31 fatal crashes involving occupants of urban transit buses, resulting in a total of 32 fatalities, of which 16 were drivers and 16 were passengers. Thus, one fatality occurs per fatal crash, on average. Frontal crashes without rollover were identified as the most common most harmful event (53 percent of crashes) followed by side crashes with no rollover (9 percent), and falling from vehicle (9 percent). Four of the 16 transit bus passenger fatalities were ejected (25 percent), compared to 74 (53 percent) for cross-country/intercity bus passengers. In summary, there are far fewer fatalities per crash for urban transit buses, a significantly lower percentage of fatalities due to ejection compared to cross-country/intercity buses, and thus a significantly lower risk of occupant ejection. For these reasons, we are not proposing to require seat belts in urban transit buses at this time.<sup>30</sup>

The motorcoach definition does not exclude “shuttle buses,” but comments are requested as to whether shuttle buses should be excluded. Keep in mind that these shuttle buses would be those buses with a GVWR of 11,793 kg (26,000 lb) or greater, 16 or more designated seating positions, and two or more rows of forward facing seats that are rearward of the driver’s seating position. Some shuttle buses of this size can traverse substantial distances at highway speeds. On the other hand, they may travel on shorter routes. We request comments on whether large (GVWR of 11,793 kg (26,000 lb) or greater, 16 or more designated seating positions) shuttle buses are used in such a different manner than motorcoaches that a requirement for seat belts would be inappropriate for the former vehicle type. We also request comments on how a shuttle bus could be defined so that it would be distinguishable from a motorcoach.

Comments are also requested on the proposed definition of “motorcoach.”

Comments are requested on the aspect of the proposed definition that would use a GVWR criterion of 11,793 kg (26,000 lb) or more. One of the NTSB’s June 22, 2010 recommendations to NHTSA resulting from the Dolan Springs, AZ crash is that NHTSA “develop regulatory definitions and classifications” and apply this rulemaking on occupant protection to all buses above 4,536 kg (10,000 lb) GVWR, except school buses. NHTSA has reviewed FARS data from 1999–2008 on passenger fatalities in buses coded in FARS as “motorcoach,” “other bus,” and “transit” in different GVWR categories. As shown in Table 6 below, there were many fewer passenger fatalities in motorcoaches and other buses with a GVWR between 4,536 kg and 11,793 kg (10,000 lb and 26,000 lb) in the 10-year period compared to passenger fatalities in those vehicles with a GVWR greater than 11,793 kg (26,000 lb).

TABLE 6—FATALITIES IN BUSES BY GVWR AND BODY TYPE; FARS 1999–2008

GVWR *	Motorcoach		Other bus		Transit	
	Driver	Pass	Driver	Pass	Driver	Pass
4,536 kg to 11,793 kg (10,000 lb to 26,000 lb) .....	0	1	6	24	0	3
Greater than 11,793 kg (26,000 lb) .....	24	161	10	30	16	13

\* Missing GVWR were imputed based on the distribution of known values.

Applying this rulemaking to buses with a GVWR of 11,793 kg (26,000 lb) or greater addresses vehicles that account for 88 percent of all fatalities in buses with a GVWR greater than 4,536 kg (10,000 lb) (other than school buses and transit buses) and addresses 89 percent of fatal ejections from such vehicles.

Comments are requested on a GVWR criterion that is less than 11,793 kg (26,000 lb). Commenters supporting such a criterion should discuss the safety need to apply the requirements for motorcoaches to buses with a GVWR of less than 11,793 kg (26,000 lb) and the cost and other impacts on shuttle buses and urban transit buses (assuming these vehicles are not excluded from the motorcoach definition).

Regarding other aspects of the proposed definition, is the 16 or more designated seating positions (including the driver) requirement reasonable? Is a criterion necessary that a motorcoach

must have two or more rows of forward facing seats that are rearward of the driver’s seating position? What other feature(s) of a motorcoach could be objectively incorporated into the definition?

*b. Requiring Seat Belts at Passenger Seating Positions*

This NPRM proposes to amend FMVSS No. 208 to require the installation of seat belts at all passenger seating positions in new motorcoaches. Currently for buses, FMVSS No. 208 requires a seat belt for only the driver’s seat in all buses. As discussed above, the risk of ejection on motorcoaches can be reduced by seat belts. Seat belts are estimated to be 77 percent effective in preventing fatal injuries in rollover crashes, primarily by preventing ejection. As for the type of seat belt that we should require, we are proposing that lap/shoulder belts be installed at forward-facing seating positions. Our

test program showed that lap/shoulder belts at forward-facing seating positions were effective at preventing critical head and neck injury values, whereas dummies in lap only belts measured HIC and Nij values surpassing critical thresholds.

However, for side-facing designated seating positions, we are providing manufacturers the option of installing either a lap belt or a lap/shoulder belt. This option is consistent with current requirements of FMVSS No. 208 (S4.4.5.6), which allow lap belts for side-facing seats on buses with a GVWR of 4,536 kg (10,000 lb) or less. We propose to permit lap belts in side-facing seats because we are unaware of any demonstrable increase in associated risk. We note that a study commissioned by the European Commission regarding side-facing seats on minibuses<sup>31</sup> and motorcoaches found that due to different seat belt designs, crash modes and a lack of real world data, it cannot

<sup>30</sup> The proposed motorcoach definition excludes “an urban transit bus sold for operation as a common carrier in urban transportation along a fixed route with frequent stops.” We request comments on whether this use-based definition

could be instead based on some common physical attribute(s) of urban transit buses that could distinguish them from cross-country/intercity/commuter buses.

<sup>31</sup> Minibus is a European term for buses that are roughly equivalent to the range of large passenger vans up to 15 passengers. They are limited to “more than 8 but no more than 16 passengers, excluding the driver.”

be determined whether a lap belt or a lap/shoulder belt would be the most effective.<sup>32</sup>

#### Integrated Anchorages

We propose that the seat belt anchorages, both torso and lap, be required to be integrated into the seat structure for motorcoach passenger seats, except for the belt anchorages in the last row of the motorcoach (if there is no wheelchair position or side emergency door behind these seats) and in the driver seating position. We propose integral lap/shoulder belts on motorcoaches to ensure that seat belts for inboard seat positions, in particular, are not mounted such that the belt webbing could impede safe passage through the bus interior during emergency egress. This provision would be consistent with that of an October 21, 2008 final rule (73 FR 62744, at 62763), in which the agency required that small school buses have lap/shoulder belts with the seat belt anchorages integrated into the seat structure, except for the last row of seats.<sup>33</sup> We note also that this provision would be consistent with ECE R.80, which requires that seat belts be fitted to the seat unless there is no seat immediately behind it.<sup>34</sup>

NHTSA seeks comment on whether there are anchorage designs, other than those integrated into the seat back, that would not impede emergency evacuation or otherwise cause injury to unbelted passengers.

The last row would be excluded from the requirement because we have less concern about emergency exit access for the last row of seats. We believe that the location and style of the last row seats in motorcoaches make it possible to place belt anchorages behind or to the side of the seat, where the belt webbing would not impede safe travel in and out of the seat. Typically the seats in the last row are integral with the vehicle body structure anyway, and most commonly, the torso restraint retractors at such seats are mounted into the bus body structure, and the shoulder belts are routed over the upper edge or through the seat back. We believe that restraints mounted in this manner will not impede access to emergency exits or become an injury hazard to unbelted passengers. However, if the seat plan

<sup>32</sup> [http://ec.europa.eu/enterprise/automotive/projects/safety\\_considerations\\_long\\_stg.pdf](http://ec.europa.eu/enterprise/automotive/projects/safety_considerations_long_stg.pdf).

<sup>33</sup> This provision was established out of concern that some manufacturers could incorporate seat belt anchorages into other structures in the school bus, potentially obstructing passengers during emergency egress.

<sup>34</sup> See ECE R.80 Appendix 5: Specifying that all "fittings forming part of the back of the seat or accessories thereto \* \* \* be unlikely to cause any bodily injury to a passenger during impact."

has a wheelchair position located behind the rearmost passenger seat, or a side emergency door rearward of it, the rearmost passenger seat must have its seat belt assembly anchorages attached to the seat structure to reduce the risk of tripping, entanglement or injury.

The driver's seating position would be excluded from the requirement for integral lap/shoulder belts because the driver's compartment is usually separated from the passenger compartment by a bulkhead or partition and passengers are less likely to be entangled in the driver's belt system during egress.

#### Seat Belt Adjustment, Fit, Lockability, and Other Requirements

NHTSA proposes that the requirements for lap/shoulder belts include provisions for seat belt adjustment and fit as specified in S7.1 of FMVSS No. 208. Specifying belt adjustment and fit would ensure that the seat belts would be able to accommodate occupants whose dimensions range from those of a 50th percentile 6-year-old child to those of a 95th percentile adult male.

