

Commercial Vehicle Safety - 2016

**COMMERCIAL VEHICLE SAFETY
IN LOUISIANA
An Analysis of Truck Crashes for 2016**

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Summary

In 2016, the total number of reported CMV crashes increased by 0.8% compared to 2015. The number of fatal CMV crashes increased from 85 in 2015 to 89 in 2016, an increase of 4.7%. The number of injury CMV crashes increased slightly from 1604 to 1636 during the same period, an increase of 2.0%.

The percentage of CMV drivers in fatal crashes cited for violations decreased from 2015 to 2016. The percentage of CMV drivers receiving violations in fatal crashes decreased from 28.4% in 2015 to 26.5% in 2016. Careless Operation and Failure To Yield were the most frequent citations. CMV drivers in injury and property damage crashes were cited for violations 48.8% and 48.1% 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 30.8% of all violations given to the driver of the CMV in fatal crashes and 35.8% in all crashes. Other violations with relatively high occurrence rates were failure to yield, with 3.8% in fatal and 12.2% in all crashes. Since careless operation is often a proxy for speed violations, we can look at the combined percentage of speed and careless operation violations. For fatal CMV crashes, the combined violations (speeding & careless operation) make up 34.6% of all violations the CMV driver receives. In all CMV crashes, this percentage is 36.6%. When failure to yield is included, these percentages increase to 38.5% for fatal crashes and 48.8% for all crashes.

The manner of collision most common in all CMV crashes are rear-end types at 33.4% and non-collision types (single vehicle crashes) at 16.9%. For fatal crashes, the types were head-on collisions at 20.2%, rear-end collisions at 23.6%, right angle collisions at 20.2%, and non-collision with motor vehicle crashes at 20.2%.

During 2016, 31.3% of all CMV crashes in Louisiana occurred on interstates, 31.9% occurred on state highways, and 19.2% occurred on U.S. highways. In 2015, the respective percentages were 30.0%, 33.0%, and 18.3%. From 2015 to 2016, the number of fatal interstate crashes increased slightly from 25 to 27. U.S. highways experienced a decrease in fatal crashes of 12.0% and state highways saw an increase of 25.0%. Thus, the overall increase in CMV related fatalities of 4.7% was largely due to the increase of fatalities on interstates and state highways.

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The number of fatal CMV crashes in work zones increased from 5 to 8 from 2015 to 2016. However, the number of fatal crashes within 5 miles of the construction zone (construction zone plus 5 miles on either end) decreased by 50.0%, namely from 8 to 4. However, the number of fatal crashes in the 5 miles approaching the construction zone from either end (excluding the construction zones) increased from 3 in 2015 to 4 in 2016.

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.

Overview

This section provides an overview of the most important issues relating to CMV crashes in 2016 and trend data for the past five years. Table 1 depicts CMV crashes from 2011 to 2016 and shows that the fatal CMV crashes have increased by 4.7% from 2015 to 2016 while the 5-year change in fatal CMV crashes was 3.5%. The CMV involved injury crashes increased by 2.0% while the CMV involved PDO crashes decreased by 0.1% from 2015 to 2016. The total number of CMV crashes increased by 0.8% from 2015 to 2016, less than the increase observed for all vehicle crashes, which was 3.2%.

Table 1: CMV Crashes 2011-2016

	CMV Crashes				CMV Crashes Percentages				All Crashes				%CMV			
Year	Fatal	Injury	PDO	Total CMV	Fatal	Injury	PDO	Total CMV	Fatal	Injury	PDO	Total	Fatal	Injury	PDO	Total
2011	86	1612	1969	3667	2.35%	43.96%	53.70%	2.45%	630	43370	105807	149808	13.65%	3.72%	1.86%	2.45%
2012	93	1600	1997	3690	2.52%	43.36%	54.12%	2.41%	654	44576	107967	153226	14.22%	3.59%	1.85%	2.41%
2013	83	1583	2104	3770	2.20%	41.99%	55.81%	2.45%	652	43553	109859	154069	12.73%	3.63%	1.92%	2.45%
2014	92	1622	2283	3997	2.30%	40.58%	57.12%	2.55%	665	44794	111504	156966	13.83%	3.62%	2.05%	2.55%
2015	85	1604	2368	4057	2.10%	39.54%	58.37%	2.41%	698	48280	119350	168329	12.18%	3.32%	1.98%	2.41%
2016	89	1636	2365	4090	2.18%	40.00%	57.82%	2.35%	705	49833	123124	173681	12.62%	3.28%	1.92%	2.35%
1 Yr % Change	4.7%	2.0%	-0.1%	0.8%	0.1%	0.5%	-0.5%	-0.1%	1.0%	3.2%	3.2%	3.2%	0.4%	0.0%	-0.1%	-0.1%
5 Yr % Change	3.5%	1.5%	20.1%	11.5%	-0.2%	-4.0%	4.1%	-0.1%	11.9%	14.9%	16.4%	15.9%	-1.0%	-0.4%	0.1%	-0.1%
Average	1.4%	2.0%	10.3%	6.6%	-0.1%	-1.9%	2.0%	-0.1%	6.9%	11.0%	11.0%	11.0%	-0.7%	-0.3%	0.0%	-0.1%

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While injury crashes involving all motor vehicles increased by 3.2% from 2015 to 2016, CMV injury crashes increased by 2.0% in the same period. CMV property damage crashes decreased by 0.1% from 2015 to 2016, while all CMV crashes combined increased by 0.8%.

