

COMMERCIAL VEHICLE SAFETY IN LOUISIANA

An Analysis of Truck Crashes for 2012

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Summary

In 2012, the total number of reported CMV crashes increased by [2.5%](#) compared to 2011. The number of fatal CMV crashes increased from 86 in 2011 to [93](#) in 2012, the same number as in 2010. The number of injury CMV crashes decreased slightly from 1,612 to [1,606](#) during the same period, a decrease of 0.4%.

The percentage of CMV drivers in fatal crashes cited for violations increased in 2012 compared to 2011. The percentage of violations in fatal crashes that CMV drivers received increased from 29% in 2011 to [36%](#) in 2012. In injury and property damage crashes, the driver of the CMV was cited for violations [51%](#) and 49% of the time, respectively. Within this same year, careless operation accounted for the majority of violations committed in association with commercial vehicle crashes. Careless operation made up [34.2%](#) of all violations given to the driver of the CMV in fatal crashes and 36.4% in all crashes. Other violations with relatively high occurrence rates were failure to yield, with [5.3%](#) in fatal and 12.0% in all crashes. In fatal crashes careless operation, failure to yield, following too closely, and driving left of center made up 58% of all violations. In all CMV crashes, this percentage is 60%.

The manner of collision most common in all CMV crashes are rear-end types at [30.9%](#) and non-collision types (single vehicle crashes) at 19.1%. For fatal crashes, the most frequent types were head-on collisions at 19.4%, rear-end collisions at 23.7%, right angle collisions at 19.4%, and non-collision with motor vehicle at 22.6%.

During 2012, [26%](#) of all CMV crashes in Louisiana occurred on interstates, 35% occurred on state highways, and 20% occurred on U.S. highways. In 2011, the respective percentages were 27%, 36%, and 21%. From 2011 to 2012, the number of fatal interstate crashes increased to 27. US highways experienced an increase in one fatal crash and state highways saw an increase of nine fatal crashes (28%) to 41. Thus, the overall increase in CMV related fatalities was largely due to the increase of fatalities on State highways and on interstates.

The number of fatal CMV crashes in work zones increased from 6 to [8](#) from 2011 to 2012. However, the number of fatal crashes within 5 miles of the construction zone (construction zone plus 5 miles on either end) decreased by 18%, namely from 11 to 9. Also, the number of fatal crashes in the 5 miles approaching the construction zone from either end (excluding the construction zone) decreased from 5 in 2011 to 1 in 2012. So while the number of fatal crashes in construction zones increased from 2011 to 2012, the number of crashes in the approaches to the work zones dropped dramatically. Also notable is an increase in all crashes in the 5 miles approaching the construction zones from either end (excluding the construction zones) from 268 in 2011 to 130 in 2012. These counts are based on the construction schedule provided by the LA DOTD and may thus differ from the actual number of crashes occurring in construction zones because the schedule may not accurately reflect the actual times work was being done.

Overall, there was a moderate increase in CMV crashes that followed the overall trend in increases in all crashes from 2011 to 2012 partly due to the economic upswing resulting in more traffic on the roads and highways of Louisiana.

Overview

This section provides an overview of the most important issues relating to CMV crashes in 2012 and trend data for the past five years. Table 1 depicts CMV crashes from 2007 to 2012 and shows that the fatal CMV crashes have increased by 8.1% from 2011 to 2012 while the 5-year change in fatal CMV crashes was -21%. The CMV involved injury crashes decreased by 0.4% while the CMV involved PDO crashes increased by 2% from 2011 to 2012. The total CMV crashes increased by 1.1% from 2011 to 2012, less than the increase observed for all vehicle crashes (3.1%).

Table 1: CMV Crashes 2007-2012

Year	CMV Crashes				CMV Crash Percentages				All crashes				% CMV			
	Fatal	Injury	PDO	Total CMV	Fatal	Injury	PDO	Total CMV	Fatal	Injury	PDO	Total	Fatal	Injury	PDO	Total
2007	118	2120	2110	4348	2.7%	49%	49%	2.72%	900	48,100	110,400	159,400	13.1%	4.4%	1.9%	2.7%
2008	102	1950	2115	4167	2.4%	47%	51%	2.64%	820	46,500	110,100	157,420	12.4%	4.2%	1.9%	2.6%
2009	74	1596	1816	3486	2.1%	46%	52%	2.24%	729	45,300	109,800	155,829	10.2%	3.5%	1.7%	2.2%
2010	93	1578	2031	3702	2.5%	43%	55%	2.50%	643	42,500	104,500	147,643	14.7%	3.7%	1.9%	2.5%
2011	86	1612	1969	3667	2.4%	44%	54%	2.42%	629	43,300	105,700	149,629	13.7%	3.7%	1.8%	2.4%
2012	93	1606	2008	3707	2.5%	43%	54%	2.40%	651	44,900	108,700	154,251	14.6%	3.6%	1.8%	2.4%
1 yr % change	8.1%	-0.4%	2.0%	1.1%	0.2%	-0.7%	0.6%	0.0%	3.5%	3.7%	2.8%	3.1%	0.8%	-0.1%	0.0%	0.0%
% 5-Year	-21%	-24%	-5%	-15%	-0.2%	-5.4%	5.6%	-0.3%	-28%	-7%	-2%	-3%	1.5%	-0.8%	-0.1%	-0.3%

The number of CMV crashes is expected to follow the trend of all crashes. Thus the CMV crashes as a percentage of all crashes may provide some insight in how programs specifically designed for the reduction of CMV crashes have worked. Fatal CMV crashes as a percentage of all fatal crashes increased in 2012 by 0.2 percentage point from 2011 while the CMV injury crashes as percent of all injury crashes declined by 0.7 percentage point from 2011. Overall, the data indicate that after a decline in fatal CMV crashes from 2007 to 2010, the CMV crashes are at the same level as in 2010. Although we do not know the exact VMT for commercial vehicles in 2011 and 2012, the fact that the total number of crashes and fatalities is on the rise again in 2012 indicates that increased commercial activities may have played a role in the increase of fatal crashes.

Figure 1: CMV and Non-CMV Crashes 2007-2012

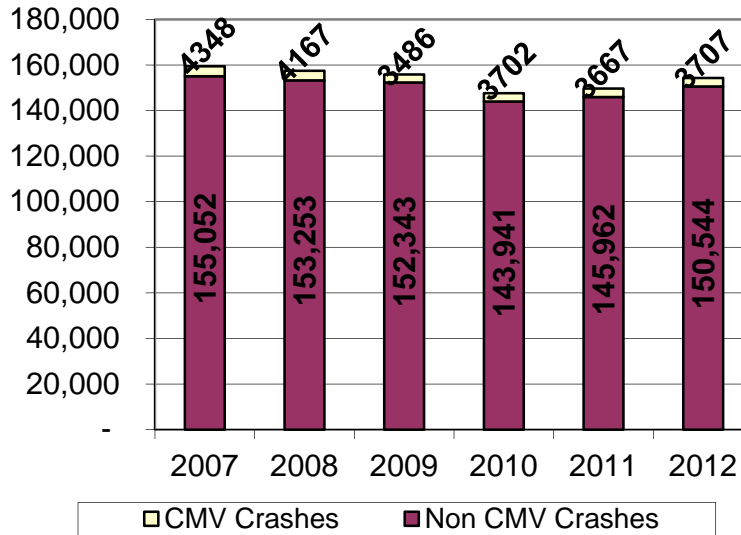


Figure 1 highlights the number of all crashes and shows the CMV crashes from 2007 to 2012. There were 40 more CMV crashes and 4582 more non-CMV crashes compared to 2011. In addition, CMV crashes accounted for 2.4% of all crashes in 2012, a decrease of .1% from 2011.

Figure 2: CMV Crashes by Severity: 2007-2012

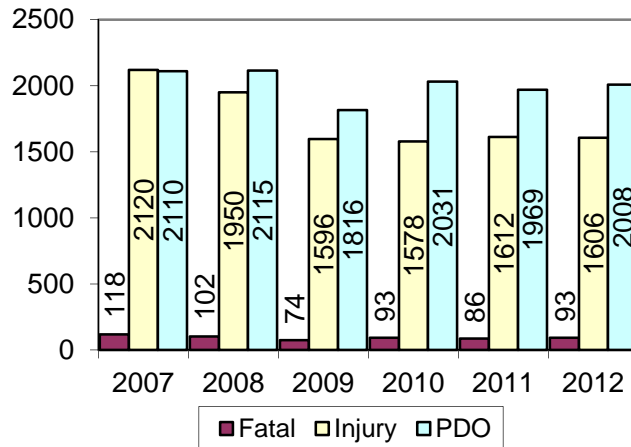


Figure 2 shows CMV crashes by severity. While injury crashes for all motor vehicles increased by 3.7 percent from 2011 to 2012, CMV injury crashes decreased by 0.4% in the same period. CMV property-damage-only crashes increased by 2% from 2011 to 2012, while all CMV crashes combined increased 1.1% from 2011 to 2012.

