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# Speeding-Related Multi-Vehicle Fatal Crashes Involving Large Trucks

## Introduction

Speeding reduces a driver's ability to steer safely around curves or objects in the roadway, extends the distance necessary to stop a vehicle, and increases the distance a vehicle travels while the driver reacts to a dangerous situation. The danger is heightened when the speeding vehicle is either a large truck or some other vehicle in its vicinity, given the distances required for large trucks to stop or to react to sudden changes on the roadway. This Analysis Brief presents findings on the extent to which speeding—driving in excess of the speed limit or driving too fast for conditions—plays a role in multi-vehicle fatal crashes involving large trucks (over 10,000 pound gross vehicle weight rating).

## Methodology

Data from large truck fatal crashes are available through NHTSA's Fatality Analysis Reporting System (FARS). This data base comprises all fatal crashes occurring on public roadways in the U.S. and for each crash includes information on driver-related factors relating to the crash (such as speeding), violations charged to any driver (including speeding-related violations), the posted speed limit on the roadway where the crash occurred, and, where possible, the estimated travel speed of each vehicle involved (the latter two fields often have missing data). For this analysis, crashes in FARS were identified as "speeding-related" if any one of the following conditions was met: (1) at least one driver-related factor for any driver in the crash had a value corresponding to "Driving too Fast for Conditions or in Excess of Posted Speed Limit"; (2) at least one violation charged to any driver in the crash was speed-related (except driving too slowly); or (3) the travel speed of at least one vehicle exceeded the posted speed limit by 10 or more miles per hour.

Using these criteria, speeding-related multi-vehicle fatal crashes involving large trucks were identified and compared to similar crashes found to be nonspeeding-related (i.e., not meeting any of the criteria outlined above) to see whether differences exist in the location of the crashes (urban vs. rural roadways), the weather at the time of the crash, the configuration of the trucks involved, and the manner of collision for all vehicles involved. In addition, the speeding-related crashes were analyzed to determine the extent to which they involved speeding on the part of the truck driver and the extent to which they involved speeding on the part of some other driver.

## Findings

In 1997 there were 4,614 fatal crashes involving large trucks, and 982 (21 percent) involved speeding on the part of at least one of the drivers involved. Of these 4,614 large truck fatal crashes, 860 were single-vehicle (truck-only) crashes and 3,754 were multi-vehicle crashes. For the multi-vehicle large truck fatal crashes, 830 (22 percent) involved speeding by at least one driver. This result is consistent with multi-vehicle fatal crashes in general (including both truck- and nontruck-related crashes), of which roughly 25 percent were speeding-related.



The multi-vehicle large truck fatal crash data for 1997 can be classified by the type of vehicle engaged in speeding. As shown in **Table 1**, 22 percent of multi-vehicle large truck fatal crashes were speeding-related. Seven percent of these crashes involved

| <b>Table 1.</b><br><b>Multi-Vehicle Fatal Crashes Involving Large Trucks in 1997 by Speeding Vehicle.</b> |                                |                                 |
|-----------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------|
| <b>Crash Type</b>                                                                                         | <b>Number of Fatal Crashes</b> | <b>Percent of Total Crashes</b> |
| Any Vehicle Speeding                                                                                      | 830                            | 22.1 %                          |
| Truck(s) Only Speeding                                                                                    | 253                            | 6.7 %                           |
| Other Vehicle(s) Only Speeding                                                                            | 558                            | 14.9 %                          |
| Speeding by both Truck and Other Vehicle                                                                  | 19                             | 0.5 %                           |
| <b>Total Multi-Vehicle Fatal Large Truck Crashes</b>                                                      | <b>3,754</b>                   | <b>100.0 %</b>                  |

Source: FARS 1997

| <b>Table 2.</b><br><b>Speeding-Related Multi-Vehicle Fatal Crashes Involving Large Trucks in 1997 by Truck Configuration.</b> |                                 |                             |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------|
| <b>Truck Configuration</b>                                                                                                    | <b>Speeding-Related Crashes</b> | <b>Total Crashes (100%)</b> |
| Single-Unit Truck Crash                                                                                                       | 208 (21%)                       | 980                         |
| Tractor/Trailer Crash                                                                                                         | 622 (22%)                       | 2,774                       |

Source: FARS 1997

| <b>Table 3.</b><br><b>Multi-Vehicle Fatal Crashes Involving Large Truck Speeding in 1997 by Truck Configuration.</b> |                                         |                             |
|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------|
| <b>Truck Configuration</b>                                                                                           | <b>Crashes Involving Truck Speeding</b> | <b>Total Crashes (100%)</b> |
| Single-Unit Truck Crash                                                                                              | 59 (6%)                                 | 980                         |
| Tractor/Trailer Crash                                                                                                | 213 (8%)                                | 2,774                       |
| All Multi-Vehicle Fatal Large Truck Crashes                                                                          | 272 (7%)                                | 3,754                       |

Source: FARS 1997

speeding on the part of the truck driver, while 15 percent of the crashes involved speeding on the part of the other driver. Very few multi-vehicle large truck fatal crashes involve speeding by both the truck and the other vehicle. (In 1997, such crashes represented roughly one-half of one percent of all fatal large truck multi-vehicle crashes.)

