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TRAFFIC SAFETY FACTS
Research Note

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Single-Unit Straight Trucks in Traffic Crashes

Highlights

Data from the Fatality Analysis Reporting System (FARS) and General Estimates System (GES) show that, in 2011, about 3 percent of fatal crashes, 1.7 percent of injury crashes, and 2 percent of property-damage-only (PDO) crashes involved single-unit trucks (SUTs). Crashes involving SUTs killed 1,064 people and injured about 38,000 people. Additionally, about 87,000 SUTs were involved in crashes that resulted in major property damage. Most of the people who died or received injuries in SUT crashes were occupants of other vehicles, bicyclists, or pedestrians rather than the occupants of SUTs. In the majority of fatal, injury, and PDO crashes, the first property-damaging or injury-producing event was an SUT's collision with another vehicle on the roadway or in motion, rather than with a fixed or non-fixed object. Such a collision was also the most harmful event, i.e., the event that caused the most severe property damage or injury, in a large majority of fatal, injury, and PDO crashes. Rollover of an SUT was not a common occurrence.

Background

Single-unit straight trucks, also known as single-unit trucks, are a class of medium and heavy trucks in which the engine, cab, drive train, and cargo area are all mounted on a single chassis. These vehicles, with a gross vehicle weight rating (GVWR) of more than 10,000 pounds, can have two axles and dual rear wheels or three or more axles and, by definition, fall in the category of large trucks. Common examples of single-unit trucks are dump trucks, sewage trucks, oilfield equipment, as well as many delivery trucks. This research note statistically describes the characteristics of crashes involving SUTs, referred to as SUT crashes. Depending upon the crash outcome, three crash categories are considered, namely, fatal crashes, injury crashes, and PDO crashes. The FARS data are used to describe the fatal crashes, and the GES data are used to describe the injury and PDO crashes. FARS contains data on a census of fatal traffic crashes. Thus, the frequencies calculated from these data are actual counts. The GES data, on the other hand, are obtained from a nationally representative probability sample of police-reported crashes that involve injury or major property damage, rather than from a census of these types of crashes. Accordingly, the estimates based on these data are subject to sampling errors. The counts presented in the tables related to injury and PDO crashes are the rounded numbers of these estimates, while the corresponding percentages are calculated from the actual estimates. The findings reported in this research note are based on FARS 2011 and GES 2011 data.

Fatal Crashes Involving SUTs

In 2011, FARS recorded 29,757 crashes in which one or more people died. Of these, 978 crashes involved SUTs, which made up about 3 percent of all fatal crashes and about 29 percent of the 3,341 fatal crashes that involved large trucks including SUTs. Fatal crashes involving SUTs were single-vehicle as well as multiple-vehicle crashes, though predominantly involving multiple vehicles. In fact, about 76 percent involved two or more vehicles (61% involved two vehicles and 15% involved three or more vehicles) as compared to 24 percent that were single-vehicle crashes. In comparison, the majority (60%) of the fatal crashes not involving SUTs were single-vehicle crashes. FARS records information about events such as collision with another vehicle on the roadway or in motion within or outside the trafficway, referred to as "motor vehicle in transport" (see Glossary of Terms). In the majority of fatal SUT crashes (71%), the first harmful event was a collision with a motor vehicle in transport (Table 1). Although much less frequent than the collision with a motor

Table 1
First Harmful Event and Manner of Collision in Fatal SUT Crashes

Crash Characteristic		Fatal SUT Crashes	
		Number	Percentage
First Harmful Event in SUT Crashes	Collision with a motor vehicle in transport	690	71%
	Collision with a non-fixed object	155	16%
	Collision with a fixed object	75	8%
	Non-collision	58	6%
	Total	**978**	**100%**
Manner of Collision in SUT Crashes	Angle	293	30%
	Front-to-rear	175	18%
	Front-to-front	141	14%
	Sideswipe, opposite direction	39	4%
	Sideswipe, same direction	29	3%
	Other	13	1%
	Not a collision with a motor vehicle in transport or a parked vehicle	288	29%
	Total	**978**	**100%**