The number of CMV crashes is expected to follow the trend of all crashes. Thus, the CMV crashes as a percent 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 percent of all fatal crashes increased in 2016 by 0.4 percentage points compared to 2015 while the CMV injury crashes as percent of all injury crashes decreased by 0.04 percentage points compared to 2015.

Figure 1: CMV and Non-CMV Crashes 2011-2016

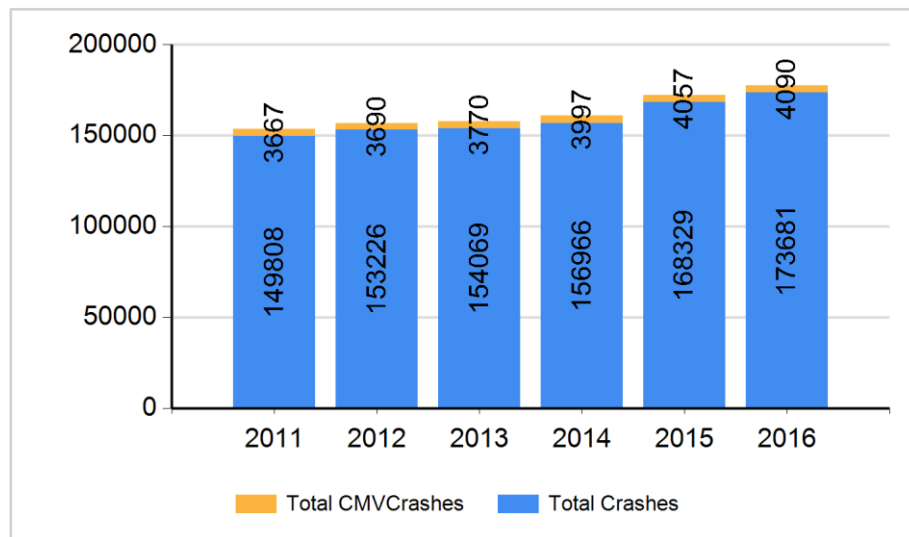
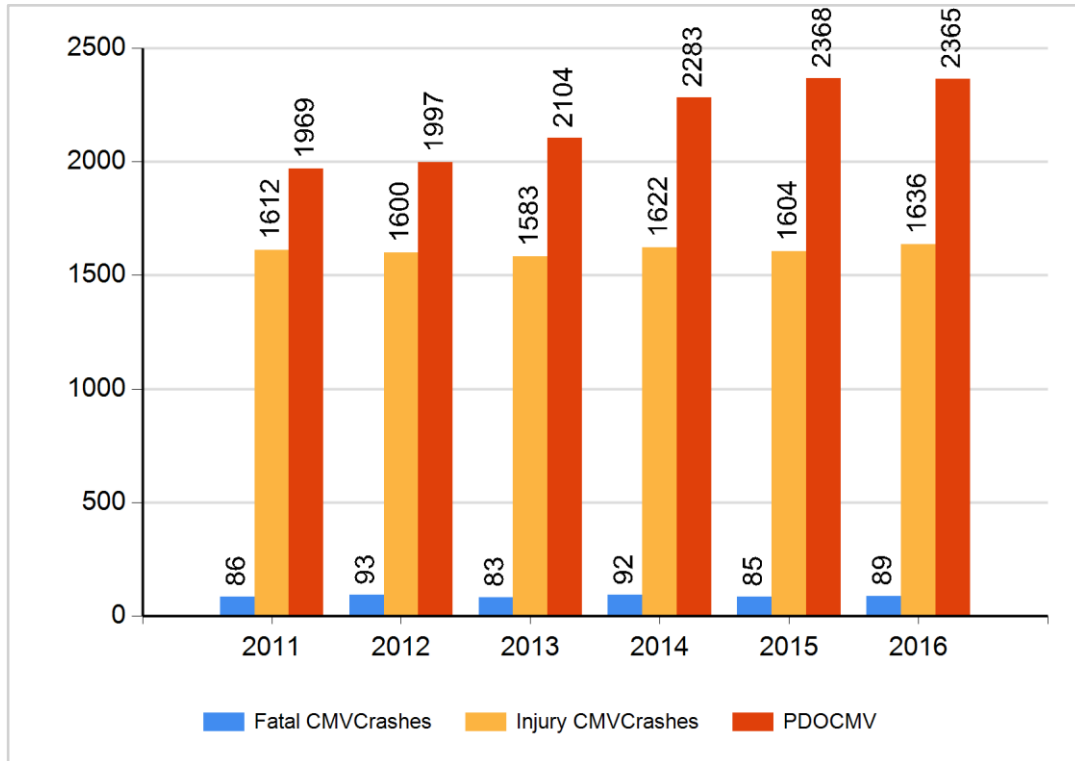


Figure 1 highlights the number of all crashes and shows the CMV crashes from 2011 to 2016. There were 33 more CMV crashes and 5,352 more non-CMV crashes compared to 2015. In addition, as Table 1 shows, CMV crashes accounted for 2.35% of all crashes in 2016, which is less than the 2.41% in 2015.

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Figure 2 shows that the number of fatal injury CMV crashes increased from 2015 to 2016, while the number of property damage only CMV crashes decreased.

