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Passenger Vehicle Occupant Fatalities: The Decline for Six Years in a Row From 2005 To 2011

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Abstract For six years in a row, the overall number of motor vehicle fatalities in the United States declined, from 43,510 in 2005 to 32,367 in 2011, a drop of 26 percent. During this time period, the number of passenger car (PC) occupant fatalities declined every year, from 18,512 in 2005 to 11,981 in 2011, a drop of 35 percent, and the number of light truck/van (LTV) occupant fatalities declined every year, from 13,037 in 2005 to 9,272 in 2011, a drop of 29 percent. This report examines data from the Fatality Analysis Reporting System. Passenger vehicles (PVs) consist of PCs and LTVs. The decline in PV occupant fatalities can be better understood by examining six fatal crash types. These six types of PV occupant fatal crashes consist of two groups of single-vehicle (SV) crashes (SV PC, SV LTV), three groups of two-vehicle crashes (PC-PC, LTV-LTV, and PC-LTV), and 3+ PV crashes. These crash types each experienced large drops in fatalities from 2005 to 2011, ranging from 25 percent and 32 percent for SV LTV and SV PC fatalities respectively, to between 35 and 39 percent for each of the three different two-vehicle crash types, and up to 43 percent for fatalities in 3+ vehicle fatal crashes. For each of the six crash groups, many factors are examined, including occupant age, seat position, vehicle body type, restraint use, ejection, crash location, crash time, alcohol-impaired driving, rollover, road type, manner of collision, and more. The percentage decline in PV occupant fatalities since 2005 was higher for age groups <16 (46%), 16 to 20 (43%) and 35 to 34 (41%), and lower for groups 45 to 64 (27%) and 65+ (22%). Driver fatalities declined by 30 percent compared to the 39 percent decline in passenger fatalities. Van occupant fatalities dropped by 46 percent, compared to the decline in fatalities to occupants of passenger cars (36%), pickups (30%) and SUVs (21%). The 37 years of FARS data since 1975 shows that the largest fatality declines coincided with the three biggest recessions in the United States economy (1980-1982, 1990-1991, 2007-2009). From 1975 to 2011, of the 10 largest annual percentage declines in PC occupant fatality rates per VMT, 8 of them occurred either during or immediately following a recession. Similarly, of the 8 largest annual percentage declines in LTV occupant fatality rates per VMT, 6 of them occurred either during or immediately following a recession. Many important safety improvements to roadways (e.g., improved lighting, rumble strips), vehicles (e.g., air bags, electronic stability control) and occupant behavior (e.g., restraint use, reduced alcohol-impaired driving, moving children to the back seat) contributed to the occupant fatality reduction. This report does not focus on estimating the relative magnitude of these safety improvements.					
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Executive Summary

This report examines the decline in motor vehicle fatalities from 2005 to 2011, with the focus being on changes in passenger vehicle fatalities over that time period. Passenger vehicles (PVs) consist of four vehicle categories: passenger cars (PC), pickup trucks, sport utility vehicles (SUVs), and vans. The categories of pickup trucks, SUVs, and vans together make up the vehicle category of “light trucks and vans” (LTV). The focus of this report is the PC and LTV vehicle groups. During the 2005-2011 time-period, the number of passenger car occupant fatalities declined every year, from 18,512 in 2005 to 11,981 in 2011, a drop of 35 percent, and the number of light truck/van occupant fatalities declined every year, from 13,037 in 2005 to 9,272 in 2011, a drop of 29 percent.

Ninety-two percent of the overall motor vehicle fatality decline from 2005 to 2011 (11,143 fewer fatalities) consisted of the drop in PV occupant fatalities (10,296). Six different PV crash types, which together represent roughly 90 percent of the 10,296 PV occupant fatalities during this time period, are examined in this report. This report uses crash data from the Fatality Analysis Reporting System (FARS) to identify areas of significant change.

The six distinct groups of fatally injured occupants on which this report focuses are: (1) PC occupants in single-vehicle crashes (SV PC), and (2) LTV occupants in SV crashes (SV LTV), (3) occupants in crashes between two PCs (PC-PC), (4) occupants in crashes between two LTVs (LTV-LTV), (5) occupants in crashes between a PC and a LTV (PC-LTV), and 6) PV occupants in 3+ vehicle PV crashes.

These six crash types were used for this report to display differences seen between single-vehicle and multivehicle crashes, PCs and LTVs, as well as vehicle compatibility issues. For example, electronic stability control is more effective at preventing SV crashes, while manner of collision plays a larger role in multivehicle crashes and vehicle compatibility. For each of the six crash groups, many factors are examined, including occupant age, seat position, vehicle body type, restraint use, ejection, crash location, crash time, alcohol-impaired driving, rollover, and road type.

The findings in this report can be viewed from two different perspectives. First and foremost, comparing the variety of percentage declines from 2005 to 2011 allows for a quick comparison of fatality reductions during this time period. For example, SV PC fatalities among occupants younger than 16 dropped 49 percent from 2005 to 2011, while SV LTV fatalities among occupants 65 or older dropped less than 1 percent. Second, comparing the magnitude of the fatality counts of the six crash types provides information on the prevalence of certain types of fatalities. For example, out of the 5,224 ejected fatalities in the six crash types in 2011, the high majority were either SV PC (1,763) or SV LTV (2,583), with only 878 combined from the other four crash types.

Table 1 below shows the 2005 and 2011 fatality counts for each of the six crash types and their percentage decline from 2005 to 2011. SV PC and SV LTV fatalities fell 32 and 25 percent respectively from 2005 to 2011. Among each of the three two-vehicle crash types (PC-PC, LTV-LTV, and PC-LTV), the decline in occupant fatalities was from 35 to 39 percent. The 3+ vehicle PV fatalities dropped 43 percent. The sum of these six crash groups is displayed in the “Sub-Total” row, and these six groups are the focus of this report.

Table 1: Passenger Vehicle Occupant Fatalities, by Crash Type, 2005-2011

Crash Type	2005	2011	% Decline
SV PC	8,136	5,557	32%
SV LTV	7,707	5,764	25%
Two-Vehicle PC-PC	2,600	1,585	39%
Two-Vehicle LTV-LTV	1,874	1,219	35%
Two-Vehicle PC-LTV	5,247	3,258	38%
3+ Vehicle PV	2,756	1,583	43%
SUB-TOTAL	28,320	18,966	33%
Other	3,229	2,287	29%
TOTAL	31,549	21,253	33%

Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File

Note that two-vehicle crashes involving “other” vehicle types (e.g., a motorcycle-LTV crash, or a large-truck-PC crash) are not included in these six groups. Fatalities from these “Other” crashes are listed in the next-to-last row of Table 1.

The percentage decline in PV occupant fatalities since 2005 was higher for age groups <16 (46%), 16 to 20 (43%) and 35 to 44 (41%), and lower for groups 45 to 64 (27%) and 65+ (22%). Driver fatalities declined by 30 percent compared to the 39-percent decline in passenger fatalities. Van occupant fatalities dropped by 46 percent, compared to the decline in fatalities to occupants of passenger cars (36%), pickups (30%) and SUVs (21%). Fatalities on interstate highways dropped more (38%) than fatalities on local roads (26%).

Of the 10 largest annual percentage declines in PC occupant fatality rates per VMT during the 37 years of FARS data collection, 8 of them (1981-1983, 1991-1992, and 2008-2010) occurred either during or immediately following recessions. The three largest annual percentage declines were 1982 (14.3%), 2008 (10.1%), and 2009 (9.5%), each occurring during a recession. Similarly, of the 8 largest annual percentage declines in LTV occupant fatality rates per vehicle miles traveled (VMT), 6 of them (1981-1983, 1992, 2008, and 2010) occurred either during or immediately following recessions. The three largest were 2008 (23.1% decline), 1982 (18.4% decline), and 1992 (18.5% decline), each occurring during a recession.

In addition to the relationship between economic recessions and passenger vehicle fatality rate declines, a relationship is also seen between high gas prices and passenger vehicle fatality rate declines. The calendar years 1980, 1981, 1982, 2006, 2007, 2008, 2010, and 2011 are the only years since 1976 where gas had average prices above \$2.95/gallon (in 2013 dollars), and these years include many of the largest declines in PC and LTV fatalities seen since 1975.

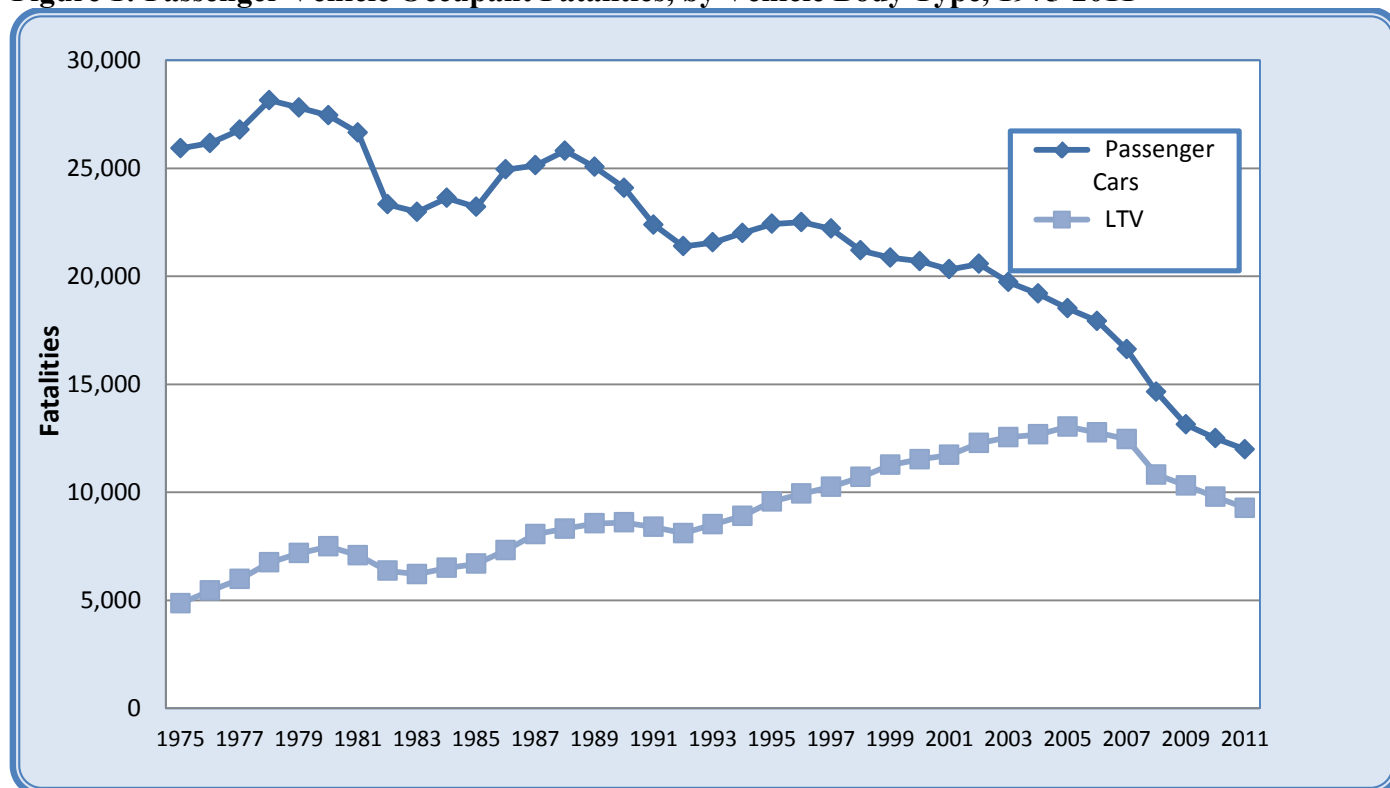
This report does not analyze all passenger vehicle drivers in the United States, but merely analyzes the characteristics and circumstances around fatal crashes involving such drivers.

Background and Introduction

Passenger Vehicle Occupant Fatality Counts and Rates, 1975-2011

Figure 1 below shows the trend in PV occupant fatalities from 1975 to 2011. While the number of PC occupant fatalities dropped from 25,929 in 1975 to 11,981 in 2011, a drop of 54 percent, the number of LTV fatalities rose from 4,856 in 1975 to 9,272 in 2011, an increase of 91 percent. In 1975, there were 94.5 million registered PCs (82%) and 20.9 million registered LTVs (18%). By 2011, there were 134.5 million PCs (56%) and 103.6 million LTVs (44%). The number of PC and LTV fatalities has each dropped every year since 2005.

