Truck Crash Profile:

The National Picture 1997

Drafted by:
Analysis Division, HIA-20
Office of Motor Carriers
Federal Highway Administration

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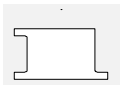

For more information:
Information on truck crashes and the nature and results of Office of Motor Carriers safety programs is available from the Office of Motor Carrier Information Analysis, Analysis Division (HIA-20), 400 Seventh Street, S.W., Washington, D.C. 20590.

Questions about this profile and the availability of other reports on OMC crash data should be directed to Ralph Craft, Analysis Division staff, at (202) 366-0324, or Scott Valentine at (202) 366-6236. The general number for the Analysis Division is (202) 366-1861. Send FAX messages to (202) 366-8842.

Executive Summary

- In 1997 there were 4,871 large trucks involved in **fatal** crashes. There were also an estimated 97,000 large trucks involved in **injury** crashes, and 342,000 involved in **property-damage-only** crashes.

- Large trucks in 1997 accounted for 9 percent of the vehicles involved in **fatal** crashes, 2 percent of those involved in **injury** crashes, and 4 percent of the vehicles involved in **property-damage-only** crashes.

- Sixty-three percent of the trucks involved in 1997 **fatal** crashes, and about 50 percent of those involved in **non-fatal** crashes were tractors pulling single semi-trailers. Four percent of the trucks involved in **fatal** crashes were doubles, and 0.3 percent were triples. Less than 5 percent of the trucks involved in **fatal** and **non-fatal** crashes were transporting hazardous materials.

- The crash rate (number of crash-involved vehicles per 100 million vehicle miles traveled) for large trucks in **fatal** crashes is slightly higher than the rate for passenger vehicles. The crash rate for passenger vehicles involved in **injury** crashes, however, is more than three times the rate for large trucks.

- In two-vehicle **fatal** crashes between a large truck and a passenger vehicle in 1997, 7 percent of the truck drivers were under 26 years old, and only 2 percent of the truck drivers were over 65. By contrast 24 percent of the passenger vehicle drivers in these crashes were under 26 years old, and 20 percent were over 65.

- In two-vehicle **fatal** crashes between a large truck and a passenger vehicle, less than 1 percent of the truck drivers had a blood alcohol concentration (BAC) of 0.10 grams per deciliter or greater, the level for intoxication in most States. By contrast 15 percent of passenger vehicle drivers in these **fatal** crashes with a truck had a BAC level of 0.10 or greater.

- Driver-related crash factors were coded for 28 percent of truck drivers involved in a **fatal** crash with a single passenger vehicle. However, driver-related crash factors were coded for 80 percent of the passenger vehicle drivers involved in these crashes.

- A large majority of 1997 **fatal** and **non-fatal** truck crashes occurred in good weather, on dry road surfaces, during the day, and on weekdays.

- The first harmful event in 78 percent of **fatal** large truck crashes was the collision of the truck with another moving vehicle. More than half of the first crash events for trucks involved in **non-fatal** crashes were collisions with another vehicle in transport.

- **None of the available data addresses crash causation or fault. Thus, the data can only be suggestive as to the reasons for truck crashes.**

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Introduction

This National Truck Crash Profile contains descriptive statistics about fatal and non-fatal (injury and property-damage-only) large truck crashes that occurred in 1997. The profile includes only some of the major aspects of truck crashes. Additional crash data on trucks, truck drivers, and motor carriers can be obtained from the Office of Motor Carriers.

Profile Data Sources

The following are the major sources of the data included in the profile. Several other sources used sparingly are referred to in the profile text.

Fatality Analysis Reporting System (FARS) -- maintained by the National Highway Traffic Safety Administration (NHTSA). The FARS is a census of crashes involving any motor vehicle traveling on a public trafficway, *but only fatal crashes*. The FARS is a very reliable national crash database. There were 4,871 large trucks involved in fatal crashes in 1997. A large truck is defined in the FARS as a truck with a gross vehicle weight rating (GVWR) of more than 10,000 pounds.

General Estimates System (GES) -- also maintained by the NHTSA. The GES is a probability-based, nationally-representative sample of all police-reported fatal, injury, and property-damage-only crashes. The data presented from the GES file are national estimates, calculated using an appropriate weighting variable. The GES data cannot be broken down by States, since the crash cases drawn are aimed only at obtaining a valid national sample. Furthermore, since GES is a sample file, estimates are subject to sampling error. According to the GES there were an estimated 444,000 large trucks involved in crashes reported to police in 1997. The GES definition of a large truck is the same as the FARS definition.

Motor Carrier Management Information System (MCMIS) Crash File -- maintained by the Office of Motor Carriers (OMC) of the Federal Highway Administration. The MCMIS Crash File includes the National Governors' Association (NGA) recommended data elements collected on trucks and buses involved in crashes that meet the NGA recommended crash threshold. An NGA reportable crash must involve a truck (a vehicle designed, used, or maintained primarily for carrying property that has at least two axles and six tires) or a bus (a vehicle with seats for at least sixteen people, including the driver). The crash must result in at least one fatality; one injury where the person injured is taken to a medical facility for immediate medical attention; or one vehicle having been towed from the scene as a result of disabling damage suffered in the crash. The crashes are reported by States to the OMC through the SAFETYNET computer reporting system.

The Crash File is intended to be a census of trucks and buses involved in fatal, injury, and towaway crashes, but some States do not report all NGA-eligible crashes. For 1997, States reported 96,585 trucks involved in crashes through SAFETYNET to the MCMIS crash file. According to 1997 GES estimates, 444,000 large trucks were involved in crashes. When the

trucks involved in injury and property-damage-only crashes that do not meet the NGA crash criteria are subtracted, there were an estimated 155,000 trucks involved in crashes that should have been reported to the OMC. Thus, the OMC received reports on about 62 percent (96,585 out of 155,000) of the trucks involved in 1997 NGA reportable crashes.

Over half the MCMIS Crash File non-fatal truck cases are injury crashes. By contrast less than one-fourth of GES non-fatal crashes involved an injury. Over 75 percent of GES non-fatal crashes were property-damage-only crashes -- many where no vehicles were towed from the scene. Thus, it may be assumed that the typical GES crash is less severe than the typical MCMIS crash.

Profile Outline

The “fatal” columns of the profile tables usually are FARS data. In the few cases where there are no FARS data, the fatal data come from the MCMIS fatal crash file. The “non-fatal” columns include data from MCMIS and GES. Some tables contain only FARS and MCMIS data, when GES data are not available. The profile has seven sections: Overview and Trends, Vehicles, Drivers, Environment, Crash, Motor Carriers, and MCMIS Crash File Progress.

The level of analysis in most of the tables in the profile is the vehicle. In other words, what is being counted is the number of vehicles involved in crashes, both fatal and non-fatal. The major exception is the driver section, where what is being counted is the number of drivers in the various categories.

Neither FARS, GES, nor MCMIS databases contain information on crash causation or fault. The data can be only suggestive about why truck crashes occur. Even so, the data can point toward problem areas that may need to be addressed, and toward possible countermeasures.

I. Overview and Trends

To put trucks involved in crashes in perspective, Table 1 below shows the number of large trucks involved in police-reported crashes in 1997, compared to all vehicles involved in police-reported crashes.

Table 1
Motor Vehicles Involved in Crashes, 1997

Crash Severity	Large Trucks	All Vehicles	Percent Large Trucks
Fatal	4,871	56,978	8.5%
Injury	97,000	4,035,000	2.4%
Property-Damage-Only	342,000	8,010,000	4.3%
Total	**444,000**	**12,102,000**	**3.7%**

Sources: FARS and GES

Large trucks involved in fatal crashes represented 8.5 percent of all vehicles involved in fatal crashes. The proportion of large trucks drops appreciably when the focus shifts to injury and property-damage-only crashes. Large trucks are only 2.4 percent of vehicles involved in injury crashes, and 4.3 percent of vehicles involved in property-damage-only crashes.