Data source: FARS 2011

vehicle in transport, a collision with a non-fixed object was more frequent (16%) than a collision with a fixed object (8%). In very few crashes, the first harmful event was non-collision (6%). FARS also provides information about the orientation of vehicles involved in a collision, such as front-to-rear, front-to-front, or at an angle. This information is recorded as the manner of collision and is based upon what happened when the first harmful

event that occurred in the crash. The FARS 2011 data shows that collision at an angle accounted for the highest percentage of fatal SUT crashes (30%), followed by front-to-rear (18%) and then front-to-front (14%) collisions. Sideswipe by vehicles traveling in the same or opposite direction was recorded in very small percentages of SUT crashes (3% and 4%, respectively). In 29 percent of the fatal SUT crashes, the collision was neither with a motor vehicle in transport nor with a parked vehicle.

People in Fatal Crashes Involving SUTs

Of the 3,757 people killed in large-truck crashes in 2011, about 28 percent (1,064) died in single-unit truck crashes alone. These included SUT occupants (13% drivers and 4% passengers) and predominantly (83%), the occupants of other vehicles, bicyclists, and pedestrians (Table 2). This shows that among the killed, the majority were people other than the occupants of the single-unit trucks. Among the killed SUT occupants, the percentage of SUT drivers exceeded the percentage of SUT passengers.

SUTs in Fatal Crashes

In 2011, the FARS recorded 1948 vehicles that were involved in fatal SUT crashes. Of these, 994 (about 51%) were single-unit trucks. In the majority of these cases (71%), the most harmful event was a collision with another motor vehicle in transport (Table 3). Regarding crash avoidance maneuver, FARS recorded this information for 868 SUTs out of a total of 994 SUTs that were involved in fatal crashes. The drivers of the majority of these SUTs (69%) did not make a maneuver, 12 percent used steering, 11 percent used brakes,

Table 2
People Killed in Fatal SUT Crashes

Occupant Status		People Killed in Fatal SUT Crashes	
		Number	Percentage
Occupant Status of Crash-Involved People	Drivers of single-unit straight trucks	140	13%
	Passengers of single-unit straight trucks	41	4%
	Others (occupants of other vehicles, bicyclists, pedestrians)	883	83%
	Total	**1064**	**100%**

Data source: FARS 2011

Table 3
Crash Characteristics of SUTs Involved in Fatal Crashes

Crash Characteristic		SUTs in Fatal Crashes	
		Number	Percentage
SUTs' Most Harmful Event	Collision with a motor vehicle in transport	705	71%
	Collision with a non-fixed object	151	15%
	Collision with a fixed object	35	4%
	Non-collision	103	10%
	Total	**994**	**100%**
SUTs' Avoidance Maneuver	Steering	103	12%
	Braking	97	11%
	Braking and steering	67	8%
	No avoidance maneuver	601	69%
	Total*	**868**	**100%**
Rollover Status of SUTs	Rollover	159	16%
	No rollover	835	84%
	Total	**994**	**100%**
Underride/Override Status of SUTs	No Underride or Override	971	98%
	Override a Motor Vehicle In Transport	17	2%
	Underride a Motor Vehicle In Transport (Compartment Intrusion)	3	<1%
	Underride a Motor Vehicle In Transport (Compartment Intrusion Unknown)	1	<1%
	Underride a Motor Vehicle In Transport (No Compartment Intrusion)	1	<1%
	Unknown if Underride or Override	1	<1%
	Total	**994**	**100%**

*Percentages are based on this total for which the information about SUT's avoidance maneuver is known
Data source: FARS 2011

and 8 percent used both brakes and steering. Rollover of SUTs was far less frequent than non-rollover; only 16 percent rolled over in comparison with 84 percent that did not roll over. Underride/override was not common among SUTs; about 2 percent of them overrode other motor vehicles that resulted into compartment intrusion. A vast majority (98%) of the crash involved SUTs neither under rode nor overrode other vehicles.