Figure 1: Passenger Vehicle Occupant Fatalities, by Vehicle Body Type, 1975-2011

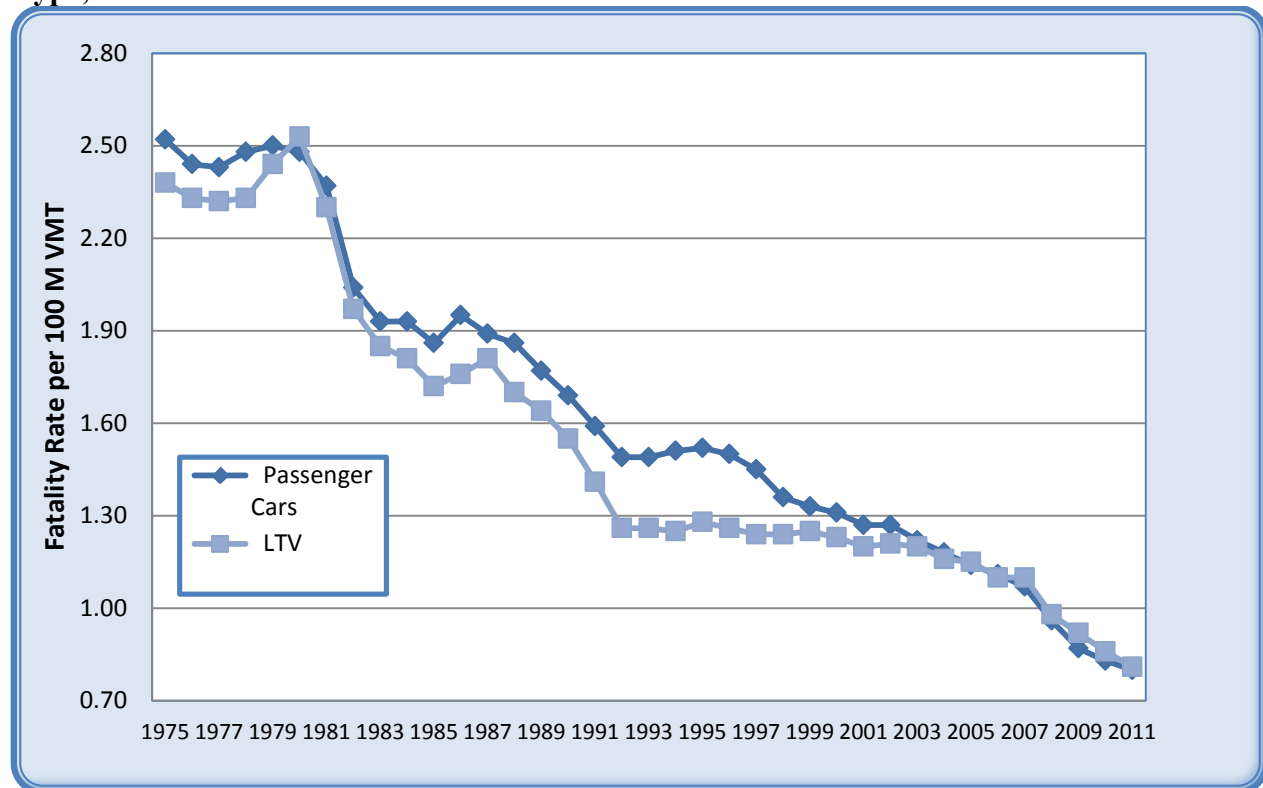


Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File

While Figure 1 displays the trend in the number of PC and LTV fatalities since 1975, Figure 2 shows the corresponding PC and LTV fatality rates per 100 M VMT during that time period. The fatality rates per 100 M VMT dropped for both PCs and LTVs by roughly two-thirds from 1975 to 2011, with PCs going from 2.52 down to 0.80 and LTVs falling from 2.38 down to 0.81. These fatality rates remained close together over this time period, with PCs having higher rates for most of the years. Since 2003, the two rates have remained close together, with LTVs having slightly higher fatality rates for the last five years since 2007.

The overall motor vehicle fatality rate per 100 M VMT fell from 3.35 in 1975 down to 1.10 in 2011, also a drop of roughly two-thirds. This overall fatality rate is higher than the individual PC and LTV fatality rates shown in Figure 2 primarily due to the higher fatality rates of motorcycles.

Figure 2: Passenger Vehicle Occupant Fatality Rate per 100 M VMT, by Vehicle Body Type, 1975-2011



Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File

The passenger vehicle occupant fatality counts and rates from 1975 to 2011 that were used to produce Figures 1 and 2 are listed in the Appendix.

Since 1975, the first year of data collection in the FARS database, many traffic safety improvements have occurred. The largest contributors to saving lives in passenger vehicle crashes include, but are not limited to, the following:

- Decrease from 1982 to 1995 in the percentage of fatal crashes that were alcohol-related (Dang, 2008), due to:
 - Minimum-legal-drinking-age laws;
 - .10 grams per deciliter and .08 g/dL blood alcohol concentration (BAC) laws;
 - the decreasing proportion of population age 18-34 from 1982 to 1999;
 - this represents a demographic that consumes more alcohol on average;
 - the increased proportion of female drivers from 1982 to 1997;
 - this represents a demographic that consumes less alcohol on average.
- Formation of grassroots organizations like Mothers Against Drunk Driving;
- Changes in cultural attitudes about drinking and driving;
- Increase in occupant restraint use. Seat belt use has increased steadily since 1975. Contributors to this increase include the passage of primary seat belt laws, placement of seat belts in front and rear seating positions, and campaigns such as *Click It or Ticket*;
- Vehicle improvements, including but not limited to frontal air bags, side air bags, electronic stability control, roof strength, ejection mitigation, and seat belt pretensioners;

- Roadway/environmental improvements, including but not limited to better lighting, rumble strips, more medians, better roadway lighting, and automated collision notification.

The Association Between Recessions and Annual Declines in Fatality Rate per 100 M VMT: 1975-2011

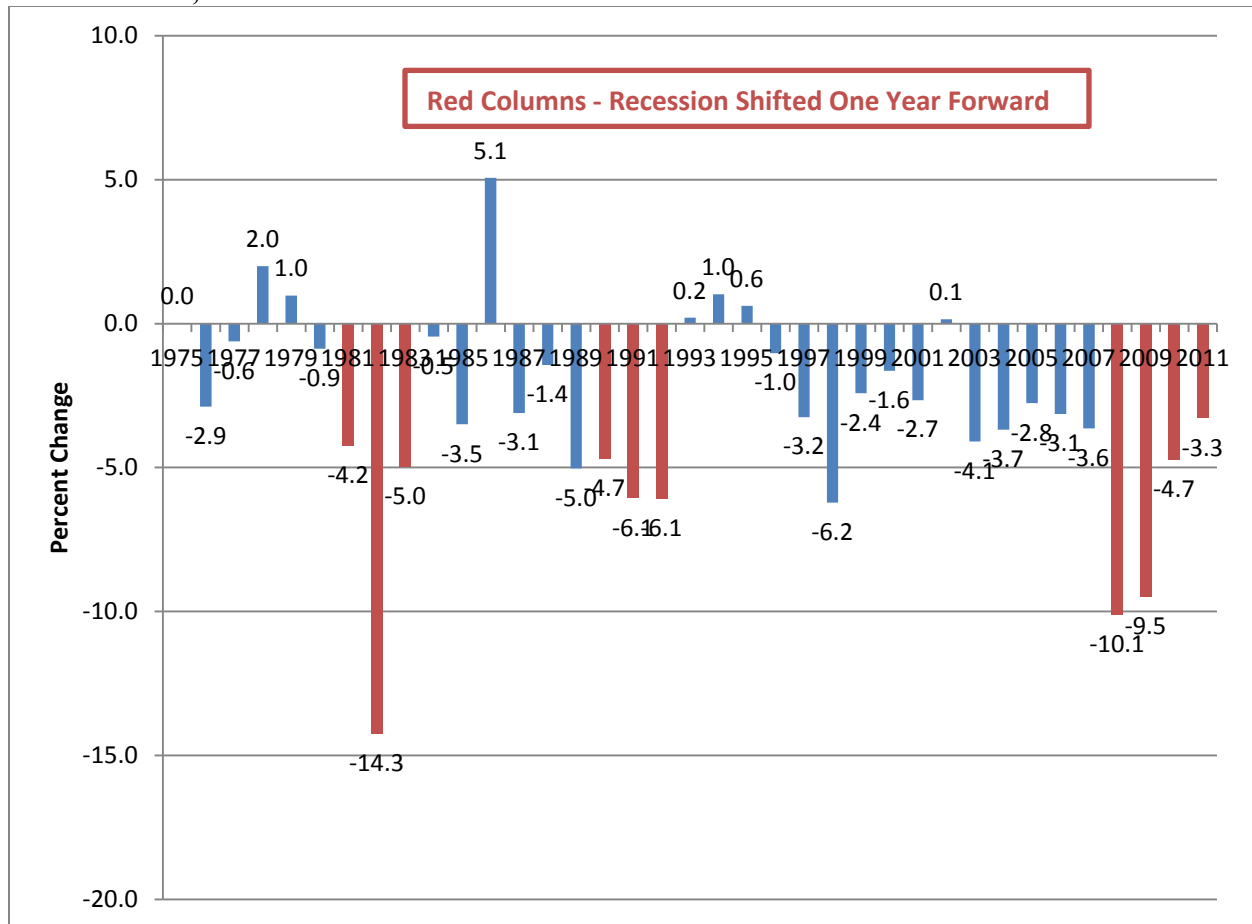
NHTSA fatality data from FARS shows that the largest declines in fatalities (Figure 1), and fatality rates per 100 million VMT (Figure 2), occurred in the early 1980s, early 1990s, and late 2000s. These declines coincided with the three biggest recessions (1980-1982, 1990-1991, 2007-2009) in the United States economy since 1975.

Figures 3 and 4 below show the annual percentage changes in PC and LTV occupant fatality rates per VMT. Note that in Figures 3 and 4, the bars represent the percentage changes in annual occupant fatality rates. A negative bar, reaching below the x-axis, shows that a decline in fatality rates occurred. These declines represent a large majority of the bars in Figures 3 and 4. A positive bar, shown above the x-axis, shows that an increase in fatality rates occurred. The lower the bar is for any calendar year, the larger the percentage decline is from the previous year. The bars shown in red represent the years during which these three largest recessions since 1975 occurred, with a shift of one year forward.

Of the 10 largest annual percentage declines in PC occupant fatality rates per VMT during the 37 years of FARS data collection on fatal crashes, 8 of them (1981-1983, 1991-1992, 2008-2010) occurred either during or immediately following recessions. The other 2 of the 10 largest declines occurred in 1989 and 1998. Each of these declines was 4.2 percent or more. The 3 largest were 1982 (14.3% decline), 2008 (10.1% decline), and 2009 (9.5% decline), each occurring during a recession. See Figure 3 for details.

Similarly, of the 8 largest annual percentage declines in LTV occupant fatality rates per VMT during the 37 years of FARS data collection on fatal crashes, 6 of them (1981-1983, 1992, 2008, 2010) occurred either during or immediately following a recession. The other two of the 8 largest declines occurred in 1985 and 1989. Each of these declines was 8.4 percent or larger. The three largest were 2008 (23.1% decline), 1982 (18.4% decline), and 1992 (18.5% decline), each occurring during a recession. See Figure 4 for details.