Furthermore, NHTSA proposes that the upper torso restraint must adjust either by means of an emergency-locking retractor that conforms to § 571.209, or by a manual adjusting device that conforms to § 571.209. In addition, we propose that the seat belt at each designated seating position, besides the driver's position, meet FMVSS No. 208's lockability requirements. The lap belt portion must be lockable so that the seat belt assembly can be used to tightly secure a child restraint system without the use of any device that must be attached by the consumer to the seat belt webbing, retractor, or any other part of the vehicle. The lap belt must be lockable without any inverting, twisting or other deformation of the belt webbing.

Among the requirements proposed by this NPRM are that each seat belt assembly must have a latch mechanism with all the latch mechanism components accessible to a seated occupant, and that the latch mechanism be capable of releasing both the upper torso restraint and the lap belt simultaneously at a single point and by a pushbutton action. It is noted that FMVSS No. 209 (49 CFR 571.209) currently applies to "seat belt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks, and buses," and so this standard would apply to any seat belt assembly installed on a motorcoach without any further action by NHTSA.

#### c. Requiring Lap/Shoulder Belts for Driver Position

Currently for buses, FMVSS No. 208 requires either a lap or lap/shoulder seat belt for the driver-seating position in all buses with a GVWR greater than 4,536 kg (10,000 lb).<sup>35</sup> This NPRM proposes to amend FMVSS No. 208 to require lap/shoulder belts for the driver seating positions in motorcoaches and for the driver's position in large school buses.<sup>36</sup> Similar to seat belt requirements in FMVSS No. 208 for other vehicles with GVWRs greater than 4,536 kg (10,000 lb), the performance of the lap/shoulder belt anchorages and attachment hardware on the driver's seating position would be assessed through FMVSS No. 210 rather than through dynamic crash testing.

Our motorcoach sled tests demonstrated that lap/shoulder belts provided superior protection over lap belts. This proposal also accords with NTSB Safety Recommendation H-90-75.

Based on our assessment of the industry, we believe that school bus and motorcoach manufacturers are already providing to some degree, or moving toward providing, lap/shoulder belts for driver seating positions. We estimate approximately 40 percent of new motorcoaches sold in 2010 will have lap/shoulder belts at the driver seating position, and that these lap/shoulder belts meet the seat belt anchorage strength requirements of FMVSS No. 210. We have included in the PRIA an estimate of the incremental cost of requiring lap/shoulder belts for the driver's position in all motorcoaches and large school buses.

We propose not to require lap/shoulder belts for drivers of transit or other buses. These buses are driven in different environments than motorcoaches. Motorcoaches are often driven on highways and other high-speed roads, so the risk of injury is greater for drivers of these vehicles. Comments are requested on whether the requirement for lap/shoulder belts for the driver should apply to transit and other buses.

<sup>35</sup> FMVSS No. 208 also currently provides manufacturers the option of equipping buses with a complete occupant protection system that protects an occupant without any action by the vehicle occupant, *i.e.*, a passive occupant protection system such as an air bag or automatic belt system. Currently, no bus manufacturer has elected to meet FMVSS No. 208 using this option. All bus manufacturers have certified compliance by installing seat belts at the driver's position.

<sup>36</sup> The driver's position in school buses with a GVWR equal to or less than 4,536 kg (10,000 lb) already is required to have a lap/shoulder belt.

#### d. Anchorage Strength Requirements

We propose that motorcoach lap/shoulder belts be required to meet the anchorage strength requirements of FMVSS No. 210. As noted above, we have proposed a requirement that motorcoach passenger lap/shoulder belts must be integrated into the seat structure. Thus, a seat belt anchorage strength requirement does more than specify the strength of the seat belt attachment to the vehicle seat; it actually encompasses the attachment of the seat to the bus. A seat belt anchorage strength requirement provides the foundation upon which the entire occupant protection system is built. If the anchorage fails, the belted occupant could be propelled beyond the confines of the occupant seat space, and injury or ejection could occur.

In developing a performance standard for lap/shoulder belt anchorages, the agency considered several alternatives, and assessed the suitability of the alternatives using seat belt anchorage test data obtained in the motorcoach crash test and sled test program. While NHTSA believes that the test data support applying FMVSS No. 210 to motorcoach passenger seat belt anchorages, we request comments on alternatives to FMVSS No. 210.

In the motorcoach research program, NHTSA evaluated the requirements of FMVSS No. 210, ECE R.14, ECE R.80, and two other methods we derived using the VRTC sled test data. We studied these alternative approaches to FMVSS No. 210 after having found in the motorcoach crash test that the vehicle in the 48 km/h (30 mph) rigid barrier crash test experienced only a 13 g peak deceleration (crash pulse). This is relatively low when compared to the peak deceleration levels in light vehicle rigid barrier crash tests. Because the crash pulse was low, we were concerned that the FMVSS No. 210 loads might be unnecessarily stringent for motorcoach seat belt anchorages. To determine how the FMVSS No. 210 and ECE R.14 forces compared to motorcoach anchorage forces, we evaluated data from our frontal sled test program to determine the magnitude of the forces exerted on the seat anchorages.

We studied five sled tests from the sled test program to determine the loads measured at the seat belt anchorages.<sup>37</sup> These five were selected because they

represented demanding yet potentially common scenarios for the loads we believe will be imparted to seat belt anchorages during a motorcoach crash. We identified the loads recorded in the sled tests at the seat anchorage points in the second row "target seat," the loads on the lap/shoulder belts in the target seat in which test dummies were restrained, and the loads to the seat back of the target seat from the unrestrained dummies in the third row. We then compared those loads to the loads that seat belt and seat anchorages are required to withstand under FMVSS No. 210, ECE R.14 and ECE R.80. In that way, we could determine which performance test best appeared to account for the loads to which the motorcoach seat belt anchorages would be exposed.

The five sled tests from the test program consisted of the following:

- The 50th percentile male test dummies restrained with lap/shoulder belts in the middle row with no test dummies in the rear row. Data from this test were deemed important because the data represented the average seat forces that would be experienced due to belt loading from the restrained occupant in the seat without any added seat back loading from the rear.
- Two 50th percentile male test dummies restrained with lap/shoulder belts in the middle row with two unrestrained 50th percentile male dummies in the rear row. Data from these tests were deemed important because they represented what we believed to be the average elevated seat forces that would be experienced due to loading from the restrained occupant in the seat and seat back loading from the unrestrained occupant in the rear row. One test used a 7 g seat, while the other test used a 10 g seat.
- One 5th percentile female test dummy and one 50th percentile male dummy restrained with lap/shoulder belts in the middle row and two unrestrained 95th percentile male dummies seated in the rear row. Data from these tests were deemed important because they represented what we believed to be the maximum rear loading seat forces that would be experienced by the target seat. One test used a 7 g seat, while the other test used a 10 g seat.

We found that of the five tests, the highest total load experienced by the seat belt anchorage was 48,569 N (10,918 lb) (or approximately 24,285 N (5,460 lb) per seating position). This load resulted from the test of the 10 g seat with two restrained 50th percentile male dummies and two unrestrained

50th percentile male dummies in the rear row.

We compared these loads to the loads which motorcoach seats would be subjected to under FMVSS No. 210, ECE R.14, and ECE R.80. This comparison is discussed below. Based on the comparison and other considerations, our preferred alternative is to apply FMVSS No. 210 to the motorcoach seat belt anchorages. We prefer FMVSS No. 210 to ECE R.14 and ECE R.80 but ask for information that can enable us to make a fuller incremental assessment of each alternative's costs and benefits, including any related to having harmonized standards between the U.S. and the EU.

#### FMVSS No. 210

In FMVSS No. 210, lap/shoulder belt anchorages and attachment hardware are required to withstand a 13,345 N (3,000 lb) force applied simultaneously to the lap and torso portions of the belt assembly for 10 seconds.<sup>38</sup> Anchorages, attachment hardware, and attachment bolts for seats with multiple designated seating positions are tested simultaneously.

In the sled test that resulted in the highest total load on the seat belt anchorages, a load of 48,569 N (10,918 lb) was measured at the seat anchorage (or approximately 24,285 N (5,460 lb) per seating position). This value was only slightly lower than the forces applied by FMVSS No. 210 (26,688 N (6,000 lb) per seating position). That is, the highest total peak dynamic loading recorded by the seat anchorage of the tests (48,569 N) was about 91 percent of that applied in FMVSS No. 210 (26,688 N per seat, or 53,379 N for a two-person motorcoach seat). These data indicate that the FMVSS No. 210 load would account for seat belt loads generated by a restrained occupant, seat inertia loads, and loading from unbelted occupants in the rear. We believe that a motorcoach seat manufactured to meet FMVSS No. 210 would better be able to withstand this tri-loading on the seat in a severe yet not uncommon motorcoach crash, than a seat that was not manufactured to account for the rearward loading. The static load profile in FMVSS No. 210 provides a factor of safety over the loads experienced in an actual crash and would adequately ensure that the anchorages will not fail when subjected to the loads of a real-world crash event.