Figure 3: CMV and Non-CMV Fatal Crashes: 2007-2012

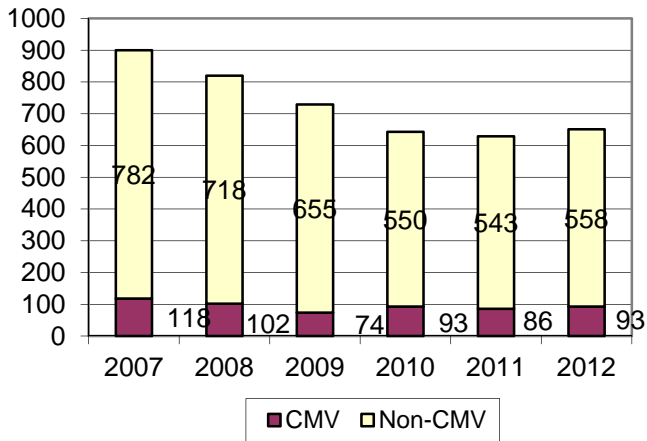
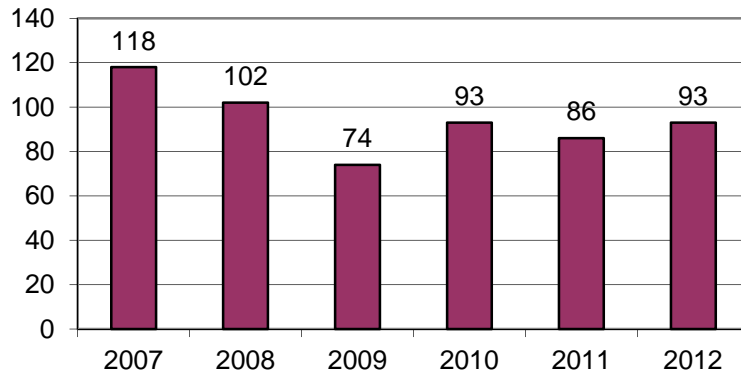


Figure 4: Fatal CMV Crashes by Year: 2007-2012



Figures 3 and 4 illustrate fatal non-CMV and CMV crashes from 2007 to 2012. While the increase in the number of non-CMV fatal crashes was 3.5% from 2011 to 2012, the CMV fatal crashes experienced a large increase of 8.1%, which amounts to 7 more fatal CMV crashes. Figure 4 shows the trend of fatal CMV crashes which indicates that 2009 had the lowest number of fatal CMV crashes in the past five years. In fact, 2009 had the lowest number of CMV fatal crashes since at least 1999 when this yearly report was first compiled. The 2012 data show that the downward trend in fatal CMV crashes experienced from 2007 to 2009 has not continued over the past three years. The year 2011 had the lowest overall traffic fatalities (676) but 2012 has been the first increase in fatalities since 2007 (721).

Due to a steady increase in Louisiana traffic over the years, the number of crashes should be adjusted by the vehicle miles traveled (VMT) by commercial vehicles. In past reports vehicle miles traveled for CMVs were obtained from the FMCSA website which was, however, discontinued after

2007 (<http://ai.fmcsa.dot.gov/CrashProfile/TruckBusFatalityRateAdj.asp>). The new FMCSA website (<http://ai.fmcsa.dot.gov/CrashProfile/TruckBusFatalityRateNew2.asp>) now proposes to use total VMT rather than commercial vehicle VMT.

Table 2 depicts the fatalities, injury crashes, PDO crashes and all crashes per 100 million miles traveled for CMVs and all vehicle crashes. While the fatality rate for CMV crashes increased slightly from 0.18 in 2011 to 0.20 in 2012, the 5-year trend shows a decline in the fatality rate from 0.26 in 2007 to 0.20 in 2012. It is important to note that with the new measure used by FMCSA, the CMV rates cannot be compared with the rates for all vehicles because of the use of total VMT to normalize CMV crashes.

Table 2: CMV and all Crashes 2007-2012 per 100 Million Miles Traveled

Year	CMV Fatality Rate and Crash Rates				Fatality Rate and Crash Rates for All Vehicles			Total Crash Rate
	Fatality Rate	Injury Crash Rate	PDO Crash Rate	Total CMV Crash Rate	Fatality Rate	Injury Crash Rate	PDO Crash Rate	
2007	0.26	4.7	4.6	9.6	1.98	105.9	243.2	351.1
2008	0.23	4.3	4.7	9.3	1.82	103.3	244.7	349.8
2009	0.16	3.6	4.0	7.8	1.62	100.9	244.5	347.1
2010	0.20	3.5	4.5	8.1	1.41	93.4	229.7	324.5
2011	0.18	3.4	4.2	7.8	1.35	93.1	227.3	321.8
2012	0.20	3.4	4.2	7.8	1.37	94.3	228.4	324.1

Analysis of Crashes by Month

Since monthly crash data fluctuate considerably from year to year, it is difficult to attribute a monthly effect on crash counts. Specifically, the fatal crash count exhibits large variations since small crash numbers vary more than large crash numbers. Nevertheless, as the data in Table 3 indicates, September had the highest number of fatal crashes with 13 fatal crashes and 15 deaths.

The analysis of the CMV crash data for the past seven years indicates that while yearly fatal crash counts in any given month may vary from 4 to 14, spring and fall tend to have the highest number of fatal CMV crashes and total CMV crashes on average. Also, over the seven years, the six months March-May and October-December have, on the average, two (2) more fatal CMV crashes and 13 more total CMV crashes than the other six months of the year. Therefore these six months March-May and October-December are the times of the year when heightened alert or enforcement is appropriate.

Table 3: CMV Crashes by Month in 2012

MONTH	FATAL CRASHES	TOTAL KILLED	INJURY CRASHES	PDO	TOTAL CRASHES	TOTAL TRUCKS AND BUSSES	% CRASHES
JANUARY	10	12	112	120	242	267	7%
FEBRUARY	9	14	128	154	291	313	8%
MARCH	6	6	158	184	348	374	9%
APRIL	8	9	136	138	282	295	8%
MAY	4	6	139	161	304	328	8%
JUNE	9	10	118	164	291	306	8%
JULY	8	10	106	178	292	309	8%
AUGUST	7	7	155	198	360	377	10%
SEPTEMBER	13	15	148	177	338	362	9%
OCTOBER	4	4	150	192	346	372	9%
NOVEMBER	7	8	123	180	310	331	8%
DECEMBER	8	10	133	162	303	320	8%
TOTAL	93	111	1606	2008	3707	3954	100%

Violations

There are two ways one can evaluate the citations in CMV crashes, depending on whether we use the number of drivers or the number of citations as the denominator. In a crash, either the CMV driver or the non-CMV driver or both may receive a citation. Thus, when the number of CMV drivers and the number of car drivers are used as the denominator, respectively, the two percentages do not add up to 100%. They may be lower or higher than 100% if there are many crashes where no driver received a citation, and this percentage will be higher than 100% if there are many crashes where both drivers received a citation. For instance, in 2007, 2008 and 2010 the two percentages add up to more than 100% for fatal crashes. The average of both percentages approximates the percentage of all drivers involved in CMV crashes that received citations.

The percentage of CMV drivers in fatal crashes who received a citation has increased by 7 percentage points from 2011 to 2012. In 2012, of all CMV drivers in fatal crashes, 36% were cited for a violation compared to 29% in 2011. For injury and property damage crashes, 51% and 49% of the CMV drivers were cited for violations, respectively. These figures show that in fatal crashes non-CMV drivers continued to have a higher percentage of citations than CMV drivers, while 49% of CMV drivers and 54% of non-CMV drivers received citations in PDO crashes the percentage of CMV drivers receiving citations in injury crashes was 51% which is higher than the 46% received by non-CMV drivers.

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Secondly, we can look at the percentage of citations going to the CMV driver versus the non-CMV driver. These two percentages add up to 100% all the time. Even if the percentage of all citations in crashes would decline to say 10%, still half, for example, could go to the CMV driver and half could go to the non-CMV driver. The percentage of citations in fatal crashes going to the CMV driver has increased from 2011 to 2012, i.e. from 29% in 2011 to 36% in 2012. For injury and property-damage-only crashes (PDO) the CMV driver received 53% and 52%, of violations, respectively.