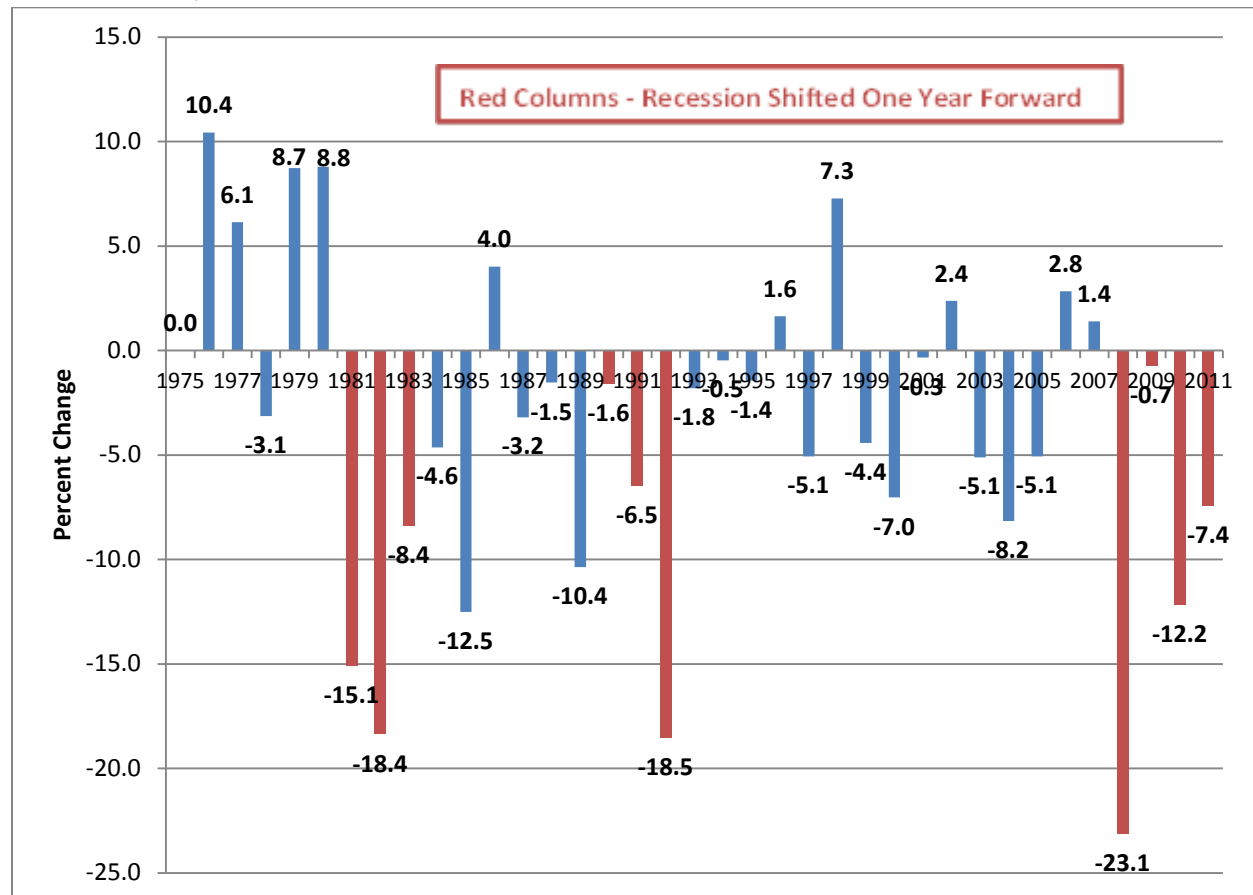
Figure 3: Percent Change, From Previous Year, in PC Occupant Fatality Rate per 100 Million VMT, 1975-2011



Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File, VMT- Federal Highway Administration

Note: The bars shown in red represent the years during which the three largest recessions since 1975 occurred, with a shift of one year forward.

Figure 4: Percent Change, From Previous Year, in LTV Occupant Fatality Rate per 100 Million VMT, 1975-2011



Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File, VMT- Federal Highway Administration

Note: The bars shown in red represent the years during which the three largest recessions since 1975 occurred, with a shift of one year forward

In addition to the positive correlation between economic recessions and annual passenger vehicle fatality rate declines, a positive correlation is also seen between high gas prices and passenger vehicle fatality rate declines.

The US Energy Information Administration (EIA) recorded data on the price of gas, in 2013 dollars, for calendar years since 1976. (www.eia.gov/forecasts/steo/realprices/) The calendar years 1980, 1981, 1982, 2006, 2007, 2008, 2010, 2011 are the only years since 1976 where gas had average prices above \$2.95/gallon. These years coincide with many of the largest declines in PC and LTV fatality rates, as shown in Figures 3 and 4.

Data and Methodology

Fatal crash data from FARS for calendar years 1975 through 2011 was used for the Background and Introduction section of this report, while the remainder of the report focuses on FARS 2005 through 2011 data.

The Results: 2005-2011 section of the report consists of two subsections. First is the Motor Vehicle Occupant and Nonoccupant Fatalities, 2005-2011 subsection, which looks at all FARS data from 2005 through 2011; second is Six Crash Groups Examined in This Report.

After the Results: 2005-2011 section is the Results: By Crash Variable section, which examines the six crash groups, by many independent variables, and is described below in this Data and Methodology section.

In order to assist with coding changes in FARS over time, variables existing in the FARS Auxiliary files were used in the high majority of the modeling in this report. Information on these Auxiliary files as well as information about the entire FARS database are available at www-nrd.nhtsa.dot.gov/Cats/listpublications.aspx?Id=J&ShowBy=DocType. These Auxiliary files consist of variables derived from the FARS database that aggregate specific variable categories (e.g., combining the variety of unique rural and urban road type categories into either “rural” or “urban” roads, or combining all various types of restraint use into a FARS definition of “restrained” or “unrestrained”). These Auxiliary files also adjust for changes in FARS variables over the different years that FARS data has been collected (e.g., a change in the FARS categories of restraint use between the FARS 2010 files and FARS 2011 files).

The report looks separately at many types of crashes where a passenger vehicle occupant was fatally injured. The first level of stratification was the following three groups of passenger vehicle crashes: single-vehicle (SV) crashes, two-vehicle crashes, and crashes involving three or more (3+) vehicles. Among SV crashes, the report compares trends of PC occupants in SV crashes, and LTV occupants in SV crashes. Occupant fatalities from two-vehicle passenger vehicle crashes were stratified into the following three categories: two-vehicle fatal crashes involving two PCs, referred to as PC-PC, two-vehicle fatal crashes involving one PC and one LTV, referred to as PC-LTV, and two-vehicle fatal crashes involving two LTVs, referred to as LTV-LTV. The last group of fatally injured PV occupants is from 3+ vehicle fatal crashes where three or more total vehicles, including at least one PV, were in the crash.

Smaller sample size of potential subgroups prevented these fatalities from being separated based on the number of PCs and LTVs that were involved in the 3+ vehicle crashes. Examples of 3+ vehicle crashes are a 3-vehicle crash between one LTV, one PC, and one motorcycle, or a 4-vehicle crash between one LTV, two large trucks, and one bus. Only PV occupants, and not occupants of other vehicles types, are included in the 3+ vehicle PV occupant counts. Also note that two-vehicle crashes involving “other” vehicle types, such as a motorcycle-LTV crash, or a large-truck-PC crash, are not included in these six groups.

Therefore, the passenger vehicle occupant fatalities included in the six crash groups are:

- SV PC occupants,
- SV LTV occupants,
- PC-PC two-vehicle crash occupants,

- PC-LTV two-vehicle crash occupants,
- LTV-LTV two-vehicle crash occupants, and
- PV Occupants in 3+ vehicle crashes.

These six crash types were used for this report to display differences seen between single-vehicle and multivehicle crashes, PCs and LTVs, as well as vehicle compatibility issues. For example, electronic stability control is more effective at preventing SV crashes, while manner of collision plays a larger role in vehicle compatibility in multivehicle crashes.

In the Results: By Crash Variable section of this report, individual crash factors (occupant age, occupant restraint use, crash location, crash type, etc.) and their trends from 2005 to 2011 in the above six crash types will be discussed.

Passenger vehicle occupants killed in fatal crashes involving a pedestrian or pedalcyclist were removed from this study; this removal of crashes makes a small reduction in the passenger vehicle fatality counts. Few passenger vehicle occupants are killed in a fatal crash where a pedestrian or pedalcyclist are struck, as the fatalities in these crashes consist mostly of the pedestrians or pedalcyclists.

FARS contains data on a census of fatal traffic crashes from the 50 States, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle travelling on a trafficway customarily open to the public and result in the death of a person (occupant of a vehicle or a non-occupant) within 30 days of the crash. FARS fatalities include occupants of passenger vehicles, large trucks, buses, and motorcycle occupants, as well as occupants of other/unknown vehicle categories, as well as pedestrians, pedalcyclists, and other/unknown types of non-occupants. These broad person-type categories make up all motor vehicle fatalities included in the FARS database.

Results: 2005-2011

While the Background and Introduction section examined trends from 1975 through 2011, the remainder of this report focuses on the recent seven-year period of 2005 through 2011.

The **Results: 2005-2011** section includes two subsections:

- **Motor Vehicle Occupant and Nonoccupant Fatalities, 2005-2011**
- **Six Crash Groups Examined in This Report**

Motor Vehicle Occupant and Nonoccupant Fatalities, 2005-2011

A summary of motor vehicle fatality counts for this seven-year period is displayed below in Table 2. Note that Table 2 includes all motor vehicle fatalities for 2005 through 2011, and thus includes fatalities that are not part of the six crash groups examined later in this report.

The far right columns of Table 2 show the number change and percent change in fatalities comparing the years 2005 and 2011. This information is shown for all vehicle occupant groups and nonoccupant groups commonly measured by NHTSA.

The first Results subsection also includes overall PC and LTV occupant fatality counts (Figure 5, with counts shown in Table 2), PC and LTV occupant fatality rates per VMT (Figure 6 and Table 3), as well as occupant fatality counts of the three categories of LTV vehicles: pickups, SUVs, and vans (Figure 7, with counts shown in Table 2). These Figures and Tables comprise the Motor Vehicle Occupant and Nonoccupant Fatalities, 2005-2011 subsection of the Results: 2005-2011.

The other subsection of the Results: 2005-2011 section, starting on page 19, is titled Six Crash Groups Examined in This Report. This subsection shows fatality trends from 2005 through 2011 in the six crash groups on which this report focuses, as displayed in the Executive Summary.

Table 2: Motor Vehicle Occupant and Nonoccupant Fatalities, 2005-2011

	2005	2006	2007	2008	2009	2010	2011	2005 to 2011 # Change	% Change
Occupants									
Passenger Cars	18,512	17,925	16,614	14,646	13,135	12,491	11,981	-6,531	-35%
Light Trucks									
Pickups	6,067	5,993	5,847	5,097	4,801	4,486	4,256	-1,811	-30%
SUVs	4,831	4,928	4,834	4,214	4,104	3,942	3,871	-960	-20%
Vans	2,112	1,815	1,764	1,492	1,396	1,346	1,128	-984	-47%
Others	27	25	13	13	11	8	17	-10	-37%
Total: Light Trucks	13,037	12,761	12,458	10,816	10,312	9,782	9,272	-3,765	-29%
Total: Passenger Vehicles	31,549	30,686	29,072	25,462	23,447	22,273	21,253	-10,296	-33%
Large Trucks	804	805	805	682	499	530	635	-169	-21%
Buses	58	27	36	67	26	44	54	-4	-7%
Motorcycles	4,576	4,837	5,174	5,312	4,469	4,518	4,612	36	1%
Other/Unknown Vehicle	659	601	614	580	554	524	506	-153	-23%
Total: Occupants	37,646	36,956	35,701	32,103	28,995	27,889	27,060	-10,586	-28%
Nonoccupants									
Pedestrian	4,892	4,795	4,699	4,414	4,109	4,302	4,432	-460	-9%
Pedalcyclist	786	772	701	718	628	623	677	-109	-14%
Other/Unknown Nonocc	186	185	158	188	151	185	198	12	6%
Total: Nonoccupants	5,864	5,752	5,558	5,320	4,888	5,110	5,307	-557	-9%
Total: Fatalities	43,510	42,708	41,259	37,423	33,883	32,999	32,367	-11,143	-26%

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

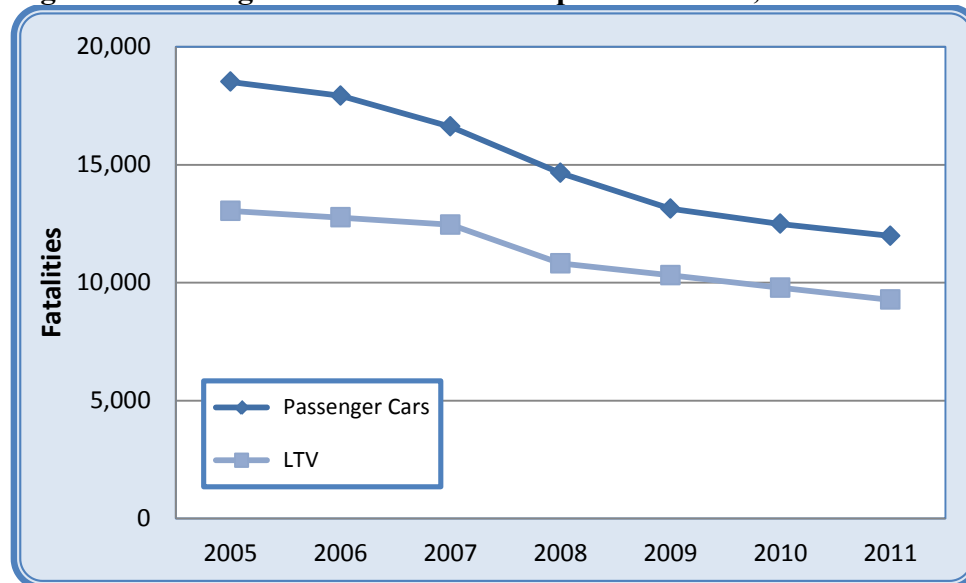
For six years in a row, the overall number of motor vehicle fatalities in the United States declined, from 43,510 in 2005 to 32,367 in 2011, a cumulative drop of 26 percent. During this time-period, the number of PC occupant fatalities declined every year, from 18,512 in 2005 to 11,981 in 2011, a drop of 35 percent, and the number of LTV occupant fatalities declined every year, from 13,037 in 2005 to 9,272 in 2011, a drop of 29 percent. These PC and LTV fatality declines are shown in Table 2 above and Figure 5 below. The largest drop in PC and LTV fatalities occurred from 2007 to 2008.

