



**NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C. 20594**

Office of Research and Engineering  
Safety Studies and Statistical Analysis Division

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**Data Report- Addendum 1**

Large Bus Accidents and Injuries in Rural and Urban Areas, 2000-2007

**A. ACCIDENT INFORMATION**

Date and Time: January 6, 2008, 8:02 p.m. MST  
Location: Southbound US Rt. 163, near MP29  
Mexican Hat, San Juan County, Utah  
Vehicle: 2007 MCI Model J4500, 56-Passenger Motorcoach  
Motor Carrier: Busco, Inc., dba Arrow Stage Lines  
Fatalities: 9  
Injuries: 44  
NTSB#: HWY-08-MH-012

**B. SAFETY STUDIES AND STATISTICAL ANALYSIS DIVISION**

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## **C. DETAILS AND SUMMARY OF THE AMENDED ANALYSIS REPORT**

This addendum to the Data Report *Large Bus Accidents and Injuries in Rural and Urban Areas, 2000-2006* (submitted on May 29, 2008) updates the analyses using the National Highway Traffic Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS) data to include accident data from calendar year 2007. In the same way as the previous report, this Addendum places the scope of the problem in the context of fatal accidents involving large buses engaged in charter and tour operations, scheduled service, commuter service, and shuttle bus service for the period 2000 – 2007. The update includes all of the analyses of accident data that were presented in the original Data Report, but with new numbers reflecting fatal accidents involving large buses that occurred in 2007. The same FARS codes and selection criteria was used in this report as described in detail in Appendix A of the Data Report.

The addition of 2007 data increased the number of fatal accidents involving large buses to almost 1,100 in the 8-year period, averaging 137 fatal accidents per year. These accidents resulted in almost 5,000 injuries, both fatal and nonfatal.

As might be expected, the addition of one year of FARS data had very little affect on the pattern of accidents, fatalities, and nonfatal injuries discussed in the Data Report. In the period 2000 – 2007, rural fatal accidents involving large buses were largely comprised of motorcoaches used in a charter or in a tour. Overall, rural fatal accidents involving charter/tour buses accounted for only 10% of the total number of fatal accidents, but resulted in 15% of the total fatalities and 34% of the total nonfatal injuries. Charter/tour buses were involved in half (52%) of the fatal rural accidents, with the remaining bus accidents divided among scheduled service (27%), commuter service (11%), and shuttle bus service (10%). This result is in contrast to urban accidents that are dominated by transit/city buses in scheduled service.

Rural fatal accidents involving charter/tour buses accounted for more than half of the rural fatalities and almost three quarters of the rural nonfatal injuries, with almost all of the nonfatal injuries suffered by the occupants of the bus. The number of charter/tour bus occupants fatally injured in rural accidents was also proportionally higher (24% of rural large bus accident fatalities) than the charter/tour bus occupants fatally injured in urban accidents (3% of urban large bus accident fatalities). It is also interesting to note that passengers of buses involved in rural fatal accidents were less likely to escape injury than their urban counterparts.

The number of persons transported to hospitals was used as an estimate of the demands placed on rural emergency medical services. The data showed that in rural accidents involving large buses, most of the people transported to hospitals were bus occupants. When only those accidents involving charter/tour buses were considered, almost all of the transported accident victims were bus occupants.

## **D. RESULTS**

There were a total of 1,093 fatal accidents involving large buses in 2000-2007 (Table 1), resulting in 1,315 fatalities and 3,471 nonfatal injuries (Table 3). Fatal accidents involving charter/tour buses accounted for 234 of the accidents (representing 21% of the total), resulting in

349 fatalities and 1,771 nonfatal injuries. The following sections discuss fatal accidents and injuries in more detail, with specific focus on comparisons between rural and urban accidents.

### **D.1 Fatal Accidents Involving Large Buses**

Fatal accidents involving large buses occurred primarily in urban areas (Table 2). There were 839 urban fatal accidents, resulting in 950 fatalities and 1,808 nonfatal injuries, accounting for 77% (839/1093) of the fatal accidents, 72% (950/1315) of the fatalities, and 52% (1808/3471) of the nonfatal injuries (Table 3). Accidents involving buses in scheduled service accounted for the majority (65%, 548/839) of the urban accidents, followed by buses in commuter service (18%, 148/839), charter/tour buses (13%, 112/839), and shuttle buses (4%, 31/839). Almost all of the scheduled service bus accidents (88%, 548/625) occurred in urban areas, and almost all of these types of urban accidents (89%, 486/548) involved transit buses. The large number of urban accidents involving buses in scheduled and in commuter service reflect the high level of public transport provided by buses in populated areas.