The number of large trucks involved in fatal crashes from 1988 to 1997 is presented in Table 2, along with the vehicle crash involvement rate in terms of vehicle miles traveled. The large truck fatal crash involvement rate is defined as the number of large trucks involved in a fatal crash per 100 million miles traveled by large trucks. A large truck is defined in FARS as a truck with a gross vehicle weight rating of more than 10,000 pounds. The number of passenger vehicles involved in fatal crashes and the crash rate for these vehicles is presented for comparison purposes. The passenger vehicle fatal crash involvement rate is the number of such vehicles involved in a fatal crash per 100 million miles traveled by passenger vehicles. Passenger vehicles are defined as passenger cars, pickup trucks, passenger vans, and sport utility vehicles.

Table 2
Vehicle Fatal Crash Involvement Rates
for Large Trucks and Passenger Vehicles, 1988-1997

Year	Fatal Crash Involvement Rates			
	Number of Trucks	Per 100 million VMT	Number of Passenger Vehicles	Per 100 million VMT
1988	5,241	3.7	52,263	2.8
1989	4,984	3.4	51,110	2.6
1990	4,776	3.2	49,705	2.5
1991	4,347	2.9	46,123	2.3
1992	4,035	2.6	44,465	2.1
1993	4,328	2.7	45,565	2.1
1994	4,644	2.7	46,626	2.1
1995	4,453	2.5	48,527	2.2
1996	4,755	2.6	48,973	2.1
1997	4,871	2.5	48,291	2.1
% Change from 1988	-7.1%	-32.4%	-7.4%	-25.0%

Sources: FARS 1988-97 and Highway Statistics 1988-97

The number of large trucks involved in fatal crashes decreased by 7 percent from 1988 to 1997 (5,241 to 4,871). There were about ten times as many passenger vehicles involved in fatal crashes as large trucks during the 10-year period. Passenger vehicles involved in fatal crashes also dropped by 7 percent (52,263 to 48,291) during these 10 years.

The large truck fatal crash rate dropped by 32 percent from 1988 to 1997, from 3.7 to 2.5 trucks involved in a fatal crash per 100 million truck miles traveled. The fatal crash rate for passenger vehicles has been lower than the rate for large trucks for each year in the 1988-1997 period by a small margin. However, the 25-percent decline in the fatal crash rate per 100 million vehicle miles traveled for passenger vehicles (from 2.8 to 2.1) was less than the decline for large trucks. Table 3 presents large truck and passenger vehicle crash rates for injury crashes. In this case passenger vehicles have a much higher crash rate.

Table 3
Vehicle Injury Crash Involvement Rates
for Large Trucks and Passenger Vehicles, 1988-1997

Year	Injury Crash Involvement Rates			
	Number of Trucks	Per 100 million VMT	Number of Passenger Vehicles	Per 100 million VMT
1988	96,000	68	3,756,000	201
1989	110,000	74	3,619,000	187
1990	107,000	72	3,567,000	180
1991	78,000	52	3,404,000	170
1992	95,000	62	3,399,000	163
1993	97,000	61	3,474,000	164
1994	95,000	56	3,697,000	170
1995	84,000	47	3,938,000	177
1996	94,000	51	3,988,000	175
1997	97,000	51	4,035,000	172

Sources: GES 1988-97, and Highway Statistics 1988-97

The number of trucks involved in injury crashes, based on GES data, has changed erratically from 1988 to 1997. The figure dropped by 29 percent from 1990 to 1991 (107,000 down to 78,000), but it has increased three times by more than 10 percent. These fluctuations are due in large part to the small number of truck crashes in the GES sample, and may not be due to actual changes. The 1997 large truck number of 97,000 ended up only 1,000 higher than the 1988 number. By contrast the number of passenger vehicles involved in injury crashes declined gradually from 1988 to 1993 (3.8 million to 3.4 million), and has climbed steadily since then (3.4 million to 4.0 million). The result is that the 1997 passenger vehicle number is 279,000 higher than the 1988 number (4,035,000 in 1997 compared to 3,756,000 in 1988).

Even with the fluctuations in the large truck estimates from 1988 to 1997, the number of passenger vehicles in injury crashes always has been 30 to 40 times the number of large trucks

involved in injury crashes. The injury crash rate for passenger vehicles was more than double the rate for large trucks for all years from 1988 to 1994. From 1995 to 1997 the passenger vehicle injury crash rate was more than triple the rate for large trucks.

Table 4
Fatalities and Injuries in
Large Truck Crashes, 1988-1997

Year	Fatalities	Injuries
1988	5,679	130,000
1989	5,490	156,000
1990	5,272	150,000
1991	4,821	110,000
1992	4,462	138,000
1993	4,849	133,000
1994	5,144	133,000
1995	4,918	117,000
1996	5,142	130,000
1997	5,355	133,000

Sources: FARS 1988-97; GES 1988-97

The numbers of people killed and injured in crashes involving at least one large truck are shown in Table 4. Fatalities increased by 8.9 percent between 1995 and 1997. However, the 1997 number of 5,355 represents only 13 percent of the total deaths in motor vehicle traffic crashes. The number of people injured in crashes involving large trucks has remained virtually unchanged since 1993. For three of the last five years (including 1997) the GES estimate of people injured in large truck crashes is 133,000. As mentioned earlier, some of the year-to-year changes in the GES injury estimates are due to sampling variation.

II. Vehicles

Large trucks (gross vehicle weight rating over 10,000 pounds) in 1997 accounted for:

- **nine** percent of the vehicles involved in fatal crashes,
- **two** percent of vehicles in injury crashes, and
- **four** percent of vehicles involved in property-damage-only crashes.

The typical large truck involved in a crash in 1997 in the United States was a truck-tractor pulling a single semi-trailer that was a van/enclosed box or flatbed. The truck was capable of carrying a large cargo load. Only a small percentage of the trucks were carrying hazardous materials at the time of the crash.

Table 5
Large Trucks Involved in Crashes
by Vehicle Configuration, 1997

Vehicle Configuration	Fatal: FARS	Non-Fatal	
		MCMIS	GES
Single Unit Truck, 2-axle	10.9%	12.7%	13.9%
Single Unit Truck, 3+axle	8.7%	9.6%	
Truck/Trailer(s)	3.4%	9.4%	1.1%
Truck Tractor (bobtail)	2.3%	2.9%	2.0%
Tractor/semi-trailer	63.5%	53.5%	46.9%
Tractor/double	4.1%	3.1%	1.4%
Tractor/triple	0.3%	0.1%	0.1%
Unknown	6.9%	3.0%	34.6%
Missing	---	5.8%	---
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

Sixty-three percent of the trucks involved in fatal crashes in 1997 were tractors pulling semi-trailers, usually an 18-wheeler (Table 5). For non-fatal crashes 54 percent of the trucks in the MCMIS Crash File and 47 percent in the GES file were tractor semi-trailers. The ratio of combination trucks (trucks pulling trailers, truck tractors pulling no trailers, and truck tractors pulling single trailers, double trailers, and triple trailers) to single-unit trucks in fatal and non-fatal crashes is more than 3 to 1. These percentages have varied little in the past five years.

Single-unit trucks accounted for only 20 percent of the trucks involved in fatal crashes in 1997. Single-unit trucks account for 19 percent of the trucks involved in non-fatal crashes in the MCMIS Crash File, and 14 percent in the GES data. One-third of the trucks in the GES sample were not classified into a vehicle configuration category.