Motorcycle fatalities decreased by 843 (16%) from 5,312 in 2008 down to 4,469 in 2009. However, the number of motorcycle fatalities increased every other year from 2005 to 2011, resulting in an overall 1 percent increase in fatalities from 2005 to 2011. Motorcyclist fatalities were the only major category of fatalities to show an overall increase from 2005 to 2011.

Large truck fatalities declined 21 percent, from 804 in 2005 to 635 in 2011. From 2007 to 2009 during the period of the recession, large-truck fatalities dropped 38 percent, from 805 down to 499.

Pedestrian fatalities dropped 16 percent, from 4,892 in 2005 to 4,109 in 2009, and then rose to 4,432 in 2011, an increase of 8 percent. The total decline in pedestrian fatalities from 2005 to 2011 was 9 percent. Pedalcyclist fatalities dropped 14 percent, from 786 in 2005 to 677 in 2011. The largest drop for both pedestrian and pedalcyclist fatalities occurred from 2008 to 2009.

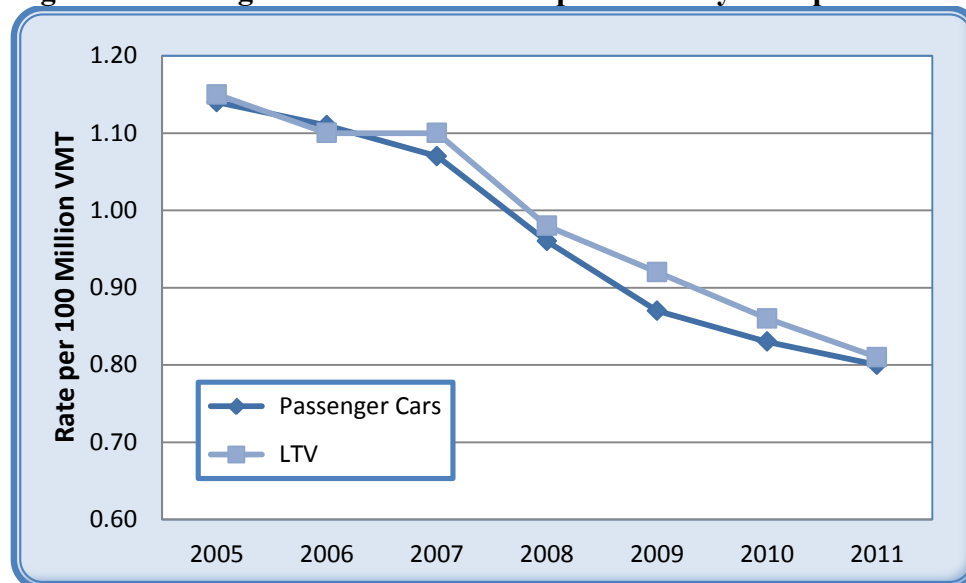
Figure 5: Passenger Car and LTV Occupant Fatalities, 2005-2011



Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Figure 6 and Table 3 show that the PC occupant fatality rate per 100 million VMT declined 30 percent from 1.14 in 2005 to 0.80 in 2011, and the LTV occupant fatality rate per 100 million VMT declined 30 percent from 1.15 in 2005 to 0.81 in 2011. The largest drop occurred from 2007 to 2008 for both PC and LTV. Between these two years, the PC occupant fatality rate fell 10 percent from 1.07 to 0.96, and the LTC occupant fatality rate fell 11 percent from 1.10 to 0.98.

Figure 6: Passenger Car and LTV Occupant Fatality Rate per 100 M VMT, 2005-2011



Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File, VMT- Federal Highway Administration

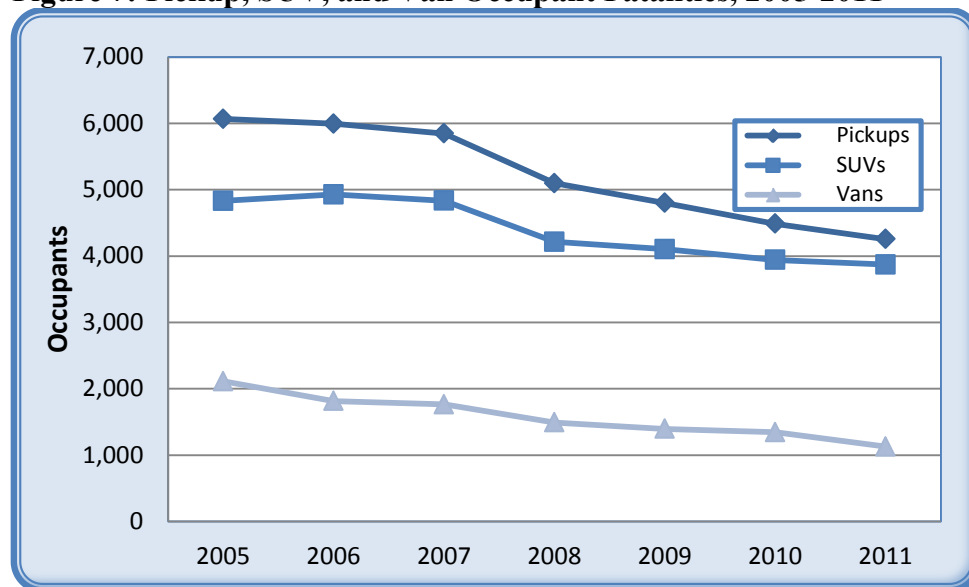
Table 3: Passenger Car and LTV Occupant Fatality Rate per 100 M VMT, 2005-2011

	2005	2006	2007	2008	2009	2010	2011
Passenger Cars	1.14	1.11	1.07	0.96	0.87	0.83	0.80
LTV	1.15	1.10	1.10	0.98	0.92	0.86	0.81

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File, VMT- Federal Highway Administration

The LTV vehicle group consists of three main categories: pickups, SUVs, and vans. All three of these vehicle types showed declines in occupant fatalities from 2005 to 2011. Figure 7 displays these LTV fatality trends. Pickup occupant fatalities dropped 30 percent, from 6,067 in 2005 to 4,256 in 2011; SUV occupant fatalities dropped 20 percent, from 4,831 in 2005 to 3,871 in 2011; and van occupant fatalities dropped 47 percent, from 2,112 in 2005 to 1,128 in 2011. The largest drop for pickups and SUVs occurred from 2007 to 2008, while the largest drop for vans occurred from 2005 to 2006.

Figure 7: Pickup, SUV, and Van Occupant Fatalities, 2005-2011



Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Six Crash Groups Examined in This Report

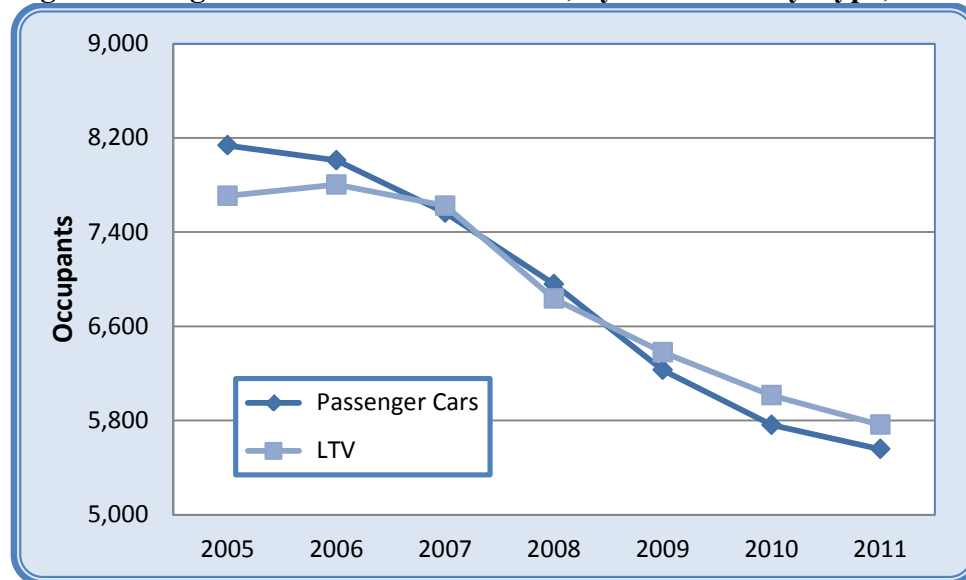
Six different PV crash types, which together represent roughly 90 percent of the PV occupant fatalities during this time period, are summarized in this section of the report. The overall change in fatality counts from 2005 to 2011 for these crash types is shown below in the first six rows of Table 4.

Table 4: Passenger Vehicle Occupant Fatalities, by Crash Type, 2005-2011			
Crash Type	2005	2011	% Decline
SV PC	8,136	5,557	32%
SV LTV	7,707	5,764	25%
Two-Vehicle PC-PC	2,600	1,585	39%
Two-Vehicle LTV-LTV	1,874	1,219	35%
Two-Vehicle PC-LTV	5,247	3,258	38%
3+ Vehicle PV	2,756	1,583	43%
SUB-TOTAL	28,320	18,966	33%
Other	3,229	2,287	29%
TOTAL	31,549	21,253	33%
Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File			

Figure 8 shows the trends in SV PC fatalities and SV LTV fatalities from 2005 through 2011. Figure 9 shows the trends in the three two-vehicle fatal crash groups (PC-PC, LTV-LTV, and PC-LTV). Figure 10 shows the trends in the 3+ vehicle PV crash group.

SV PC and SV LTV fatalities fell 32 and 25 percent respectively from 2005 to 2011, with their largest drop occurring from 2007 to 2009, during the recession (see Figure 8 and Table 5). From 2005 to 2011, SV PC fatalities declined from 8,136 to 5,557 and SV LTV fatalities fell from 7,707 to 5,764.

Figure 8: Single-Vehicle Crash Fatalities, by Vehicle Body Type, 2005-2011



Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Table 5: Single-Vehicle Crash Fatalities, by Vehicle Body Type, 2005-2011

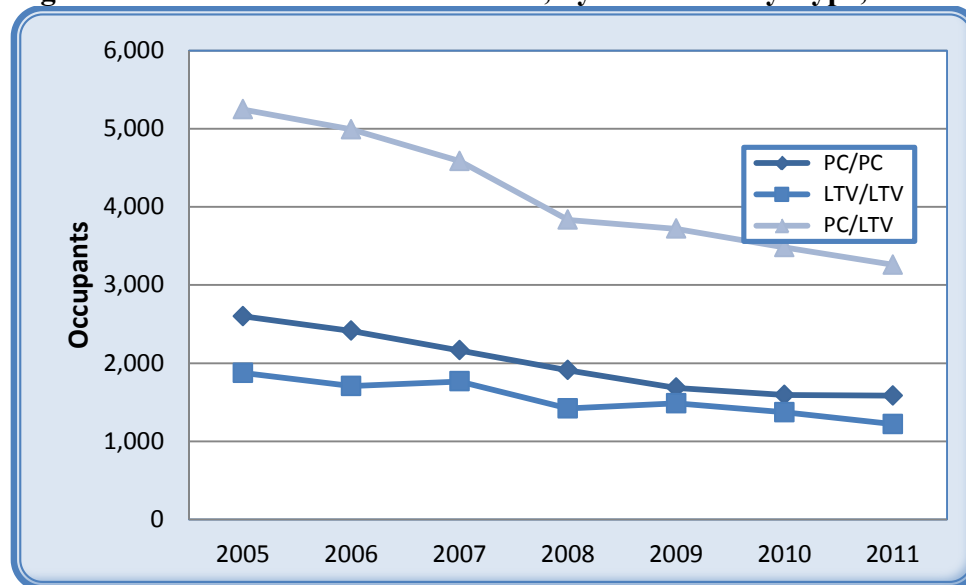
	2005	2006	2007	2008	2009	2010	2011
Passenger Cars	8,136	8,009	7,564	6,958	6,228	5,762	5,557
LTV	7,707	7,803	7,623	6,834	6,379	6,014	5,764

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Figure 9 and Table 6 display trends in two-vehicle crashes between PCs and LTVs. Among each of the three crash types (PC-PC, LTV-LTV, and PC-LTV), the decline in occupant fatalities was from 35 to 39 percent. Each crash type showed their largest fatality decline from 2007 to 2008.

