



# Work Zone Fatal Crashes Involving Large Trucks, 2012

In 2012, 30,800 fatal crashes took place on our Nation’s roadways, with 11.2 percent (3,464) involving at least 1 large truck. While the majority of all fatal crashes (98.2 percent) took place outside of a work zone in 2012, 547 fatal crashes (1.8 percent) occurred in a construction, maintenance, utility or other work zone (see Table 1). In contrast, 3.7 percent of fatal crashes involving large trucks took place in a work zone in 2012— double the percentage for all fatal crashes.

This analysis brief examines factors that contribute to work zone fatal crashes involving large trucks. Analysis shows:

- **Large truck fatal crashes in work zones are more likely to involve three or more vehicles.** In 2012, 32.6 percent of large truck fatal crashes in work zones involved three or more vehicles, while 16.9 percent of large truck fatal crashes in general involved three or more vehicles.
- **Large truck involvement in work zone fatal crashes is more likely than in fatal crashes in general.** In 2012, nearly 24 percent of fatal crashes in work zones involved at least one large truck, while 11.2 percent of all fatal crashes involved a large truck (see Figure 1).

- **The majority of large truck fatal crashes in work zones involve large trucks that are in-transport, and most are rear-ended.** In 2012, approximately 19 percent of fatal crashes in work zones involved at least one large truck that was parked or working. The majority (81 percent) of work zone fatal crashes involved large trucks that were in-transport or traveling through the work zone. In 2012, 56.2 percent of large trucks in work zone fatal crashes were rear-ended (impacted at 6 o’clock).

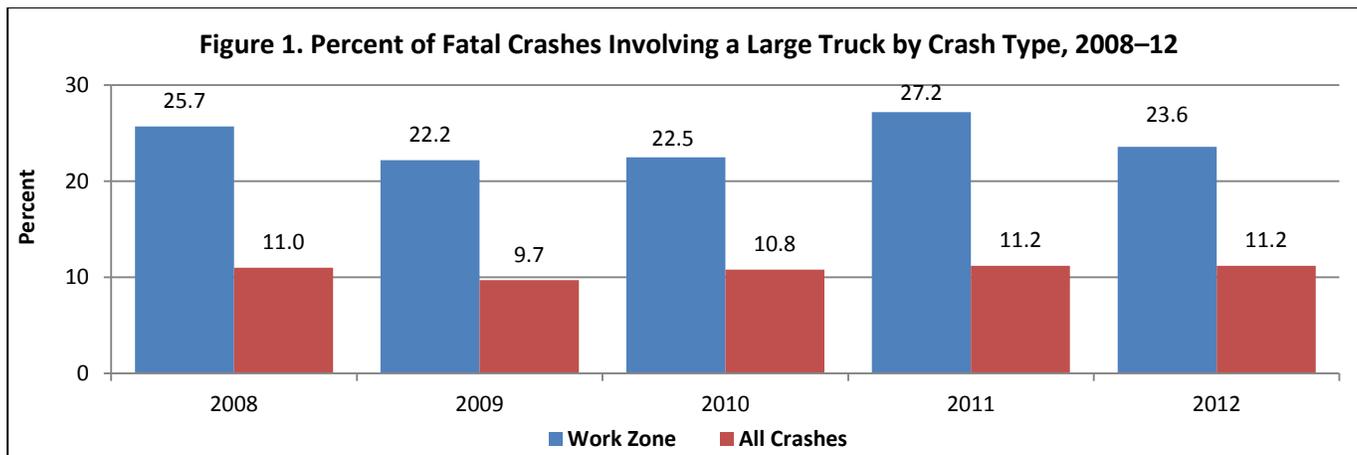
Table 2 presents a high-level summary of the results of this analysis.

Crash Type	All Fatal Crashes	Work Zone Fatal Crashes
Involved at Least One Large Truck	11.2%	23.6%
Involved a Large Truck and Two or More Vehicles	16.9%	32.6%
Involved a Large Truck That Was Parked/Working	4.1%	18.9%

Note: Parked/Working large truck data comes from the Parkwork datafile in FARS. Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

Crash Location	2008		2009		2010		2011		2012	
	Number	Percent								
<b>Fatal Crashes Involving Large Trucks</b>										
Not a Work Zone	3,584	95.5	2,852	95.6	3,153	96.4	3,214	95.5	3,335	96.3
Work Zone	170	4.5	131	4.4	117	3.6	145	4.3	129	3.7
Unknown	0	0.0	0	0.0	1	0.0	6	0.2	0	0.0
<b>Total</b>	<b>3,754</b>	<b>100.0</b>	<b>2,983</b>	<b>100.0</b>	<b>3,271</b>	<b>100.0</b>	<b>3,365</b>	<b>100.0</b>	<b>3,464</b>	<b>100.0</b>
<b>All Fatal Motor Vehicle Crashes</b>										
Not a Work Zone	33,510	98.1	30,273	98.1	29,756	98.2	29,300	98.1	30,253	98.2
Work Zone	662	1.9	589	1.9	521	1.7	533	1.8	547	1.8
Unknown	0	0.0	0	0.0	19	0.1	34	0.1	0	0.0
<b>Total</b>	<b>34,172</b>	<b>100.0</b>	<b>30,862</b>	<b>100.0</b>	<b>30,296</b>	<b>100.0</b>	<b>29,867</b>	<b>100.0</b>	<b>30,800</b>	<b>100.0</b>