Table 6
Large Trucks Involved in Crashes
by Cargo Body Type, 1997

Cargo Body	Fatal	Non-Fatal
Van/Enclosed Box	42.4%	35.8%
Flatbed	13.6%	11.8%
Dump	10.4%	8.6%
Cargo Tank	7.4%	5.0%
Garbage/Refuse	1.9%	2.3%
Concrete Mixer	1.0%	3.7%
Auto Transporter	0.8%	0.8%
Other	9.8%	22.9%
Unknown	12.8%	---
Missing	---	9.1%
Total	**4,871**	**93,210**

Sources: FARS and MCMIS Crash File

More than one-third of the trucks involved in crashes (42 percent of the fatals, 36 percent of the non-fatals) had a van/enclosed box cargo body type (Table 6). The other three highest-ranking cargo body types account for less than another third of the total. These are flatbeds (14 percent of fatals, 12 percent of non-fatals); dump trucks (10 percent of fatals, 9 percent of non-fatals); and cargo tank trucks (7 percent of fatals, 5 percent of non-fatals). Cargo tanks are those most likely

to carry hazardous materials in bulk. Unfortunately, other, unknown, and missing data add up to 23 percent in FARS and 32 percent in MCMIS, which makes further analysis difficult.

Gross Vehicle Weight Rating

The gross vehicle weight rating (GVWR) is the maximum manufacturer's recommended total weight for the vehicle and its cargo. Trucks involved in crashes are overwhelmingly those that can carry heavy loads.

Table 7
Trucks Involved in Crashes
by Gross Vehicle Weight Rating, 1997

GVWR	Fatal	Non-Fatal
Under 10,001 lbs	0.4%	0.9%
10,001 - 26,000 lbs	8.9%	7.7%
Over 26,000 lbs	78.3%	75.1%
Unknown	7.6%	--
Missing	4.9%	16.2%
Total	**4,871**	**93,210**

Sources: FARS and MCMIS Crash File

Three-fourths of the trucks involved in fatal and non-fatal crashes in 1997 (78 percent in FARS and 75 percent in MCMIS) had GVWRs over 26,000 pounds (Table 7). By comparison, passenger cars in fatal and non-fatal crashes had an average GVWR in the 2,000-4,000 pound range. Less than 10 percent of the trucks involved in fatal and non-fatal crashes had GVWRs in the 10,000-26,000 pound range, and almost all of those were single-unit trucks.

Hazardous Materials Cargo

One note should be mentioned about the following hazardous materials (HM) tables. In the FARS data, large trucks are counted as carrying hazardous materials if they display an HM placard, or if later investigation shows that they were carrying HM without a placard. For the NGA crash data element, however, the reporting officer just records the presence of an HM placard on the truck. Some suspect that there are a significant number of trucks that carry hazardous materials without displaying the required HM placards.

Table 8
Large Trucks Involved in Crashes
Carrying Hazardous Materials, 1997

HazMat Placard	Fatal: FARS	Non-Fatal	
		MCMIS	GES
Yes	4.1%	3.5%	1.8%
No	93.7%	45.4%	0.1%
Unknown	2.2%	---	98.2%
Missing	---	51.1%	---
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

With these caveats in mind, the data in Table 8 indicate that only a small percentage of trucks in crashes displayed an HM placard. In fatal crashes only 4 percent of the trucks displayed an HM placard, while in non-fatal crashes 4 percent of trucks in the MCMIS Crash File and 2 percent of trucks in the GES file displayed an HM placard. The large percent of missing data in MCMIS may be due to police officers not responding to the element on the police accident reports when no placard is present, as opposed to checking the "No" response. The overwhelming percentage of unknown data in GES may be due to the same problem.

Table 9
Large Trucks Involved in Crashes
that Released Hazardous Materials Cargo, 1997

Cargo Release	Fatal	Non-fatal
Yes	37.5%	25.0%
No	62.5%	75.0%
Total	**120**	**2,675**

Source: MCMIS Crash File

Hazardous materials were released from the cargo compartment in 38 percent of vehicles displaying an HM placard that were involved in fatal crashes and 25 percent of those involved in non-fatal crashes, according to MCMIS Crash File data (Table 9). Neither FARS nor GES includes HM cargo release data.

The Trucks Involved in Fatal Accidents (TIFA) database from the University of Michigan Transportation Research Institute is the most reliable fatal crash database for trucks. For the years 1992 through 1996 the TIFA data show an average of 201 trucks a year carrying HM involved in fatal crashes. Of these an average of 30 percent released HM cargo as a result of the crash, a figure slightly lower than that recorded for trucks carrying HM in fatal crashes in the 1997 MCMIS Crash File. Final 1997 TIFA data will not be available for several months.

Table 10
Large Trucks Involved in Crashes
by Class of Hazardous Materials Leakage, 1997

Class of HM Leakage	Fatal	Non-Fatal
1 - Explosives	9%	2.7%
2 - Gases	2%	9.3%
3 - Flammable Liquid	29%	26.0%
4 - Flammable Solids	0%	1.2%
5 - Oxidizing Substances	0%	1.9%
6 - Poison & Infectious Substances	2%	1.3%
7 - Radioactive Material	0%	0.1%
8 - Corrosives	7%	4.9%
9 - Miscellaneous Dangerous Goods	31%	37.6%
Missing	20%	14.9%
Total	**45**	**670**

Source: MCMIS Crash File

For trucks involved in fatal crashes that released hazardous materials, the most common HM released from the truck were Class 9 miscellaneous dangerous goods (31 percent of the releases in fatal crashes and 38 percent in non-fatal crashes). These goods include liquid and solid hazardous wastes, substances that do not present a transportation hazard but are hazardous to the environment (such as PCBs), and substances that are hazardous when raised to a high temperature (such as hot asphalt).

The second most common HM spilled in 1997 were Class 3 flammable liquids (29 percent in fatal crashes and 26 percent in non-fatal crashes). The large majority of these substances are gasoline and fuel oil. Explosives accounted for 9 percent of the releases in fatal crashes, and gases were 9 percent of the spills in non-fatal crashes. The HM class was not recorded for 20 percent of the trucks that released HM in fatal crashes and 15 percent in non-fatal crashes.

The number of trucks that released HM in 1997 fatal crashes (45) was exactly the same in 1996, while the number of trucks with releases in non-fatal crashes dropped from 804 in 1996 to 670 in 1997. The types of materials that leaked changed from 1996 to 1997. Thirty-eight percent of the releases in fatal crashes were flammable liquids in 1996, as opposed to a smaller 29 percent in 1997. On the other hand the miscellaneous dangerous goods number increased from 9 percent in 1996 to 31 percent in 1997. In non-fatal crashes the flammable liquid number increased slightly from 23 percent in 1996 to 26 percent in 1997. The miscellaneous dangerous materials percent increased from 26 percent to 38 percent.

In total, hazardous materials are a minor element in truck crashes for two reasons:

- First, only a small percentage of trucks involved in crashes carry hazardous materials.

- Second, the HM carried usually stays in the cargo compartment. Only 45 trucks released HM in fatal crashes reported to the MCMIS Crash File in 1997. Of the more than 93,000 trucks involved in non-fatal crashes in the MCMIS database, there were HM releases in only 670 cases.

Therefore, HM releases rarely play a role in deaths or injuries. The Research and Special Programs Administration (RSPA) reported an average of only 11 deaths a year attributable to exposure to HM in highway crashes over the past ten years. Since RSPA data come only from interstate carriers, total fatalities are understated, perhaps by a multiple of three. In any event, total fatalities related to exposure to HM in highway crashes would be a small percent of the 5,355 total fatalities in large truck crashes in 1997.

III. Drivers

Truck drivers involved in 1997 crashes were generally between 26 and 45 years old. A large majority had valid drivers licenses at the time of the crash, and were in apparently normal condition at the time of the crash. Most did not have any driver-related crash factors recorded when involved in a fatal crash. Drivers of the passenger vehicles in fatal collisions with trucks were more likely than the drivers of the trucks to be under 26 years old and over 65, have invalid drivers licenses, be legally drunk, and be cited for driver-related crash factors.