Table 4: Violations as Percentage of Drivers and Percent of all Violations

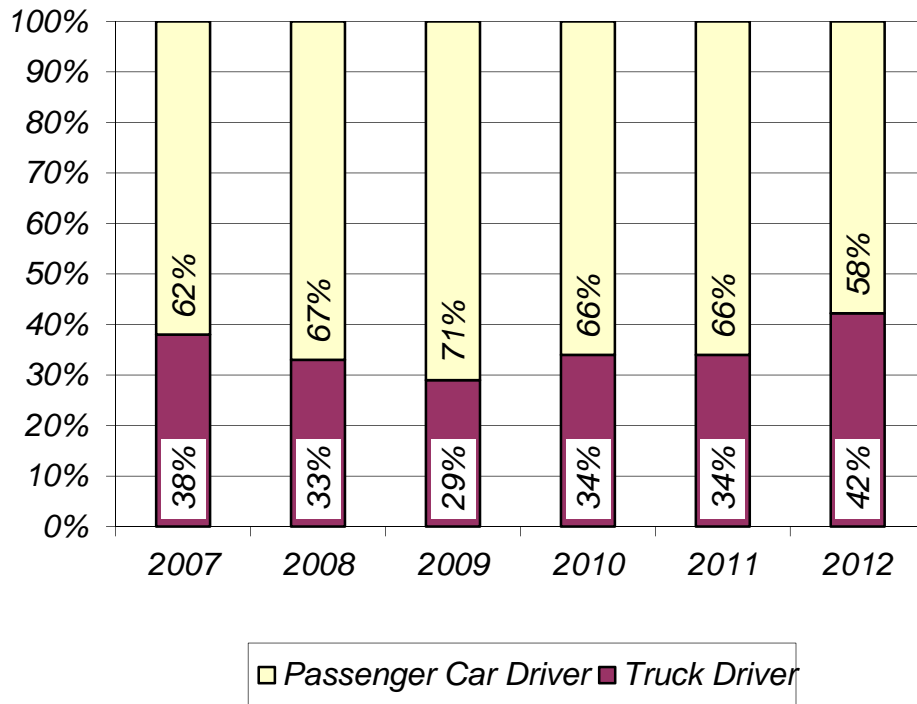
As Percentage of Drivers	VIOLETIONS	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
		CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver
	2007	35%	68%	47%	53%	48%	53%	47%	54%
2008	32%	78%	49%	49%	48%	55%	48%	53%	
2009	27%	66%	51%	48%	49%	53%	49%	51%	
2010	33%	68%	51%	49%	51%	55%	51%	52%	
2011	29%	49%	52%	47%	50%	51%	50%	49%	
2012	36%	57%	51%	46%	49%	54%	49%	50%	
These are the percentage of drivers receiving citations.									
As Percentage of Violations	VIOLETIONS	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
		CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver
	2007	37%	63%	39%	61%	40%	60%	39%	61%
2008	30%	70%	50%	50%	53%	47%	51%	49%	
2009	29%	71%	51%	49%	52%	48%	51%	49%	
2010	34%	66%	52%	48%	54%	46%	52%	48%	
2011	34%	66%	53%	47%	55%	45%	54%	46%	
2012	42%	58%	53%	47%	52%	48%	52%	48%	
These are all the citations in a crash and the percentages going to either CMV driver or other car driver.									

The different views become apparent when the total number of citations given to the drivers decline over time. In 2012, citations in fatal crashes were given more frequently, 36% and 57% of the time for CMV and Non-CMV, a considerable increase from 29% and 49% in 2011. This means, approximately 39% of the drivers in fatal CMV crashes received a citation in 2011, while 46% received a citation in 2012, an increase of about 7 percentage points. Thus while the percentage of citations in fatal crashes has increased considerably, the relative distribution of these citations

changed in the past year with 42% going to the CMV driver in fatal crashes and 58% going to the non-CMV driver.

Figure 5 reiterates the findings expressed above, namely that the relative percentage of citations going to CMV drivers versus the non-CMV drivers in fatal CMV crashes have been relatively stable over the past years with roughly one third of citations going to the CMV driver and the remaining going to the non-CMV driver. The number of violations have shifted more towards the CMV drivers in 2012.

Figure 5: CMV and Non-CMV Driver Violations in Fatal Crashes: 2007-2012



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Table 5: Type of Violation of CMV Driver

VIOLATIONS	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
CARELESS OPERATION	13	34.2%	310	35.4%	385	37.4%	708	36.4%
CUT CORNER ON LEFT TURN	0	0.0%	9	1.0%	8	0.8%	17	0.9%
CUTTING IN, IMPROPER PASSING	1	2.6%	18	2.1%	39	3.8%	58	3.0%
DISREGARDED TRAFFIC CONTROL	2	5.3%	45	5.1%	25	2.4%	72	3.7%
DRIVER CONDITION	1	2.6%	13	1.5%	9	0.9%	23	1.2%
DRIVING LEFT OF CENTER	4	10.5%	10	1.1%	19	1.8%	33	1.7%
EXCEEDING SAFE SPEED LIMIT	0	0.0%	4	0.5%	8	0.8%	12	0.6%
EXCEEDING STATED SPEED LIMIT	1	2.6%	2	0.2%	2	0.2%	5	0.3%
FAILED TO DIM HEADLIGHTS	0	0.0%	0	0.0%	0	0.0%	0	0.0%
FAILED TO SET OUT FLAGS, FLARES	0	0.0%	1	0.1%	1	0.1%	2	0.1%
FAILURE TO SIGNAL	0	0.0%	0	0.0%	0	0.0%	0	0.0%
FAILURE TO YIELD	2	5.3%	127	14.5%	105	10.2%	234	12.0%
FOLLOWING TOO CLOSELY	3	7.9%	105	12.0%	89	8.6%	197	10.1%
IMPROPER BACKING	0	0.0%	20	2.3%	36	3.5%	56	2.9%
IMPROPER PARKING	0	0.0%	2	0.2%	4	0.4%	6	0.3%
IMPROPER STARTING	0	0.0%	1	0.1%	1	0.1%	2	0.1%
MADE WIDE RIGHT TURN	0	0.0%	6	0.7%	9	0.9%	15	0.8%
NO VIOLATIONS	68		835		1089		1992	
OTHER	6	15.8%	82	9.4%	120	11.7%	208	10.7%
OTHER IMPROPER TURNING	2	5.3%	24	2.7%	33	3.2%	59	3.0%
TURNED FROM WRONG LANE	0	0.0%	14	1.6%	13	1.3%	27	1.4%
UNKNOWN	3	7.9%	59	6.7%	79	7.7%	141	7.3%
VEHICLE CONDITION	0	0.0%	24	2.7%	44	4.3%	68	3.5%
Total Violations	38	100.0%	876	100.0%	1029	100.0%	1943	100.0%
Column % of Violations in Crash	36%		51%		49%		49%	
Row % of Violations in Crash	42%		53%		52%		52%	

Table 5 shows the types of violations drivers receive. In 2012, careless operation accounted for the majority of violations of the CMV driver in fatal crashes, 13 occurrences or 34%, in association with fatal commercial vehicle crashes. The percentage of careless operation of CMV drivers was 35.4% for injury CMV crashes and 37.4% for PDO crashes.

Manner of Collision

Table 6 shows the manner of collision. “Head-on”, “right angle”, and “rear-end” collisions make up more than 81% [(18+22+18) / (93-21)] of all fatal multi-vehicle CMV crashes. This is a 10.6 percentage point increase from 70.4% in 2011 for these three types of collisions. Also, the non-collision fatal CMV crashes increased from 14 in 2011 to 21 in 2012.

Table 6: Manner of Collision

MANNER OF COLLISION	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
HEAD-ON	18	19.4%	40	2.5%	29	1.5%	87	2.4%
LEFT TURN - ANGLE	0	0.0%	65	4.1%	63	3.1%	128	3.5%
LEFT TURN - OPPOSITE DIRECTION	3	3.2%	49	3.1%	50	2.5%	102	2.8%
LEFT TURN - SAME DIRECTION	0	0.0%	30	1.9%	33	1.7%	63	1.7%
NON-COLLISION WITH MOTOR VEHICLE	21	22.6%	217	13.5%	470	23.4%	708	19.1%
OTHER	4	4.3%	114	7.1%	132	6.6%	250	6.8%
REAR END	22	23.7%	569	35.5%	552	27.5%	1143	30.9%
RIGHT ANGLE	18	19.4%	269	16.8%	230	11.5%	517	14.0%
RIGHT TURN - OPPOSITE DIRECTION	0	0.0%	7	0.4%	14	0.7%	21	0.6%
RIGHT TURN - SAME DIRECTION	0	0.0%	19	1.2%	32	1.6%	51	1.4%
SIDESWIPE - OPPOSITE DIRECTION	4	4.3%	45	2.8%	53	2.6%	102	2.8%
SIDESWIPE - SAME DIRECTION	3	3.2%	181	11.3%	347	17.3%	531	14.3%
Total	93	100.0%	1606	100.1%	2008	100.2%	3707	100.1%