Injury Crashes Involving SUTs

The GES data suggest that, in 2011, an estimated 1,472,000 crashes occurred in which one or more people were injured. About 1.7 percent (25,000) of these crashes were single-unit truck crashes, referred to as injury SUT crashes. One or more vehicles (including SUTs) were involved in these crashes; the majority of crashes involved two vehicles (74%), about 15 percent involved three or more vehicles, and 11 percent involved SUTs alone. Like FARS, the GES also records infor-

mation about events such as collision with another vehicle on the roadway or in motion within or outside the trafficway, referred to as "motor vehicle in transport." In a considerably large number of injury crashes involving SUTs (86%), the first harmful event was a collision with a motor vehicle in transport (Table 4). In addition, collision with a fixed object (6%) was more common than a collision with a non-fixed object (4%). Non-collision as the first harmful event occurred in 4 percent of the SUT crashes. About 36 percent of the injury SUT crashes were front-to-rear crashes, and in about 32 percent, the vehicles collided at an angle. Front-to-front collisions occurred in 4 percent of these crashes. Sideswipe of vehicles traveling in the same direction was more frequent (9%) as compared to sideswipe in the opposite direction (1%). Rear-to-rear collision was rare and occurred in only 1 percent of the SUT crashes. Finally, in 14 percent of the SUT crashes causing injury, the collision was not with a motor vehicle in transport.

People in Injury Crashes Involving SUTs

Estimates from the GES data show that, in 2011, about 38,000 people suffered injuries in single-unit truck crashes. About 16 percent of the injured people were drivers of SUTs and 7 percent passengers of SUTs (Table 5a). A much higher percentage (77%) of other people was also injured in these crashes. These were occupants of other vehicles, bicyclists, motorcyclists, and pedestrians. Regarding the severity of injuries to the 6,000 SUT drivers, 10 percent suffered incapacitating injuries, 30 percent had non-incapacitating injuries, and 56 percent received possible injuries. Among 3,000 SUT passengers who were injured in single-unit truck crashes, 5 percent suffered incapacitating injuries, 53 percent non-incapacitating injuries, and 40 percent received possible injuries. In addition to the drivers and passengers of SUTs, about 29,000 other people were injured. About 8 percent of them suffered incapacitating injuries and 28 percent received non-incapacitating injuries, while 57 percent received possible injuries.

Table 5b shows distributions of people in each of the four injury categories listed in Table 5a. Of all the people who received possible injuries in SUT crashes, 16 percent were SUT drivers, 6 percent SUT passengers, and a large majority (78%) was of people who were not SUT occupants (i.e., occupants of other vehicles, bicyclists, and pedestrians). In comparison, among those who had non-incapacitating injuries, 17 percent were SUT drivers, 9 percent SUT passengers, and 74 percent others. Among people who suffered incapacitating injuries 20 percent were drivers of SUTs, 4 percent passengers of SUTs, and a large majority (76%) was of people other than SUT drivers and SUT passengers. Additionally, about 2,000 people were recorded injured for whom the injury severity was unknown.

Table 4
First Harmful Event and Manner of Collision in Injury Causing Crashes

Crash Characteristic		Injury SUT Crashes	
		Estimated Number†	Percentage‡
First Harmful Event in SUT Crashes	Collision with a motor vehicle in transport	22,000	86%
	Collision with a fixed object	2,000	6%
	Collision with a non-fixed object	1,000	4%
	Non-collision	1,000	4%
	Total	**25,000**	**100%**
Manner of Collision in SUT Crashes	Front-to-Rear	9,000	36%
	Angle	8,000	32%
	Sideswipe, same direction	2,000	9%
	Front-to-Front	1,000	4%
	Sideswipe, opposite direction	<500	1%
	Rear-to-rear	<500	1%
	Other	<500	2%
	Unknown/Not reported	<500	<1%
	Not collision with a motor vehicle in transport	4,000	14%
	Total	**25,000**	**100%**

† Estimated frequencies rounded off to the nearest thousand, may not sum to the total shown
‡ Percentages calculated prior to rounding off the estimated frequencies
Data source: GES 2011