Figure 2: CMV Crashes by Severity: 2011-2016



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CMV property damage crashes decreased by 0.1% from 2015 to 2016, while all CMV crashes combined increased by 0.8%.

Figure 3: CMV and Non-CMV Fatal Crashes 2011-2016

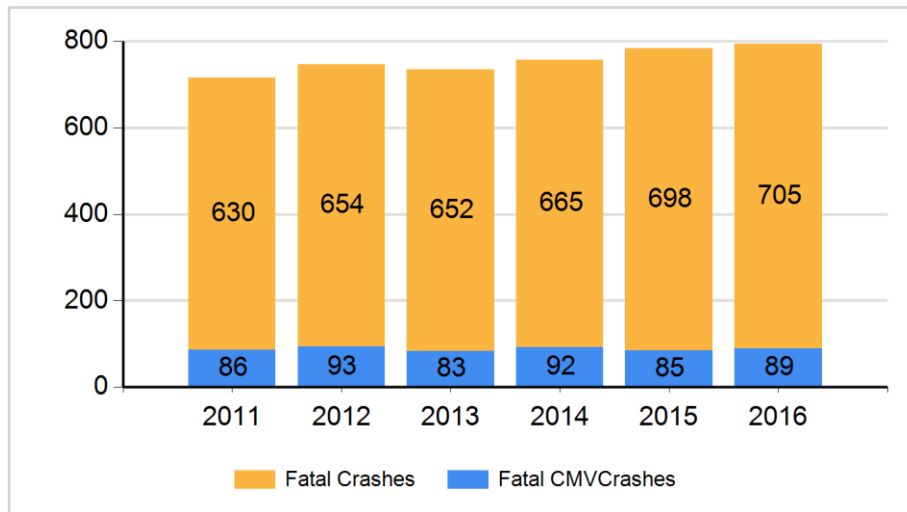
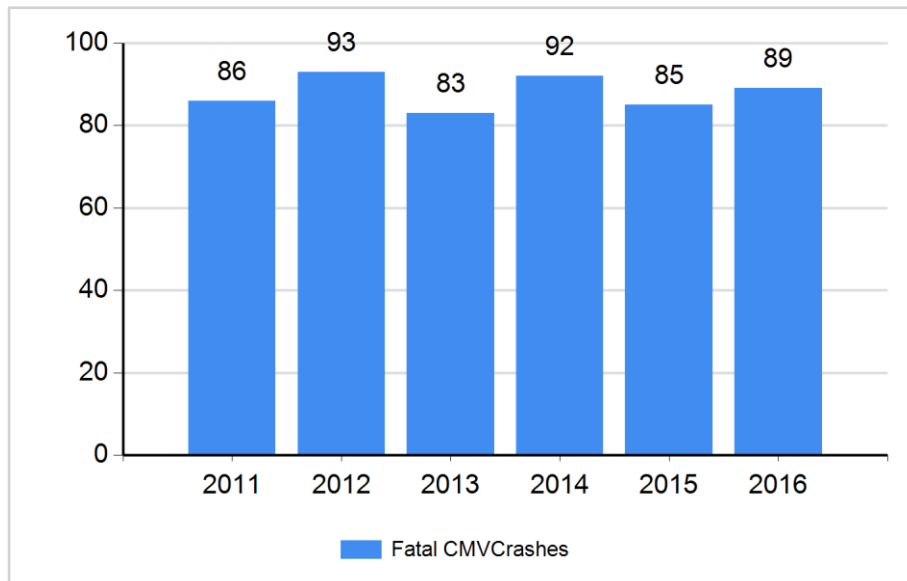


Figure 4: Fatal CMV Crashes by Year: 2011-2016



Figures 3 and 4 illustrate fatal non-CMV and CMV crashes from 2011 to 2016. While the increase in the number of non-CMV fatal crashes was 1% from 2015 to 2016, the CMV fatal crashes experienced a large increase of 4.7%, which amounts to 4 more fatal CMV crashes and 2% more fatalities. Figure 4 shows the trend of fatal CMV crashes which indicates that 2013 had the lowest number of fatal CMV crashes in the past five years. In fact, 2013 had the lowest number of CMV fatal crashes since at least 1999 when the yearly report was first compiled.

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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 (<http://ai.fmcsa.dot.gov/CrashProfile/TruckBusFatalityRateAdj.asp>) which was, however, discontinued after 2007. 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 fatal crashes, injury crashes, PDO crashes, and all crashes per 100 million miles traveled by all vehicles. The fatality rate for CMV crashes was 0.18 in 2016, the same as in 2015. 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 2011-2016 per 100 Million Miles Traveled

	CMV Crash Rates				Crash Rates for All Vehicles			
Year	Fatal Crash Rate	Injury Crash Rate	PDO Crash Rate	Total CMV Crash Rate	Fatal Crash Rate	Injury Crash Rate	PDO Crash Rate	Total Crash Rate
2011	0.18	3.47	4.23	7.88	1.35	93.25	227.49	322.10
2012	0.20	3.42	4.27	7.89	1.40	95.32	230.87	327.66
2013	0.17	3.31	4.41	7.89	1.37	91.20	230.03	322.60
2014	0.19	3.36	4.73	8.28	1.38	92.83	231.09	325.30
2015	0.18	3.33	4.91	8.42	1.45	100.19	247.66	349.30
2016	0.18	3.34	4.82	8.34	1.44	101.65	251.15	354.27

Analysis of Crashes by Month

Since monthly crash data fluctuates considerably from year to year, it is difficult to conclude that the month of the year has any effect on the number of crashes. Specifically, the fatal crash count exhibits large variations since small crash numbers vary more, percentage wise, than large crash numbers.