In rural areas, charter/tour buses, rather than scheduled service buses, accounted for greatest proportion of accidents. Charter/tour buses were involved in more than half (52%, 114/219) of the fatal rural accidents, with the remaining accidents divided among scheduled service (27%, 59/219), commuter service (11%, 25/219), and shuttle bus service (10%, 21/219). Motorcoaches were involved in more than 60% (136/219) of all these rural accidents, and almost all of these rural motorcoach accidents were being used in a tour or charter.

These data show that rural fatal accidents involving large buses are primarily comprised of motorcoaches being used in a tour or as a charter. This result is in contrast to urban accidents that are dominated by transit/city buses in scheduled service.

Table 1: Fatal Accidents Involving Large Buses, 2000-2007

<b>Bus Use</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>Total</b>
<b>Charter/Tour</b>	27	33	30	20	37	36	19	32	234
<b>Scheduled Service</b>	110	80	73	82	65	57	80	78	625
<b>Commuter</b>	21	28	21	22	14	22	30	20	178
<b>Shuttle</b>	6	5	9	7	8	10	2	9	56
<b>Total</b>	164	146	133	131	124	125	131	139	1093

Table 2: Fatal Bus Accidents by Rural or Urban Location and Type of Bus, 2000-2007

	Rural	Urban
<b>Charter/Tour</b>		
Motorcoach	104	96
Transit/City Bus	5	13
GVWR 10-26K	5	3
<b>Scheduled Service</b>		
Motorcoach	18	57
Transit/City Bus	40	486
GVWR 10-26K	1	5
<b>Commuter Service</b>		
Motorcoach	4	11
Transit/City Bus	18	132
GVWR 10-26K	3	5
<b>Shuttle Service</b>		
Motorcoach	10	14
Transit/City Bus	3	6
GVWR 10-26K	8	11
<b>Total</b>	219	839

## D.2 Fatalities and Injuries

**D2.1. All Fatalities and Injuries.** Fatalities and injuries resulting from the fatal accidents involving large buses is shown in shown in Table 3. As might be expected, the large number of urban accidents produced the greatest number of fatalities and nonfatal injuries. However, nonfatal injuries were more evenly distributed between urban and rural accidents.

In urban areas, there were 950 fatalities and 1,808 nonfatal injuries in fatal accidents involving large buses. Accidents involving buses in scheduled service accounted for most of the urban fatalities (61%, 581/950) and half of the nonfatal injuries (50%, 908/1808).

In rural areas, there were 346 fatalities and 1,617 nonfatal injuries. Rural fatal accidents involving charter/tour buses accounted for 56% (195/346) of the rural fatalities and 72% (1172/1617) of the rural nonfatal injuries. It is interesting to note that rural charter/tour bus fatal accidents resulted in more fatalities and nonfatal injuries than urban charter/tour bus accidents, a pattern that is exactly the reverse for accidents involving buses in any other type of service or use. In fact, rural accidents involving charter/tour buses resulted in twice the number of nonfatal injuries as the same type of urban accidents.

Table 3: Fatalities and Nonfatal Injuries in Fatal Accidents Involving Large Buses, 2000-2007

	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>Fatalities</b>			
Charter/Tour	349	195	148
Scheduled Service	661	69	581
Commuter	206	45	160
Shuttle	99	37	61
<b>Total</b>	1315	346	950
<b>Nonfatal Injuries</b>			
Charter/Tour	1771	1172	586
Scheduled Service	1187	248	908
Commuter	246	100	145
Shuttle	267	97	169
<b>Total</b>	3471	1617	1808
<b>Total Fatalities &amp; Injuries</b>	4786	1963	2758
<b>Uninjured</b>			
Charter/Tour	343	177	161
Scheduled Service	592	47	534
Commuter	173	23	146
Shuttle	51	20	31
<b>Total Uninjured</b>	1159	267	872

**D2.2. Bus Occupants.** Overall, bus occupants accounted for a small percentage (15%, 197/1315) of the fatalities in accidents involving large buses (Table 4). However, a greater number of bus occupants were fatally injured in rural accidents than in urban accidents, with these fatalities accounting for more than a third (120/346) of the total number of people killed in rural accidents. In contrast, bus occupants accounted for only 8% (77/950) of the fatalities in urban accidents. The proportion of charter/tour bus occupants fatally injured in rural accidents (24%, 82/346) represented a greater proportion of the total number of rural fatalities than did the urban charter/tour bus occupants fatally injured in urban accidents (3%, 29/950).