Table 5a
Occupants of SUTs and Other People Injured in SUT Crashes

Characteristic		People Injured in SUT Crashes	
		Estimated Number†	Percentage‡
Injuries to SUT Drivers	Possible/complaint injury	3,000	56%
	Non-incapacitating injury	2,000	30%
	Incapacitating injury	1,000	10%
	Injured – severity unknown	<500	4%
	Total SUT drivers (16% of the 38,000 injured persons)	**6,000**	**100%**
Injuries to SUT Passengers	Non-incapacitating injury	1,000	53%
	Possible/complaint injury	1,000	40%
	Incapacitating injury	<500	5%
	Injured – severity unknown	<500	2%
	Total SUT passengers (7% of the 38,000 injured persons)	**3,000**	**100%**
Injuries to Other People	Possible/complaint injury	17,000	57%
	Non-incapacitating injury	8,000	28%
	Incapacitating injury	2,000	8%
	Injured – Severity unknown	2,000	7%
	Total other people (77% of the 38,000 injured persons)	**29,000**	**100%**

† Estimated frequencies rounded off to the nearest thousand, may not sum to the total shown
‡ Percentages calculated prior to rounding off the estimated frequencies
Data source: GES 2011

Table 5b
Injury Severity Levels of People Injured in SUT Crashes

Characteristic		People Injured in SUT Crashes	
		Estimated Number†	Percentage‡
Possible Injuries	SUT drivers	3,000	16%
	SUT passengers	1,000	6%
	Others (occupants of other vehicles, bicyclists, pedestrians)	17,000	78%
	Total possible injuries (57% of the 38,000 injured persons)	**21,000**	**100%**
Non-Incapacitating Injuries	SUT drivers	2,000	17%
	SUT passengers	1,000	9%
	Others (occupants of other vehicles, bicyclists, pedestrians)	8,000	74%
	Total non-incapacitating (29% of the 38,000 injured persons)	**11,000**	**100%**
Incapacitating Injuries	SUT drivers	1,000	20%
	SUT passengers	<500	4%
	Others (occupants of other vehicles, bicyclists, pedestrians)	2,000	76%
	Total incapacitating Injuries (8% of the 38,000 injured persons)	**3,000**	**100%**
Injured-Severity Unknown	SUT drivers	<500	10%
	SUT passengers	<500	2%
	Others (occupants of other vehicles, bicyclists, pedestrians)	2,000	88%
	Total unknown injury severity (6% of the 38,000 injured persons)	**2,000**	**100%**

† Estimated frequencies rounded off to the nearest thousand, may not sum to the total shown
‡ Percentages calculated prior to rounding off the estimated frequencies
Data source: GES 2011

SUTs in Injury Crashes

In 2011, an estimated 25,000 single-unit trucks were involved in injury crashes. For the majority of these vehicles (87%), the most harmful event was a collision with a motor vehicle in transport (Table 6). As compared to this event, a collision with a fixed or non-fixed object occurred in much smaller number of crashes (4% in each case). The information about crash avoidance maneuver was unknown for about 10,000 SUTs. The drivers of 28 percent of the remaining 15,000 SUTs attempted crash avoidance maneuver, while the other 72 percent did not make a maneuver. Among those who made a maneuver (about 4,000), 53 percent applied brakes, 35 percent used crash avoidance maneuver other than braking, and very few (8%) used both braking and steering. The GES 2011 data also shows that 8 percent of the SUTs involved in injury crashes rolled over.

Table 6
Crash Characteristics of SUTs Involved in Injury Crashes

Characteristic		SUTs in Injury Crashes	
		Estimated Number†	Percentage‡
SUT's Most Harmful Event	Collision with a motor vehicle in transport	22,000	87%
	Collision with a fixed object	1,000	4%
	Collision with a non-fixed object	1,000	4%
	Non-collision	1,000	5%
	Total	**25,000**	**100%**
SUT's Avoidance Maneuver	Braking (53% of 4,000)	2,000	15%
	Braking and steering (8% of 4,000)	<500	2%
	Other avoidance maneuvers (35% of 4,000)	2,000	10%
	Other actions (3% of 4,000)	<500	1%
	No avoidance maneuver	11,000	72%
	Total*	**15,000***	**100%**
Rollover Status of SUT	Rollover	2,000	8%
	No rollover	24,000	92%
	Total	**25,000**	**100%**

† Estimated frequencies rounded off to the nearest thousand, may not sum to the total shown
‡ Percentages calculated prior to rounding off the estimated frequencies
*Percentages are based on this total for which the information about SUT's avoidance maneuver is known
Data source: GES 2011