Among PC-PC fatalities, the decline of 254 fatalities from 2007 to 2008 was similar to the decline of 250 from 2006 to 2007. While LTV-LTV fatalities declined by 655 from 2005 to 2011, over half of that 6-year decline occurred in 1 year, from 2007 to 2008. PC-LTV fatalities dropped by 1,413 from 2005 to 2008, compared to a drop of 576 from 2008 to 2011.

Figure 9: Two-Vehicle Crash Fatalities, by Vehicle Body Type, 2005-2011



Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

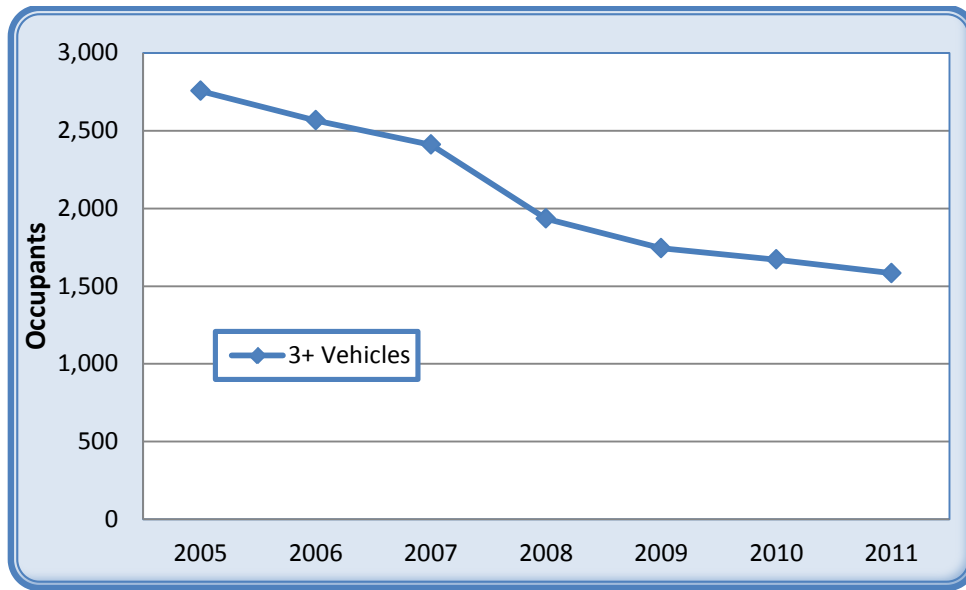
Table 6: Two-Vehicle Crash Fatalities, by Vehicle Body Type, 2005-2011

	2005	2006	2007	2008	2009	2010	2011
PC/PC	2,600	2,414	2,164	1,910	1,684	1,592	1,585
LTV/LTV	1,874	1,707	1,767	1,421	1,487	1,372	1,219
PC/LTV	5,247	4,991	4,585	3,834	3,720	3,481	3,258

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

While Figure 8 shows trends in two different SV crash types, and Figure 9 shows trends in three different two-vehicle crash types, Figure 10 combines all passenger vehicle crashes of three or more vehicles into one group. From 2005 to 2011, the number of passenger vehicle occupants killed in crashes of three or more vehicles dropped by 43 percent, from 2,756 down to 1,583. By far the largest annual decline occurred from 2007 to 2008, with a drop of 476 fatalities, from 2,410 to 1,934. The data used to produce Figure 10 is shown below in Table 7.

Figure 10: Passenger Vehicle Occupant Fatalities, Among Crashes With 3+ Vehicles, 2005-2011



Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Table 7: Passenger Vehicle Occupant Fatalities, Among Crashes With 3+ Vehicles, 2005-2011

	2005	2006	2007	2008	2009	2010	2011
3+ Vehicles	2,756	2,566	2,410	1,934	1,744	1,671	1,583

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Results: By Crash Variable

The crash variables discussed in this section include occupant age, seat position, restraint use, ejection status, vehicle body type, speeding, alcohol-impaired driving, rollover, time of day, day of week, junction, manner of collision, roadway function class, and rural versus urban. Summary categories are produced for each variable. For example, age is stratified into <16, 16 to 20, 21 to 24, 25 to 34, 35 to 34, 45 to 64, and 65+ groups; seat position is summarized as driver versus occupant; restraint use is summarized as restrained versus unrestrained.

These variables were chosen to display the heterogeneity of the fatality declines seen across the variable categories and the six crash groups. Some variables were not included in the report due to the lack of variety in fatality declines between the six crash groups across the categories of the variable. Examples of variables which showed less variation across the six crash groups are driver weight, month of crash, and involvement of police pursuit.

Fatality counts for 2005 and 2011 are presented, and percentage declines between these two years are also shown. Of the six different crash types introduced in the Executive Summary section, and described in the Data and Methodology section, highlights from the trends of these six crash types will be mentioned for each variable.

To help the reader put the tables of this section of the report into perspective, the summary of the fatality decline in these six crash types is listed below in Table 8. These numbers were first presented in the Executive Summary of this report.

The remainder of the Results: By Crash Variable section, following Table 8, stratifies the crashes according to other variables, which are individually displayed in the rows of each table.

Note that when cell counts are referred to in the text of the report (adjacent to the tables), then the counts are highlighted in yellow, to assist the reader in locating the numbers to which the text refers. These highlighted cells begin in Table 9.

Table 8: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Crash Type							
	Single- Vehicle PC	Single- Vehicle LTV	Two- Vehicle PC-PC	Two- Vehicle LTV- LTV	Two- Vehicle PC- LTV	3+ Vehicle PV	Total
2005	8,136	7,707	2,600	1,874	5,247	2,756	28,320
2011	5,557	5,764	1,585	1,219	3,258	1,583	18,966
2005-2011 % Decline	32%	25%	39%	35%	38%	43%	33%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Occupant Age

Table 9 below shows the occupant age distribution of the fatalities from the six crash types which this report focuses on. First shown are fatalities in 2005, followed by fatalities in 2011, and then the percentage decline seen in each of the fatality categories, from 2005 to 2011. For example, the number of SV PC fatalities for occupants age less than 16 dropped from 342 in 2005 to 173 in 2011, a drop of 49 percent.

The three occupant age categories that showed the largest percentage decline were the <16 (46% decline), 16 to 20 (43% decline), and 35 to 34 (41% decline) age occupants. The percentage declines among the 65+ age range (22%), 45 to 64 age range (27%), and the 25 to 34 age range (28%) were the smallest. The 21 to 24 age range showed a 36 percent decline in occupant fatalities from 2005 to 2011.

For individual crash types, the two smallest declines were in SV LTV fatalities for 65+ occupants (less than one%) and 45- to 64-year-old occupants (16%). The largest declines were in 3+ vehicle PV crashes in the 16 to 20 (63%) and 25 to 34 age ranges (52%), and in the PC-PC and LTV-LTV categories for the <16, 16 to 20, and 35 to 34 age ranges, which all declined by over 50 percent. Percentages and numbers discussed above are highlighted below.

Table 9: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Occupant Age and Crash Type

Age Groups	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
<16	342	409	135	123	291	173	1,473
16-20	1,882	1,042	359	161	734	326	4,504
21-24	1,390	917	248	116	483	224	3,378
25-34	1,473	1,516	315	250	679	407	4,640
35-44	1,002	1,306	289	290	622	343	3,852
45-64	1,220	1,845	524	539	1,108	741	5,977
65+	813	653	720	392	1,322	539	4,439
2011							
<16	173	247	64	57	175	86	802
16-20	1,057	743	174	78	381	122	2,555
21-24	937	608	154	71	278	122	2,170
25-34	1,177	1,130	217	160	466	197	3,347
35-44	618	837	141	141	331	200	2,268
45-64	934	1,546	334	392	736	417	4,359
65+	656	650	500	320	890	437	3,453
2005-2011 % Decline							
<16	49%	40%	53%	54%	40%	50%	46%
16-20	44%	29%	52%	52%	48%	63%	43%
21-24	33%	34%	38%	39%	42%	46%	36%
25-34	20%	25%	31%	36%	31%	52%	28%
35-44	38%	36%	51%	51%	47%	42%	41%
45-64	23%	16%	36%	27%	34%	44%	27%
65+	19%	0%	31%	18%	33%	19%	22%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Crashes Involving Young Drivers (Age 16 to 20)

Table 10 below shows the distribution of the fatalities from the six crash types, comparing crashes involving a driver 16 to 20 years old with all other crashes. First shown are fatalities in 2005, followed by fatalities in 2011, and then the percentage decline seen in each of the fatality categories, from 2005 to 2011. Note that “other crash” refers to a crash where none of the drivers in the crash were 16 to 20.

For crashes involving drivers 16 to 20, five of the six crash type categories showed fatality declines of 45 percent or higher, with the highest decline from 2005 to 2011 being among 3+ PV crashes (55%). The overall fatality decline among crashes involving drivers 16 to 20 was 45 percent, compared to the much smaller decline of 30 percent among other crashes. The smallest fatality difference between crashes involving drivers 16 to 20 and other drivers was seen among SV LTV fatal crashes, where the drop in fatalities involving drivers age 16 to 20 (31%) was only 7 percentage points higher than the drop among other SV LTV crashes (24%). Percentages and numbers discussed above are highlighted below.

Table 10: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Age of Drivers Involved and Crash Type							
Age of Drivers Involved	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Involving Driver Age 16-20	1,968	1,052	773	356	1,346	740	6,235
Other Crash	6,168	6,655	1,827	1,518	3,901	2,016	22,085
2011							
Involving Driver Age 16-20	1,087	729	370	177	707	332	3,402
Other Crash	4,470	5,035	1,215	1,042	2,551	1,251	15,564
2005-2011 % Decline							
Involving Driver Age 16-20	45%	31%	52%	50%	47%	55%	45%
Other Crash	28%	24%	33%	31%	35%	38%	30%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Crashes Involving Older Drivers (65 or Older)

While Table 10 showed that fatalities in crashes involving drivers 16 to 20 dropped 45 percent overall, Table 11 shows that fatalities in crashes involving drivers 65+ only dropped about half that amount (23%). This decline among crashes involving drivers 65+ was far below the overall national decline of 33 percent.

For crashes involving drivers 65+, changes among the six crash types varied greatly. SV LTV fatalities in crashes involving a driver 65+ was the only crash group in this report which showed an increase from 2005 to 2011, up 3 percent from 582 to 598. This is written as a negative percentage decline in Table 11 below. Among crashes involving drivers 65+, SV PC and LTV-LTV fatalities dropped less than 20 percent, while only PC-PC fatalities dropped more than 30 percent. Percentages and numbers discussed above are highlighted below.

Table 11: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Age of Drivers Involved and Crash Type							
Age of Drivers Involved	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Involving Driver 65+	756	582	803	451	1,458	795	4,845
Other Crash	7,380	7,125	1,797	1,423	3,789	1,961	23,475
2011							
Involving Driver 65+	626	598	553	367	1,030	578	3,752
Other Crash	4,931	5,166	1,032	852	2,228	1,005	15,214
2005-2011 % Decline							
Involving Driver 65+	17%	-3%	31%	19%	29%	27%	23%
Other Crash	33%	27%	43%	40%	41%	49%	35%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

The percent of overall fatalities that were in crashes involving an older driver (65+) increased for all six crash types from 2005 to 2011. In 3+ vehicle PV crashes, the percentage rose 8 percentage points, from 29 percent in 2005 to 37 percent in 2011, while in SV PC and SV LTV crashes the percentage rose only 2 points. The percent of overall fatalities that were in crashes involving an older driver also rose for PC-PC crashes (4 percentage points), LTV-LTV crashes (6 percentage points), and PC-LTV crashes (4 percentage points).

Driver Versus Occupant

For all six crash types, the drop in fatalities from 2005 to 2011 was higher among occupants (39% decline) than among drivers (30% decline). Table 12 shows that the decline in occupant fatalities was between 6 and 12 percentage points higher than the decline in driver fatalities, for all six crash types.

The drop in occupant fatalities in the four multivehicle crash categories was 42 percent in LTV-LTV and PC-LTV crashes, 44 percent in PC-PC crashes, and 51 percent in 3+ vehicle PV crashes. By comparison, the drop in driver fatalities from 2005 to 2011 was below 40 percent for these four multivehicle crash types. The smallest percentage decline in driver fatalities was a 22 percent drop among SV LTV crashes. Percentages and numbers discussed above are highlighted below.