Source: U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration (NHTSA), Fatality Analysis Reporting System (FARS), available at: <http://www.nhtsa.gov/FARS>.



Note: Percentages are based on fatal crashes that involved at least one large truck.  
 Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

As shown in Table 3, approximately 64 percent of fatal crashes involving large trucks were two-vehicle crashes, and an additional 20 percent were single-vehicle crashes. Looking at work zone fatal crashes involving large trucks, just over half (53.3 percent) involved two vehicles. An additional 33 percent involved three or more vehicles and only 14 percent were single-vehicle crashes.

<b>Table 3. Large Truck Fatal Crashes by Number of Vehicles Involved, 2012</b>				
Crash Size	All Large Truck Fatal Crashes		Large Truck Fatal Crashes in a Work Zone	
	Number	Percent	Number	Percent
Single-vehicle	678	19.6%	18	14.0%
Two-vehicle	2,201	63.5%	69	53.5%
Three or more vehicles	585	16.9%	42	32.6%
<b>Total</b>	<b>3,464</b>	<b>100.0%</b>	<b>129</b>	<b>100.0%</b>

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

In 2012, 162 large trucks were involved in work zone fatal crashes (see Table 4). Over the past 5 years, an average of 151 large trucks per year involved in work zone fatal crashes had a weight rating of at least 26,001 pounds. In contrast, an average of 20 large trucks per year involved in work zone fatal crashes had a weight rating between 10,001 and 26,000 pounds.

<b>Table 4. Large Trucks in Work Zone Fatal Crashes by Weight Rating, 2008–12</b>					
Weight Rating	2008	2009	2010	2011	2012
10,001–26,000 lb	15	20	13	33	20
≥26,001 lb	192	144	136	142	142
Unknown	2	0	1	0	0
<b>Total</b>	<b>209</b>	<b>164</b>	<b>150</b>	<b>175</b>	<b>162</b>

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

Table 5 depicts the number of large trucks in work zone fatal crashes by work zone type and truck function (whether the truck was parked/working when it became involved in a fatal crash). Parked/working large truck fatal crash data comes from the Parkwork datafile<sup>1</sup> maintained by NHTSA, and records are unique to those that are recorded in the FARS database. In 2012, there were 32 parked or working large trucks involved in work zone fatal crashes (in addition to the 162 FARS-reportable large truck work zone fatal crashes), accounting for 16.5 percent of all large trucks involved in work zone fatal crashes.

<b>Table 5. Number of Large Trucks in Fatal Crashes by Function, 2010–12</b>			
Crash Location	2010	2011	2012
<b>Not a work zone</b>	<b>3,482</b>	<b>3,586</b>	<b>3,773</b>
Large Trucks	3,343	3,452	3,640
Parked/Working Large Trucks	139	134	133
<b>Work Zone</b>	<b>167</b>	<b>207</b>	<b>194</b>
Large Trucks	151	181	162
Parked/Working Large Trucks	16	26	32
<b>Total</b>	<b>3,649</b>	<b>3,793</b>	<b>3,967</b>

Note: Parked/Working large truck data comes from the Parkwork datafile in FARS.

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

<sup>1</sup> The Parkwork datafile was created in 2010 and contains information about parked and working vehicles that were involved in FARS crashes. A parked vehicle is a motor vehicle which is stopped off the roadway. A working vehicle is a motor vehicle that was in the act of performing highway construction, maintenance, or utility work related to the trafficway when it became involved in a fatal crash. For more information refer to: <http://www-nrd.nhtsa.dot.gov/Pubs/811855.pdf>.

Texas had the greatest proportion of work zone fatal crashes involving large trucks in 2012 at 21.7 percent, followed by California with 12.4 percent (see Table 6). Over the past 5 years, Texas has averaged 21.8, Illinois 10.2, and California 9.6 work zone fatal crashes involving large trucks.