Driver Age

The FARS and GES databases have information on all drivers involved in fatal and non-fatal crashes, while the MCMIS Crash File only has data on the truck driver. In over three-fourths of fatal and non-fatal truck crashes in 1997, the truck collided with a passenger vehicle -- a passenger car or light truck (pickup, van, or sport utility vehicle). Table 11 presents data on the ages of the drivers of large trucks and the drivers of passenger vehicles involved in fatal and non-fatal crashes between large trucks and passenger vehicles. The two columns of FARS data show the ages for truck drivers and passenger vehicle drivers involved in two-vehicle fatal crashes with each other. The last two columns have GES data on the ages of the truck drivers and passenger vehicle drivers involved in non-fatal crashes with each other.

Table 11
Drivers in Two-Vehicle Crashes Involving a Large Truck and a Passenger Vehicle by Driver Age, 1997

Driver Age	Fatal		Non-Fatal	
	Large Trucks	Passenger Vehicles	Large Trucks	Passenger Vehicles
< 26	7.2%	23.8%	9.8%	25.2%
26-45	57.4%	35.3%	58.3%	42.9%
46-65	32.7%	20.8%	30.3%	22.6%
66-75	2.2%	9.7%	1.3%	5.5%
>75	0.1%	10.1%	0.3%	3.9%
Unk/Miss.	0.4%	0.3%	---	---
Total	**2,822**	**2,822**	**241,000**	**241,000**

Sources: FARS and GES

Table 11 includes the ages of 2,822 truck drivers and the same number of passenger vehicle drivers that were involved in the two-vehicle fatal crashes. The total represents 58 percent of the total number of trucks involved in fatal crashes. The other trucks were involved in single-vehicle crashes; two-vehicle crashes with a bus, motorcycle, or another large truck; or multi-vehicle crashes. By contrast the 2,822 passenger vehicles involved in fatal crashes with large trucks represent only 6 percent of the 48,973 passenger vehicles involved in all types of fatal crashes.

The age profiles of the truck drivers involved in two-vehicle fatal crashes with passenger vehicles and those of the drivers of the cars and light trucks involved are very different. Only 7 percent of the truck drivers were younger than 26 years old and only 2 percent were older than 65. By contrast 24 percent of the drivers of the passenger vehicles were younger than 26, and 20 percent were older than 65. Thus, while 46 percent of the passenger vehicle drivers were either under 26 or over 65, only 10 percent of the truck drivers were in these two age categories.

The age profiles for drivers in non-fatal truck/passenger vehicle crashes are similar to those for drivers in fatal crashes. Only 10 percent of truck drivers in these non-fatal crashes were under the age of 26, and 2 percent were over 65. Twenty-five percent of passenger vehicle drivers in these crashes were under 25 years old, and 9 percent were over 65 -- one-third at the two extremes of the age scale.

It should be noted that drivers must be at least 21 years old to obtain a commercial drivers license (CDL). A CDL is needed to operate a truck in commerce with a gross vehicle weight rating over 26,000 pounds, or to drive a truck of any GVWR carrying hazardous materials.

Driver License Status

The FARS database contains information on the status of each crash-involved driver's license. A large majority of all drivers involved in fatal truck crashes held valid licenses. However, there are differences between the large truck and passenger vehicle drivers.

Of the 2,822 drivers of large trucks involved in fatal crashes with passenger vehicles, 89 percent (2,521) held valid CDLs and another 7 percent (209) held other valid licenses at the time of the crash, for a total of 96 percent. (NOTE: Since CDLs are not required to drive all large trucks, the presence of another valid license can be sufficient to comply with the law.) Among the remaining 5 percent of the truck drivers, 33 had suspended, revoked, expired, or canceled licenses; 9 had other invalid licenses; and the license status of the remaining 50 drivers was not known.

Among the drivers of the passenger vehicles involved in fatal crashes with large trucks, 89 percent had valid licenses, compared with 96 percent of the truck drivers. Among the remaining 11 percent of passenger vehicle drivers 84 had no license; 188 had a suspended, revoked, expired, or canceled license; and the license status of the remaining 29 drivers was not known.

Thus, while 52 truck drivers out of the 3,603 (1.4 percent) involved in a fatal crash with a passenger vehicle had an invalid license, 350 of the passenger vehicle drivers out of 4,275 (8.2 percent) involved in these crashes had invalid licenses or none at all. The proportion of passenger vehicle drivers with invalid or no licenses in these crashes was more than three times higher than the proportion of truck drivers with invalid or no licenses.

Driver Condition

One NGA crash data element is apparent driver condition, which is based on the reporting police officer's opinion. Of the 3,375 truck drivers in fatal crashes in the MCMIS Crash File, "appeared normal" was checked 74 percent of the time, unknown 12 percent of the time, and 9 percent of the cases had no driver condition recorded. For the remaining 5 percent of the drivers, 58 were affected by fatigue or asleep, 50 had been drinking, 37 had been using illegal drugs, 21 were sick, and 5 were affected by medication they took.

Among the 93,210 truck drivers in non-fatal crashes in the MCMIS Crash File, 84 percent appeared normal, and for 14 percent the driver condition was unknown or not recorded. Among the other 2 percent, 1,457 appeared to be affected by fatigue or were asleep, 510 had been drinking, 105 had been using illegal drugs, and 203 were sick. In sum there appeared to be nothing wrong with the physical condition of over 90 percent of the truck drivers involved in fatal and non-fatal crashes.

Driver Restraint Use

Seat belts have proven to have safety benefits in preventing deaths and serious injuries in motor vehicle crashes. The following table compares seat belt use in two-vehicle fatal crashes between large trucks and passenger vehicles.

Table 12
Driver Safety Belt Use in Two-Vehicle Crashes
Between a Large Truck and a Passenger Vehicle, 1997

Belt Use	Fatal Crashes		Non-Fatal Crashes	
	Large Trucks	**Passenger Vehicles**	**Large Trucks**	**Passenger Vehicles**
Yes	74.8%	47.1%	77.0%	83.2%
No	16.6%	43.8%	8.4%	6.6%
Unknown	8.6%	9.1%	14.7%	10.2%
Total	**2,822**	**2,822**	**241,000**	**241,000**

Sources: FARS and GES

In these fatal crashes, 75 percent of truck drivers were using their seat belts, while less than half (47 percent) of passenger vehicle drivers were using theirs (Table 12). This difference may account for a part of the disproportionate number of passenger vehicle drivers killed in crashes with large trucks. In non-fatal crashes the difference between truck and passenger vehicle drivers is much smaller. The number of truck drivers not wearing their seats belts is two percentage points higher than the number of passenger vehicle drivers (8.4 percent to 6.6 percent).

Driver Alcohol Use

In two-vehicle crashes between a large truck and a passenger vehicle a much larger percentage of the passenger vehicle drivers had blood containing at least some level of alcohol, as Table 13 illustrates.

Table 13
Driver Alcohol Use in Crashes Between a Large Truck and a Passenger Vehicle, 1997

Driver Alcohol BAC Levels	Fatal Crashes	
	Large Trucks	Passenger Vehicles
.00	98.3%	79.4%
.01 to .09	0.9%	5.5%
.10 and over	0.8%	15.1%
Total	**2,822**	**2,822**

Sources: FARS and GES

In these fatal two-vehicle large truck-passenger vehicle crashes, only 2 percent of the truck drivers had any level of alcohol in their blood. Only 0.8 percent of the truck drivers had a blood alcohol content level greater than the legal limit in 35 States and the District of Columbia, 0.10 grams per deciliter. By contrast alcohol was present much more often among passenger vehicle drivers in these crashes. Twenty-one percent of the passenger vehicle drivers had some alcohol in their blood, and 5.5 percent were above the 35 State legal limit of 0.10 alcohol BAC. In non-fatal crashes between a truck and a passenger vehicle there was no alcohol reported for the truck driver in 96.5 percent of the cases and for the passenger vehicle driver in 96.8 percent of the cases -- both numbers being very high and almost identical. The non-fatal numbers are based on police-reported alcohol involvement from GES and not on BAC test results.