Table 12: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Person Type and Crash Type							
Person Type	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Driver	5,783	5,401	1,767	1,293	3,568	1,858	19,670
Occupant	2,353	2,306	833	581	1,679	898	8,650
2011							
Driver	4,083	4,228	1,118	881	2,277	1,140	13,727
Occupant	1,474	1,536	467	338	981	443	5,239
2005-2011 % Decline							
Driver	29%	22%	37%	32%	36%	39%	30%
Occupant	37%	33%	44%	42%	42%	51%	39%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

In SV PC, SV LTV, and all three two-vehicle crash types, the percentage of fatalities who were drivers rose 2 to 3 percentage points from 2005 to 2011. This percentage of fatalities who were drivers climbed 5 percent among 3+ vehicle fatalities, from 67 to 72 percent. Each of the six crash types had roughly 70 percent drivers and 30 percent passengers.

Restraint Use

Table 13 below shows the breakdown of fatalities from the six crash types, by restraint use. From 2005 to 2011, restrained fatalities declined 29 percent, while unrestrained fatalities dropped 37 percent. For each crash type except SV PC, the percentage drop among unrestrained fatalities was 12-16 percentage points higher than the drop among restrained fatalities. The percentage drop among unrestrained SV PC fatalities (35%) was still 8 percentage points higher than among restrained SV PC fatalities (27%), as shown in Table 13.

The declines varied greatly by crash type. For example, the drop in restrained fatalities in SV LTV crashes (14%) was only half the drop in restrained fatalities among LTV-LTV crashes (28%). The drop in unrestrained fatalities was 50 percent for both PC-PC crashes and 3+ vehicle PV crashes. Percentages and numbers discussed above are highlighted below.

Table 13: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Restraint Use and Crash Type

Restraint Use	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Restraint Used	2,693	1,882	1,452	899	2,906	1,544	11,376
Restraint Not Used	4,809	5,374	957	856	1,998	960	14,954
2011							
Restraint Used	1,969	1,618	964	643	1,957	961	8,112
Restraint Not Used	3,134	3,736	483	501	1,091	482	9,427
2005-2011 % Decline							
Restraint Used	27%	14%	34%	28%	33%	38%	29%
Restraint Not Used	35%	30%	50%	41%	45%	50%	37%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

In order to better understand the big picture for restraint use in fatal crashes, one must be aware that restraint use among fatally injured occupants rose among all six crash types from 2005 to 2011. For PC-PC crashes, LTV-LTV crashes, PC-LTV crashes, and 3+ vehicle PV crashes, the restraint use increased by 5 percentage points for each of the four crash types. By comparison, the restraint use increased by 2 percentage points for SV PC fatalities and 4 percentage points for SV LTV fatalities.

This increase in the restraint use of people in fatal crashes is a major contributor to the overall reduction in fatalities from 2005 to 2011. Because fewer people were unrestrained in fatal crashes in 2011 than 2005, that contributes greatly to the large drop in unrestrained fatalities (37% decline) over that time period; the corresponding increase in restraint use among people involved in fatal crashes plays a role in the relatively smaller percentage drop in restrained fatalities (29%).

Restraint use in fatal crashes varied greatly between the six crash types. While the restraint use increased in 2011 to 60-61 percent in PC-PC, PC-LTV, and 3+ vehicle fatalities, the restraint use was lower in LTV-LTV (53%), SV PC (35%), and SV LTV (28%) fatalities. For each of the six crash types, the restraint use was coded unknown for 6 to 10 percent of the fatalities, with the percent unknown restraint use highest among occupants in 3+ vehicle crashes.

An additional fact about restraint use is that observed occupant restraint use, as recorded through the National Occupant Protection Use Survey (NOPUS), remained between 81 and 85 percent from 2005 to 2011. Belt use was 82 percent in 2005 and 84 percent in 2011.

Ejection Status

The number of fatalities where the occupants were ejected declined 35 percent from 2005 to 2011, while the number of fatalities where the occupants were not ejected dropped 32 percent. For all six crash types, the percentage declines were larger among ejected fatalities than non-ejected fatalities.

To properly interpret Table 14, it is important to remember that roughly 80 percent of ejection fatalities occurred in SV crashes. The decline in SV PC and SV LTV ejections is likely influenced by the increased presence of ESC in the vehicle fleet (Sivinski, 2011), as well as increases in restraint use.

SV LTV crashes and 3+ vehicle PV crashes show the largest differences between the percentage declines in ejected versus non-ejected fatalities. The SV LTV ejected fatalities dropped 31 percent from 2005 to 2011, while the SV LTV not-ejected fatalities only dropped 19 percent (see Table 14), and the 3+ vehicle PV ejected fatalities dropped 62 percent, while the non-ejected fatalities dropped only 39 percent. Percentages and numbers discussed above are highlighted below.

Table 14: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Ejection Status and Crash Type							
Ejection Status	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Ejected	2,696	3,764	252	332	625	412	8,081
Not Ejected	5,413	3,908	2,342	1,534	4,611	2,339	20,147
2011							
Ejected	1,763	2,583	138	206	376	158	5,224
Not Ejected	3,780	3,160	1,445	1,011	2,876	1,422	13,694
2005-2011 % Decline							
Ejected	35%	31%	45%	38%	40%	62%	35%
Not Ejected	30%	19%	38%	34%	38%	39%	32%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Vehicle Body Type

Four Categories of Vehicle Body Type

The majority of this report categorized vehicle body types into the two main NHTSA groups of passenger vehicles: PCs and LTVs. This section of the report further separates the vehicle body type of passenger vehicles into more specific categories. In Table 15 vehicle body type is stratified into 4 categories, and then Table 16 further separates vehicle body type into 11 categories. Each of these category groupings are discussed below.

Table 15 below displays the 4 main NHTSA vehicle body type categories among passenger vehicles: passenger car, SUV, van, and pickup. The declines in fatalities from 2005 to 2011 for passenger cars (36% decline), pickups (30% decline), SUVs (21% decline), and vans (46% decline) are shown below.

The SV PC fatalities dropped 32 percent, and the PC-PC fatalities dropped 39 percent, and these two percentage changes are shown below in Table 15, as well as in Table 8 at the beginning of the Results section. The remaining percentage declines shown in this section are different than other numbers in this report, due to the different grouping of vehicle body types in Tables 15 and 16.

While SV LTV fatalities showed an overall decline of 25 percent from 2005 to 2011, these declines varied greatly by vehicle body type. Among SV LTV crashes, fatalities dropped 44 percent among van occupants, 26 percent in pickups, and 19 percent in SUVs. By comparison, the fatality decline was larger in LTV-LTV fatal crashes, compared to SV LTV fatal crashes. Table 15 shows that among LTV-LTV fatal crashes, van fatalities dropped the same percentage (44%), while pickup (37% decline) and SUV (27% decline) fatalities dropped 11 and 8 more percentage points, respectively, than SV LTV fatalities did for their respective vehicle body types.

For each vehicle body type, the largest percentage decline in fatalities among the six crash types was seen in the 3+ vehicle PV category. Table 15 shows that for this crash type, van fatalities declined by 58 percent from 2005 to 2011, followed by pickup fatalities (48% decline), passenger car fatalities (42% decline), and SUV fatalities (27% decline). Percentages and numbers discussed above are highlighted below.

Table 15: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Vehicle Body Type and Crash Type

Vehicle Body Type	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Passenger Car	8,136	---	2,600	---	4,198	1,749	16,683
LTV – SUV	---	3,079	---	622	390	323	4,414
LTV – Van	---	900	---	401	225	255	1,781
LTV – Pickup	---	3,710	---	851	432	427	5,420
2011							
Passenger Car	5,557	---	1,585	---	2,548	1,017	10,707
LTV – SUV	---	2,488	---	454	328	237	3,507
LTV – Van	---	503	---	225	125	108	961
LTV – Pickup	---	2,761	---	537	257	220	3,775
2005-2011 % Decline							
Passenger Car	32%	---	39%	---	39%	42%	36%
LTV – SUV	---	19%	---	27%	16%	27%	21%
LTV – Van	---	44%	---	44%	44%	58%	46%
LTV – Pickup	---	26%	---	37%	41%	48%	30%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Among the two columns showing SV PC and PC-PC fatalities, 100 percent of the fatally injured occupants were in passenger cars, as passenger cars were (clearly) the only body type category involved these crash types. For this reason, the other cells in these two columns are filled with dashes, and not numbers.

Among SV LTV fatalities, the percentage of pickup occupants remained at 48 percent from 2005 to 2011, while the percent SUV occupants increased from 40 to 43 percent and the van occupants decreased from 12 to 9 percent. Two-vehicle LTV-LTV fatalities experienced similar changes from 2005 to 2011, shifting up from 33 to 37 percent SUV, down from 21 to 18 percent van, with pickup fatalities representing the remaining 45 percent of these fatalities. Among two-vehicle PC-LTV fatal crashes, passenger cars account for around 80 percent of the total PC-LTV fatalities, with pickups (8%) and vans (4%) showing little change, and SUVs increasing from 7 percent in 2005 to 10 percent in 2011.

Among 3+ vehicle fatal crashes involving PVs, the percent of PV fatalities represented by SUV occupants increased from 12 to 15 percent, while the percent of van fatalities fell from 9 to 7 percent. The percent of pickup fatalities and PC fatalities remained near 14 percent and 64 percent respectively.

Eleven Categories of Vehicle Body Type

Table 16 below is similar to Table 15 above, however Table 16 below further stratifies the passenger vehicle body type categories. In Table 16, passenger car sub-categories are: “convertible”, “2 door sedan/hard top/coupe”, “3 door/2 door hatchback”, “4 door sedan/hardtop”, and “station wagon.” SUV sub-categories are “compact” and “large.” Van sub-categories are “minivan” and “large van.” Pickup sub-categories are “compact” and “standard.” Note that several precise body type categories with small annual fatality counts (i.e. step van, pickup with camper) are not included in Table 16, and thus the total counts in Table 15 and 16 do not match exactly.

Because some of the six crash types involve only certain vehicle types, some of the cells in Table 16 are empty. For example, there are no minivan fatality counts in the SV PC crash type. Also note the count sizes of Table 16 when reading the percentage changes from 2005 to 2011. Some count sizes are relatively large, such as 5,046 “4 door/sedan/hardtop” fatalities in 2005, while others are much smaller, like 56 two-vehicle PC-LTV fatalities in 2005 where the vehicle was “large SUV.”

Thus the variety in percentage changes in fatalities from 2005 to 2011 is much larger among these crash types where the fatality counts are quite small. For example, the change in two-vehicle PC-LTV “large SUV” fatalities was from 56 in 2005 to 74 in 2011, an increase of 32 percent. Percentage changes are expected to vary more when the fatality counts are relatively small. For this reason, Table 16 can be interpreted best by looking at both the percentage changes, as well as the 2005 and 2011 fatality counts used to calculate these percentage changes.

For all six crash types combined, the percentage decline in fatalities among passenger car occupants ranged from 54 percent for “3 door/2door hatchbacks” and 48 percent for “2 door sedan/hard top/coupe”, down to only 11 percent for “station wagons.” “Convertibles” and “4-door sedan/hardtops” dropped 33 and 32 percent respectively, from 2005 to 2011. Among SUV fatalities, the size of the SUV played a large role in the trend in fatalities. While “compact SUV” fatalities dropped 23 percent, “large SUV” fatalities dropped only 6 percent. Similarly, “compact pickup” fatalities also dropped more (37% decline) than “large pickup” fatalities (26% decline). The large decline in van fatalities was similar for both “minivans” (44% decline) and “large vans” (50% decline).

The declines in the five body type categories of SV PC crashes and the six body type categories of SV LTV crashes were less than or equal to the overall fatality declines for each of the 11 corresponding vehicle body types. This paralleled the findings throughout this report showing large fatality declines in multivehicle crashes compared to SV crashes. “Large SUV” fatalities showed no percentage change among SV LTV crashes, with 499 fatalities in 2005 and 497 fatalities in 2011. “Station wagon” fatalities actually increased by 15 percent, up from 229 in 2005 to 263 in 2011.

Among both pickups and SUVs in LTV-LTV crashes, the “compact” vehicles showed a much higher decline in fatalities than the larger vehicles. In these LTV-LTV crashes, “SUV compact” fatalities dropped 29 percent and “pickup compact” fatalities dropped 48 percent, while “SUV large” fatalities dropped only 4 percent, and “pickup standard” fatalities dropped only 27 percent. The decline in van fatalities in LTV-LTV crashes was more similar across vehicle size, as “minivan” fatalities (43%) and “large van” fatalities (47%) declined a similar amount from 2005 to 2011. Percentages and numbers discussed above are highlighted below. Note that a

negative percentage decline reflects an increase in fatalities, as shown in SV PC fatalities among station wagon occupants (see Table 16 below).