PDO Crashes Involving SUTs

As estimated from the GES 2011 data, about 3,670,000 crashes resulted in property damage only. About 2 percent of these crashes involved one or more SUTs. The single-unit truck PDO crashes involved single as well as multiple vehicles; 8 percent involved only SUTs, 85 percent involved two vehicles, and 6 percent involved three or more vehicles. The statistics in Table 7 show that the most frequently occurring first harmful event in these crashes was collision with a motor vehicle in transport (81%). Compared to the occurrence of this event, a collision with a non-fixed object was much less frequent (10%) and even less frequent was a collision with a fixed object (8%). Front-to-rear collision was the most frequent manner of collision (28%). A collision at an angle occurred in 17 percent of the PDO crashes that involved SUTs. Sideswipe of vehicles traveling in the same direction was more frequent (23%) than sideswipe in the opposite direction (6%). Front-to-front collisions were relatively rare; only 1 percent of the crashes occurred in this manner. Additionally, in 19 percent of the PDO crashes the collision was not with a motor vehicle in transport.

Table 7
First Harmful Event and Manner of Collision in PDO Crashes Involving SUTs

Characteristic		PDO SUT Crashes	
		Estimated Number†	Percentage‡
First Harmful Event in SUT Crash	Collision with motor vehicle in transport	69,000	81%
	Collision with non-fixed object	9,000	10%
	Collision with fixed object	7,000	8%
	Non-collision	1,000	1%
	Total	**86,000**	**100%**
Manner of Collision in SUT crash	Front-to-Rear	25,000	28%
	Sideswipe, same direction	20,000	23%
	Angle	14,000	17%
	Sideswipe, opposite direction	5,000	6%
	Front-to-Front	1,000	1%
	Rear-to-Rear	<500	<1%
	Not a collision with motor vehicle in transport	17,000	19%
	Other/Not Reported/ Unknown	5,000	6%
	Total	**86,000**	**100%**

† Estimated frequencies rounded off to the nearest thousand, may not sum to the total shown
‡ Percentages calculated prior to rounding off the estimated frequencies
Data source: GES 2011

Table 8
Crash Characteristics of SUTs Involved in PDO Crashes

Crash Characteristic		SUTs in PDO Crashes	
		Estimated Number†	Percentage‡
SUT's Most Harmful Event	Collision with motor vehicle in transport	71,000	82%
	Collision with a non-fixed object	9,000	10%
	Collision with a fixed object	6,000	6%
	Non-collision	1,000	1%
	Total	**87,000**	**100%**
SUT's Avoidance Maneuver	Braking	3,000	7%
	Braking and steering	1000	2%
	Steering	2,000	5%
	No avoidance maneuver	43,000	85%
	Other actions	<500	<1%
	No driver present	<500	1%
	Total*	**50,000***	**100%**
Rollover Status of SUTs	Rollover	1,000	1%
	No rollover	87,000	99%
	Total	**87,000**	**100%**

† Estimated frequencies rounded off to the nearest thousand, may not sum to the total shown
‡ Percentages calculated prior to rounding off the estimated frequencies
*Percentages are based on this total for which the information about SUT's avoidance maneuver is known
Data source: GES 2011

SUTs in PDO Crashes

The GES data shows that, in 2011, about 87,000 single-unit trucks were involved in PDO crashes. For a majority of these vehicles (82%), the most harmful event was a collision with another motor vehicle in transport (Table 8). While 10 percent experienced collision with a non-fixed object, 6 percent experienced a collision with a fixed object. For about 43 percent (37,000) of the SUTs, the avoidance maneuver was unknown. The drivers of 15 percent of the remaining 50,000 SUTs attempted crash avoidance maneuver, while the majority of the rest (85%) did not make a maneuver. Among the SUT drivers who made a maneuver, 7 percent used brakes, 5 percent used steering, and very few (2%) used both braking and steering. The data also shows that very few of the SUTs involved in PDO crashes experienced rollover (1%).