Table 3: CMV Crashes by Month in 2016

MONTH	FATAL CRASHES	TOTAL KILLED	INJURY CRASHES	PDO	TOTAL CRASHES	TOTAL TRUCKS AND BUSES	% CRASHES
January	6	6	128	166	300	319	7.33%
February	7	7	138	202	347	371	8.48%
March	11	11	137	209	357	376	8.73%
April	6	8	143	209	358	390	8.75%
May	8	8	128	190	326	347	7.97%
June	2	2	120	208	330	353	8.07%
July	10	12	114	174	298	320	7.29%
August	8	10	140	222	370	398	9.05%
September	8	9	168	210	386	405	9.44%
October	10	12	138	208	356	376	8.70%
November	6	8	152	184	342	362	8.36%
December	7	7	130	183	320	336	7.82%
TOTAL	89	100	1636	2365	4090	4353	100.00%

Nevertheless, as the data in Table 3 indicates, March had the highest number of fatal crashes with 11 fatal crashes and 11 deaths. The analysis of the CMV crash data for 2016 indicates yearly fatal crash counts in any given month may vary from 2 to 11 with the three highest months being March, July, and October with 11, 12, and 12 people killed.

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 2014 the two percentages added 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.

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The percentage of CMV drivers in fatal crashes who received a citation has decreased by 1.9 percentage points from 2015 to 2016. In 2016, of all the CMV drivers in fatal crashes, 26.5% were cited for a violation compared to 28.4% in 2015. For injury and property damage crashes, 48.8% and 48.1% of the CMV drivers were cited for violations, respectively. Also 57.5% of non-CMV drivers received violations in fatal CMV crashes in 2016. These figures show that in fatal crashes non-CMV drivers continued to have a higher percentage of citations than CMV drivers. In PDO crashes 48.1% of CMV drivers and 53.7% of non-CMV drivers received citations. The percentages of CMV drivers receiving citations in injury crashes was 48.8% which is higher than the 48.1% received by non-CMV drivers.

Secondly, we can look at the percentage of citations going to CMV versus the non-CMV driver. These two percentages add up to 100% all of 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 2015 to 2016, i.e. from 28.72% in 2015 to 29.89% in 2016 (see Table 4b). For injury and property damage only crashes (PDO) the CMV driver received 48.90% and 50.99% of violations, respectively.

Table 4a: Violations as a Percentage of Drivers

As Percentage of Drivers								
VIOLATIONS	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
Year	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver
2011	30.19%	48.74%	51.59%	47.21%	50.07%	51.78%	50.20%	49.49%
2012	36.19%	56.04%	51.14%	46.35%	48.48%	53.99%	49.31%	50.44%
2013	34.83%	62.77%	48.82%	48.20%	48.56%	53.36%	48.36%	51.19%
2014	29.91%	74.36%	47.25%	50.29%	47.17%	55.36%	46.77%	53.41%
2015	28.42%	73.63%	49.80%	48.25%	49.06%	52.61%	48.90%	51.19%
2016	26.53%	57.55%	48.78%	48.11%	48.09%	53.73%	47.88%	51.32%
*These are the percentage of drivers receiving citations.								

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Table 4b: Violations as a Percentage of all Violations

As Percentage of Violations								
VIOLATIONS	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
YEAR	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver	CMV Driver	Passenger Car Driver
2011	35.56%	64.44%	53.33%	46.67%	54.81%	45.19%	53.67%	46.33%
2012	42.70%	57.30%	53.17%	46.83%	51.69%	48.31%	52.13%	47.87%
2013	34.44%	65.56%	48.97%	51.03%	51.50%	48.50%	50.01%	49.99%
2014	35.56%	64.44%	48.20%	51.80%	51.48%	48.52%	49.74%	50.26%
2015	28.72%	71.28%	50.71%	49.29%	52.50%	47.50%	51.23%	48.77%
2016	29.89%	70.11%	48.90%	51.10%	50.99%	49.01%	49.69%	50.31%
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 change over time. The relative distribution of the citations changed in the past year with 29.89% going to the CMV driver in fatal crashes and 70.11% going to the non-CMV driver. Thus in 2016, although the total percentage of citations in fatal CMV crashes declined, citations were given more frequently (50.31%) to the non-CMV drivers in 2016 compared to 2015 where 48.77% went to the non-CMV driver (Table 4b).

Figure 5 visualizes the findings expressed above, namely the relative percentage citations going to CMV drivers versus non-CMV drivers in fatal CMV crashes. Overall, the percentages have been relatively stable over the past years for fatal crashes with roughly one third of citations going to the CMV driver and the remaining going to the non-CMV driver.