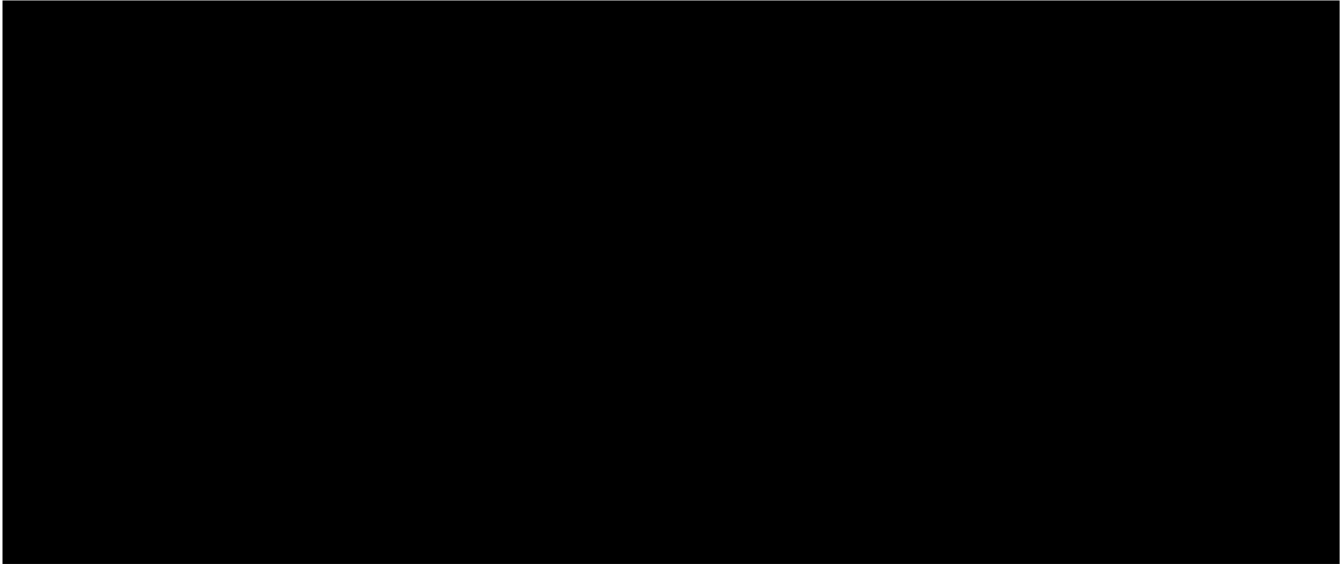
High Crash Locations in Interstate Corridors

There are two main corridors in Louisiana, (1) Interstate 10/12 corridor in south Louisiana from the Texas state line to the Mississippi state line and (2) Interstate 20 corridor in north Louisiana from the Texas state line to the Mississippi state line. Both corridors have significant interstate traffic.

Interstate 10/12 Corridor

The Interstate 10/12 corridor includes 16 parishes, and these parishes accounted for 42% of fatal CMV crashes and 64% of all CMV crashes in 2011.

Figure 6: Interstates 10/12 Corridor



The corridor includes Louisiana Interstates 10, 110, 210, 310, 610, 12, 55, 59 and parts of Interstate 49 as shown in Figure 6. The major US Highways along the corridor are US 90, 190 and 61.

The cumulative percentage graphs provide an easy to understand method to identify high crash locations. For any interval of mileposts, the steeper the graph, the more crashes occur within the mileposts. For instance, Figure 7 shows the cumulative frequency of commercial vehicle crashes for 2012 and 2011 by milepost on Interstate 10 along with all crashes. The comparison between 2011 and 2012 shows that the percentage of crashes within the first 50 miles of interstate 10 has increased slightly from 18% to 22%. The most obvious area for CMV crashes in 2012 was between milepost 210 and 240. Remarkable, the pronounced area of crashes around Baton Rouge in 2011 has disappeared in 2012.

Figure 7: Cumulative Percentage of Interstate 10 Crashes 2012 and 2011

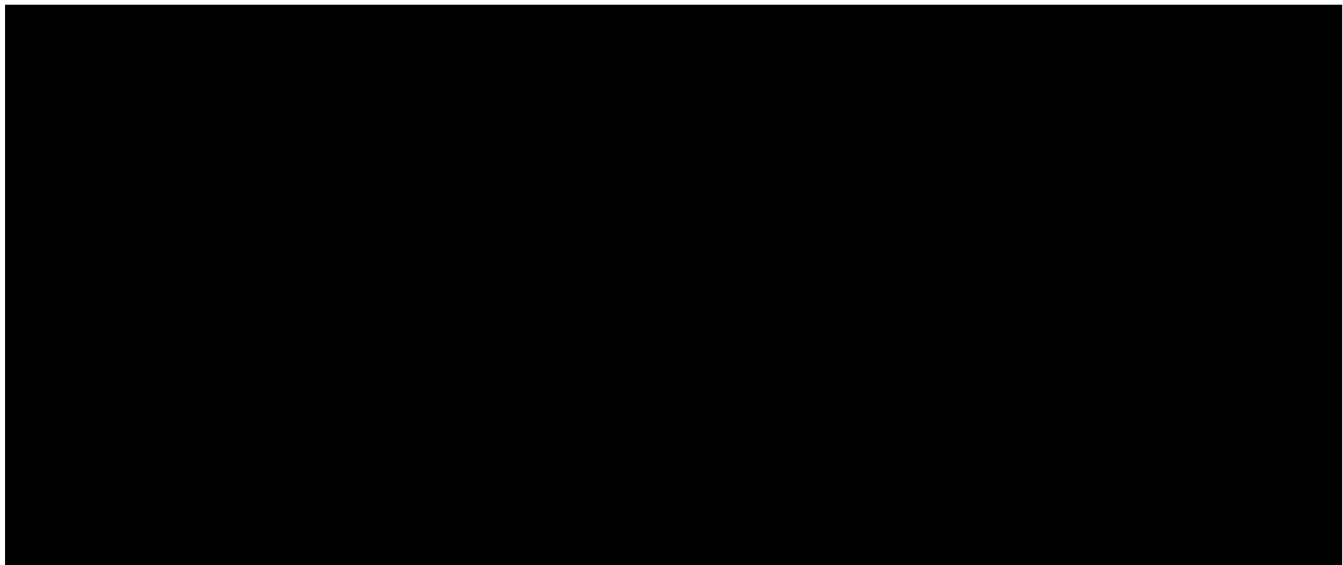
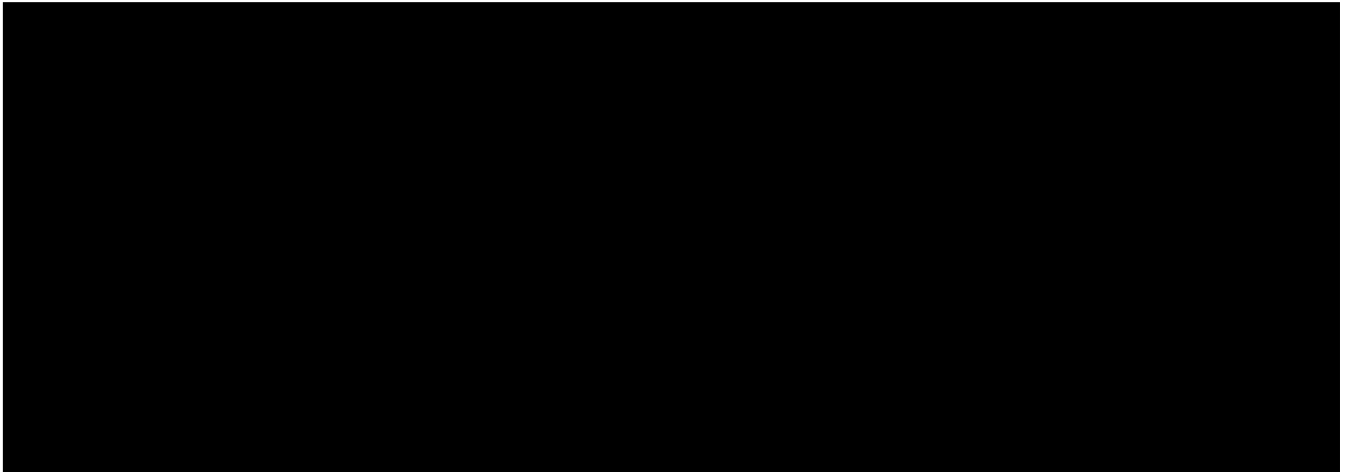


Figure 8a shows the concentration of CMV crashes on I10 between I55 and the Causeway.

Figure 8a: Interstate 10 in New Orleans Mileposts 200 to 230



The interstate section of I10 between West Baton Rouge and the I10/12 split has about 13% of all crashes on I10, but about 22% of all CMV crashes. These crashes are shown in Figure 8b.