People Killed and Injured in Large Truck Crashes

Since most commercial trucks involved in crashes have a gross vehicle weight rating (GVWR) of over 26,000 pounds and passenger vehicles have a GVWR of under 10,000 pounds, it is not surprising that when vehicles collide the occupants of the passenger vehicle are more likely to suffer injuries (Table 14).

Table 14
People Killed and Injured in Large Truck Crashes, 1997

Location of Persons	Fatal Crashes	Injury Crashes
Large Truck Occupants	13.4%	23.6%
Non-Truck Occupants	78.2%	74.8%
Non-Motorists	8.4%	1.5%
Total	**5,355**	**133,000**

Sources: FARS and GES

In fatal crashes involving a large truck the occupants of the other vehicles involved accounted for over three-fourths of the fatalities (78 percent). Truck occupants accounted for only 13 percent of the fatalities, and the other 8 percent were pedestrians or bicyclists. In injury crashes the pattern is the same, but not quite as pronounced. Non-truck vehicle occupants account for three-fourths of the injuries, while the number for truck drivers is ten percentage points higher (24 percent). The big decrease is in the non-motorist category, which drops from 8 percent to 1.5 percent.

Driver Crash Factors

Driver-related crash factors recorded by police officers at the scene are included in FARS. The three tables below show: (1) a comparison between the driver factors for large trucks versus passenger vehicles where fatal large truck-passenger vehicle(s) collisions take place, (2) a comparison between large truck and passenger driver factors for each type of vehicle when involved in single-vehicle fatal crashes, and (3) a list of passenger vehicle driver-related crash factors when passenger vehicles collide with other passenger vehicles in fatal crashes. Passenger vehicles include passenger cars, passenger vans, pickup trucks, and sport utility vehicles.

The FARS database includes 98 different driver-related crash factors. In each of the three tables only twelve factors are listed. In Tables 15 and 16 the top twelve factors for the truck drivers are listed, and the corresponding percentages for the passenger vehicle drivers. In Table 17 the top twelve factors for the passenger vehicle drivers are recorded. The FARS coders include up to four driver-related factors for each driver involved in a crash. The tables include the percent of drivers

cited for each factor, whether that factor was the only one listed for the driver, or was the second, third, or fourth factor. Thus, when adding the percentages for the major driver factors cited for large trucks or passenger vehicles, the number will usually exceed the percent of total drivers recorded with factors. For example, only 29 percent of truck drivers involved in fatal crashes with passenger vehicles were assigned driver-related factors. However, the number of truck drivers cited for the top 12 factors totals 33 percent. Clearly many truck drivers were cited for more than one factor.

The following is a list of the factors presented in the three tables, and any available information about each from the FARS coding manual. Further questions about the factors should be directed to NHTSA.

- Driving Too Fast -- Driving too fast for conditions, or in excess of posted maximum speed limit

- Ran Off Road/Lane -- Failure to keep in proper lane or running off road

- Failure to Yield Right of Way -- Failure to yield to pedestrian, other vehicles, streetcar already in intersection

- Failure to Obey Traffic Devices -- Failure to obey actual traffic sign, traffic control device, or traffic officer; failure to obey safety zone traffic laws

- Inattentive -- Driver distracted by cigarette, children, adjusting radio and other devices, reading, talking, television, etc.

- Drowsy/Asleep -- Drowsy, sleepy, asleep, fatigued not due to other factors, such as drugs

- Ill, Passed Out/Blackout -- Diabetic reactions, seizure, heart attack, high/low blood pressure, fainting

- Manslaughter, Homicide -- Non-traffic violation charged (manslaughter or other homicide offense committed without malice)

- Erratic/Reckless Driving -- Operating a vehicle in an erratic, reckless, careless or negligent manner; operating at erratic or suddenly changing speeds

- Following Improperly -- Following too closely; vehicles in caravan too close to allow entry

- Vision Obscured by Weather -- Vision obscured by rain, snow, fog, smoke, sand, dust

- Ice, Water, Snow on Road -- Ice, snow, slush, water, sand, dirt, oil, wet leaves on road

- Driving Wrong Side of Road -- Driving on wrong side of road intentionally or unintentionally
- Starting or Backing Improperly -- Backing up on one way roadway; starting out onto highway from parked position on shoulder
- Over Correcting -- Based police officer judgment, with knowledge of driver's intention
- Hit and Run Vehicle Driver -- (no explanation given)
- Making Improper Turn -- Too wide a right or left turn; unsafe U-turn
- Passing with Insufficient Distance -- Passing with insufficient distance or inadequate visibility or failing to yield to overtaking vehicle

Table 15
Driver-Related Factors in a Fatal Crash
Between a Large Truck and a Passenger Vehicle, 1997

Driver-Related Factors	Large Trucks	Passenger Vehicles
Driver Factor(s) Recorded?		
Yes	27.7%	80.3%
No	72.3%	19.7%
Total Drivers	**2,822**	**2,822**
Selected Factors		
Failure to Yield Right of Way	6.6%	19.7%
Ran Off Road/Out of Traffic Lane	5.1%	26.3%
Driving Too Fast	4.5%	14.1%
Failure to Obey Traffic Devices	3.6%	11.1%
Inattentive	2.6%	11.3%
Manslaughter, Homicide	2.3%	0.8%
Erratic/Reckless Driving	1.9%	5.1%
Ice, Water, Snow on Road	0.9%	3.1%
Starting or Backing Improperly	0.9%	0.1%
Driving on Wrong Side of Road	0.8%	5.5%
Following Improperly	0.7%	2.4%
Vision Obscured by Weather	0.7%	1.1%

Source: FARS

Truck driver-related factors were cited by officers at the scene for 28 percent of the truck drivers in fatal crashes where the truck collided with a single passenger vehicle. Among the individual factors cited the three most common were failure to yield the right-of-way (7 percent), ran off road or lane (5 percent), and driving too fast (also 5 percent).

The picture is radically different for passenger vehicle drivers involved in fatal crashes with a truck. Police officers cited passenger vehicle driver factors for 80 percent of the drivers, almost three times as often as truck drivers. The top three factors for these drivers also were ran off road or out of traffic lane (26 percent), failure to yield right-of-way (19 percent), and driving too fast (14 percent). However, inattentive and failure to obey traffic control devices (both cited for 8 percent of passenger vehicle drivers) were also frequently noted. Compared to truck drivers a higher percentage of passenger vehicle drivers were cited for 10 of the 12 factors, the exceptions being manslaughter/homicide and starting or backing improperly.

Table 16
Driver-Related Factors
in Single-Vehicle Fatal Crashes, 1997

Driver-Related Factors	Large Trucks	Passenger Vehicles
Driver Factor(s) Recorded?		
Yes	69.1%	83.5%
No	30.9%	16.5%
Total Drivers	**847**	**18,130**
Selected Factors		
Ran off Road/Out of Traffic Lane	39.1%	56.0%
Driving too Fast	17.4%	37.0%
Inattentive	9.9%	10.1%
Drowsy/Asleep	8.1%	4.8%
Failure to Yield Right-of-Way	5.7%	2.8%
Erratic/Reckless Driving	4.5%	8.0%
Failure to Obey	3.3%	2.1%
Over Correcting	2.7%	6.7%
Hit and Run Vehicle Driver	2.5%	3.3%
Manslaughter, Homicide	1.7%	2.7%
Ill, Passed Out/Blackout	1.5%	1.6%
Ice, Water, Snow on Road	1.3%	2.6%

Source: FARS

Police cited driver-related factors for 69 percent of truck drivers and 84 percent of passenger vehicle drivers in single-vehicle fatal crashes. Ran off road and driving too fast were the most common factors for both groups, with passenger vehicle drivers cited more often. Inattentive (10 percent) and drowsy/asleep (8 percent) rank third and fourth for truck drivers. Passenger vehicle drivers were also cited for inattentive driving in 10 percent of the cases, and 5 percent were cited for drowsy or asleep.