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Figure 5: CMV and Non-CMV Driver Violations in Fatal Crashes: 2011-2016

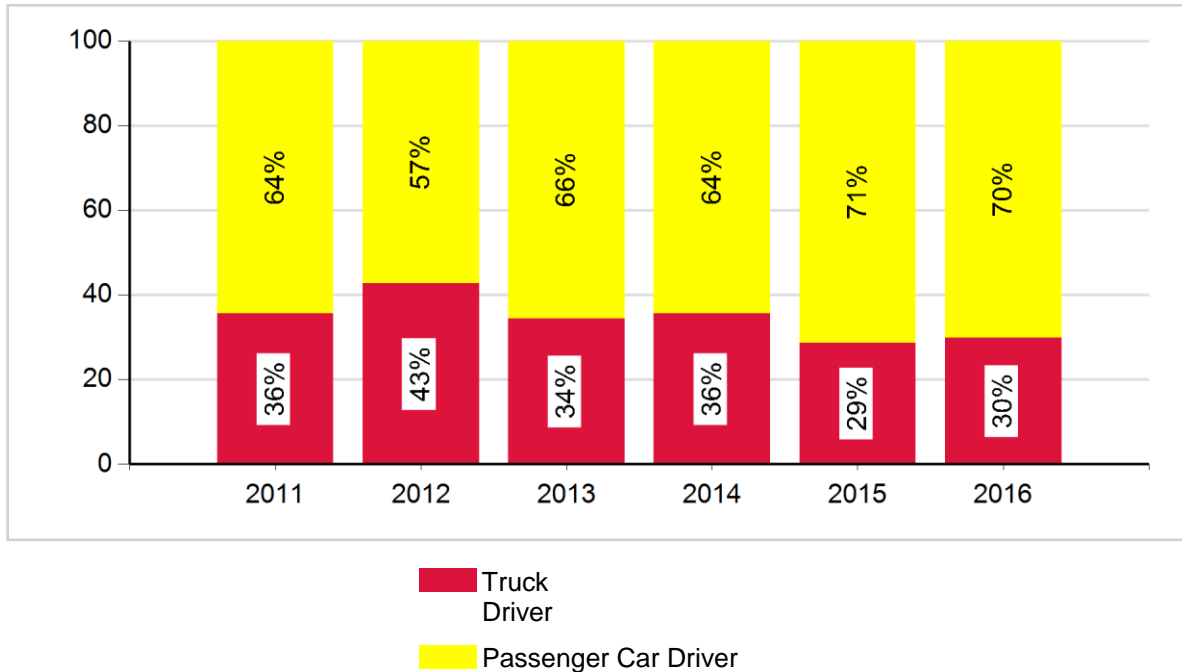


Table 5 shows the types of violations drivers receive. In 2016, CARELESS OPERATION and OTHER violations accounted for the majority of violations of the CMV driver in fatal crashes, namely 8 and 3, respectively, which combined accounted for 52.38% of violations. The percentage of CARELESS OPERATION and OTHER violations for CMV drivers was 47.71% for injury CMV crashes and 49.43% for PDO crashes.

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Table 5: Type of Violation of CMV Driver

VIOLATIONS	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
CARELESS OPERATION	8	30.8%	304	36.1%	430	35.6%	742	35.8%
CUT CORNER ON LEFT TURN	0	0.0%	5	0.6%	15	1.2%	20	1.0%
CUTTING IN, IMPROPER PASSING	1	3.8%	28	3.3%	47	3.9%	76	3.7%
DISREGARDED TRAFFIC CONTROL	1	3.8%	33	3.9%	35	2.9%	69	3.3%
DRIVER CONDITION	1	3.8%	15	1.8%	14	1.2%	30	1.4%
DRIVING LEFT OF CENTER	0	0.0%	15	1.8%	25	2.1%	40	1.9%
EXCEEDING SAFE SPEED LIMIT	1	3.8%	5	0.6%	8	0.7%	14	0.7%
EXCEEDING STATED SPEED LIMIT	0	0.0%	1	0.1%	2	0.2%	3	0.1%
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%	0	0.0%	2	0.2%	2	0.1%
FAILURE TO SIGNAL	0	0.0%	0	0.0%	5	0.4%	5	0.2%
FAILURE TO YIELD	1	3.8%	115	13.7%	137	11.4%	253	12.2%
FOLLOWING TOO CLOSELY	1	3.8%	106	12.6%	101	8.4%	208	10.0%
IMPROPER BACKING	2	7.7%	20	2.4%	38	3.1%	60	2.9%
IMPROPER PARKING	0	0.0%	12	1.4%	11	0.9%	23	1.1%
IMPROPER STARTING	0	0.0%	3	0.4%	1	0.1%	4	0.2%
MADE WIDE RIGHT TURN	0	0.0%	3	0.4%	8	0.7%	11	0.5%
OTHER	3	11.5%	60	7.1%	119	9.9%	182	8.8%
OTHER IMPROPER TURNING	1	3.8%	18	2.1%	41	3.4%	60	2.9%
TURNED FROM WRONG LANE	0	0.0%	4	0.5%	14	1.2%	18	0.9%
UNKNOWN	5	19.2%	79	9.4%	107	8.9%	191	9.2%
VEHICLE CONDITION	1	3.8%	16	1.9%	47	3.9%	64	3.1%
NO VIOLATIONS	72		884		1303		2259	
TOTAL VIOLATIONS	26	100.0%	842	100.0%	1207	100.0%	2075	100.0%
% Violations from Table 4a	26.53%		48.78%		48.09%		47.88%	
% from Table 4b	29.89%		48.90%		50.99%		49.69%	

**Includes multiple violations for the driver*

Manner of Collision

Table 6 shows the manner of collision. "REAR END," "HEAD-ON," and "RIGHT ANGLE" collisions make up more than 80.3% $[(21 + 18 + 18) / (89 - 18)]$ of all fatal multi-vehicle CMV crashes. This is a 6.9 percentage point decrease from 87.2% in 2015 for these three types of collisions. Also, the non-collision fatal CMV crashes increased from 7 in 2015 to 18 in 2016.