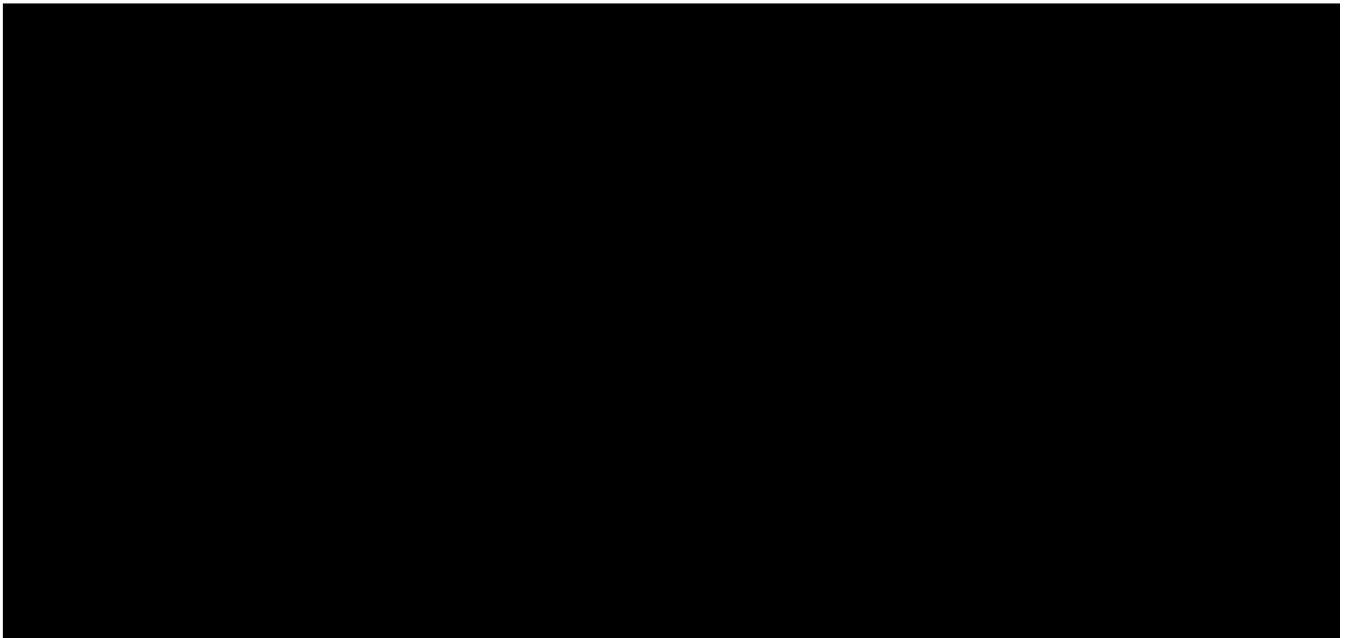
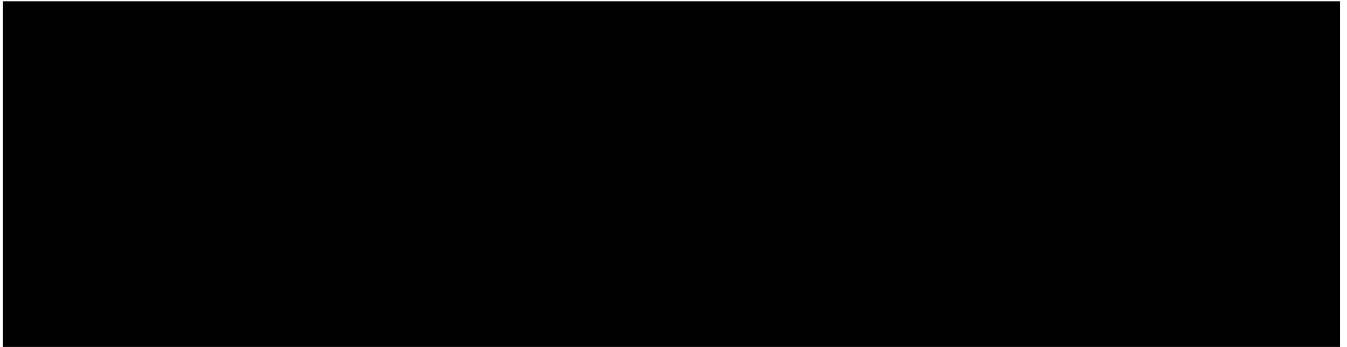


Figure 8c shows that several CMV crashes occurred on the I10 Bridge in Baton Rouge which indicates a hot spot for crashes.

Figure 8c: Interstate 10 Bridge in Baton Rouge



The cumulative graphs for interstate 12 show that the area between Baton Rouge and Denham Springs, which was under construction during 2011, has seen a significant reduction in crashes in 2012. Figure 9 shows a significant decrease in the cumulative percent of CMV crashes from 40% in 2011 to 10% in 2012 within the first 10 miles of Interstate 12.

Figure 9: Cumulative Percent of Interstate 12 Crashes 2012 and 2011

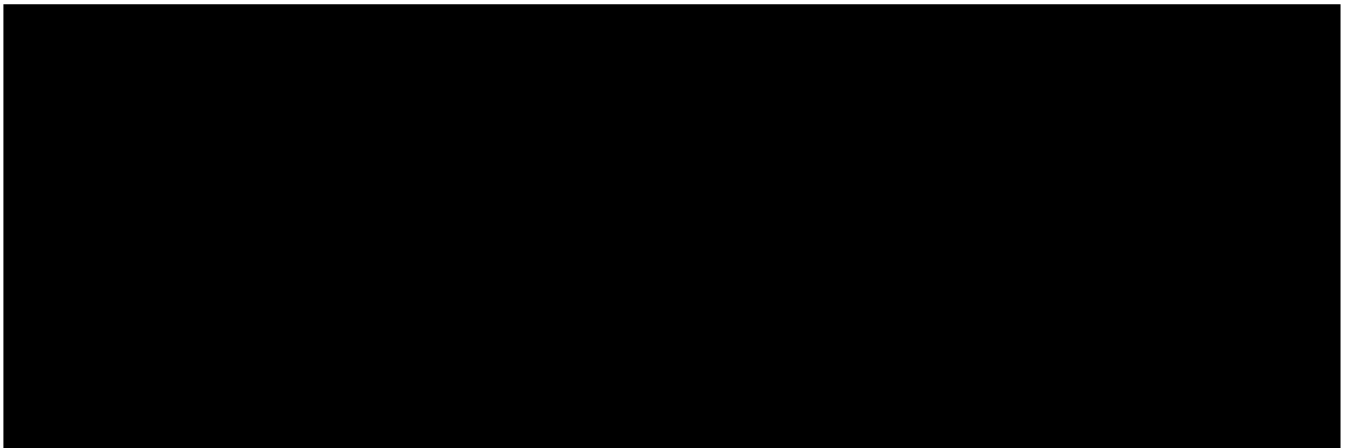
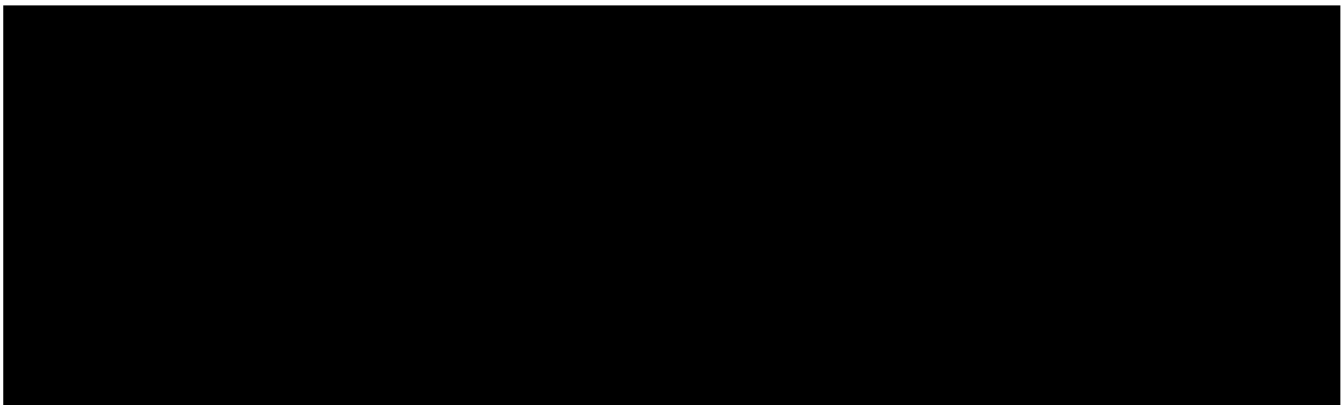


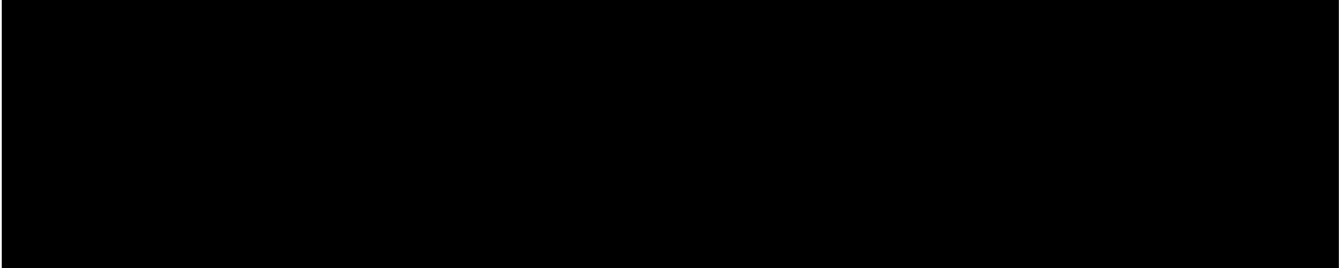
Figure 10 shows the Interstate 12 corridor between Baton Rouge and Slidell with considerably fewer crashes than in 2011.