Table 17
Passenger Vehicle Driver-Related Factors:
Fatal Crashes Between Two Passenger Vehicles, 1997

Driver-Related Factors	Passenger Vehicles
Driver Factor(s) Recorded?	
Yes	55.0%
No	45.0%
Total Drivers	**18,758**
Selected Factors	
Ran Off Road/Out of Traffic Lane	16.3%
Failure to Yield Right-of-Way	15.6%
Driving Too Fast	11.1%
Failure to Obey	9.0%
Inattentive	5.6%
Erratic/Reckless Driving	3.2%
Driving on Wrong Side of Road	3.0%
Manslaughter, Homicide	2.8%
Ice, Water, Snow on Road	2.5%
Making Improper Turn	1.7%
Passing with Insufficient Distance	1.3%
Over Correcting	1.1%

Source: FARS

Driver-related crash factors were recorded for 55 percent of passenger vehicle drivers when only passenger vehicles were involved in the multi-vehicle fatal crashes (Table 17). But when their vehicles were involved in fatal crashes with trucks, 80 percent of passenger vehicle drivers were cited with driver related factors (Table 15). This difference of 25 percentage points perhaps illustrates that passenger vehicle drivers may not be as knowledgeable or careful about driving around trucks as they are about driving around other non-commercial vehicles. However, the major factors recorded by police for passenger vehicles are similar, whether they collide with trucks or other passenger vehicles. The three most cited factors for passenger vehicle drivers -- in either type of fatal crash -- are failure to yield right-of-way, running off the road or out of the traffic lane, and driving too fast. Most of the other major passenger vehicle driver-related crash factors recorded in Table 17 also appear in Table 15.

A Note of Caution

"Related Factor" does not necessarily mean fault or crash cause. As noted in the second edition of the MCSAFE safety update, published by the OMC Analysis Division in November 1997, related factors are merely the judgment of the officer at the scene and are **not** based on a thorough evaluation of the crash in an attempt to determine the cause of the crash or crash contributing factors. Some of the factors in the tables, such as manslaughter/homicide and hit and run driver, are charges assessed to drivers after the crash, not descriptions of pre-crash behavior that leads to crashes.

Given this caveat, the data presented in this section in Tables 15, 16, and 17 suggest that more comprehensive crash evaluations might lead to the conclusion that drivers of passenger vehicles are at fault in more fatal large truck-passenger vehicle crashes than the drivers of the large trucks.

A final caution is that fatal crashes account for less than 2 percent of total truck crashes. There are no national data on driver-related crash factors in injury and property-damage-only crashes.

IV. Environment

Most truck crashes occur in favorable weather conditions, on dry pavement, during the day, and on a weekday. Passenger vehicle crashes also occur overwhelmingly during good weather and on dry pavement, but are more likely to take place at night and on weekends than truck crashes. Most fatal truck crashes took place on Interstate Highways or other principal arterial highways, but most fatal crashes also occurred on undivided highways.

Weather and Road Surface Conditions

Weather problems are present in only a small minority of truck crashes, according to the data in Tables 18 and 19.

Table 18
Large Trucks Involved in Crashes
by Weather Condition, 1997

Weather Condition	Fatal: FARS	Non-Fatal	
		MCMIS	GES
No Adverse Conditions	83.2%	68.4%	83.7%
Rain	10.2%	12.1%	11.4%
Snow	3.0%	5.1%	3.9%
Fog	2.5%	1.2%	0.5%
Sleet, Hail	0.6%	1.2%	0.2%
Other	0.2%	5.6%	0.3%
Unknown	0.2%	0.6%	---
Missing	---	5.7%	---
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

For 83 percent of the trucks involved, there were no adverse weather conditions at the time of the fatal crash. According to GES data, for 84 percent of trucks involved in non-fatal crashes there was good weather, while the MCMIS number was a lower 68 percent. The 6 percent missing data in the MCMIS data probably accounts for some of the difference between MCMIS and the other two databases. For 10 percent of the trucks involved in fatal crashes and about 12 percent of

those involved in non-fatal crashes, rain was present. Snow ranks second as an adverse weather condition.

Table 19
Large Trucks Involved in Crashes
by Road Surface Condition, 1997

Road Surface Condition	Fatal: FARS	Non-Fatal	
		MCMIS	GES
Dry	78.8%	67.9%	76.7%
Wet	16.2%	16.9%	17.1%
Ice	2.4%	4.8%	3.6%
Snow or Slush	2.3%	3.6%	2.2%
Sand, Mud, Dirt, or Oil	0.1%	0.2%	0.2%
Other	0.0%	0.2%	0.2%
Unknown	0.2%	0.6%	---
Missing	---	5.8%	---
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

The data in Table 19 data are consistent with those in Table 18. For more than three-fourths of trucks involved in fatal crashes and GES-reported non-fatal crashes, the crashes occurred on dry pavement. For two-thirds of the trucks involved in non-fatal crashes on the MCMIS Crash file, the crashes took place on dry pavement. Here again the 6 percent missing data in MCMIS probably accounts for much of the difference from the GES results. Wet pavement was cited for 16 percent of trucks involved in fatal crashes and for 17 percent of trucks involved in non-fatal crashes in the MCMIS and GES data. Ice was cited for 2 percent of trucks involved in fatal crashes, 5 percent of those in non-fatal crashes according to MCMIS, and 4 percent of those involved in non-fatal crashes according to GES.

Light, Time of Day, and Day of Week

The following three tables provide data on light conditions when the crash occurred, the time of day, and the day of the week. While a large majority of fatal truck crashes take place during the day, almost half of passenger vehicle fatal crashes occur at night. Passenger vehicle fatal crashes are also more likely to occur on weekend days than are fatal truck crashes.

Table 20
Large Trucks Involved in Crashes by Light Condition, 1997

Light Condition	Fatal: FARS	Non-Fatal	
		MCMIS	GES
Daylight	63.6%	68.7%	78.1%
Dark - not lighted	24.1%	13.7%	9.4%
Dark - lighted	7.9%	7.4%	9.8%
Dawn	2.6%	2.4%	1.6%
Dusk	1.7%	1.6%	1.1%
Unknown/Missing	---	6.2%	---
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

Table 21
Large Trucks Involved in Crashes by Time of Day, 1997

Time	Fatal: FARS	Non-Fatal	
		MCMIS	GES
12:00am- 2:59am	7.3%	5.0%	4.1%
3:00 - 5:59	8.2%	6.4%	3.8%
6:00 - 8:59	15.0%	16.7%	13.9%
9:00 - 11:59	16.0%	19.9%	20.2%
12:00pm- 2:59pm	18.1%	20.2%	23.5%
3:00 - 5:59	16.4%	17.7%	20.8%
6:00 - 8:59	9.4%	8.1%	7.9%
9:00 - 11:59	8.7%	5.9%	5.7%
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

For 64 percent of the trucks involved in fatal crashes in 1997, the crash took place during daylight conditions, while for non-fatal involvements daytime accounts for 69 percent of the trucks in MCMIS and 78 percent of the trucks in GES (Table 20). The data in Table 21 are consistent with Table 20 -- for 66 percent of the trucks involved in fatal crashes the crash occurred between 6:00 a.m. and 6:00 p.m., daytime business hours, plus commuting time. The NHTSA defines daytime as beginning at 6:00 a.m. and ending at 5:59 p.m. Night begins at 6:00 p.m. and extends until 5:59 a.m. For non-fatal truck crash involvements the daytime (6:00 a.m. to 5:59 p.m.) figures are higher -- 75 percent in the MCMIS Crash File and 78 percent in the GES file.