<sup>37</sup> As explained above, the seat belt anchorage comprises any component involved in transferring seat belt loads to the vehicle structure. See S3, FMVSS No. 210. Since the motorcoach seat belts are attached to the vehicle seat, the seat belt anchorage includes the seat frame and seat pedestal.

<sup>38</sup> The exception is Type 2 lap belts that have detachable torso belts. The lap belt anchorages and attachment hardware of these belts are required to withstand an applied force of 22,241 N (5,000 lb) for 10 seconds.



## ECE R.14 and ECE R.80

We examined the ECE R.14 and ECE R.80 procedures for relevancy to motorcoaches used in the U.S. The ECE R.14 procedure is a static test method to evaluate safety belt and seat anchorage strength and the ECE R.80 procedures evaluate the seat's anchorage strength and the seat back's energy absorption capability for protection to occupants in the rear seat.

The ECE R.14 load does not include the load that rearward unbelted occupants would impose on the seat in front of the unbelted occupants. ECE R.14 applies a load of 4,500 N to the shoulder belt and 4,500 N to the lap belt (total of 9,000 N). In addition, it applies inertial seat loading of  $6.6g \times$  the weight of the seat. For a 40 kg seat, this is 1,300 N per seating position. The total seat load is 10,300 N per seating position. (For reference, FMVSS No. 210 applies a load of 26,688 N per seating position). In accounting only for belt loading on the seat and the inertial seat loading for 6.6 gs, ECE R.14 does not take into account the loading from an unrestrained occupant in the rear. In addition, we note also that the lap and shoulder belt loads measured in the agency's sled tests exceeded the 4,500 N applied force per ECE R.14. In the sled test with two restrained 50th percentile male dummies in the target seat and without any dummies in the rear row, the total lap and shoulder belt loads exceeded 9,000 N for both dummies.

The ECE R.80 load does not include the seat belt loads from the restrained occupant in the seat and only evaluates anchorage strength in terms of the loading of the seat back from unrestrained and restrained occupants in the rearward row. The ECE R.80 optional static test to evaluate anchorage strength applies a load of 5,000 N to each seating position. This load represents about 19 percent of the applied load in FMVSS No. 210 and about 20 percent of the seat anchorage loads measured in the agency's sled tests. The 5,000 N applied load is also lower than the estimated loading on the target seat in the sled tests from the unrestrained occupant in the rearward row.

The ECE R.14 applied belt loads and inertial seat loads result in higher seat anchorage loads than the ECE R.80 applied seat loads. However, ECE R.14 and ECE R.80 both determine seat belt and seat anchorage strength by separately considering the loading from the belted occupant in the seat and the loading due to unrestrained occupants in the rear row. There is no requirement in ECE regulations for the seat

anchorages to sustain the combined loads from the restrained occupant in the seat and rear occupant loading.

In developing this proposal to require seat belts on motorcoaches, we wanted to ensure protection to the belted occupant in a 48 km/h (30 mph) crash in reasonably foreseeable situations, including situations where an unbelted occupant is in the rear. Our sled tests show the importance of accounting for the loads from the unbelted occupants rear of the target seat. In the test of the 7 g seat with restrained 50th percentile male dummies in the target seat and unrestrained 50th percentile male dummies in the rear, we estimated that the total peak load on the anchorages from the lap/shoulder belts alone for one motorcoach seating position was 11,400 N and that from rear occupant loading was 8,150 N. The contribution of anchorage loads in this sled test from the seat belt loading alone was greater than the 9,000 N applied by ECE R.14 and the loading from rear occupant loading was greater than the 5,000 N applied by ECE R.80. Further, we expect that the anchorage loads due to seat belt loads would be greater than that estimated in this sled test when the seat is occupied by a restrained 95th percentile male. Similarly, the anchorage loads due to rear occupant loading would be greater when the rear seat occupants are 95th percentile male.

Unfortunately, nonuse of the seat belts on motorcoaches by a number of occupants is very plausible at this time. Australian data indicate that seat belt use on motorcoaches in that country was as low as 20 percent.<sup>39</sup> For the reasons explained above, we believe that ECE R.14 requirements are insufficient to protect the belted occupant in these circumstances.

We have examined real world data in the EU for insights into this issue but the data were unhelpful. It appears that while the U.S. has more fatalities in rollover (due to ejections), the EU has a high percent of fatalities in frontal crashes. The European data is a bit ambiguous, however, because of the nonuniform classification of buses in different countries. In addition, the EU data include transit buses. Thus, it is not clear whether the higher percentage of fatalities in frontal crashes is due to poor restraint performance or due to differences in vehicle classification and how the vehicles are used.

We do not believe there would be adverse consequences associated with applying FMVSS No. 210 to motorcoach

seat belt anchorages rather than ECE R.14, although comments are requested on the benefits and costs of adopting ECE R.14 over FMVSS No. 210. Would motorcoach seats have to be significantly heavier to meet the more stringent strength requirements of FMVSS No. 210, or made stiffer and more uncomfortable, as compared to seats rated by their manufacturer as meeting ECE R.14? Would significant changes to meet FMVSS No. 210 requirements lead to reduced number of passengers that can be accommodated on buses? We do not believe there would be adverse consequences to meeting FMVSS No. 210 in terms of weight, comfort, or cost, because data from our testing program indicate that the Amaya 7 g seats we acquired to evaluate in our motorcoach testing program—seats on the market today—appeared to have been already made to meet the more stringent requirements of FMVSS No. 210.

In April 2009, VRTC tested existing Amaya lap/shoulder belt seat designs to evaluate FMVSS No. 210 performance. The agency sought to understand the extent to which changes will be needed to existing 7 g and 10 g seat and seat anchorage designs in order to meet the performance requirements in FMVSS No. 210. Two static tests were performed using the test method in FMVSS No. 210.<sup>40</sup> For these tests, floor and side seat rails removed from the crash tested motorcoach were used to anchor the seats being tested to the test fixture to determine if current seat mounts would be capable of meeting the loads generated through the FMVSS No. 210 procedure. The floor-mounted seat rails obtained from the crash tested motorcoach were made of steel and welded directly to the test fixture. The side seat rails obtained from the crash tested motorcoach were made of aluminum and affixed to the test fixture to prevent movement during the static load tests. The subject seats were then installed in the test fixture in accordance with the manufacturer's installation instructions. (We note that one limiting factor of the tests was the fact that the seat rails removed from the crash tested motorcoach were mounted directly to the test fixture rather than

<sup>40</sup> An additional test was conducted on a 10 g seat because an initial FMVSS No. 210 test was conducted on a 10 g seat using the same seat mounting rails used during the 7 g seat test. During this 10 g seat test, the seat failed to meet the FMVSS No. 210 loads. However, we determined that this test should be deemed invalid because the seat rails were reused. It was unknown to what extent the rails were damaged during the previous test, thus affecting the results of the subsequent test. The rails were replaced on the test fixture and a second test using a 10 g rated seat was performed successfully.

<sup>39</sup> "Three Point Seat Belts on Coaches—the First Decade in Australia", by Griffiths, Paine, and Moore, Queensland Transport Australia, 2009.

the monocoque structure of the motorcoach. We are uncertain of how the load response of the monocoque structure differed from the response of the test fixture.<sup>41</sup> However, we believe that the test fixture sufficiently emulated the motorcoach structure in determining the performance of the seat during the FMVSS No. 210 tests. The test fixture incorporated long enough sections of the seat mounting rails (mounted in a manner that closely resembled the rail installation in the motorcoach) to ensure that any localized forces would be captured during the test procedure).

Both the 7 g and 10 g seats were able to meet the FMVSS No. 210 performance requirements as installed in the test fixture. This not only demonstrates the practicability of our proposed FMVSS No. 210 requirements with current designs, it shows that meeting FMVSS No. 210 is not likely to adversely affect the weight or comfort of current "7 g" seats.

Nonetheless, to examine the costs and benefits of the proposed amendments, although ECE R.14 might be ineffective in some circumstances we would like to explore the regulation as an alternative to FMVSS No. 210. NHTSA has been unable to assess how much more costly and how much more beneficial in monetized terms would FMVSS No. 210 be over the ECE R.14 requirement, in part because we have not been able to test 7 g and 10 g motorcoach seats that barely meet the ECE requirements and that do not meet FMVSS No. 210. The Amaya seats we tested met FMVSS No. 210, so in effect were FMVSS No. 210 seats. We could not assess the incremental costs and benefits that would result from changing these Amaya seats to meet FMVSS No. 210, since the seats already met FMVSS No. 210.