Figure 10: Interstate 12 Crashes



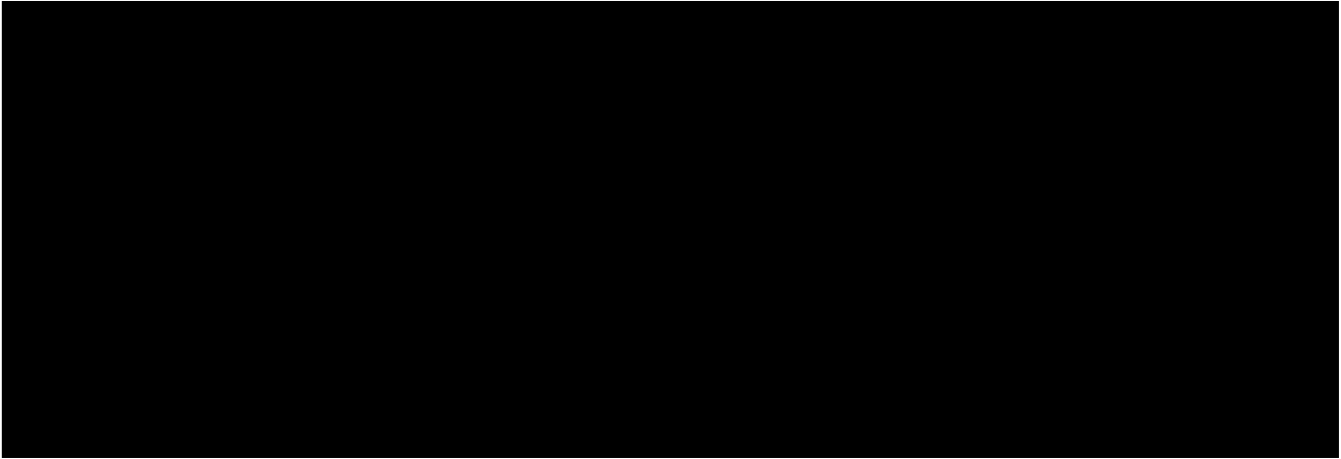
Interstate 20 Corridors

Figure 11: Interstate 20 Corridor



The Interstate 20 corridor includes 10 parishes. The three parishes (CADD0, BOSSIER and OUACHITA) account for 10% of all commercial vehicle crashes in 2012. As illustrated in Figure 11, the corridor includes Interstates 20, 220 and parts of Interstate 49. The major US Highways along the corridor are US 61, 65, 71, 80, 165 and 167.

Figure 12 shows the cumulative frequency of commercial motor vehicle crashes by milepost on Interstate 20 along with all crashes. The percentage of CMV crashes within the first 50 miles of interstate 20 decreased significantly in 2012 from 45% to 30%. The graph also shows that in 2012 there were no major hot spots on I20 with the exception of around milepost 25 which had about 10% of CMV crashes on I20.

Figure 12: Cumulative Frequency of CMV Crashes on Interstate 20

Work-Zone Crashes

Work zones are of specific interest for enforcement activities because they are potential hotspots for crashes. The work zones were derived from a DOTD file containing all scheduled work on interstates. Because this schedule may not accurately reflect the actual construction, the numbers in Table 7a are likely to be inflated. There are also work-zone indicators on the crash report form (Work Zone Indicator (Yes/No) and a Road Condition field with 14 options two of which are Construction Repair and Construction No Warning). However, these crash report fields have drawbacks as well. The form may not be filled out consistently in cases when there is a work zone but no work is performed. Also, since many of the crashes occur before the work zone, when traffic slows down or comes to a standstill, these crashes may be missed in the crash report. This analysis therefore will include the 5 miles of the approach to the construction zone. Since we do not have the detailed information about the lane the construction is in or if both lanes are under construction, we include 5 miles on either side of the construction zone indicated in the work schedule by the DOTD. Table 7a shows that the number of fatal CMV crashes on all interstates increased by 4 from 23 in 2011 to 27 in 2012 while the number of fatal crashes in construction zones increased by 2 from 6 to 8, when only the schedule is used. However, the number of crashes must be adjusted by the construction time and miles under construction. For instance, the year 2012 had 46% more construction zone day miles, i.e. miles times days under construction. We will therefore adjust the crash count by the miles multiplied by the days under construction to normalize the count. This adjustment does not take into consideration the VMT of CMV within the construction zones because it is not readily available. When miles and days under construction are taken into account, fatal crashes decreased from 5.7 fatalities per day-mile in 2011 to 5.2 fatal crashes per day-mile in 2012.

The number of fatal crashes in the +/-5 miles of the approach to the construction zones decreased from 5 in 2011 to 1 in 2012 and the number of fatal crashes per day mile decreased from 4.2 in 2011 to 0.7 in 2012. Also seen in Table 7a is an decrease in all CMV crashes within the +/-5 miles that include the construction zones, i.e., from 567 in 2011 to 392 in 2012, a decrease of 31%,

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while the number of crashes within construction zones decreased from 299 in 2011 to 262 in 2012, a decrease of 12%.

Table 7a: Work-Zone CMV Crashes on Interstates (2011-2012) using DOTD Schedule Only

Within 5 miles of construction zone refers to 2 times 5 miles plus length of construction,

In 5 miles approach to construction zone refers to only the 5 miles on either side of the construction zone excluding the construction zone

	WHERE	2012				2011				Percentage Change			
		FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL
ALL CMV CRASHES ON INTER-STATES	Count	27	362	578	967	23	370	607	1000	17%	-2%	-5%	-3%
	PER 100,000 Day-MILES	8.3	110.8	176.9	295.9	7.0	113.2	185.7	306.0	17%	-2%	-5%	-3%
CONSTRUCTION ZONES	Count	8	96	158	262	6	118	175	299	33%	-19%	-10%	-12%
	PER 100,000 Day-MILES	5.2	62.0	102.0	169.1	5.7	111.3	165.1	282.0	-9%	-44%	-38%	-40%
WITHIN 5 MILES OF CONSTRUCTION ZONES	Count	9	136	247	392	11	218	338	567	-18%	-38%	-27%	-31%
	PER 100,000 Day-MILES	3.0	44.8	81.3	129.1	4.9	97.1	150.5	252.4	-39%	-54%	-46%	-49%
IN 5 MILES APPROACH TO CONSTRUCTION ZONE	Count	1	40	89	130	5	100	163	268	-80%	-60%	-45%	-51%
	PER 100,000 Day-MILES	0.7	26.9	59.8	87.4	4.2	84.3	137.5	226.0	-84%	-68%	-56%	-61%

Using crashes that are marked both on the crash report as work-zone related (see Table 7b) (ROAD_COND_CD in ('G','I') Or CONST_MAINT_ZN = 1), the number of fatal crashes in construction zones WAS ZERO IN 2011 AND 2012. The number of crashes within the +/-5 miles approaches to the construction zones is zero, since officers are unlikely to mark the crash as in a work zone in their report when the crash occurred before or after the work zone. Table 7b therefore does not report crashes before or after construction zones.

Table 7b: Work-Zone CMV Crashes on Interstates (2011-2012) based on Crash Report

Within 5 miles of construction zone refers to 2 times 5 miles plus length of construction,
 ## In 5 miles of construction zone refers to only the 5 miles before and 5 miles after construction zone excluding the construction zone

WHERE	2012				2011				Percentage Change				
	FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL	
ALL CMV CRASHES ON INTER-STATES	Count	27	362	578	967	23	370	607	1000	17%	-2%	-5%	-3%
	PER 100,000 Day-MILES	8.3	110.8	176.9	295.9	7.0	113.2	185.7	306.0	17%	-2%	-5%	-3%
CONSTRUCTION ZONES	Count	0	17	11	28	0	24	23	47	0%	-29%	-52%	-40%
	PER 100,000 Day-MILES	0.0	11.0	7.1	18.1	0.0	22.6	21.7	44.3	0%	-52%	-67%	-59%
WITHIN 5 MILES OF CONSTRUCTION ZONES	Count	0	17	11	28	0	42	28	70	0%	-60%	-61%	-60%
	In 100,000 Day-MILES	0.0	5.6	3.6	9.2	0.0	18.7	12.5	31.2	0%	-70%	-71%	-70%
IN 5 MILES APPROACH TO CONSTRUCTION ZONE	Count	0	0	0	0	0	13	10	23	0%	-100%	-	-100%
	In 100,000 Day-MILES	0.0	0.0	0.0	0.0	0.0	11.0	8.4	19.4	0%	-100%	100%	-100%

Seat Belt Usage

Seat belt usage is one of the most important factors preventing death in a crash. Table 8 shows that in 2012, 36% of CMV drivers killed in a crash did not wear a seat belt while 59% of all drivers killed in all crashes were not wearing a seat belt.

Table 8: Seat Belt Usage

This includes only drivers with known seat belt use.