The time pattern of fatal truck crashes contrasts with that of passenger vehicles. For 34 percent of trucks involved in fatal crashes the crash took place during the night, but for 45 percent of passenger vehicles involved in fatal crashes the crash occurred at night, an 11 percentage point difference. In non-fatal crashes there is a smaller difference. For trucks in the GES file 22 percent of the non-fatal crashes occurred at night. For passenger cars in the GES file 27 percent of the non-fatal crashes took place at night, a difference of 5 percentage points.

Table 22
Large Trucks Involved in Crashes by Day of Week, 1997

Day	Fatal: FARS	Non-Fatal	
		MCMIS	GES
Sunday	6.3%	4.6%	4.9%
Monday	15.7%	17.3%	16.1%
Tuesday	17.5%	17.5%	17.6%
Wednesday	16.6%	17.6%	17.5%
Thursday	17.6%	17.9%	19.0%
Friday	17.1%	17.8%	17.6%
Saturday	9.2%	7.2%	7.3%
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

Truck crash involvements were concentrated during the five working days of the week. The fatal crashes for only 16 percent of the trucks involved in fatal crashes took place on the weekend. In contrast the fatal crashes for 33 percent of passenger vehicles involved in fatal crashes took place on Saturday and Sunday -- double the percent for trucks. The non-fatal crashes of only 13 percent of the trucks involved in the MCMIS Crash File and 12 percent in the GES file occurred on the

weekend. By contrast the non-fatal crashes of 21 percent of passenger vehicles took place on Saturday and Sunday.

Crash Roadways

The FARS database contains information on the types of roadways and trafficways where fatal crashes occur. The MCMIS Crash File contains data only on the type of trafficway. The following two tables present data on these two variables.

Table 23
Large Trucks Involved in Fatal Crashes
by Roadway Type, 1997

Roadway Type	Large Trucks
Interstate Highway	24.3%
Other Principal Arterial	36.1%
Minor Arterial	17.8%
Collector	13.4%
Local Road/Street	6.3%
Unknown/Missing	2.1%
Total	**4,871**

Source: FARS

According to the Federal Highway Administration's Highway Statistics 1996 (latest data available), 39 percent of all truck miles were driven on Interstate Highways in 1996. By contrast, for trucks involved in fatal crashes only 24 percent of the crashes occurred on Interstate Highways in 1997. Interstate Highways are the safest roadways in the nation, both for trucks and for other vehicles. Other principal arterial highways accounted for more than one-third (36 percent) of trucks in fatal crashes. Many of these highways are high-quality divided highways, but many others are not divided and do not have controlled access, both conditions that are less safe than Interstate Highways.

Table 24
Large Trucks Involved in Crashes by Type of Trafficway, 1997

Trafficway	Fatal: FARS	Non-Fatal	
		MCMIS	GES
Not Physically Divided	56.4%	38.2%	44.4%
Divided Highway-**without** barrier	31.2%	24.7%	33.6%
Divided Highway-**with** barrier	10.8%	17.9%	
One-Way Trafficway	0.8%	4.3%	5.0%
Missing/Unknown	0.8%	14.9%	17.1%
Total	**4,871**	**93,210**	**439,000**

Sources: FARS, MCMIS Crash File, and GES

For more than half of all trucks involved in fatal crashes in 1997 (56 percent) the crashes took place on undivided highways. When the divided highway without barrier numbers are added, almost 90 percent of the trucks involved in fatal crashes were operating on highways where the opposing lanes were not separated by barriers. By contrast the MCMIS Crash File data show that for only 38 percent of all trucks involved in non-fatal crashes the crash occurred on highways that were not physically divided, and another 25 percent occurred on divided highways that did not have a barrier -- a total of 53 percent. The GES figure for undivided highways was 44 percent of trucks involved in non-fatal crashes.

V. Crash

Most fatal truck crashes in 1997 took place in rural areas. The first event and first harmful event in the majority of fatal and non-fatal truck crashes was a collision with another vehicle in traffic. While the impact area for most fatal crashes was the front of the truck, the impact area in non-fatal crashes was more evenly distributed to all sides of the truck.

This section covers crash location in terms of the areas and jurisdictions that have the highest number of crashes, the events that happened during the crashes, and the point of impact on the trucks.

Geographic Location

For 67 percent of the trucks involved in fatal crashes, the crash took place in rural areas in 1997. In most States, however, the individual counties with the highest number of fatal crashes were predominantly urban in character. This is possible because rural counties outnumber urban counties in a large majority of States. For example, the counties in Texas with the most fatal crashes are those that include the major cities of Houston, Dallas, Forth Worth, San Antonio, Austin, and El Paso. However, most fatal crashes take place in the 200 rural counties of the State.

Crash Events

The first harmful and most harmful events are coded in the FARS and GES databases for each crash. The MCMIS Crash File records the first and up to three subsequent events (not necessarily harmful) that happened to the truck involved in the crash. The first and most harmful events from FARS and GES are, therefore, defined differently from the first and subsequent events from MCMIS. To decide on first and most harmful events the reporting officer or FARS analyst must make a judgment on which crash events were significant and which were not. Asking the reporting officer to record the first, second, third, and fourth event that happened to the truck involved in the crash usually does not require the officer to make a judgment call. The officer only has to record the events that happened to the truck in the sequence they happened. Even so, there are strong similarities in the results from the two approaches, as recorded in Table 25.

Table 25
Large Trucks Involved in Crashes
by First Harmful or First Crash Event, 1997

First Event	Fatal: FARS	Non-Fatal	
		MCMIS	GES
Collision With Vehicle in Transport	78.0%	58.2%	73.0%
Collision With Fixed Object	8.0%	3.2%	9.3%
Collision With Pedestrian	6.1%	0.4%	0.2%
Overturn (Rollover)	3.5%	3.2%	2.3%
Collision With Pedalcycle	1.5%	0.2%	0.1%
Collision With Parked Motor Vehicle	1.0%	1.4%	8.2%
Collision With Train	0.7%	0.2%	0.1%
Collision With Other Object	0.3%	1.1%	0.4%
Collision With Animal	0.2%	0.6%	0.9%
Ran Off Road	*	11.0%	*
Jackknife	*	2.6%	0.8%
Cargo Loss or Shift	*	1.2%	*
Explosion/Fire	0.0%	0.4%	0.1%
Other	0.7%	8.9%	4.6%
Missing	*	0.0%	*
Total	**4,871**	**93,210**	**439,000**

* -- These crash events are not coded in FARS or GES
Sources: FARS, MCMIS Crash File, and GES

For almost four-fifths (78 percent) of large trucks involved in fatal crashes and almost three-fourths (73 percent) of large trucks involved in non-fatal crashes, the first harmful event was a collision between the truck and another vehicle, according to the FARS and GES databases respectively. According to the MCMIS Crash File for 58 percent of the trucks involved in a non-fatal crash, the first crash event was a collision between the truck and another vehicle in transit.

The main reason that the MCMIS percentage for collision with a vehicle in transport is much lower than the FARS and GES numbers is that the first event codes in MCMIS include ran off road and cargo load or shift, neither of which is counted as a harmful event in FARS and GES. However, these events may be the first in a chain that leads to a crash. Together these two first events, plus jackknife which is not counted as a harmful event in FARS, accounted for 15 percent of the cases in the MCMIS Crash File. Ran off the road alone accounted for 11 percent of the MCMIS cases, second behind collision with a vehicle in transport, and much more common than the third place event, collision with a fixed object (3 percent of the trucks involved in non-fatal crashes). For GES non-fatal crashes, collision with a fixed object ranked second (9 percent) behind collision with a vehicle in transport, and collision with a parked vehicle was third (8 percent).