State	2008	2009	2010	2011	2012
Texas	27	17	14	23	28
Illinois	13	10	12	7	9
California	7	9	5	11	16
Florida	13	8	8	7	7
Georgia	11	4	10	6	6
Indiana	6	5	2	11	4
Arkansas	4	5	3	5	4
Tennessee	3	3	0	5	5
Wisconsin	2	4	2	1	5
Nebraska	1	2	1	3	4
<b>Total</b>	<b>170</b>	<b>131</b>	<b>117</b>	<b>145</b>	<b>129</b>

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

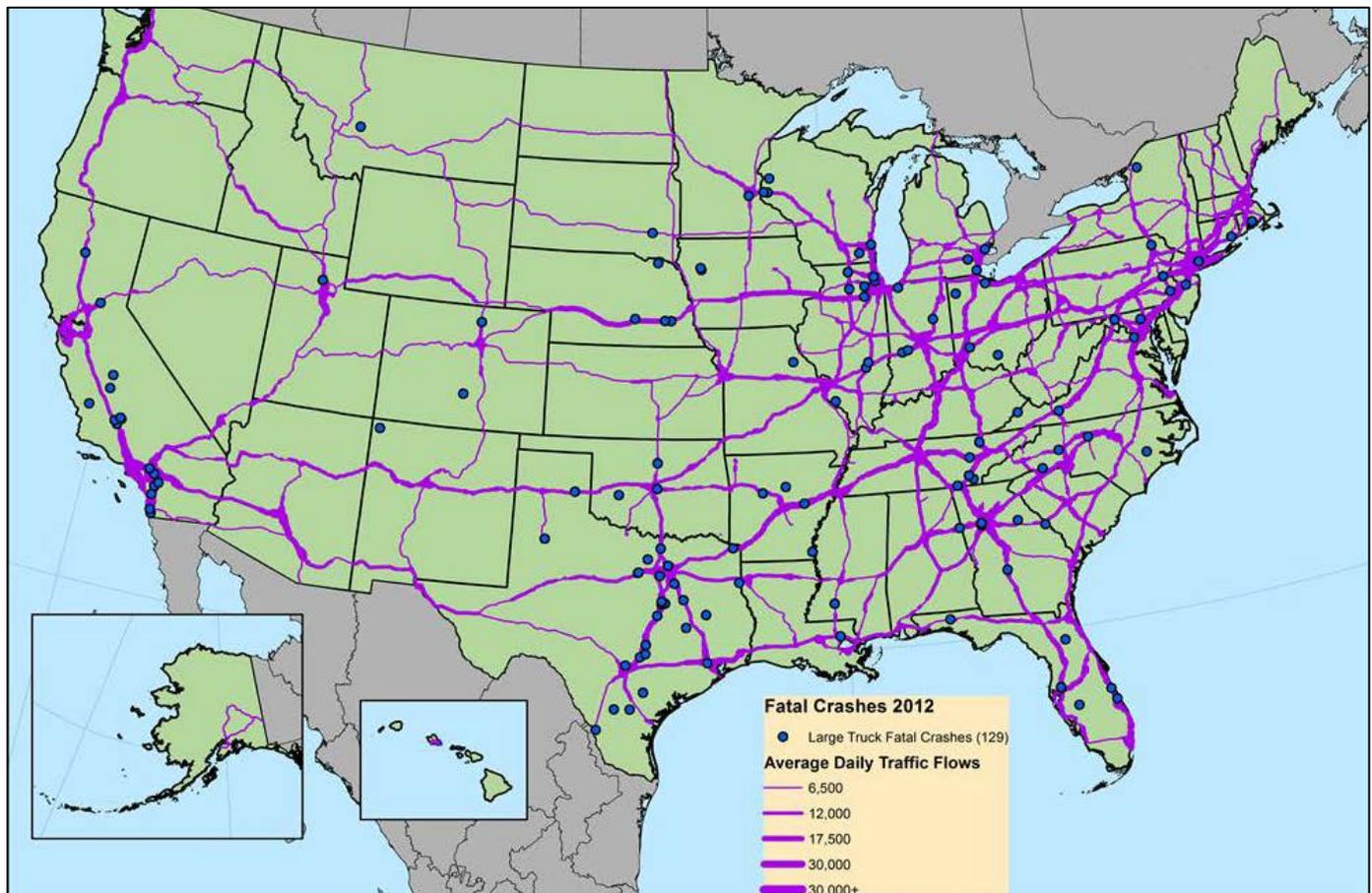
As can be seen from the data in Table 7, 61.2 percent of work zone fatal crashes involving large trucks took place on a two-way divided trafficway in 2012. An additional 34.1 percent took place on a two-way, non-divided trafficway.

Trafficway Description	2010	2011	2012
Non-Trafficway Area	1	0	1
Two-Way, Not Divided	35	47	44
Two-Way, Divided, Unprotected (Painted > 4 Feet) Median	35	33	26
Two-Way, Divided, Positive Median Barrier	43	58	53
One-Way Trafficway	1	3	3
Two-Way, Not Divided With a Continuous Left-Turn Lane	2	1	0
Entrance/Exit Ramp	0	3	2
<b>Total</b>	<b>117</b>	<b>145</b>	<b>129</b>

Note: FARS coding changed in 2010; as such data prior to 2010 is not comparable to later years.