To help NHTSA examine the costs and benefits of alternatives, NHTSA requests information from commenters as to the performance of minimally-compliant ECE R.14 seats (*i.e.*, seats that meet ECE R.14 and not FMVSS No. 210). What are the incremental costs and benefits of meeting ECE R.14? What are the incremental costs and benefits of FMVSS No. 210? How does a minimally-compliant seat perform when tested to FMVSS No. 210? How does such a seat perform when tested in accordance with ECE R.14? How much do these minimally-compliant seats weigh? What is their cost? Comments

<sup>41</sup> One possibility is that the monocoque structure would act similarly, but would flex more. This flexion could conceivably open gaps in the floor rails or side rails near the anchorage hardware, which could lead to seat separation from the rail.

are requested on whether loading from an unbelted occupant rearward of the target seat should be included in the forces applied to the seat belt anchorages in the FMVSS compliance test. Are manufacturers that sell buses in the U.S. and the EU already complying with the current ECE R.14 standard? Are there any advantages to harmonizing U.S. standards with EU standards? What are the additional costs and benefits for having different standards in the U.S.?

#### VRTC Devised Procedures

NHTSA also considered in the research program two alternative methods to evaluate seat belt anchorage strength but both were deemed not sufficiently beneficial to pursue in this NPRM. In the first method, "Method A," we evaluated the sum of the seat belt forces from the lap/shoulder belt and the rear dummy femur forces to estimate the loading experienced by the seat in the sled tests. We found that Method A closely replicated the total loads acting on the seat back and seat belt portion of the seat but did not capture the full load on the seat in the sled test. Method A was deemed to significantly underestimate the forces exhibited at the seat anchorage points.

In the second method, "Method B," we evaluated the sum of the peak dynamic forces acting on the seat anchorages to estimate the load profile. We found that Method B more closely estimated the dynamic anchorage loading profile from the sled tests than the Method A profile. However, the loads estimated by Method B were very close to the performance requirements specified in FMVSS No. 210. With the results being similar, we concluded that it would be appropriate to propose to specify FMVSS No. 210 loading in the NPRM rather than developing an entirely new performance test method to determine anchorage strength.

For the reasons provided above, we propose our preferred alternative of subjecting motorcoach seat belt anchorages to FMVSS No. 210.

#### *e. Regulatory Alternatives*

NHTSA has examined the benefits and costs of the proposed amendments, wishing to adopt only those amendments that contribute to improved safety, and mindful of the principles for regulatory decisionmaking set forth in Executive Order 12866, Regulatory Planning and Review. In accordance with the Executive Order, NHTSA has analyzed an alternative of requiring lap belts for passenger seating positions, instead of lap/shoulder belts for these seating

positions. NHTSA is also considering an alternative regarding the anchorage strength requirement that the lap/shoulder belts should meet, *i.e.*, ECE R.14 anchorage strength requirements, as opposed to FMVSS No. 210 requirements. These alternatives are addressed below.

#### Lap Belts

The agency has examined an alternative of adding a lap belt only as a substitute for lap/shoulder belts on motorcoaches. The examination has reinforced our preference for lap/shoulder belts.

Real world data on light vehicles and sled testing with motorcoach seats both show that lap/shoulder belts are more effective than lap belts in reducing injuries and fatalities. Given the cost estimates and effectiveness estimates assumed in NHTSA's analysis, the cost per equivalent life saved is essentially the same between lap belts and lap/shoulder belts. The breakeven point for lap belt use is 17 percent and for lap/shoulder belt use is 24 percent. However, lap/shoulder belts are used more often than lap belts. The ratio of this difference is essentially the same as was found between lap and lap/shoulder belt usage in the rear seat of passenger cars. Assuming that this relationship would hold for motorcoaches, the cost per equivalent life saved for lap belts is essentially the same as for lap/shoulder belts. *See* the PRIA for more information.

#### Anchorage Strength Requirements

In Section VI.d of this preamble, NHTSA discussed its proposal for the strength requirements the agency believes motorcoach seat belt anchorages (and the seat structure itself) should meet. The preferred alternative is our proposal to extend FMVSS No. 210 to motorcoach seat belt anchorages. However, as discussed in Section VI.d, we seek comment on the alternative of applying the requirements of ECE R.14 rather than FMVSS No. 210. Our reasons for preferring FMVSS No. 210 are discussed in Section VI.d, as are questions asking for information that could enable us to better assess the costs and benefits of ECE R.14 requirements.

As the agency does in all its FMVSS rulemaking, in developing this proposal NHTSA considered international standards for harmonization purposes. The agency thus reviewed regulations issued by Australia and Japan. In Australia, buses with 17 or more seats and with GVWRs greater than or equal to 7,714 lb must comply with ADR 68 (Occupant Protection in Buses). The ADR 68 anchorage test specifies

simultaneous application of loading from the belted occupant, the unbelted occupant in the rear (applied to the seat back), and the inertial seat loading from a 20 g crash pulse. We estimate that the ADR 68 anchorage test would result in significantly greater (1.5 times higher) anchorage loads than those measured in our sled tests. In addition, the maximum deceleration in our 48 km/h (30 mph) motorcoach crash test was only 13 g compared to the 20 g specified for inertial seat loading in ADR 68. For these reasons, NHTSA decided not to further consider ADR 68. NHTSA decided against further consideration of Japan's regulation because Japan requires lap belts, and the performance requirements we are seeking are for lap/shoulder belts.

## VII. Other Issues

### a. FMVSS No. 207, "Seating systems"

In formulating this rulemaking, NHTSA also considered whether FMVSS No. 207, "Seating systems," should apply to motorcoach passenger seats. The standard establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibility of their failure by forces acting on them as a result of vehicle impact. For most vehicles required by FMVSS No. 208 to have seat belts, the seat belt anchorages must be certified to the strength requirements of FMVSS No. 210 and the seats must be certified to FMVSS No. 207. Part of the FMVSS No. 207 requirements tests the forward strength of the seat attachment to the vehicle replicating the load that would be applied through the seat center of gravity by inertia in a 20 g vehicle deceleration.

If the seat belt anchors are attached to the seat, FMVSS No. 207 requires that the FMVSS No. 210 anchorage loads be applied at the same time the FMVSS No. 207 inertial load is applied. This stems from the fact that during a crash, a seat with an integrated seat belt will have to sustain the loading due to both the seat mass and the seat belt load from the occupant. However, FMVSS No. 207 specifically exempts (at S.4.2) all bus passenger seats, including motorcoaches, except for small school bus passenger seats.

As earlier explained, our sled test program found that the forces experienced by the seat anchorages of a lap/shoulder belt seat could be as much as 48,569 N (10,918 lb). This is approximately 91 percent of the forces applied by the FMVSS No. 210 test procedure (53,376 N (12,000 lb), for a seat with two seating positions). The forces measured at the seat anchorages

included the sum of the inertial loading from the seat as well as the seat belt loads from the dummy in our sled tests. We believe these forces are realistically captured by our proposed FMVSS No. 210 requirement, although at a lesser deceleration level than that specified by FMVSS No. 207 (10 g versus 20 g).

We note that the 20 g multiplier in FMVSS No. 207 for inertial loads is appropriate for the deceleration levels experienced by light passenger vehicles. However, as evidenced by our full-scale motorcoach crash, the motorcoach passenger seats only experience about half of this. Therefore, we believe the FMVSS No. 210 requirement that we are proposing for motorcoach seats will encompass the necessary requirements for ensuring that restraints integrated into seats are tested adequately and that the seat attachment is robust. For these reasons, we believe that the inertial loads regulated by FMVSS No. 207 have already been factored into our proposed FMVSS No. 210 loading requirements. Thus, additional FMVSS No. 207 requirements for motorcoach passenger seats are not needed.