Analysis

The analysis of FARS and GES data brings out some commonalities between, fatal, injury, and PDO crashes that involved single-unit trucks. For instance, irrespective of the crash category, crashes involving SUTs were predominantly two-vehicle crashes, and rollover of SUTs was rare in these crashes. In addition, the first harmful event of the crash and the most harmful event of the SUT display similar descriptive patterns (Figure 1). In both cases, irrespective of the crash outcome (fatality, injury, or property damage only), collision with another motor vehicle in transport was the most frequently occurring event. In addition, collision with a non-fixed object, both as first harmful event and most harmful event, was the most frequently occurring event in fatal crashes, followed by PDO crashes and then injury crashes.

Along with the above-mentioned similarities among fatal, injury, and PDO SUT crashes, the data also points to some differences. For instance, while the front-to-front collision was the highest in the case of fatal crashes; the collision at an angle and front-to-rear collision were the most occurring manners of collision in injury crashes and sideswipe between vehicles traveling in the same or opposite direction was the most common in PDO crashes.

Rollover of a vehicle can occur at the first instance or as an event subsequent to its collision with a fixed or non-fixed object such as a vehicle in transport, guardrail face, signpost, animal, barrier, etc. Table 9 shows how frequently the SUT's rollover was the first harmful event in a crash. Based on the FARS 2011 data, SUTs rolled over in 159 crashes that resulted into fatalities. In the case of 35 (19%) of these, rollover occurred at the first instance, while in a majority of them (72%) SUTs

Figure 1
Comparison between first harmful and most harmful event for fatal, injury, and PDO crashes

Figure 1a
Comparison: First harmful event in the crash

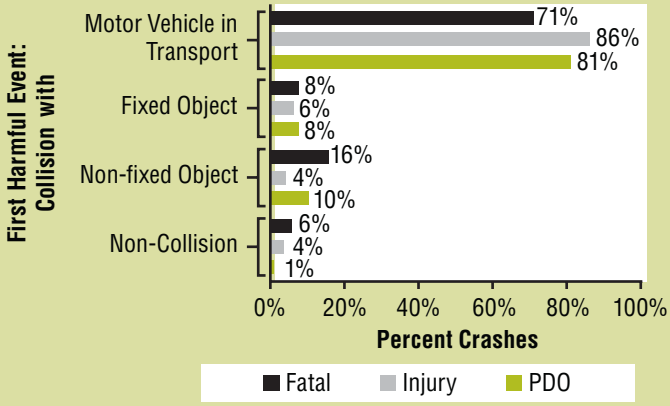


Figure 1b
Comparison: Most harmful event of the vehicle

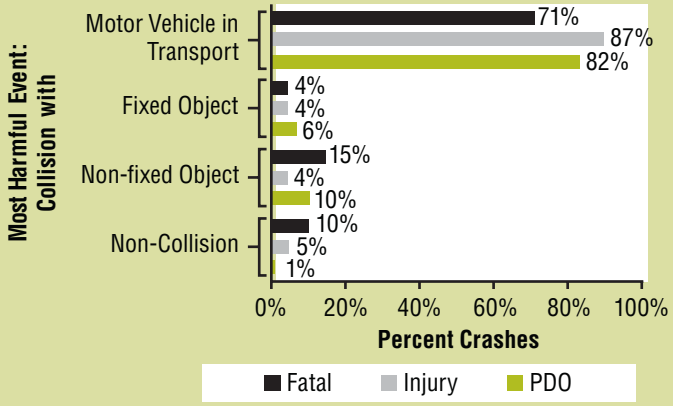
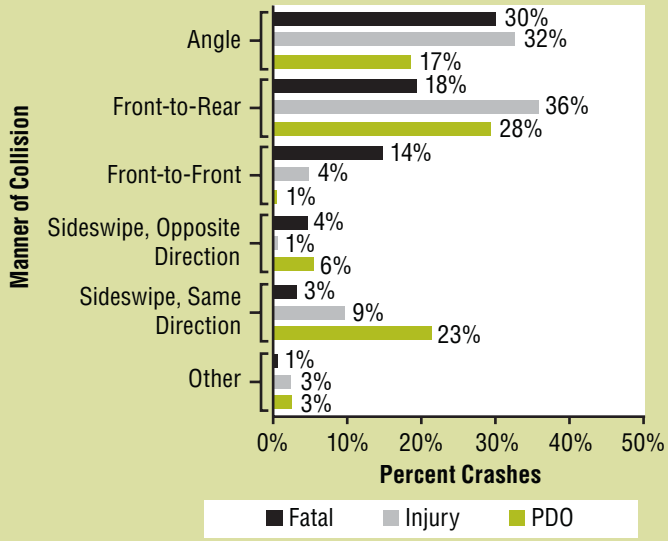