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

**Figure 2. Large Truck Fatal Crashes in Work Zones, 2012.**



Note: Average Daily Truck Traffic Flows are based on Freight Analysis Framework (FAF) 3.4.

Sources: **Fatal Crashes** – USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>. **Traffic Flows** - USDOT FHA, FAF Version 3, available at: [http://www.ops.fhwa.dot.gov/freight/freight\\_analysis/faf/](http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/).

Figure 2 depicts the locations of all work zone fatal crashes that involved a large truck in 2012 overlaid on the average daily truck traffic flows on interstate highways.<sup>(2)</sup>

In approximately 77 percent of work zone fatal crashes involving large trucks, the most harmful event<sup>(3)</sup> was a motor vehicle in transport (see Table 8). Pedestrian events were the second most harmful, accounting for 10 percent of fatal work zone crashes in 2012.

Approximately 77 percent of work zone fatal crashes involving large trucks that coded “pedestrian” as the most harmful event occurred on the roadway with a striking impact at 12 o’clock (i.e., front impact). In 69.2 percent of large truck work zone fatal crashes involving pedestrians, the striking vehicle was traveling straight, and no avoidance maneuver was attempted.

Most Harmful Event	2010	2011	2012
Motor Vehicle In-transport	91	99	95
Pedestrian	7	18	13
Fire/Explosion	4	7	6
Rollover/Overturn	7	8	5
Working Motor Vehicle	4	2	2
Other	4	11	8
<b>Total</b>	<b>117</b>	<b>145</b>	<b>129</b>

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

The critical pre-crash event (as shown in Table 9) identifies the attribute that best describes a vehicle’s activity prior to the driver’s realization of an impending critical event. In 2012, the most critical pre-crash event was traveling in the same direction with a higher speed, accounting for 27.2 percent of fatal work zone crashes involving a large truck. Approximately 11.7 percent of crashes involved vehicles traveling in opposite directions over the left lane line, and an additional 11.1 percent involved the other vehicle being stopped.

Critical Pre-Crash Event	2010	2011	2012
Traveling in same direction with higher speed	39	46	44
From opposite direction over left lane line	9	18	19
Other vehicle stopped	16	25	18
Pedestrian involved	6	11	10
Traveling in same direction with lower or steady speed	5	5	10
<b>Total</b>	<b>150</b>	<b>175</b>	<b>162</b>

Note: The FARS variable this table is based on was first introduced in 2010. Individual rows do not add up to total as total includes work zone fatal crashes with other critical pre-crash events.

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

Table 10 depicts the manner of collision, or orientation, for in-transport motor vehicles in work zone fatal crashes that involved at least one large truck. Since 2008, the greatest proportion (on average 41.8 percent) of fatal crashes in work zones has been front-to-rear collisions. In 2012, 9.3 percent were front-to-front crashes, 13.2 percent were angle crashes and 45.7 percent were front-to-rear crashes. In 2012, 56.2 percent of large trucks involved in work zone fatal crashes were impacted at 6 o’clock (i.e., rear ended) and 39.3 percent were impacted at 12 o’clock (i.e., front impact).

Manner of Collision	2008	2009	2010	2011	2012
Not a Collision with Motor Vehicle In-transport	41	34	29	46	34
Front-to-rear	70	52	49	59	59
Front-to-front	15	8	11	11	12
Angle	32	21	19	19	17
Sideswipe—Same Direction	8	9	6	7	5
Sideswipe—Opposite Direction	3	4	2	1	1
Rear-to-side	0	1	1	0	1
Other	1	0	0	1	0
Unknown	0	2	0	1	0
<b>Total</b>	<b>170</b>	<b>131</b>	<b>117</b>	<b>145</b>	<b>129</b>

Source: USDOT, NHTSA, FARS, available at: <http://www.nhtsa.gov/FARS>.

<sup>2</sup> Traffic flow data is based on the Freight Analysis Framework Version 3 (FAF<sup>3</sup>) maintained by the Federal Highway Administration (FHWA). Interstate highways depicted on the map are part of the National Highway System (NHS). For more information on FAF<sup>3</sup>, refer to: [http://faf.oml.gov/fafweb/Data/Freight\\_Traffic\\_Analysis/faf\\_fta.pdf](http://faf.oml.gov/fafweb/Data/Freight_Traffic_Analysis/faf_fta.pdf).

<sup>3</sup> Harmful events are judgment calls of the FARS analysis based on data within the police accident report. For more information, refer to the FARS Analytic User’s Manual at: <http://www-nrd.nhtsa.dot.gov/Pubs/811855.pdf>