Table 16: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Vehicle Body Type and Crash Type							
Vehicle Body Type	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Passenger Car							
Convertible	191	--	32	--	58	18	299
2dr Sedan/Hard Top/Coupe	2,051	--	480	--	751	333	3,615
3dr/2dr Hatchback	461	--	117	--	182	77	837
4dr sedan/Hard Top	5,046	--	1,828	--	2,960	1,216	11,050
Station Wagon	229	--	84	--	175	72	560
SUV							
Compact	--	2,426	--	521	322	228	3,497
Large	--	499	--	76	56	83	714
Van							
Minivan	--	636	--	335	182	187	1,340
Large Van	--	245	--	60	39	66	410
Pickup							
Compact	--	1,224	--	392	192	180	1,988
Standard	--	2,455	--	452	236	241	3,384
2011							
Passenger Car							
Convertible	129	--	22	--	36	14	201
2dr Sedan/Hard Top/Coupe	1,129	--	222	--	378	138	1,867
3dr/2dr Hatchback	211	--	58	--	81	31	381
4dr sedan/Hard Top	3,725	--	1,181	--	1,860	773	7,539
Station Wagon	263	--	64	--	128	44	499
SUV							
Compact	--	1,865	--	368	245	206	2,684
Large	--	497	--	73	74	24	668
Van							
Minivan	--	362	--	191	104	90	747
Large Van	--	134	--	32	20	18	204
Pickup							
Compact	--	835	--	205	129	81	1,250
Standard	--	1,914	--	330	128	139	2,511
2005-2011 % Decline							
Passenger Car							

Convertible	32%	--	31%	--	38%	22%	33%
2dr Sedan/Hard Top/ Coupe	45%	--	54%	--	50%	59%	48%
3dr/2dr Hatchback	54%	--	50%	--	55%	60%	54%
4dr sedan/Hard Top	26%	--	35%	--	37%	36%	32%
Station Wagon	-15%	--	24%	--	27%	39%	11%
SUV							
Compact	--	23%	--	29%	24%	10%	23%
Large	--	0%	--	4%	-32%	71%	6%
Van							
Minivan	--	43%	--	43%	43%	52%	44%
Large Van	--	45%	--	47%	49%	73%	50%
Pickup							
Compact	--	32%	--	48%	33%	55%	37%
Standard	--	22%	--	27%	46%	42%	26%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Speeding

Among SV PC and SV LTV fatalities, the percentage decline from 2005 to 2011 was larger among speeding involved crashes than among crashes where speeding was not involved. For SV PC crashes, the number of speeding involved fatalities dropped 34 percent, while the number of fatalities from other crashes dropped only 30 percent. Similarly, for SV LTV crashes the number of speeding involved fatalities dropped 28 percent, while the number of other crashes dropped only 23 percent.

For each of the other four crash types however, the decline in the number of speeding involved fatalities was 5 to 7 percentage points less than the decline in the number of fatalities where speeding was not involved. This variation across crash types was not often seen throughout this report; for example, Table 12 on page 28 shows that the number of driver fatalities dropped a smaller percentage than the number of passenger fatalities, for all six crash types, not just four of the six crash types.

When the six crash types are combined, the percentage decline in speeding involved fatalities (32%) was almost identical to the decline in fatalities from other crashes (33%).

This report is not able to conclude why the magnitude of the percentage declines was not consistently impacted by whether or not the crash involved speeding. This finding, as well as several other findings in this report, point to further research in the future. Percentages and numbers discussed above are highlighted below.

Table 17: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Speeding Involvement and Crash Type

Speeding Involvement	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Speeding Involved Crash	4,230	3,046	639	382	1,106	817	10,220
Other Crash	3,906	4,661	1,961	1,492	4,141	1,939	18,100
2011							
Speeding Involved Crash	2,809	2,198	416	270	734	501	6,928
Other Crash	2,748	3,566	1,169	949	2,524	1,082	12,038
2005-2011 % Decline							
Speeding Involved Crash	34%	28%	35%	29%	34%	39%	32%
Other Crash	30%	23%	40%	36%	39%	44%	33%

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Alcohol-Involved Driving

Passenger vehicle occupants can be categorized into the following five alcohol testing categories: No Alcohol, Positive BAC, Not Tested, Tested with Unknown Results, and Unknown if Tested. In order to summarize the trend in alcohol-impaired driving from 2005 to 2011, Table 18 below combines these five categories into two groups: Positive BAC, and Other. Positive BAC reflects a BAC of .01 grams per deciliter or above, referred to here as “alcohol-involved.” This is not equal to “alcohol-impaired” driving, which reflects a BAC of .08 g/dL or above.

The high majority of fatalities where the drivers had positive BACs occurred in single-vehicle crashes. Among SV PC and SV LTV fatalities, the decline from 2005 to 2011 was 6 to 7 percentage points smaller among occupants with positive BACs than among other occupants. For SV PC crashes, the number of fatalities with positive BACs dropped 27 percent, while the number of fatalities from other alcohol involvement categories dropped 34 percent. Similarly, for SV LTV crashes the number of fatalities with positive BACs dropped 21 percent, while the number of fatalities from other alcohol involvement categories dropped 27 percent. Among the three two-vehicle crash types, the percentage declines were fairly consistent. All six of these percentage declines, shown in Table 18, were between 35 and 40 percent. In 3+ vehicle PV crashes, the decline in fatalities among occupants with positive BACs was 48 percent, which was 6 percentage points higher than the 42 percent decline among other occupants.

Note: The two categories which saw the largest decline in fatalities were Not Tested and Tested with Results Unknown. The large declines in these two categories represent an improvement in BAC testing over this 7-year period, and contribute to the smaller decline in SV PC and SV LTV fatality counts with a positive BAC. To help put these results in perspective, it is helpful to note that since 1995, the overall percentage of traffic fatalities where the highest BAC in the crash was .08+ g/dL has remained between 30 and 32 percent each and every year.

Table 18: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Alcohol Involvement and Crash Type

Alcohol Involvement	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Positive BAC	2,954	2,617	366	258	640	313	7,148
Other Categories	5,182	5,090	2,234	1,616	4,787	2,443	21,352
2011							
Positive BAC	2,160	2,056	231	161	407	162	5,177
Other Categories	3,397	3,708	1,534	1,058	2,851	1,421	13,969
2005-2011 % Decline							
Positive BAC	27%	21%	37%	38%	36%	48%	28%
Other Categories	34%	27%	39%	35%	40%	42%	35%

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Rollover

While the overall national decline in passenger vehicle fatalities from 2005 to 2011 was 33 percent, Figure 19 below shows that both the decline in fatalities from rollover involved crashes as well as the decline in fatalities from other crashes were also both 33 percent.

In 2011, 80 percent of rollover involved crash fatalities were from SV PC or SV LTV crashes. By comparison, only 46 percent of other crash fatalities were SV PC or SV LTV crashes. This shows that single-vehicle crashes are much more likely to involve a rollover than multivehicle crashes.

For SV crashes involving rollovers, the fatalities dropped 34 percent among SV PC crashes, compared to a 28 percent fatality decline among SV LTV rollover involved crashes. Other SV PC and other SV LTV fatalities dropped only 30 and 20 percent respectively, as shown below in Table 19. This larger reduction in rollover involved crash fatalities in single-vehicle crashes is likely related to the expansion of ESC in the vehicle fleet, as ESC plays a large role in preventing rollovers in single-vehicle crashes. Percentages and numbers discussed above are highlighted below.

Table 19: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Rollover Status and Crash Type							
Rollover Involvement	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Rollover Involved Crash	3,670	5,129	323	564	1,069	678	11,433
Other Crash	4,466	2,578	2,277	1,310	4,178	2,078	16,887
2011							
Rollover Involved Crash	2,436	3,693	181	336	674	339	7,659
Other Crash	3,121	2,071	1,404	883	2,584	1,244	11,307
2005-2011 % Decline							
Rollover Involved Crash	34%	28%	44%	40%	37%	50%	33%
Other Crash	30%	20%	38%	33%	38%	40%	33%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Time of Day, Day of the Week

Table 20 below shows the distribution of the fatalities from the six crash types, by time of day and day of the week. Time of day categories are daytime (6 a.m. to 5:59 p.m.) and nighttime (6 p.m. to 5:59 a.m.), and day of the week categories are weekday (Monday 6 a.m. to Friday 5:59 p.m.) and weekend (Friday 6 p.m. to Monday 5:59 a.m.). For each of the six crash types, four categories are shown, representing the four combinations of these two variables. For example, the number of nighttime/weekend SV PC fatalities dropped from 2,918 in 2005 to 2,038 in 2011, a drop of 30 percent.

The four time of day/day of week categories each showed similar overall percentage declines in fatalities, ranging from a 31 percent decline for daytime/weekday fatalities up to a 36 percent decline for nighttime/weekday fatalities. From 2005 to 2011, nighttime/weekend fatalities dropped 32 percent and daytime/weekend fatalities dropped 33 percent.

The largest fatality counts among SV PC and SV LTV crashes were nighttime/weekend, while the largest fatality counts of the four multivehicle crash types (PC-PC, LTV-LTV, PC-LTV, and 3+ vehicle PV) were each during the daytime/weekday. Table 20's list of percentage declines in fatalities shows no clear impact from the time of the crash across the six crash types. Percentages and numbers discussed above are highlighted below.

Table 20: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Time of Crash and Crash Type							
Time of Day/ Day of the Week	Single- Vehicle PC	Single- Vehicle LTV	Two- Vehicle PC-PC	Two- Vehicle LTV- LTV	Two- Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Daytime/Weekday	1,857	2,160	1,042	838	2,308	1,408	9,613
Nighttime/Weekday	2,211	1,902	441	286	917	422	6,179
Daytime/Weekend	1,023	1,131	424	319	908	395	4,200
Nighttime/Weekend	2,918	2,408	693	429	1,110	531	8,089
2011							
Daytime/Weekday	1,382	1,681	625	574	1,485	865	6,612
Nighttime/Weekday	1,439	1,341	277	177	487	223	3,944
Daytime/Weekend	648	829	253	222	628	220	2,800
Nighttime/Weekend	2,038	1,837	424	243	655	275	5,472
2005-2011 % Decline							
Daytime/Weekday	26%	22%	40%	32%	36%	39%	31%
Nighttime/Weekday	35%	29%	37%	38%	47%	47%	36%
Daytime/Weekend	37%	27%	40%	30%	31%	44%	33%
Nighttime/Weekend	30%	24%	39%	43%	41%	48%	32%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Junction

The definition of a junction includes crashes occurring at an intersection, or related to the intersection, as well as crashes which involve a driveway access, a railway grade crossing, or are entrance/exit ramp related.

The trend in the involvement of a junction in a fatal crash varied greatly among the six crash types. Among fatalities involving a junction, only a 16 percent decline of SV PC and a 7 percent decline of SV LTV fatalities occurred from 2005 to 2011. The decline among non-junction related fatalities in SV PC crashes (34%) and SV LTV crashes (26%) was much higher. Among the four multivehicle crash types in Table 21, the percentage declines from 2005 to 2011 were similar among both junction-related and non-junction-related fatalities, with all percentage declines in fatalities for these eight crash types being between 36 and 48 percent.

Among SV PC and SV LTV fatal crashes combined, only 8 percent occurred at junctions. As expected, multivehicle fatalities were roughly five times more likely to occur at junctions than single-vehicle fatalities. This crash distribution is why the overall decline in junction-related fatalities was 35 percent, slightly above the decline in non-junction-related fatalities of 33 percent, despite the lower decline in SV PC and SV LTV junction-related fatalities. The decline in junction related fatalities among PC-LTV crashes (44%) was eight percentage points higher than the decline in non-junction related fatalities (36%) among PC-LTV crashes, and the count of junction related fatalities was highest in PC-LTV crashes (1,242). Percentages and numbers discussed above are highlighted below.

Table 21: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Junction and Crash Type

Involvement of Junction	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Junction	560	351	947	630	2,206	741	5,435
Non-Junction	7,200	6,963	1,529	1,155	2,756	1,879	21,482
2011							
Junction	471	328	605	396	1,242	487	3,529
Non-Junction	4,756	5,167	879	755	1,755	974	14,286
2005-2011 % Decline							
Junction	16%	7%	36%	37%	44%	34%	35%
Non-Junction	34%	26%	43%	35%	36%	48%	33%

Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File

Manner of Collision

When examining the manner of collision between vehicles in a crash, the major categories are rear-end, head-on, angle, sideswipe, and “no collision with motor vehicle in transport.” Given that manner of collision is focusing on the collision between two or more vehicles, this section will not apply to SV PC crashes or SV LTV crashes.