### b. Energy Absorption Capability of Seat Backs

After reviewing the data from the full scale crash test and the sled tests, NHTSA seeks comment on the energy absorbing capability of the seat backs of current motorcoaches to provide impact protection to occupants. Unbelted occupants in the sled tests, primarily 5th percentile female dummies, had HIC and Nij values in excess of IARVs when they struck the seat back in front of them. Additionally, in some sled tests the belted dummies interacted with the forward seat back when unbelted dummies in the rear seat struck their seat back, resulting in elevated HIC and Nij values to the belted dummies.<sup>42</sup>

While seat belts provide protection by retaining occupants in their seats in various crash scenarios, including rollovers, we would like to know whether there may be some potential for seat backs to become stiffer to accommodate the additional loads from seat belts. We are interested in information on specifications on force-deflection characteristics and/or impact deceleration characteristics for seat backs, that would help ensure that seat backs provide sufficient energy absorbing capability, to mitigate injuries to unbelted occupants while maintaining adequate protection to

<sup>42</sup> The belted dummies in our sled tests did not interact with the front seat backs and had lower HIC and Nij values when the dummy in the row behind was either restrained or not present.

belted occupants. These specifications may also enhance protection for the belted occupant in the event of interaction with the front seat back. We seek comment on manufacturers' current use of padding on seat backs to improve protection for occupants aft of the seat back. Do manufacturers now design motorcoaches to meet seat back force deflection characteristics or padding specifications with occupant protection in mind?<sup>43</sup>

### c. Retrofitting Used Buses

NHTSA considered proposing to require buses currently in use to be equipped (or retrofitted) with seat belts and seat belt anchorage strength required by this NPRM. The Secretary of Transportation has authority to promulgate safety standards for "commercial motor vehicles and equipment subsequent to initial manufacture."<sup>44</sup> The Office of the Secretary has delegated authority to NHTSA to: "promulgate safety standards for commercial motor vehicles and equipment subsequent to initial manufacture when the standards are based upon and similar to a [FMVSS] promulgated, either simultaneously or previously, under chapter 301 of title 49, U.S.C."<sup>45</sup> Additionally, the Federal Motor Carrier Safety Administration (FMCSA) is authorized to enforce the safety standards applicable to commercial vehicles operating in the U.S. While this NPRM does not set forth proposed regulatory text requiring buses "subsequent to initial manufacture" to be retrofitted with seat belts for the driver or passenger seating positions, we request information on several issues relating to retrofitting passenger seating positions on used motorcoaches.

We seek to know more about the technical and economic feasibility of a retrofit requirement. Motorcoach buses can have a service life of 20 years or longer. Based on our testing, we believe that significant strengthening of the motorcoach structure would be needed in order to accommodate the additional seat belt loading, particularly for those buses that have been in service longer. Thus, each motorcoach in service would likely require an individual structural assessment.<sup>46</sup> We believe this could be

<sup>43</sup> See, e.g., the seat back force deflection and the impactor energy absorption test in ECE R.80 and the impactor test in ADR 68.

<sup>44</sup> Under Sec. 101(f) of Motor Carrier Safety Improvement Act of 1999 (Pub. L. 106-159; Dec. 9, 1999).

<sup>45</sup> See 49 CFR Section 1.50(n).

<sup>46</sup> We note that during our roof strength testing conducted in February 2008, the seat anchorages of an older model motorcoach failed during an ECE R.66 type test. We believe this to be an example of the type of coach that is still in service, but would

a very complex and costly process for some motorcoaches, and in many cases, retrofitting with seat belts might not be structurally possible.

We note that in August 2009, the American Bus Association (ABA), Motor Coach Canada, Trailways Transportation System, Prevost Car (U.S.), Setra of North America, and National Seating Company submitted a position paper to the agency on the issue of retrofitting in service buses.<sup>47</sup> (In the interest of simplicity, we collectively refer below to submitters of this paper as the “ABA.”) The ABA supported the installation of seat belts on newly manufactured motorcoaches, and supported a “voluntary retrofit requirement” for seat belts on existing motorcoaches, provided that, “(i) existing buses are structurally sound enough to support the enhancements that are necessary, (ii) the original bus manufacturer and/or other companies make viable 2 or 3 point [lap belt or lap/shoulder belt] retrofit kits available, and (iii) the cost of retrofitting the bus is within the technical and economic reach of many motorcoach operators.”<sup>48</sup> The ABA further commented that any “retrofit performance standard” should allow for either lap or lap/shoulder belts to be installed. They stated that they believe the amount of rebuilding that would be necessary for motorcoaches that are already in service to be retrofitted with lap/shoulder belts would be cost prohibitive for many of the smaller motorcoach operating businesses, while lap belts could be integrated into existing seats with less difficulty and cost. ABA commented that lap belts, in conjunction with “energy absorbing seats and compartmentalization of the seating configuration” would provide significant safety benefits with regard to ejection mitigation and restricting occupant movement during a crash.

The ABA estimated that installation costs for retrofitting seat belts would

need extensive modifications to meet the seat belt anchorage performance requirements. See <http://regulations.gov>, Docket no. NHTSA–2007–28793.

<sup>47</sup> See <http://regulations.gov>, Docket no. NHTSA–2007–28793–0020.

<sup>48</sup> Regarding ABA’s “voluntary retrofit requirement,” ABA’s paper appears to suggest that NHTSA should not require motorcoaches currently in use to be retrofitted. The paper appears to be saying the decision to retrofit a bus should be voluntary on the part of industry, and operators that decide to install belts—after having considered the structural soundness of the bus, the availability of kits, and the cost of retrofitting—should be free to decide to install 2 point or 3 point belts. The paper also states that “a voluntary retrofit standard can provide guidance with regard to requisite performance levels” and that “any retrofit performance standard must allow for either 2 or 3 point belts \* \* \* .”

range from \$6,000 per vehicle for lap belts, to upwards of \$60,000 per vehicle for lap/shoulder belts. The ABA reported that approximately 79 percent of the motorcoach carriers are small businesses operating fewer than 10 motorcoaches (with an average fleet size of 3 motorcoaches). Hence, we expect that motorcoach for-hire operators, many of which are small businesses, and/or operate the more structurally challenged motorcoaches, would bear the greatest impact by a seat belt retrofit requirement.

In September 2009, Greyhound Lines, Inc. (Greyhound) submitted independent comments on retrofitting seat belts on motorcoaches that are already in service, as well as provided their support for seat belts on newly manufactured motorcoaches.<sup>49</sup> Greyhound agreed with the ABA that any seat belt retrofitting should occur on a voluntary basis to ease the cost burden on the small business operators. However, it added that if NHTSA were to adopt a retrofit requirement, that requirement should exclusively require lap/shoulder belts and should establish a future date by which all motorcoaches operating in the U.S. must have seat belts installed that meet the new standards. Greyhound supported its view for retrofitting lap/shoulder belts by noting that the agency sled test research indicated that dummies restrained by lap belts generally exhibited more severe head and neck injuries than the unbelted dummies.

Given the agency’s feasibility, cost, and small business concerns, and our knowledge that motorcoach structures can vary in construction and materials, we are seeking public comment in a number of areas to improve our understanding of the impacts of implementing a seat belt retrofit requirement on existing motorcoaches. We also include questions on enforceability since we are working closely with FMCSA to understand how a retrofit requirement might be enforced during periodic or routine commercial vehicle safety inspections, including those of motorcoaches crossing into the U.S. from Canada and Mexico.

#### Motorcoach Retrofit Requirements

1. Please explain why the agency should (or should not) consider a retrofit seat belt requirement for existing motorcoaches. Please discuss:

a. Should NHTSA consider developing technical standards for voluntarily retrofitting motorcoach passenger seats with seat belts?

<sup>49</sup> See <http://regulations.gov>, Docket no. NHTSA–2007–28793–0021.

b. In the absence of a requirement, how would the motorcoach industry self-regulate to facilitate the voluntary installation of belts on existing buses that are structurally sound enough to support the enhancements?

c. Are there other voluntary improvements that motorcoach operators would consider in improving occupant crash protection?

2. If a seat belt retrofit requirement were issued for existing motorcoaches, should operators be permitted to install lap belts instead of only lap/shoulder belts (*i.e.*, the ABA approach)? As explained above, ABA stated that they believe the amount of rebuilding necessary for motorcoaches that are already in service to be retrofitted with lap/shoulder belts would be cost prohibitive for many of the smaller motorcoach operating businesses, while lap belts could be integrated into existing seats with less difficulty and cost. ABA informed the agency that lap belts, in conjunction with “energy absorbing seats and compartmentalization of the seating configuration” would provide significant safety benefits with regard to ejection mitigation and restricting occupant movement during a crash. As noted above, Greyhound suggested that if NHTSA were to adopt a retrofit requirement, that requirement should exclusively require lap/shoulder belts.

In our test program, the lap belted dummies had elevated head and neck injury measures in the test conditions evaluated, compared to dummies restrained by lap/shoulder belts. Additionally, the motorcoach seats did not demonstrate “energy absorption” or “compartmentalization” characteristics during our tests.

However, lap belts could be effective in mitigating ejections in motorcoach rollover crashes, and some motorcoaches already on the road may have been originally manufactured such that a lap belt could be readily retrofitted to the seat, while a lap/shoulder belt could not be without significant structural modification and cost. NHTSA believes that lap/shoulder belts would provide superior protection compared to lap belts and should be required for new motorcoaches. However, considering the costs and other impacts on small businesses of retrofitting seat belts on used buses and the effectiveness of lap belts in preventing occupant ejection in rollover crashes, we ask for comments on whether requiring operators to install lap/shoulder belts would be appropriate if it is possible to retrofit lap belts to lap belt-ready seats. Comments are

requested on the associated safety implications.