Table 6: Manner of Collision

MANNER OF COLLISION	FATAL CRASHES		INJURY CRASHES		PDO		TOTAL CRASHES	
HEAD-ON	18	20.22%	41	2.51%	22	0.93%	81	1.98%
LEFT TURN - ANGLE	1	1.12%	31	1.89%	70	2.96%	102	2.49%
LEFT TURN - OPPOSITE DIRECTION	2	2.25%	45	2.75%	60	2.54%	107	2.62%
LEFT TURN - SAME DIRECTION	0	0.00%	17	1.04%	46	1.95%	63	1.54%
NON-COLLISION WITH MOTOR VEHICLE	18	20.22%	217	13.26%	457	19.32%	692	16.92%
OTHER	3	3.37%	88	5.38%	197	8.33%	288	7.04%
REAR END	21	23.60%	632	38.63%	715	30.23%	1368	33.45%
RIGHT ANGLE	18	20.22%	239	14.61%	270	11.42%	527	12.89%
RIGHT TURN - OPPOSITE DIRECTION	0	0.00%	6	0.37%	8	0.34%	14	0.34%
RIGHT TURN - SAME DIRECTION	0	0.00%	19	1.16%	36	1.52%	55	1.34%
SIDESWIPE - OPPOSITE DIRECTION	6	6.74%	70	4.28%	65	2.75%	141	3.45%
SIDESWIPE - SAME DIRECTION	2	2.25%	231	14.12%	419	17.72%	652	15.94%
Total	89	100.00%	1636	100.00%	2365	100.00%	4090	100.00%

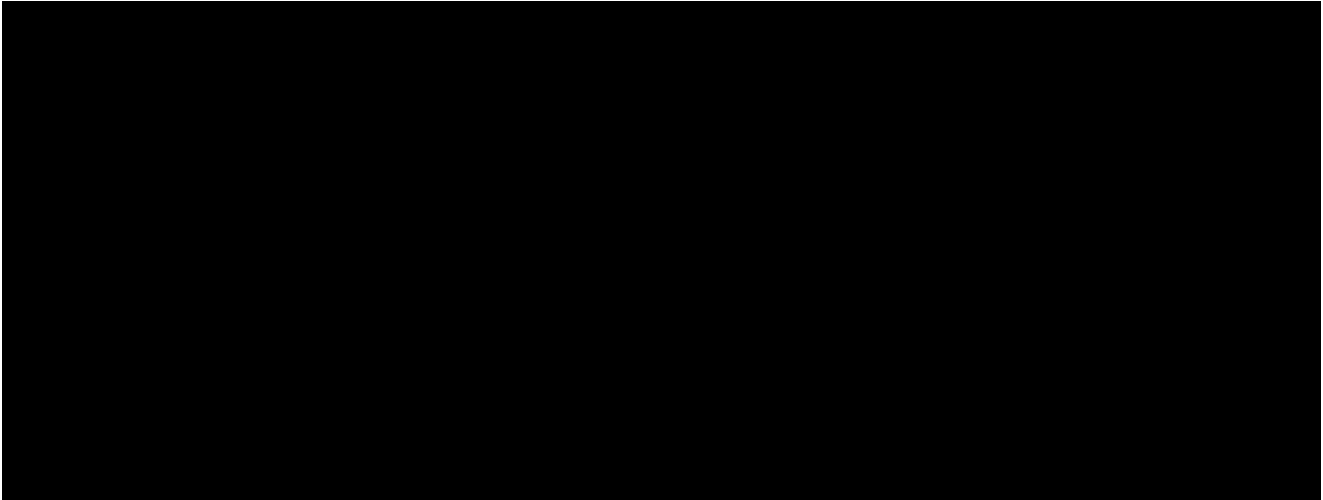
High Crash Locations in Interstate Corridors

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 55% of fatal CMV crashes and 61% of all crashes in 2016.