The largest fatality counts in Table 22 are seen among angle crashes and head-on crashes, with much smaller counts seen for rear-end crashes and sideswipe crashes. The smallest fatality counts are the “not collision with motor vehicle in transport” crashes, where multiple vehicles crashed but did not collide with each other.

The largest overall percentage declines in fatalities from 2005 to 2011 were among angle crashes (45%) and head-on crashes (36%). For angle crashes, the fatalities declined between 40 and 47 percent for all four crash types shown in Table 22. Head-on fatalities declined between 30 and 39 percent for the three two-vehicle crash types and declined 47 percent for 3+ vehicle PV crashes. Among manners of collision other than angle or head-on, some of the large variation in percentage declines is due to the smaller fatality counts of these crash types, as 6 of the 20 fatality counts for 2011 were below 100. Over three-quarters of the 2011 fatalities in Table 22 were in either angle or head-on crashes. Percentages and numbers discussed above are highlighted below.

Table 22: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Manner of Collision and Crash Type

Manner of Collision	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005					
Not Collision with Motor Vehicle in Transport	87	75	159	189	510
Rear-End	143	128	336	641	1,248
Head-On	949	715	1,468	594	3,726
Angle	1,340	852	3,070	947	6,209
Sideswipe	74	86	187	352	699
2011					
Not Collision with Motor Vehicle in Transport	69	56	128	83	336
Rear-End	94	110	288	425	917
Head-On	579	474	1,032	315	2,400
Angle	775	508	1,624	511	3,418
Sideswipe	62	62	168	227	519
2005-2011 % Decline					
Not Collision with Motor Vehicle in Transport	21%	25%	19%	56%	34%
Rear-End	34%	14%	14%	34%	27%
Head-On	39%	34%	30%	47%	36%
Angle	42%	40%	47%	46%	45%
Sideswipe	16%	28%	10%	36%	26%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File					

Roadway Function Class

Roadway function class categories include the following.

- interstate
- freeway and expressway
- principal arterial, other
- minor arterial
- collector
- local

Relatively little variation was seen in the decline of fatal crashes across roadway function class categories from 2005 to 2011, with overall percentage declines all being between 38 percent (interstate) and 26 percent (local). For SV LTV crashes (38% fatality decline) and LTV-LTV crashes (48% fatality decline), the largest declines in these two crash categories were seen on interstate roads. This shift is potentially due to higher gas prices and a corresponding reduction in long distance trips in LTVs. Each of the other four crash type categories showed their largest percentage decline on roadways other than interstate roads. Percentages and numbers discussed above are highlighted below.

Table 23: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Roadway Function Class and Crash Type

Roadway Function Class	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Interstate	1,010	1,531	209	185	407	658	4,000
Freeway and expressway	334	251	102	46	208	184	1,125
Principal arterial, other	1,134	1,029	856	558	1,603	879	6,059
Minor arterial	1,296	1,144	579	449	1,282	569	5,319
Collector	2,189	1,952	490	423	1,050	261	6,365
Local	2,074	1,664	336	200	621	165	5,060
2011							
Interstate	667	955	137	97	260	355	2,471
Freeway and expressway	189	171	78	40	143	97	718
Principal arterial, other	895	884	509	388	1,072	580	4,328
Minor arterial	854	759	357	304	743	308	3,325
Collector	1,427	1,488	286	263	604	133	4,201
Local	1,446	1,436	209	115	421	99	3,726
2005-2011 % Decline							
Interstate	34%	38%	34%	48%	36%	46%	38%
Freeway and expressway	43%	32%	24%	13%	31%	47%	36%
Principal arterial, other	21%	14%	41%	30%	33%	34%	29%
Minor arterial	34%	34%	38%	32%	42%	46%	37%
Collector	35%	24%	42%	38%	42%	49%	34%
Local	30%	14%	38%	43%	32%	40%	26%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

Rural Versus Urban

Table 24 shows that the number of rural fatalities declined 34 percent from 2005 to 2011, while the number of urban fatalities dropped 31 percent. For all six crash types, the percentage declines were larger among rural fatalities than urban fatalities.

To properly interpret Table 24, it is important to note that the distribution of crash types is different between rural and urban areas. While 65 percent of 2011 rural fatalities are from SV PC or SV LTV crashes, only 52 percent of 2011 urban fatalities are from SV PC or SV LTV crashes. This is to be expected given the lower traffic density in rural areas, and thus the increased likelihood of a crash in a rural area being a single-vehicle crash.

The differences in percentage declines, defined as how much larger the rural percentage decline was compared to the urban percentage decline, was smaller in SV PC (3%) and SV LTV (5%) fatalities, compared to PC-PC (12%), LTV-LTV (11%), and 3+ vehicle PV (7%) fatalities. Among multivehicle crashes, only PC-LTV fatalities showed a relatively smaller difference (4%) between the percentage decline of rural fatalities (39%) and urban fatalities (35%). Percentages and numbers discussed above are highlighted below.

Table 24: Percentage Decline in Passenger Vehicle Occupant Fatalities From 2005 to 2011, by Rural/Urban Status and Crash Type							
Rural Versus Urban	Single-Vehicle PC	Single-Vehicle LTV	Two-Vehicle PC-PC	Two-Vehicle LTV-LTV	Two-Vehicle PC-LTV	3+ Vehicle PV	Total
2005							
Rural	4,940	5,625	1,380	1,327	2,978	1,301	17,551
Urban	3,149	2,021	1,201	537	2,222	1,425	10,555
2011							
Rural	3,327	4,153	767	818	1,814	706	11,585
Urban	2,198	1,587	813	394	1,435	867	7,294
2005-2011 % Decline							
Rural	33%	26%	44%	38%	39%	46%	34%
Urban	30%	21%	32%	27%	35%	39%	31%
Source: FARS 2005 -2010 Final Files and FARS 2011 Annual Report File							

The percent of crashes that were urban increased within all six crash types. The largest increase was seen in PC-PC fatalities, rising from 46 percent urban in 2005 up to 51 percent urban in 2011. The percent of each of the other five crash types coded as urban rose from one to three percentage points over that time period.

Limitations

This report does not measure a causal relationship between the decline in passenger vehicle fatalities seen from 2005 through 2011, and any of the variables examined in the FARS database. Instead, it examines univariate trends over this time period for many key factors in fatal crashes.

The periods of recession and the varying costs of gasoline are discussed in this report due to the strong relationship seen between these two economic factors and the annual declines in motor vehicle fatalities. Neither of these economic factors can be guaranteed to be causal factors in the fatality declines seen in corresponding time periods. This pattern will be examined more in future traffic safety research.

The FARS variable on relationship to road is not included in this report due to data limitations. In 2009, a shift from the category of off-roadway (shoulder) to off-roadway (median) and off-roadway (other) was recorded among all six crash types. This shift was strongest in single-vehicle crashes, which are more likely to be off-roadway. A smaller shift in the same direction was also seen in multivehicle crashes. This shift prevents proper crash comparisons being done between crashes before 2009 and crashes 2009 and later.

FARS collects crash information on the initial impact point and the principal impact point, as determined from the police crash report. In 2010 and 2011, an increase in the unknown and non-collision categories, along with a drop in the frontal impact category, was seen in the principal impact coding in FARS. This shift was largest in SV crashes. Much state-by-state variation was seen in the coding of this variable. For these reasons, the shift in principal impact point coding from 2005 to 2011 was not discussed in this report. The initial impact point in a crash is often more difficult to determine. Large shifts in this variable were seen over time and between states, and due to the difficulty in accurately determining the initial impact point in a crash, this variable was also not included in this report.

Conclusion

For six years in a row, the overall number of motor vehicle fatalities in the United States declined, from 43,510 in 2005 to 32,367 in 2011, a cumulative drop of 26 percent. During this time-period, the number of passenger car occupant fatalities declined every year, from 18,512 in 2005 to 11,981 in 2011, a drop of 35 percent, and the number of LTV occupant fatalities declined every year, from 13,037 in 2005 to 9,272 in 2011, a drop of 29 percent. The PC and LTV occupant fatality rates per 100 million VMT both declined 30 percent from 2005 to 2011.

The decline in passenger vehicle fatalities can be better understood by examining six major crash types. These six groups of fatalities consist of single-vehicle crashes (SV PC, SV LTV), two-vehicle crashes (PC-PC, LTV-LTV, and PC-LTV), and 3+ vehicle PV crashes. Crash type stratification was used for this report to display differences in single-vehicle and multivehicle crashes, PC and LTV involvement in fatal crashes, as well as vehicle compatibility issues.

These six crash types each experienced a large drop in fatalities from 2005 to 2011, ranging from 25 percent and 32 percent for SV LTV and SV PC fatalities respectively, to between 35 and 39 percent for each of the three different two-vehicle crash types, up to 43 percent for 3+ vehicle PV fatalities.

The percentage decline in occupant fatalities from 2005 to 2011 was higher for age groups <16 (46%), 16 to 20 (43%) and 35 to 34 (41%), and lower for age groups 45 to 64 (27%) and 65+ (22%). Driver fatalities (30%) declined less than passenger fatalities (39%). Van occupant fatalities (46%) dropped more than occupants of passenger cars (36%), pickups (30%) and SUVs (21%). Occupant fatalities declined more for angle crashes (45%) and head-on crashes (36%), and less for rear-end crashes (27%) and sideswipe crashes (26%). Fatalities on interstate roads dropped more (38%) than fatalities on local roads (26%).

NHTSA fatality data from FARS since 1975 shows that the largest fatality declines from 1975 to 2011 coincided with the three biggest recessions in the United States economy (1980-1982, 1990-1991, 2007-2009) during those years. Of the 10 largest annual percentage declines in PC occupant fatality rates per VMT during the 37 years of FARS data collection, 8 of them (1981-1983, 1991-1992, 2008-2010) occurred either during or the year immediately following a recession. The 3 largest annual percentage declines were 1982 (14.3%), 2008 (10.1%), and 2009 (9.5%), each occurring during a recession.

Similarly, of the 8 largest annual percentage declines in LTV occupant fatality rates per VMT, 6 of them (1981-1983, 1992, 2008, 2010) occurred either during or immediately following a recession. The 3 largest were 2008 (23.1% decline), 1982 (18.4% decline), and 1992 (18.5% decline), each occurring during a recession.

The calendar years 1980, 1981, 1982, 2006, 2007, 2008, 2010, and 2011 are the only years since 1976 where gas had average prices above \$2.95/gallon (in 2013 dollars). These years coincide with many of the largest declines in PC and LTV fatality rates.

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Appendix:

Table 25: Passenger Vehicle Occupant Fatalities, by Vehicle Body Type, 1975-2011										
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
PC	25,929	26,166	26,782	28,153	27,808	27,449	26,645	23,330	22,979	23,620
LTV	4,856	5,438	5,976	6,745	7,178	7,486	7,081	6,359	6,202	6,496
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
PC	23,212	24,944	25,132	25,808	25,063	24,092	22,385	21,387	21,566	21,997
LTV	6,689	7,317	8,058	8,306	8,551	8,601	8,391	8,098	8,511	8,904
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
PC	22,423	22,505	22,199	21,194	20,862	20,699	20,320	20,569	19,725	19,192
LTV	9,568	9,932	10,249	10,705	11,265	11,526	11,723	12,274	12,546	12,674
	2005	2006	2007	2008	2009	2010	2011			
PC	18,512	17,925	16,614	14,646	13,135	12,491	11,981	-----	-----	-----
LTV	13,037	12,761	12,458	10,816	10,312	9,782	9,272	-----	-----	-----

Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File

**Table 26: Passenger Vehicle Occupant Fatality Rates per 100 M VMT,
By Vehicle Body Type, 1975-2011**

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
PC	2.52	2.44	2.43	2.48	2.50	2.48	2.37	2.04	1.93	1.93
LTV	2.38	2.33	2.32	2.33	2.44	2.53	2.30	1.97	1.85	1.81
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
PC	1.86	1.95	1.89	1.86	1.77	1.69	1.59	1.49	1.49	1.51
LTV	1.72	1.76	1.81	1.70	1.64	1.55	1.41	1.26	1.26	1.25
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
PC	1.52	1.50	1.45	1.36	1.33	1.31	1.27	1.27	1.22	1.18
LTV	1.28	1.26	1.24	1.24	1.25	1.23	1.20	1.21	1.20	1.16
	2005	2006	2007	2008	2009	2010	2011			
PC	1.14	1.11	1.07	0.96	0.87	0.83	0.80	-----	-----	-----
LTV	1.15	1.10	1.10	0.98	0.92	0.86	0.81	-----	-----	-----

Source: FARS 1975 -2010 Final Files and FARS 2011 Annual Report File, VMT- Federal Highway Administration

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