3. What are the appropriate performance requirements for a retrofit lap belt or lap/shoulder belt approach? How would the strength of the anchorages be evaluated to determine if the performance requirements were met?

4. What lead time and phase-in issues should the agency consider for a retrofit requirement, and why?

a. How long would it take (in weeks) to retrofit a motorcoach with seat belts?

b. Should special lead-time and phase-in consideration be given for small businesses?

c. Would a retrofit requirement be more practicable if it were limited to only a portion of the fleet of motorcoaches currently in use? For example, should a retrofit requirement be applied only to vehicles manufactured less than five years prior to the effective date of the final rule? The appeal of doing so is that it might limit the requirement to motorcoaches encountering only five years worth of wear and tear. Further, it would apply a retrofit belt requirement to motorcoaches with the greatest amount of useable life ahead of them, as compared to the rest of the on-road motorcoach fleet. In addition, bounding the time frame would limit the impact of a retrofit requirement on small businesses, since such businesses are more likely to purchase used motorcoaches than new ones, and may be more likely than not to purchase or own motorcoaches that were produced prior to the proposed time frame of this example. Therefore, the agency is seeking information on the age of motorcoaches in the fleets owned by small businesses.

d. Comments are requested on other options the agency could take to identify portions of the on-road fleet to which a retrofit requirement should apply. Are there existing seats on motorcoaches that are "lap-belt ready," to which a lap belt can be attached that require no modification to the vehicle structure? How would the agency distinguish those seats from seats that are not seat-belt ready?

5. What are the risks to vehicle occupants in rollover and non-rollover crashes in the event of an improper retrofit installation?

#### Motorcoach Seat Anchorages

6. Do all motorcoach models share a common seat anchorage design? Please specify those that share a common design, by year and model.

7. Will any of the existing seat anchorages meet the FMVSS No. 210

strength requirements? Please specify which models, by year of manufacture.

8. What are the minimum steps necessary to retrofit a motorcoach with seat belts that comply with FMVSS No. 210? What structural changes would be necessary to make the seat anchorages accommodate the additional strength required for the addition of seat belts? Should FMVSS No. 210 strength requirements be reduced in stringency for retrofitted seat belts? What should those requirements be and should they apply to the retrofitted system?

9. We note that sometimes vehicle and equipment manufacturers will make retrofit kits available to consumers for the purpose of retrofitting existing vehicles with new equipment. Is it practical for motorcoach manufacturers to provide upgrade kits for each model with appropriate instructions so that installers can make the modifications? Please explain why or why not.

#### Cost to Retrofit

10. What is the total cost of retrofitting a motorcoach with seat belts? Please also provide a break-down of the following components:

a. Cost to modify the motorcoach structure to meet the FMVSS No. 210 seat anchorage requirements. Please specify by make/model of the existing motorcoach.

b. Cost to modify existing seat structures to accommodate seat belts. Please specify in terms of labor-hours, materials, and additional weight of the modifications by model and year of manufacture.

c. Cost difference between installing lap belts versus lap/shoulder belts.

d. Cost implications for taking a motorcoach out of service to be retrofitted (both for small and large businesses).

e. Cost of attaching lap belts to "seat-belt ready" seats (seats that can withstand the load of the occupant without structural modifications to the seat or vehicle).

f. Cost impacts from increased fuel usage for retrofitting lap belts or lap/shoulder belts on motorcoaches with and without seat-belt ready seats.

11. In the event that the motorcoach structure is insufficient as manufactured or has deteriorated to the extent that it cannot be modified to withstand the additional loads imposed by seat belts, what is the economic effect of the loss of that bus from the operator's fleet?

#### Enforcement of Retrofit Requirements

12. How can we assure that the modifications performed would meet FMVSS Nos. 208 and 210 requirements?

13. Would it be reasonable to require that each motorcoach be evaluated for structural integrity prior to performing modifications necessary for the installation of seat belts? Who would perform the structural evaluation? Would this evaluation in itself deteriorate the structural integrity?

14. Would it be reasonable to assess compliance with a retrofit requirement by means of only visually inspecting the vehicle? In what ways could we reasonably and effectively assess compliance with retrofit requirement?

#### d. School Buses

This rulemaking action should not be understood to suggest that we are considering proposing lap/shoulder belts in large school buses. NHTSA has recently decided against requiring seat belts on large school buses (over 4,536 kg (10,000 lb)) GVWR. See 73 FR 62744, October 21, 2008, *supra*.

As discussed in the October 21, 2008 final rule, *supra*, requiring installation of seat belts on large school buses would increase school bus costs that the purchaser would have to bear. Those costs could result in fewer school buses used to transport children and more students having to use alternative, less safe means to get to school. Because data indicate that the safety need for seat belts on large school buses is low, and because the net effect on safety could be negative if the costs of purchasing and maintaining the seat belts and ensuring their correct use results in non-implementation or reduced efficacy of other pupil transportation programs that affect child safety, NHTSA does not believe that passenger seat belts should be required on large school buses. Instead, the agency believes that local school transportation planners should be given the ability to analyze the transportation risks particular to their needs, and to decide whether they wish to incur the cost of purchasing large school buses equipped with passenger seat belts.

#### VIII. Lead Time

If the proposed changes in this NPRM were made final, NHTSA proposes a three year lead time for new bus manufacturers to meet the new motorcoach seat belt requirements. We believe three years are necessary for the motorcoaches since some design, testing, and development will be necessary to certify compliance to the new requirements. NHTSA proposes that optional early compliance be permitted.

With regard to a possible retrofit requirement, we request comments on the approach of NHTSA's requiring the

belts be retrofitted on subject vehicles (e.g., vehicles that are manufactured five or fewer years prior to the compliance date of the final rule) by a set future date (e.g., three years after the compliance date of the final rule).

To illustrate such an approach, assume a final rule is published in 2011. Such an approach could require new motorcoaches manufactured on or after January 1, 2015 (the January 1 of the next year, three years after publication of the final rule; the “compliance date” of the final rule) to meet the requirements for new motorcoaches. The approach would require motorcoaches manufactured on or after January 1, 2010 to be retrofitted with seat belts, and meet the amendments for retrofitted buses, by January 1, 2018. Thus, as of January 1, 2018, all motorcoaches built after January 1, 2010 would have restraints.

**IX. Overview of Costs and Benefits**

Based on a 10 year average, there were 18.6 fatalities and 7,887 injuries to motorcoach occupants. We estimate that installing lap/shoulder seat belts on new motorcoaches would save 1–8 lives and prevent 144–794 injuries, depending upon the usage of lap/shoulder belts in motorcoaches.<sup>50</sup> The cost of adding lap/shoulder belts and making structural changes to the motorcoach floor would be approximately \$12,900 per vehicle, with the total cost being \$25.8 million for the 2,000 motorcoaches sold per year. Lifetime fuel costs due to an increased weight of the motorcoach would be an additional cost (estimated below). The cost per equivalent life saved is estimated to be \$1.3 million to \$9.9 million.

**BENEFITS**

Fatalities .....	1 to 8.
AIS 1 injuries (Minor) .....	92 to 506.
AIS 2–5 (Moderate to Severe) ..	52 to 288.
<b>Total Non-fatal Injuries .....</b>	<b>144 to 794.</b>

**COSTS**

[2008 Economics]

Per Vehicle .....	\$12,900.
Total Fleet .....	\$25.8 million.
Fuel Costs per Vehicle @ 3%.	\$1,085 to \$1,812.
Fuel Costs per Vehicle @ 7%.	\$800 to \$1,336.

<sup>50</sup> The PRIA assumes that the seat belt use rate on motorcoaches would be between 15 percent and the percent use in passenger vehicles, which was 83 percent in 2008. These annual benefits would accrue when all motorcoaches in the fleet have lap/shoulder belts.

**COST PER EQUIVALENT LIFE SAVED**

15% Belt usage .....	\$7.4 to \$9.9 mill.
83% Belt usage .....	\$1.3 to \$1.8 mill.
Breakeven Point in belt usage.	24%.

The cost of installing lap/shoulder belts on new motorcoaches is estimated as follows. The incremental cost of adding passenger seats with lap/shoulder belts on a 54 passenger motorcoach is approximately \$9,900. The cost to change the seat anchorages and to reinforce the floor is approximately \$3,000. We estimate that total cost of adding belts, changing the anchorages and reinforcing the floor is approximately \$12,900. The agency has also estimated increased costs in fuel usage. The increased fuel costs depend on added weight (estimated to be 161 lbs or 269 lbs<sup>51</sup>) and the discount rate used. NHTSA estimates the increased costs in fuel usage for added weight and discounts the additional fuel used over the lifetime of the motorcoach using a 3 percent and 7 percent discount rate. See the PRIA for more details.