Year	CMV Driver						All Drivers					
	Drivers Killed w/o Seatbelt	Total Number of Drivers Killed	% of Drivers Killed w/o seatbelt	Drivers Seriously Injured w/o Seatbelt	Total Number of Drivers Seriously Injured	% of Drivers Seriously Injured w/o seatbelt	Drivers Killed w/o Seatbelt.	Total No. of Drivers Killed	% of Drivers Killed w/o seatbelt.	Drivers Seriously Injured w/o Seatbelt.	Total No. of Drivers Seriously Injured	% of Drivers Seriously Injured w/o seatbelt.
2007	14	20	70%	2	8	25%	360	544	66%	297	974	30%
2008	9	16	56%	2	12	17%	323	485	67%	296	887	33%
2009	3	5	60%	4	10	40%	289	443	65%	262	805	33%
2010	7	12	58%	3	12	25%	223	367	61%	226	705	32%
2011	2	7	29%	4	14	29%	247	370	67%	224	705	32%
2012	5	14	36%	3	8	38%	206	352	59%	213	633	34%

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5-Year Total	50	92	54%	24	94	26%	2344	3651	64%	2106	6567	32%
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On average, CMV drivers killed had a higher rate of seat belt usage than drivers killed while driving other vehicles. However, since the number of CMV drivers killed is relatively small, these percentages vary more than the percentages for all drivers. The 5-year average of CMV drivers killed not wearing a seat belt was 54%.

Hazardous Material

CMV crashes involving CMVs carrying hazardous material are of particular interest due to their potential danger to the environment and community when hazardous materials are released. Over the past five years, from 2007 to 2011, on average, about 15% of crashes involving hazardous material results in a release of the hazardous material. This percentage dropped to 9% in 2012. The actual percentage of release may be higher since many of the CMVs identified as transporting hazardous material may actually be returning with an empty load, thus the percentage of releases based on crashes with full loads of hazardous material may be much higher than the percentages shown in Table 9.

Table 9: Hazardous Material Crashes
(Includes only known Chemicals Transported)

Year	Transport	Released	% Released
2007	127	20	16%
2008	94	16	17%
2009	102	19	19%
2010	99	15	15%
2011	87	13	15%
2012	94	8	9%

The interstates accounted for 36% of all crashes involving hazardous materials in 2012. Specifically, Interstate 10 accounts for 59% of all hazardous material crashes on interstates in 2012. US highways account for 21% of all hazardous material crashes in 2012, with US 90 and US 190 accounting for 46% of hazardous material crashes on US highways. State highways accounted for 42% of all hazardous crashes in 2012.

The types of hazardous material reported in CMV crashes are displayed in Table 10. On average, 17% involve corrosive material, 13% involve flammable gasses, and 46% involve

flammable liquids. The remaining percentages are various chemicals. Note that Table 10 does not include unknown chemicals.

Table 10: Type of Hazardous Material in CMV Crashes
(Includes only known Chemicals Transported)

PLC	Year	2003		2004		2005		2006		2007		2008		2009		2010		2011		2012	
		Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.
	CORROSIVE GASES (CANADA)	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
80	CORROSIVE MATERIALS	19	2	9	3	19	2	17	3	29	3	18	2	17	5	19	4	20	1	14	2
	DANGEROUS WASTES (CANADA)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DANGEROUS WHEN WET MATERIALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	ENVIRON HAZARDOUS SUBSTANCES(CANADA)	0	0	0	0	1	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0
	EXPLOSIVES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	EXPLOSIVES-MASS EXPLOSION HAZARD	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0
14	EXPLOSIVES WITH A NO SIGNIFICANT BLAST HAZARD	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
	EXPLOSIVES WITH A PREDOMINANTLY A FIRE HAZARD	0	0	2	0	0	0	2	0	1	1	1	0	0	0	0	0	0	0	0	0
12	EXPLOSIVES-PROJECTION HAZARD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	EXTREMELY INSENSITIVE DETONATING ARTICLES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	FLAMMABLE GASES	15	2	8	2	1	0	13	1	21	3	23	2	17	4	19	3	12	0	16	2
30	FLAMMABLE LIQUIDS	36	7	26	7	56	10	59	13	53	8	74	13	58	6	52	6	42	10	44	2
41	FLAMMABLE SOLIDS	1	0	0	0	0	0	1	0	0	0	4	0	3	1	1	0	1	0	5	1
	FLAMMABLE SOLIDS or SPONT ANEOUSLY COMBUSTIBLE MATERIALS or DANGEROUS WHEN WET MATERIALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	GASES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	GASES TOXIC BY INHALATION	1	0	0	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	2	0
	INFECTIOUS SUBSTANCES	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	MISC DANGEROUS GOODS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
	MISC DANGEROUS GOODS(CANADA)	4	0	4	1	1	0	1	0	4	1	0	0	0	0	0	0	0	0	0	0
91	NON-FLAM, NON-TOXIC COMPRESSED GASES	1	1	3	1	7	2	5	1	8	2	7	0	5	1	7	2	9	2	4	1
22	ORGANIC PEROXIDES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	OXIDIZERS	0	0	0	0	0	0	0	0	0	0	1	0	2	2	0	0	0	0	0	0
	OXIDIZERS and ORGANIC PEROXIDES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	RADIOACTIVE MATERIALS	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
70	SPONT ANEOUSLY COMBUSTIBLE MATERIALS	0	0	0	0	1	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0
42	TOXIC MATIERALS	2	1	4	0	0	0	0	0	3	1	5	0	0	0	1	0	2	0	0	0
	TOXIC MATERIALS and INFECTIOUS SUBSTANCES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
61	VERY INSENSITIVE DETONATING ARTICLES	0	0	0	0	0	0	0	0	0	0	0	0	102	19	0	0	0	0	0	0
Total	Total	82	13	57	14	86	15	102	19	127	20	138	18	204	38	99	15	87	13	94	8

Distractions

Although distractions play an important role in all crashes, including CMV crashes, no fatal CMV crashes were reported in 2012 in which cell phone usage was the cause of distraction. Table 11 shows the breakdown of crashes by type of distraction for CMV crashes.

Table 11: Distractions

Driver Distraction Description	Fatal	Injury	PDO	Total
CELL PHONE	0	4	4	8
NOT DISTRACTED	74	1818	1284	3176
OTHER ELECTRONIC DEVICE	0	7	2	9
OTHER INSIDE THE VEHICLE	2	33	19	54
OTHER OUTSIDE THE VEHICLE	0	33	25	58
UNKNOWN	27	334	230	591

Figure 13: Cell Phone Use as a Distraction in CMV Crashes

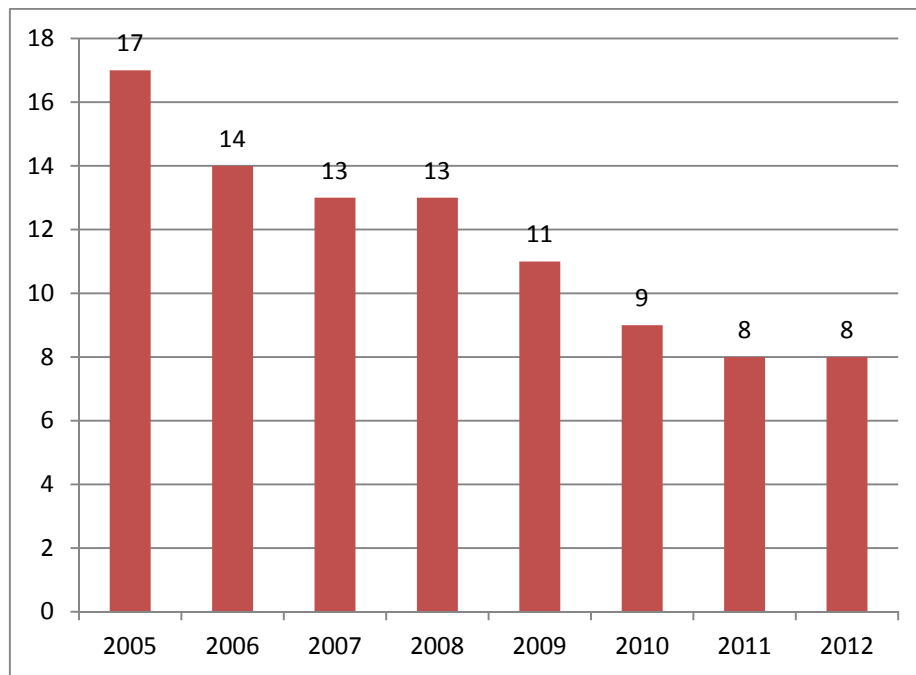


Figure 13 shows that crashes involving cell phone usage of CMV drivers have decreased by 53% from 2005 to 2012, namely from 17 in 2005 to 8 in 2011 and 2012.

Changes in Number of Crashes by Parish

The 15 parishes with the highest number of fatal and non-fatal CMV crashes are listed in Table 12. In 2012, Louisiana experienced a significant increase in all CMV crashes along the I10/I12 corridor: CALCASIEU (+46%), WEST BATON ROUGE (+17%) and ORLEANS (+21%). Lafourche (+40%) and Ouachita (+34%) also had considerable increases in CMV crashes. Thus the I10/12 corridor is a candidate for increased enforcement to counteract the increasing trend in crashes.