### Truck Configuration

**Tables 2 and 3** present data on speeding-related multi-vehicle fatal truck crashes by truck configuration (single-unit vs tractor-trailer). Based on the 1997 FARS data, no relationship was found between truck configuration and speed involvement. The data suggest that the percentage of such crashes involving speeding by any vehicle is roughly the same regardless of the configuration of the trucks involved. Likewise, the percentage of multi-vehicle fatal large truck crashes involving speeding specifically on the part of the truck driver (see **Table 3**) is also roughly the same for both single-unit and tractor-trailer crashes.

### Weather Conditions

Adverse weather conditions appear to be associated with an increased incidence of speeding-related crashes involving large trucks. Data from the FARS indicate that in 1997, 25 percent of all speeding-related multi-vehicle large truck fatal crashes occurred during adverse weather conditions (**Table 4**). By comparison, 15 percent of the nonspeeding-related multi-vehicle large truck fatal crashes occurred during adverse weather conditions. For the speeding-related crashes, 16 percent occurred in rainy weather (compared to 10 percent for the nonspeeding-related crashes) and 7 percent occurred during snow storms (compared to 2 percent of the nonspeeding-related crashes).

### Roadway Location

**Table 5** shows the percentage of multi-vehicle large truck fatal crashes that occurred in 1997 for various types of roadway, for both speeding-related and nonspeeding-related crashes. The table shows that the percentage of speeding-related crashes that occur on interstates and urban expressways is higher than the percentage of nonspeeding-related crashes that occur on these roads. About 35 percent of the speeding-related crashes occur on rural interstates, urban interstates, or urban expressways, compared to 21 percent of the nonspeeding-related crashes.

### Manner of Collision

**Table 6** compares the manner of collision for speeding-related and nonspeeding-related multi-vehicle large truck fatal crashes in 1997. As shown in the table, angle crashes (where the initial impact results from two vehicles approaching each other at an angle) are less common in speeding-related crashes

than nonspeeding-related crashes. This fact is consistent with the data in the previous table, which show that a higher proportion of the speeding-related crashes occur on interstates and expressways (where the highway is divided and angle collisions less likely).

Table 6 shows that for the speeding-related crashes, rear-end collisions occur with much greater frequency (34 percent of the speeding-related crashes vs. 15 percent of the nonspeeding-related crashes). This is true regardless of which vehicle is doing the speeding, although rear-end collisions appear more prevalent in crashes involving truck speeding (39 percent of such crashes). This latter observation may result from the fact that large trucks, given their mass, have greater stopping distances than other vehicles, especially when speeding.

When considering all speeding-related multi-vehicle large truck fatal crashes (i.e., regardless of which vehicle is doing the speeding), there does not appear to be much difference in the frequency of head-on collisions between speeding-related and nonspeeding-related crashes (27 percent of the speeding-related crashes and 29 percent of the nonspeeding-related crashes). If, however, crashes involving truck speeding are compared with crashes involving speeding by another vehicle, head-on collisions occur with much greater frequency in collisions involving speeding by the other vehicle (31 percent of such crashes versus 19 percent involving truck speeding).

### Distribution by States

Table 7 lists the 10 States with the highest proportion of multi-vehicle large truck fatal crashes that can be identified as speeding-related, based on FARS data from 1992 to 1997 (to ensure some degree of stability in the numbers, this analysis only considers the 44 States having an average of 10 multi-vehicle large truck fatal crashes or more per year during this 6-year period). Compared with the national averages for the 6-year period (bottom row of table), both the percentage of total crashes involving truck driver speeding, as well as the percentage of total crashes involving speeding by some other driver, are considerably higher for most of these States. It is not clear, however, whether these data reflect real differences in driver

behavior for these particular States, or merely differences in the level of post-crash traffic enforcement (i.e., issuance of citations) across States, as well as differences in State reporting practices for filling out a police accident report.

## Conclusion

Based on the 1997 FARS data, roughly 22 percent of large truck fatal crashes involving more than one vehicle are speeding-related crashes. Approximately 7 percent of multi-vehicle large truck fatal crashes involve speeding on the part of the truck driver and approximately 15 percent involve speeding on the part of another driver. No relationship was found between truck vehicle configuration (single unit vs. tractor-trailer) and the incidence of speeding-related crashes.