The agency has examined an alternative of adding a lap belt only as a substitute for lap/shoulder belts on motorcoaches. Real world data on light vehicles and sled testing with motorcoach seats both show that lap/shoulder belts are more effective than lap belts in reducing injuries and fatalities. Given the cost estimates and effectiveness estimates assumed, the breakeven point for lap belt use is 17 percent and for lap/shoulder belt use is 24 percent (a difference of 7 percentage points). The agency has found that lap/shoulder belt usage is 10 percentage points higher than lap belt usage in the rear seat of passenger cars. Assuming that this relationship would hold for motorcoaches, if lap/shoulder belt usage is 10 percentage points higher than lap belt usage, lap/shoulder belts would be more cost effective than lap belts. See the PRIA for more information.

We are not proposing at this time to require that used buses be retrofitted with the lap/shoulder belt system. The service life of a motorcoach can be 20 years or longer. We estimate that the cost of retrofitting can vary substantially. We estimate it could cost

<sup>51</sup> See PRIA for this NPRM. This estimate is based on preliminary results from a NHTSA contractor conducting cost/weight teardown studies of motorcoach seats. The weight added by 3-point lap/shoulder belts ranged from 5.96 to 9.95 pounds per 2-person seat. This is the weight only of the seat belt assembly itself and does not include changing the design of the seat, reinforcing the floor, walls or other areas of the motorcoach. The final cost and weight results from the study will be placed in the docket for this NPRM.

between \$6,000<sup>52</sup>–\$34,000 per vehicle to retrofit the vehicle with lap belts and with sufficient structure to meet today’s proposal. We also estimate it could cost \$40,000 per vehicle to retrofit it with lap/shoulder belts and reinforced structure so as to meet FMVSS No. 210 to support the load of belted occupants during a crash.<sup>53</sup> The existing fleet size is estimated to be 29,325 motorcoaches. Hence, the fleet cost of retrofitting lap belts is estimated to range from \$175,950,000 (\$6,000 × 29,325) to \$997,050,000 (\$34,000 × 29,325), while the fleet cost of retrofitting lap/shoulder belts is estimated to be \$1,173,000,000 (\$40,000 × 29,325). These costs do not include increased remaining lifetime fuel costs incurred by adding weight to the motorcoach. Weight would vary depending upon the needed structural changes and lifetime fuel cost would vary depending upon the age of motorcoaches that would be retrofitted.

Retrofitting used motorcoaches may not be structurally viable for many motorcoaches and may not be economically feasible for many motorcoach for-hire operators, many of which are small businesses. However, we have included a comprehensive set of questions about retrofit in this preamble. The answers to those questions will aid us in determining whether to issue a separate supplemental NPRM (SNPRM) to require retrofit. If we issue such an SNPRM, we will assess the impact of the proposed rule on small entities in accordance with the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) and prepare and publish an initial regulatory flexibility analysis if appropriate.

**X. Rulemaking Analyses and Notices**

*Executive Order 12866 and DOT Regulatory Policies and Procedures*

The agency has considered the impact of this rulemaking action under Executive Order 12866 and the Department of Transportation’s regulatory policies and procedures (44 FR 11034; February 26, 1979) and determined that it is economically “significant,” and also a matter of Congressional and public interest. Accordingly, the action was reviewed

<sup>52</sup> This assumes that the motorcoach structure is lap belt-ready, and can accommodate the loads set forth in this proposal.

<sup>53</sup> As discussed elsewhere in this preamble, NHTSA has determined that the FMVSS No. 210 loads that this NPRM proposes for new motorcoach belt anchorages appear to be more stringent than ECE R.80 loads and more representative of the imparted loads measured at the seat belt anchorages in a motorcoach.

under the Executive Order. NHTSA has prepared a PRIA for this NPRM.<sup>54</sup>

This NPRM proposes: (1) To define the types of buses to which this NPRM would apply (*i.e.*, to provide a definition of “motorcoach”); (2) to require lap/shoulder belts for all passenger seating positions in motorcoaches; and (3) to require lap/shoulder belts for the driver’s position on motorcoaches and on large school buses.

We estimate that installing lap/shoulder seat belts on new motorcoaches would save 1–8 lives and prevent 144–794 injuries. The total cost of adding seat belts and making structural changes to the motorcoach floor, and of lifetime fuel costs, would be approximately \$27.4 million to \$29.4 million. The cost per equivalent life saved is estimated to be \$1.3 million to \$9.9 million. The benefits, costs, and other impacts of this rulemaking are discussed at length in the PRIA.

#### *Regulatory Flexibility Act*

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.*, small businesses, small organizations, and small governmental jurisdictions). The Small Business Administration’s regulations at 13 CFR Part 121 define a small business, in part, as a business entity “which operates primarily within the United States.” (13 CFR 121.105(a)). No regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

NHTSA has considered the effects of this rulemaking action under the Regulatory Flexibility Act. According to 13 CFR 121.201, the Small Business Administration’s size standards regulations used to define small business concerns, motorcoach

manufacturers would fall under North American Industry Classification System (NAICS) No. 336111, *Automobile Manufacturing*, which has a size standard of 1,000 employees or fewer. Using the size standard of 1,000 employees or fewer, NHTSA estimates that there are 5 large motorcoach manufacturers in the United States.

With regard to the amendments of a final rule applying to new motor vehicles, I hereby certify that if made final, this proposed rule would not have a significant economic impact on a substantial number of small entities. None of the U.S. motorcoach manufacturers and motorcoach seat manufacturers is a small business.

With regard to a retrofit requirement applying to a population of on-road vehicles, NHTSA is seeking information on the potential effects of a retrofit requirement on small businesses, small organizations, and small Government jurisdictions. This preamble and the PRIA for this NPRM have questions that would assist the agency in analyzing the potential impacts of a retrofit requirement on small businesses. An estimated 78.8 percent of the 3,137 motorcoach carriers in the United States in 2007 (or about 2,470 carriers) have less than 10 motorcoaches in their fleet, and an average of three motorcoaches and eleven employees. The documents request comments on the merits of applying a retrofit requirement to a limited population of on-road vehicles to minimize any significant economic impact on small entities, such as applying a retrofit requirement to only those motorcoaches manufactured after 2010, and/or only to motorcoaches that have seat-belt ready passenger seats, etc., and providing extra lead time for the vehicles to be retrofitted. Responses to those questions will assist the agency in deciding whether to proceed with a proposal to require on-road motorcoaches to be retrofitted with seat belts.

#### *Executive Order 13132 (Federalism)*

NHTSA has examined today’s proposed rule pursuant to Executive Order 13132 (64 FR 43255, August 10, 1999) and concluded that no additional consultation with States, local governments, or their representatives is mandated beyond the rulemaking process. The agency has concluded that the proposed rule does not have sufficient federalism implications to warrant either consultation with State and local officials or preparation of a federalism summary impact statement. The proposed rule would not have “substantial direct effects on the States, on the relationship between the national

government and the States, or on the distribution of power and the responsibilities among the various levels of government.”

NHTSA rules can have preemptive effect in two ways. First, the National Traffic and Motor Vehicle Safety Act contains an express preemption provision:

When a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may prescribe or continue in effect a standard applicable to the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter.

49 U.S.C. 30103(b)(1).

Second, the Supreme Court has recognized the possibility, in some instances, of implied preemption of State requirements imposed on motor vehicle manufacturers, including sanctions imposed by State tort law. That possibility is dependent upon there being an actual conflict between a FMVSS and a State requirement. If and when such a conflict exists, the Supremacy Clause of the Constitution makes the State requirements unenforceable. *See Geier v. American Honda Motor Co.*, 529 U.S. 861 (2000), finding implied preemption of state tort law on the basis of a conflict discerned by the court,<sup>55</sup> not on the basis of an intent to preempt asserted by the agency itself.<sup>56</sup>

NHTSA has considered the nature (*e.g.*, the language and structure of the regulatory text) and purpose of today’s proposed rule and does not foresee any potential State requirements that might conflict with it. Without any conflict, there could not be any implied preemption of state law, including state tort law.

#### *National Environmental Policy Act*

NHTSA has analyzed this NPRM for the purposes of the National Environmental Policy Act. The agency has determined that implementation of this action would not have any significant impact on the quality of the human environment.

#### *Paperwork Reduction Act*

Under the procedures established by the Paperwork Reduction Act of 1995, a person is not required to respond to a collection of information by a Federal

<sup>55</sup> The conflict was discerned based upon the nature (*e.g.*, the language and structure of the regulatory text) and the safety-related objectives of FMVSS requirements in question and the impact of the State requirements on those objectives.