Table 12: CMV Crashes by Parishes

PARISH	FATAL CRASHES		TOTAL CRASHES		2012-2011	
	2012	2011	2012	2011	Diff	% Change
EAST BATON ROUGE	4	8	326	341	-15	-4%
JEFFERSON	3	0	214	198	16	8%
CALCASIEU	4	1	205	140	65	46%
LAFAYETTE	2	3	201	207	-6	-3%
ST. TAMMANY	5	6	132	161	-29	-18%
TANGIPAHOA	4	3	117	129	-12	-9%
CADDO	7	7	141	158	-17	-11%
ORLEANS	1	4	307	253	54	21%
LAFOURCHE	3	3	122	87	35	40%
LIVINGSTON	1	3	103	108	-5	-5%
RAPIDES	1	4	116	108	8	7%
TERREBONNE	1	1	82	86	-4	-5%
BOSSIER	1	1	110	100	10	10%
OUACHITA	2	3	126	94	32	34%
WEST BATON ROUGE	0	0	83	71	12	17%
State	93	86	3707	3667	40	1%

Rural CMV Crashes

Table 13a displays the count of crashes on rural roads by highway type. Although the data shows that rural roads account for most of the fatal and injury crashes, rural roads make up the majority of the roadway sections. While the fatal CMV crashes on US highways increased by only one from 2011 to 2012, the fatal CMV crashes on state highways decreased by 9 (+28%), and the fatal CMV crashes on interstates increased by 4 (+17%). The injury crashes during the same period exhibit a 2% decrease on interstates, a 1% decrease on state highways and a 4% decrease on US highways. Overall, parish roads and city streets experienced the highest increase in CMV crashes, namely 17% and 24% respectively.

Table 13a: CMV Crashes by Highway Type 2012

HIGHWAY TYPE	FATAL CRASHES			INJURY CRASHES			PDO			TOTAL		
	2012 CRASH	2011 CRASH	Difference	2012 CRASH	2011 CRASH	Difference	2012 CRASH	2011 CRASH	Difference	2012 CRASH	2011 CRASH	Difference
INTERSTATE	27	23	17%	362	370	-2%	578	607	-5%	967	1000	-3%
US HIGHWAY	21	20	5%	355	369	-4%	369	384	-4%	745	773	-4%
STATE HIGHWAY	41	32	28%	577	583	-1%	667	686	-3%	1285	1301	-1%
PARISH ROAD	1	4	-75%	95	94	1%	145	108	34%	241	206	17%
CITY STREET	3	7	-57%	210	187	12%	243	175	39%	456	369	24%
TOTAL	93	86	8%	1606	1612	0%	2008	1969	2%	3707	3649	1%
% Interstates	29%	27%	2%	23%	23%	0%	29%	31%	-2%	26%	27%	-1%
% US	23%	23%	-1%	22%	23%	-1%	18%	20%	-1%	20%	21%	-1%
% State	44%	37%	7%	36%	36%	0%	33%	35%	-2%	35%	36%	-1%
State, US & Interstates	96%	87%	8%	81%	82%	-1%	80%	85%	-5%	81%	84%	-3%

Table 13b: Percentage of Rural CMV Crashes 2012

	Fatal	Injury	PDO	Total
Interstates	81%	53%	61%	58%
US	76%	51%	49%	51%
State	83%	68%	72%	70%
Parish	0%	84%	85%	84%
City	67%	1%	1%	1%
Total	80%	53%	57%	55%

The crash report does not permit us to determine if a crash was urban or rural. The only indicator that may be used is the city code. Table 13b gives a different perspective of rural versus urban crashes. Table 13b shows the percentage of crashes by severity and highway type that were coded with city code 00. This code is most often used by the state police to identify crashes that occurred outside of city limits. However, some crashes worked by state police could have been inside city limits. About 81% of the fatal interstate CMV crashes occurred in rural areas and about 53% of the injury interstate CMV crashes occurred in rural areas. Overall, 80% of fatal CMV crashes and 53% of all CMV crashes occur in rural areas. Thus rural interstates, US highways, and state highways should continue to be the focus of enforcement.

Bus Crashes

Small and large busses are of particular interest to law enforcement because of the potential risk of high number of fatalities in a single crash. The number of CMV bus crashes, injuries, and fatalities is depicted in Table 14. In 2012, there were 97 large bus crashes where 348 passengers were injured inside the bus. There were 27 small bus crashes with no people killed but 33 passengers injured. There were 172 school bus crashes with 405 passengers injured. Overall, in 2012, there were 2 people killed in 296 bus crashes and 786 passengers injured. Compared to 2011, the number of bus crashes has decreased from 314 to 296 in 2012. However, the number of injured bus passengers has increased from 696 in 2011 to 786 in 2012. The number of school bus crashes have decreased by 11%, while small bus crashes have decreased by 7% and large bus crashes have increased by 5%.

Table 14: CMV Bus Crashes in 2012

Year		Count	School Bus	Small Bus	Large Bus	Total
2011	Inside Bus	Number of Crashes	193	29	92	314
	Inside Bus	Number Killed	0	5	0	5
		Number Injured	440	40	216	696
	In Bus Crash	Number Killed	3	7	5	15
Number Injured		598	66	337	1001	
2012	Inside Bus	Number of Crashes	172	27	97	296
	Inside Bus	Number Killed	0	0	0	0
		Number Injured	405	33	348	786
	In Bus Crash	Number Killed	1	1	0	2
		Number Injured	712	48	423	1183

Figure 14 shows the trend in bus crashes. While bus crashes have decreased from 2011 to 2012, the total number of bus crashes has trended between 250 and 300. The 2006 year was marked by the post Katrina clean-up and thus the number of crashes was relatively low because of less bus traffic.

Figure 14: Bus Crashes by Year

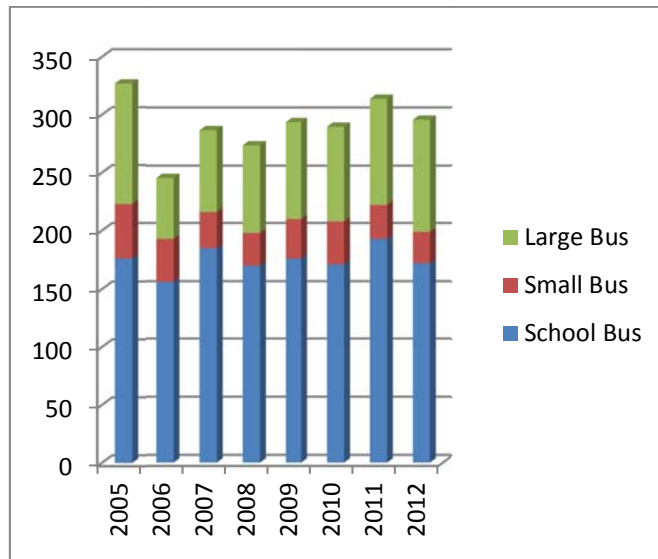
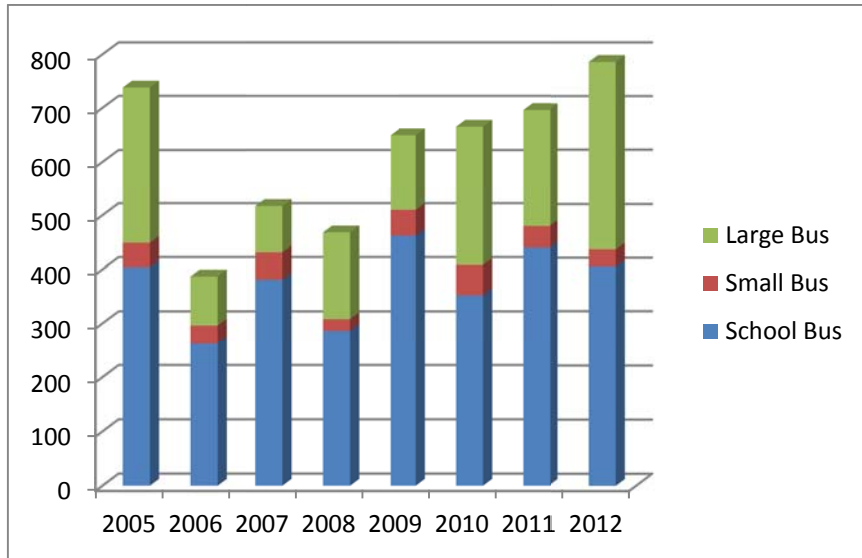


Figure 15: Bus-Crash Injuries by Year



Although the number of bus crashes have decreased by 6% from 2011 to 2012, namely from 314 to 296, the number of injuries have increased by 18%, namely from 1001 to 1183. The years 2005 and 2006 were affected by hurricane Katrina and thus may not be suitable for comparisons.

Note: Definition of Reportable CMV Crashes: To qualify for reporting to the SafetyNET, the crash has to involve a private or public motor carrier, a CMV weight of at least 10,001 pounds or above, a tow of one of the vehicles, or the transportation of a person to medical treatment away from the crash scene, or a fatality.