For trucks involved in fatal crashes the second-ranked first harmful event was a collision with a fixed object (8 percent). The third most common event was collision with a pedestrian (6 percent), according to FARS. When a truck collides with a pedestrian, there is fairly good chance the result will be a fatality or serious injury. In these crashes the pedestrian killed is usually walking in the road, improperly crossing the trafficway, or darting into the road.

Type of Crash

The point of impact on vehicles involved in crashes can shed important light on crashes, and this is an area where fatal and non-fatal crashes differ dramatically, as shown in Table 26.

Table 26
Large Trucks Involved in Crashes
by Initial Impact Area, 1997

Impact Area	Fatal	Non-Fatal
Front	63.0%	27.0%
Rear	15.2%	15.0%
Left Side	8.9%	20.7%
Right Side	5.8%	28.8%
Non Collision	2.4%	7.1%
Other/Unknown	1.8%	1.3%
Total	**4,871**	**439,000**

Sources: FARS and GES

Unlike most other tables in this profile where fatal and non-fatal crash data are similar, there is a marked contrast between the two columns in Table 26. The front of the truck was the initial impact area for 63 percent of trucks involved in fatal crashes. By contrast the front of the truck was the initial impact area for only 27 percent of the trucks involved in non-fatal crashes. Side impact crashes are much more prevalent in non-fatal truck crashes, accounting for almost half of all the trucks involved (49 percent). Rear impact crashes are about the same for fatal and non-fatal crashes, and non-collision crashes, such as rollovers, are more common in non-fatal crashes.

When large trucks collided with passenger vehicles in fatal crashes the front was the initial impact area for over 60 percent of both vehicles. Thus, in a majority of fatal crashes for both large trucks and passenger vehicles the crash took place in the forward vision of the drivers. There is a large difference, however, in the rear end of the vehicle as an initial impact point. For large trucks the rear was the initial point of impact in 17 percent of the cases, while for passenger vehicles the number was only 6 percent. Thus, it is three times more likely in fatal crashes between large trucks and passenger vehicles that the truck is struck in the rear rather than the passenger vehicle being struck in the rear.

VI. Motor Carriers

The MCMIS Crash File collects data on whether the motor carrier operating each vehicle involved in a crash was an interstate or intrastate carrier. For 1997 a total of 78 percent of the trucks involved in crashes were operated by interstate motor carriers. From 1994 through 1996 the percent of interstate trucks involved in crashes varied from 72 percent to 75 percent.

The only national crash database that identifies truck and bus motor carriers by name is the MCMIS Crash File. As of August 22, 1997, the MCMIS database contained information on 105,192 trucks and buses involved in crashes that occurred in 1997 as reported by the States. The file also contains data on more than 103,000 vehicles involved in crashes in 1996, over 90,000 for 1995, over 80,000 for 1994, and fewer for 1993 and 1992. Nearly all vehicles are identified by the operating motor carrier at the time of the crash.

Crash data play a vital role in measuring motor carrier safety. The OMC is building a new data-based motor carrier safety status system, SafeStat, to guide carrier and vehicle selection for compliance reviews and roadside inspections. All interstate motor carriers will receive a SafeStat number. Forty percent of the score will be based on crashes in the MCMIS Crash File. OMC field staff will conduct safety compliance reviews on the motor carriers with the worst SafeStat scores.

To guide roadside vehicle and driver inspections, an Inspection Selection System (ISS) has been developed. The ISS is now being revised so that it will match the SafeStat system which, as noted above, relies heavily on MCMIS Crash File data. The only difference is the addition of a factor for any carrier that has not had a roadside inspection in a long time. When trucks and buses pull into roadside inspection stations, State personnel will be able to enter the carrier identification number into a computer and receive an ISS score for the carrier. The vehicles and drivers of those carriers with high ISS scores, indicating a bad safety record, will be selected more often for a roadside safety inspection than those vehicles of carriers with low scores.

VII. MCMIS Crash File Progress

As noted in the Introduction, the OMC received crash reports on an estimated 62 percent of the trucks and buses that were involved in crashes in 1997 that met the NGA criteria for a reportable crash. One way to estimate how well States are doing in reporting crashes to the OMC is to compare the FARS numbers for large trucks involved in fatal crashes with the MCMIS Crash File numbers of trucks involved in fatal crashes. The FARS is considered a reliable data source for all fatal crashes, including fatal truck crashes. If the number of trucks involved in fatal crashes in the MCMIS Crash File is close to the FARS number for a State, that State is at least reporting to the OMC almost all fatal crashes.

The FARS and MCMIS numbers need not match exactly. The two databases use slightly different definitions for a truck. For FARS a vehicle is a large truck if it has a gross vehicle weight rating of more than 10,000 pounds. For the MCMIS Crash File a truck must be designed, used, or maintained primarily for carrying property, and have at least two axles and six tires. Even with this difference in definitions, the FARS and the MCMIS Crash File numbers should be very close.

Table 27 provides a State-by-State comparison of the MCMIS Crash File numbers for trucks involved in fatal crashes with FARS numbers for large trucks involved in fatal crashes. The table includes the 50 States and the District of Columbia, but excludes the five United States territories -- Puerto Rico, the Virgin Islands, Guam, the Northern Marianas, and American Samoa. The table shows that States reported 70 percent of truck FARS numbers. Only 17 States reported MCMIS fatals within 10 percent of FARS. These included big States, such as Pennsylvania and Wisconsin, and small States such as Delaware and Idaho. On the other hand, 9 States reported less than 50 percent of the FARS numbers. These States also include large ones, such as California and Ohio, and small ones, such as Maine and Nevada.

Concluding Comments

For the OMC the most important questions involving motor carrier crashes are what are the crash problems, why do crashes happen, and how do OMC and State programs and activities relate to ameliorating the conditions that lead to crashes. None of the current truck and bus crash databases provide in-depth data on the causes or reasons for truck and bus crashes, although some of the data is suggestive of crash causes. The OMC Analysis Division relies on OMC field staff and our State partners to suggest ways to analyze the data to best support safety efforts in the field. The tables and comments presented in this report are examples of the ways the Analysis Division can examine the existing data.

Table 27
Large Trucks in 1997 Fatal Crashes by State: FARS vs. MCMIS Totals

State	FARS	MCMIS	State	FARS	MCMIS
Alabama	166	160	Montana	24	20
Alaska	7	4	Nebraska	46	47
Arizona	72	35	Nevada	27	8
Arkansas	113	48	New Hampshire	12	0
California	369	164	New Jersey	77	39
Colorado	75	39	New Mexico	51	22
Connecticut	23	23	New York	142	97
Delaware	15	14	North Carolina	195	134
District of Columbia	3	3	North Dakota	12	14
Florida	284	176	Ohio	203	93
Georgia	218	184	Oklahoma	96	51
Hawaii	3	8	Oregon	76	72
Idaho	30	30	Pennsylvania	166	174
Illinois	166	125	Rhode Island	2	2
Indiana	159	127	South Carolina	89	95
Iowa	75	69	South Dakota	15	16
Kansas	80	69	Tennessee	129	81
Kentucky	108	107	Texas	410	337
Louisiana	122	6	Utah	46	54
Maine	21	0	Vermont	15	10
Maryland	88	56	Virginia	117	81
Massachusetts	38	39	Washington	77	55
Michigan	127	68	West Virginia	52	27
Minnesota	88	49	Wisconsin	80	82
Mississippi	99	1	Wyoming	24	27
Missouri	139	133	**Total**	**4,871**	**3,375**

Sources: FARS and MCMIS Crash File