Table 4: Bus Occupant Fatalities and Nonfatal Injuries  
in Fatal Accidents Involving Large Buses, 2000-2007

	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>Fatalities</b>			
Charter/Tour	111	82	29
Scheduled Service	18	8	10
Commuter	10	8	2
Shuttle	58	22	36
<b>Total</b>	197	120	77
<b>Nonfatal Injuries</b>			
Charter/Tour	1572	1061	502
Scheduled Service	868	201	645
Commuter	195	89	106
Shuttle	234	84	149
<b>Total</b>	2869	1435	1402
<b>Total Fatalities &amp; Injuries</b>	3066	1555	1479
<b>Uninjured</b>			
Charter/Tour	172	61	108
Scheduled Service	470	34	427
Commuter	144	18	125
Shuttle	37	12	25
<b>Total Uninjured</b>	734	108	617

Furthermore, bus occupants were more likely to be nonfatally than fatally injured (Table 4). Bus occupants accounted for 89% (1435/1617) of the nonfatal injuries in rural accidents, and 78% (1402/1808) of the nonfatal injuries in urban accidents.

Rural accidents involving charter/tour buses accounted for the largest proportion of all rural nonfatal injuries (72%, 1172/1617). In fact, almost all (91%, 1061/1172) of the nonfatal injuries in these rural bus accidents occurred on the bus. Furthermore, rural fatal accidents involving charter/tour buses accounted for only 10% (104/1093) of the total number of fatal accidents involving large buses, but resulted in 15% (195/1315) of the total fatalities and 34% (1172/3471) of the total nonfatal injuries. In addition, passengers of buses involved in rural fatal accidents were less likely to escape injury than their urban counterparts; only 7% (108/1663) of bus occupants in rural accidents were reported uninjured, whereas 29% (617/2096) of bus occupants in urban areas were uninjured.

### **D.3 Injured Transported to Hospitals**

The demands placed on emergency medical services can be estimated by the number injured in the accident who were transported to a hospital. FARS provides hospital transport data for all injured, and indicates whether the injured person was an occupant of the bus. Almost 75% (3451/4786) of all the people injured in fatal accidents involving large buses were transported to a hospital (Table 5). This was the case for both rural and urban accidents.

As might be expected, a greater proportion of the nonfatally injured (81%, 2794/3471) than the fatally injured (50%, 657/1315) were transported to a hospital. In rural areas, a much smaller proportion of the fatally injured (26%, 90/346) were transported, perhaps reflecting the much greater severity of rural accidents and the longer emergency medical response times in rural areas.

For all accidents, a large proportion of the injured who were transported to a hospital (67%, 2302/3451) were bus occupants (Table 6). In rural fatal accidents involving large buses, most of the transported injured were bus occupants (84%, 1198/1423). In urban accidents, a much smaller proportion of the transported injured were bus occupants (55%, 1097/1995).

When only rural accidents involving charter/tour buses were considered, bus occupants accounted for almost all (88%, 909/1036) of the accident victims transported to a hospital. Almost all (98%, 895/909) of these bus occupant transports had suffered nonfatal injuries.

Table 5: Injured Transported to Hospital, 2000-2007

	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>Fatally Injured Transported</b>			
Charter/Tour	114	50	63
Scheduled Service	409	22	378
Commuter	107	11	95
Shuttle	27	7	19
<b>Total</b>	<b>657</b>	<b>90</b>	<b>555</b>
<b>Nonfatally Injured Transported</b>			
Charter/Tour	1492	986	499
Scheduled Service	892	175	705
Commuter	201	83	117
Shuttle	209	89	119
<b>Total</b>	<b>2794</b>	<b>1333</b>	<b>1440</b>
<b>Total Transported</b>	<b>3451</b>	<b>1423</b>	<b>1995</b>



Table 6: Injured Bus Occupants Transported to Hospital, 2000-2007

	<b>Total</b>	<b>Rural</b>	<b>Urban</b>
<b>Fatally Injured Transported</b>			
Charter/Tour	19	14	5
Scheduled Service	9	2	7
Commuter	3	1	2
Shuttle	8	4	4
<b>Total</b>	<b>39</b>	<b>21</b>	<b>18</b>
<b>Nonfatally Injured Transported</b>			
Charter/Tour	1328	895	430
Scheduled Service	605	132	470
Commuter	152	72	80
Shuttle	178	78	99
<b>Total</b>	<b>2263</b>	<b>1177</b>	<b>1079</b>
<b>Total Transported</b>	<b>2302</b>	<b>1198</b>	<b>1097</b>