**Table 4.**  
Percentage of Multi-Vehicle Fatal Crashes Involving Large Trucks by Adverse Weather Conditions and Speeding Involvement.

| Weather                     | Speeding Involvement |            |                  |                   |
|-----------------------------|----------------------|------------|------------------|-------------------|
|                             | None                 | Speeding   |                  |                   |
|                             |                      | By Truck   | By Other Vehicle | By Either Vehicle |
| Normal                      | 85%                  | 74%        | 74%              | 75%               |
| Adverse                     | 15%                  | 26%        | 26%              | 25%               |
| Rain*                       | 10%                  | 18%        | 15%              | 16%               |
| Snow                        | 2%                   | 5%         | 9%               | 7%                |
| <b>Total Crashes (100%)</b> | <b>2,924</b>         | <b>272</b> | <b>577</b>       | <b>830</b>        |

Source: FARS 1997

\*includes sleet

**Table 5.**  
Percentage of Multi-Vehicle Fatal Crashes Involving Large Trucks in 1997 by Roadway Location and Speed Involvement.

| Roadway Location | Speeding-Related Crashes | Nonspeeding-Related Crashes |
|------------------|--------------------------|-----------------------------|
| Rural Interstate | 18%                      | 10%                         |
| Rural Other      | 47%                      | 59%                         |
| Urban Interstate | 13%                      | 8%                          |
| Urban Freeway    | 5%                       | 3%                          |
| Urban Other      | 17%                      | 20%                         |
| <b>Total</b>     | <b>100% (830)</b>        | <b>100% (2,924)</b>         |

Source: FARS 1997

## Researcher

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## Distribution

This Analysis Brief is being distributed according to a standard distribution. Direct distribution is being made to the Resource Centers and Divisions.

## Availability

This Analysis Brief is available from the Office of Data Analysis and Information Systems, Telephone: (202) 366-1861.

## Key Words

speeding, multi-vehicle fatal crashes, large truck fatal crashes, weather conditions, interstates, head-on collisions, rear-end collisions.

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**Table 6.**  
**Multi-Vehicle Fatal Crashes Involving Large Trucks in 1997 by Manner of Collision and Speed Involvement.**

| Manner of Collision              | Speeding-Related Crashes | Nonspeeding-Related Crashes | Crashes with Truck Speeding | Crashes with Other Vehicle Speeding |
|----------------------------------|--------------------------|-----------------------------|-----------------------------|-------------------------------------|
| Rear-End                         | 34 %                     | 15 %                        | 39 %                        | 31 %                                |
| Head-on                          | 27 %                     | 29 %                        | 19 %                        | 31 %                                |
| Angle                            | 25 %                     | 46 %                        | 22 %                        | 26 %                                |
| Sideswipe, same direction        | 3 %                      | 3 %                         | 3 %                         | 3 %                                 |
| Sideswipe, Opposite Direction    | 2 %                      | 3 %                         | 2 %                         | 2 %                                 |
| Not Collision with Motor Vehicle | 9 %                      | 4 %                         | 13 %                        | 8 %                                 |
| Unknown                          | 0 %                      | 0 %                         | 1 %                         | 0 %                                 |
| Total*                           | 100 %                    | 100 %                       | 100 %                       | 100 %                               |

Source: FARS 1997

\* Columns may not add up to 100 percent due to rounding error

**Table 7.**  
**Percentage of Large Truck Multi-Vehicle Fatal Crashes Involving Speeding by State in 1992-1997\***

| State | Speeding-Related Crashes | Truck Driver Speeding | Other Driver Speeding | Average Annual Multi-Vehicle Large Truck Fatal Crashes |
|-------|--------------------------|-----------------------|-----------------------|--------------------------------------------------------|
| WY    | 48 %                     | 18 %                  | 34 %                  | 11                                                     |
| CA    | 44 %                     | 13 %                  | 32 %                  | 248                                                    |
| NV    | 38 %                     | 11 %                  | 29 %                  | 22                                                     |
| OK    | 37 %                     | 14 %                  | 25 %                  | 61                                                     |
| AZ    | 38 %                     | 11 %                  | 28 %                  | 55                                                     |
| TX    | 34 %                     | 9 %                   | 25 %                  | 276                                                    |
| PA    | 31 %                     | 13 %                  | 19 %                  | 144                                                    |
| MT    | 30 %                     | 5 %                   | 25 %                  | 14                                                     |
| NM    | 29 %                     | 5 %                   | 25 %                  | 29                                                     |
| US    | 22 %                     | 7%                    | 16 %                  | 3,482                                                  |

Source: FARS 1997

\*analysis only considers the 44 States having at least 10 multi-vehicle/large truck fatal crashes per year during this six year period.

The percentage of multi-vehicle large truck fatal crashes that occur during adverse weather conditions as well as the percentage of multi-vehicle large truck fatal crashes that occur on interstates and urban freeways are higher for speeding-related crashes than nonspeeding-related crashes. Speeding-related multi-vehicle large truck fatal crashes are also more than twice as likely to involve a rear-end collision than similar nonspeeding-related crashes. There is a wide disparity across States in the reported proportion of multi-vehicle large truck fatal crashes that are speeding-related. It is not clear, however, whether such disparities represent real differences across States, or merely differences in police enforcement and reporting practices.