Figure 6: CMV Crashes in Interstates 10/12 Corridor



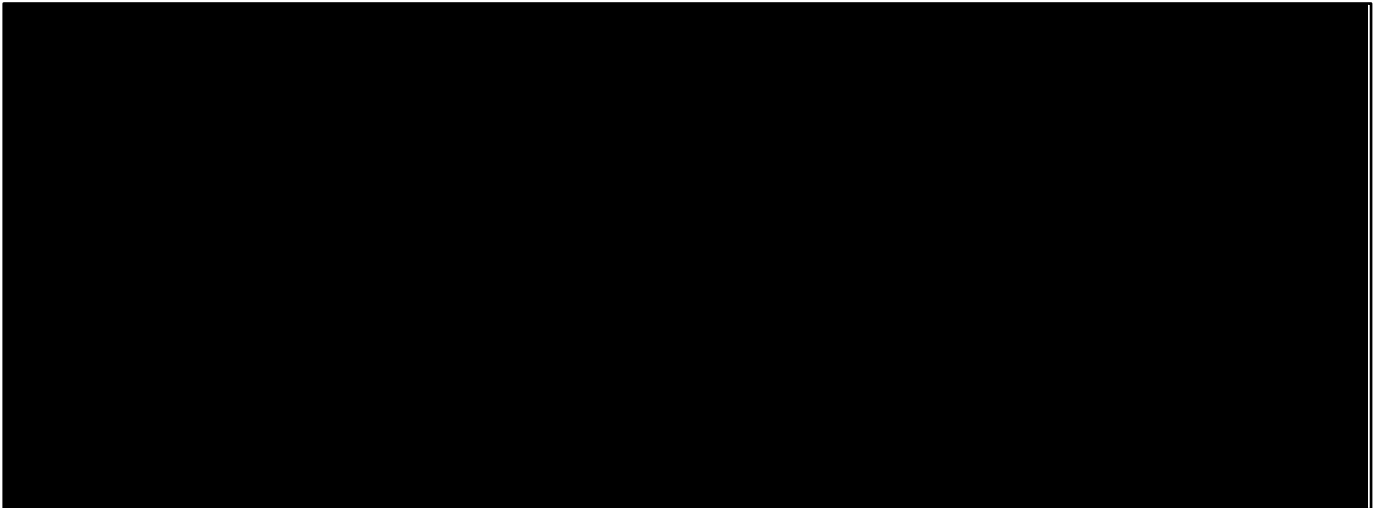
The corridor includes Louisiana Interstates 10, 110, 310, 610, 12, 55, and parts of 59 as shown in Figure 6. The major US Highways along the corridor are US 90, US 190 and US 61.

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 2016 and 2015 by milepost on interstate 10 along with all crashes. The comparison between 2015 and 2016 shows the percentage of crashes within the first 50 miles of Interstate 10 has increased slightly from 24% to 26%. The most obvious area for CMV crashes in 2016 was between milepost 210 and 240.

Figure 7: Cumulative Percentage of Interstate 10 Crashes 2015 and 2016



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



The interstate section of I10 between West Baton Rouge and the I10/12 split has about 4% of all crashes on I10, but about 6% of all CMV crashes. These crashes are shown in Figure 8b.

Figure 8b: CMV Crashes on Interstate 10 Between WBR and I10/12 Split



Figure 8c shows that several CMV crashes in 2016 occurred on the I10 bridge in Baton Rouge.

Figure 8c: CMV Crashes on Interstate 10 Bridge in Baton Rouge



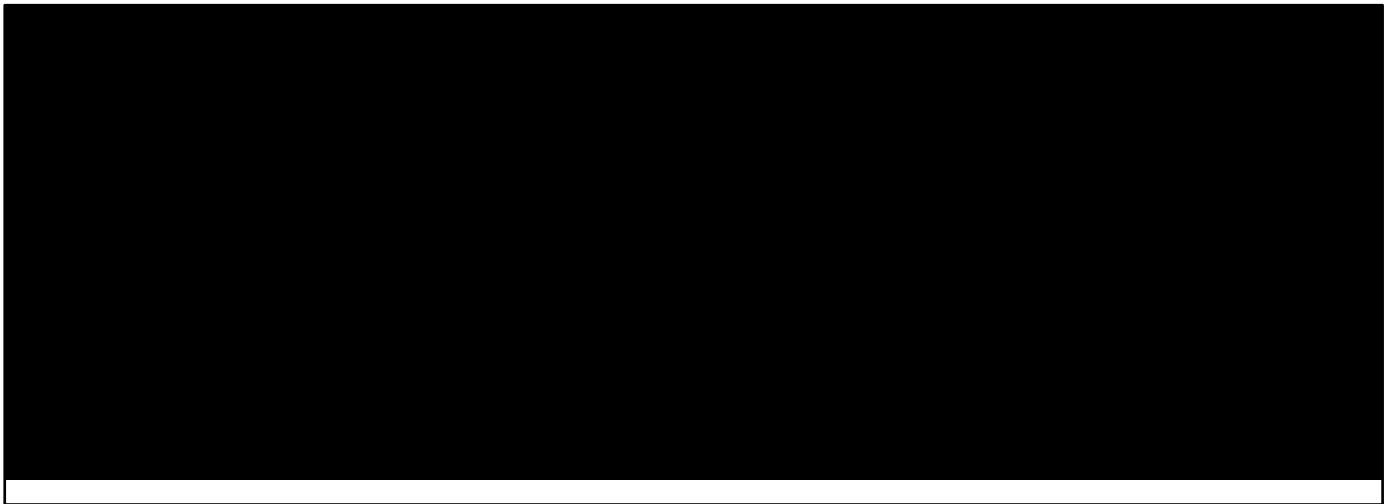
Figure 9 shows a decrease in the cumulative percent of CMV crashes within the first 20 miles of Interstate 12 from 25% in 2015 to 19% in 2016.

Figure 9: Cumulative Percent of Interstate 12 Crashes 2015 and 2016



Figure 10 shows the Interstate 12 corridor between Baton Rouge and Slidell, which had an increase in CMV crashes from 161 in 2015 to 183 in 2016, and an increase in fatalities over the same period (2 to 4).