<sup>56</sup> Indeed, in the rulemaking that established the rule at issue in this case, the agency did not assert preemption.

<sup>54</sup> NHTSA’s PRIA is available in the docket for this NPRM and may be obtained by downloading it or by contacting Docket Management at the address or telephone number provided at the beginning of this document.

agency unless the collection displays a valid OMB control number. This rulemaking would not establish any new information collection requirements.

#### *National Technology Transfer and Advancement Act*

Under the National Technology Transfer and Advancement Act of 1995 (NTTAA) (Pub. L. 104–113), “all Federal agencies and departments shall use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments.” After carefully reviewing the available information, including standards from the European Union, Australia and Japan, NHTSA has determined that there are no voluntary consensus standards that we will be incorporating into this rulemaking. The reasons the agency has decided against adopting the international regulations regarding the performance of seat belt anchorages were discussed earlier in this preamble.

#### *Executive Order 12988*

With respect to the review of the promulgation of a new regulation, section 3(b) of Executive Order 12988, “Civil Justice Reform” (61 FR 4729, February 7, 1996) requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect; (2) clearly specifies the effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct, while promoting simplification and burden reduction; (4) clearly specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. This document is consistent with that requirement. Pursuant to this Order, NHTSA notes as follows.

The issue of preemption is discussed above in connection with E.O. 13132. NHTSA notes further that there is no requirement that individuals submit a petition for reconsideration or pursue other administrative proceeding before they may file suit in court.

#### *Unfunded Mandates Reform Act*

The Unfunded Mandates Reform Act of 1995 requires agencies to prepare a written assessment of the costs, benefits and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local or tribal governments, in the

aggregate, or by the private sector, of more than \$100 million annually (adjusted for inflation with base year of 1995). This NPRM would not result in expenditures by State, local or tribal governments, in the aggregate, or by the private sector in excess of \$100 million annually.

#### *Executive Order 13045*

Executive Order 13045 (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be “economically significant” as defined under E.O. 12866, and (2) concerns an environmental, health, or safety risk that NHTSA has reason to believe may have a disproportionate effect on children. This rulemaking is not subject to the Executive Order because it is not economically significant as defined in E.O. 12866. However, as previously explained, because children make up as much as 27 percent of motorcoach ridership, this NPRM, if made final, should have a beneficial safety effect on them.

#### *Executive Order 13211*

Executive Order 13211 (66 FR 28355, May 18, 2001) applies to any rulemaking that: (1) Is determined to be economically significant as defined under E.O. 12866, and is likely to have a significantly adverse effect on the supply of, distribution of, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action. This rulemaking is not subject to E.O. 13211.

#### *Plain Language*

Executive Order 12866 and the President’s memorandum of June 1, 1998, require each agency to write all rules in plain language. Application of the principles of plain language includes consideration of the following questions:

- Have we organized the material to suit the public’s needs?
- Are the requirements in the rule clearly stated?
- Does the rule contain technical language or jargon that isn’t clear?
  - Would a different format (grouping and order of sections, use of headings, paragraphing) make the rule easier to understand?
  - Would more (but shorter) sections be better?
  - Could we improve clarity by adding tables, lists, or diagrams?
  - What else could we do to make the rule easier to understand?

If you have any responses to these questions, please include them in your comments on this proposal.

#### *Regulation Identifier Number (RIN)*

The Department of Transportation assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. You may use the RIN contained in the heading at the beginning of this document to find this action in the Unified Agenda.

#### *Privacy Act*

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT’s complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78).

## **XI. Public Participation**

#### *How do I prepare and submit comments?*

Your comments must be written and in English. To ensure that your comments are correctly filed in the Docket, please include the docket number of this document in your comments.

Your comments must not be more than 15 pages long. (49 CFR 553.21). We established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments.

Comments may also be submitted to the docket electronically by logging onto the Docket Management System website at <http://www.regulations.gov>. Follow the online instructions for submitting comments.

Please note that pursuant to the Data Quality Act, in order for substantive data to be relied upon and used by the agency, it must meet the information quality standards set forth in the OMB and DOT Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB’s guidelines may be accessed at <http://www.whitehouse.gov/omb/fedreg/reproducible.html>.

#### *How can I be sure that my comments were received?*

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon



receiving your comments, Docket Management will return the postcard by mail.

*How do I submit confidential business information?*

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under **FOR FURTHER INFORMATION CONTACT**. In addition, you should submit a copy, from which you have deleted the claimed confidential business information, to the docket at the address given above under **ADDRESSES**. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation. (49 CFR Part 512.)

*Will the agency consider late comments?*

We will consider all comments received before the close of business on the comment closing date indicated above under **DATES**. To the extent possible, we will also consider comments that the docket receives after that date. If the docket receives a comment too late for us to consider in developing a final rule (assuming that one is issued), we will consider that comment as an informal suggestion for future rulemaking action.

*How can I read the comments submitted by other people?*

You may read the comments received by the docket at the address given above under **ADDRESSES**. The hours of the docket are indicated above in the same location. You may also see the comments on the Internet. To read the comments on the Internet, go to <http://www.regulations.gov>. Follow the online instructions for accessing the dockets.

Please note that even after the comment closing date, we will continue to file relevant information in the docket as it becomes available. Further, some people may submit late comments. Accordingly, we recommend that you periodically check the Docket for new material. You can arrange with the docket to be notified when others file

comments in the docket. See [www.regulations.gov](http://www.regulations.gov) for more information.

**List of Subjects in 49 CFR Part 571**

Imports, Motor vehicle safety, Motor vehicles, and Tires.

In consideration of the foregoing, NHTSA proposes to amend 49 CFR Part 571 as set forth below.

**PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS**

1. The authority citation for Part 571 continues to read as follows:

**Authority:** 49 U.S.C. 322, 30111, 30115, 30117 and 30166; delegation of authority at 49 CFR 1.50.

2. Section 571.3 is amended by adding the definition “Motorcoach” in alphabetical order, to read as follows:

**§ 571.3 Definitions.**

\* \* \* \* \*

*Motorcoach* means a bus with a gross vehicle weight rating (GVWR) of 11,793 kilograms (26,000 pounds) or greater, 16 or more designated seating positions (including the driver), and at least 2 rows of passenger seats, rearward of the driver’s seating position, that are forward-facing or can convert to forward-facing without the use of tools. *Motorcoach* includes buses sold for intercity, tour, and commuter bus service, but does not include a school bus, or an urban transit bus sold for operation as a common carrier in urban transportation along a fixed route with frequent stops.

\* \* \* \* \*

3. Section 571.208 is amended by redesignating the existing regulatory text of S4.4.3.1 as paragraph (a), adding paragraphs (b) and (c), and adding S7.1.6, to read as follows:

**§ 571.208 Standard No. 208; Occupant crash protection.**

\* \* \* \* \*

S4.4.3.1

(a) \* \* \*

(b) Each school bus with a gross vehicle weight rating greater than 4,536 kg (10,000 pounds) and each motorcoach, manufactured on or after [date 3 years after publication date of rule], must be equipped with a Type 2 seat belt assembly at the driver’s designated seating position. The seat belt assembly must comply with FMVSS No. 209 (49 CFR 571.209) and with S7.1

and S7.2 of this standard. The pelvic portion of a dual retractor Type 2 belt assembly installed in compliance with this requirement must include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed in compliance with this requirement includes an automatic locking retractor for the lap belt portion, that seat belt assembly must comply with paragraphs (a) through (c) of S4.4.2.2 of this standard. If a seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner’s manual must include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle must comply with S7.4.2(c) of this standard.

(c) Motorcoaches manufactured on or after [date 3 years after publication date of rule] must be equipped with a Type 2 seat belt assembly that is attached to the seat structure at every designated seating position for passengers other than a side-facing position. Side-facing designated seating positions must be equipped, at the manufacturer’s option, with a Type 1 or Type 2 seat belt assembly. Seats with no other seats behind them, no wheelchair positions behind them, or side emergency doors behind them are excluded from the requirement that the seat belt anchorages must be attached to the seat structure. Seat belt assemblies at all designated seating positions for passengers must comply with paragraphs (a) through (c) of S7.1.1.5, S7.1.6 and S7.2 of this standard.

\* \* \* \* \*

S7.1.6 *Motorcoach passenger seats.* The seat belt assemblies on motorcoach passenger seats will operate by means of any emergency-locking retractor that conforms to 49 CFR 571.209 to restrain persons whose dimensions range from those of a 50th percentile 6-year-old child to those of a 95th percentile adult male. The seat belt assemblies will operate in this manner with the seat back in any position.

\* \* \* \* \*

Issued on: August 12, 2010.

**Joseph S. Carra,**  
*Acting Associate Administrator for Rulemaking.*

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