Figure 2
Comparison manners of collision in fatal, injury, and PDO crashes



rolled over after hitting other objects. According to the GES 2011 data, SUTs rolled over in about 2,000 injury crashes. Of these, rollover of the SUT was the first harmful event in 42 percent and a subsequent event in about 58 percent of the injury crashes. These data also show that rollover was the first harmful event for about 56 percent and a subsequent event for the remaining 44 percent of the 1,000 SUTs involved PDO crashes. A comparison of the statistics for the three crash types shows that rollover of an SUT, as a first harmful event, was more frequently occurring event in injury crashes and PDO crashes as compared to fatal crashes in which this event occurred subsequent to another event.

The ranking of crash events: first harmful event, most harmful event, and manner of collision based on their frequencies of occurrence in fatal, injury, and PDO crashes is presented in Table 10. This provides a broad picture of the relative likelihood of these events in the three categories of crashes (fatal, injury, and property damage only) and can provide directions for further research related to SUT crashes. For example, looking into the variation in collisions from fixed to non-fixed objects and the variation in manner of collision from angle to front-to-rear across the three categories of crashes can provide deeper insight into the occurrence of SUT crashes.

Glossary of Terms

First harmful event – the first property damage or injury producing event in the crash.

Most harmful event – the most severe property damage or injury producing event for the vehicle.

Manner of collision – the orientation of the vehicles in a collision, if a non-collision, it is classified as such.

Rollover – a vehicle's rotation of 90 degrees or more about any true longitudinal or lateral axis.

Avoidance maneuver – describes the actions taken by the driver of the vehicle in response to the impending danger.

Motor vehicle in transport – refers to a motor vehicle on a roadway or in motion within or outside the traffic way, as defined in Manual on Classification of Motor Vehicle Traffic Accidents, 7th Edition. Both GES and FARS use the term "motor vehicle in transport" in this context.

Table 9
Rollover as the First Harmful Event in Fatal, Injury, and PDO Crashes

Rollover as	STAT.	SUTs in		
		Fatal Crashes	Injury Crashes	PDO Crashes
First harmful event	N•	35	1,000†	<1,000†
	%	19%	42%‡	56%‡
Subsequent event	N•	124	<1,000†	<500†
	%	71%	58%‡	44%‡
Total	N•	159	2,000†	1,000†
	%	100%	100%	100%

N• Count (fatal) or estimated frequency (Injury and PDO)
† Estimated frequencies rounded off to the nearest thousand, may not sum to the total shown
‡ Percentages (based on the total for which the relevant information about SUT's is known) calculated prior to rounding of the estimated frequencies
Data source: FARS 2011, GES 2011

For More Information

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Table 10
Frequency-Based Ranking of Crash Events in SUTs Involved in Fatal, Injury, and PDO Crashes

Crash characteristic	Rank	Crash classification		
		Fatal SUT Crashes	Injury SUT Crashes	PDO SUT Crashes
First harmful event: collision	1	with a motor vehicle in transport	with a motor vehicle in transport	with a motor vehicle in transport
	2	with a non-fixed object	with a fixed object	with a non-fixed object
	3	with a fixed object	with a non-fixed object	with a fixed object
	4	non-collision	non-collision	non-collision
Most harmful event: collision	1	with motor vehicle in transport	with motor vehicle in transport	with motor vehicle in transport
	2	with a non-fixed object	with a fixed object	with a non-fixed object
	3	non-collision	with a non-fixed object	with a fixed object
	4	with a fixed object	non-collision	non-collision
Manner of collision	1	Angle	Front-to-rear	Front-to-rear
	2	Front-to-rear	Angle	Sideswipe, same direction
	3	Front-to-front	Front-to-front	Angle
	4	Sideswipe, opposite direction	Sideswipe, same direction	Sideswipe, opposite direction
	5	Sideswipe, same direction	Sideswipe, opposite direction	Front-to-front

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