Figure 10: CMV Crashes on Interstate 12



Interstate 20 Corridor

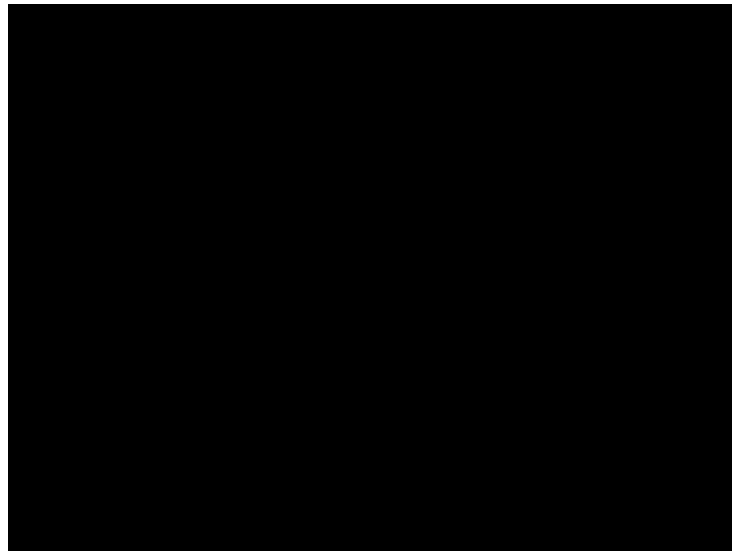
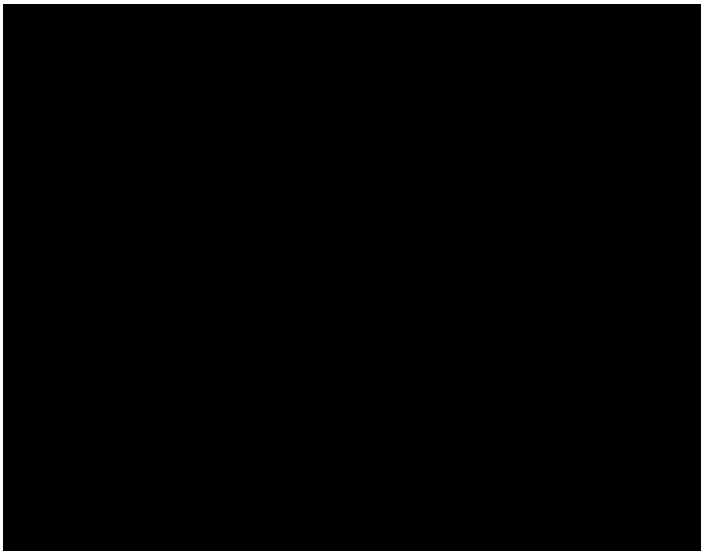
The Interstate 20 corridor includes 10 parishes. The three parishes (Ouachita, Caddo, and Bossier) account for 9% of all commercial vehicle crashes in 2016. As illustrated in Figure 11, the corridor includes Interstate 20, 220 and parts of Interstate 49. The major US highways along the corridor are 61, 65, 71, 80, 165, 167.

Figure 11: Interstate 20 Corridor



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 increased from about 36% in 2015 to about 42% in 2016.

Figure 12: Cumulative Frequency of CMV and all 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 higher than the true number of work zone crashes. 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 they may not be filled out consistently in cases where 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 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 DOTD.

Table 7a shows that the number of fatal CMV crashes on all interstates increased by 8.0% from 25 in 2015 to 27 in 2016 while the number of fatal crashes in construction zones increased by 60.0% from 5 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 2016 had 253.4% 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 9.2 fatal crashes per day-mile in 2015 to 4.2 fatal crashes per day-mile in 2016.

The number of fatal crashes within the +/-5 miles of the construction zones decreased from 13 in 2015 to 12 in 2016 and the number of fatal crashes per day mile decreased from 30.2 in 2015 to 6.9 in 2016 although there was a 253.4% increase in construction.

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Also seen in Table 7a is an increase in all CMV crashes within the +/- 5 miles that include the construction zones, i.e., from 235 in 2015 to 244 in 2016, an increase of 3.8%, while the number of crashes within construction zones decreased from 364 in 2015 to 190 in 2016, a decrease of 47.8% .

Table 7a: Work-Zone CMV Crashes on Interstates (2015-2016)
(Based on DOTD Schedule)

Within 5 miles of construction zone refers to 2 times 5 miles plus the 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	2016				2015				Percent Change			
		FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL
ALL CMV CRASHES ON INTER-STATES	Count	27	455	790	1272	25	424	761	1210	8.0%	7.3%	3.8%	5.1%
	Per 100K Miles	8.0	134.4	233.3	375.7	7.4	125.2	224.8	357.4	8.0%	7.3%	3.8%	5.1%
CONSTRUCTION ZONES	Count	8	65	117	190	5	122	237	364	60.0%	-46.7%	-50.6%	-47.8%
	Per 100K Day-Miles	4.2	33.9	61.1	99.1	9.2	225.0	437.0	671.2	-54.7%	-84.9%	-86.0%	-85.2%
WITHIN 5 MILES OF CONSTRUCTION ZONE	Count	12	157	265	434	13	208	378	599	-7.7%	-24.5%	-29.9%	-27.5%
	Per 100K Day-Miles	6.9	90.4	152.5	249.8	30.2	483.8	879.2	1393.2	-77.2%	-81.3%	-82.7%	-82.1%
IN 5 MILE APPROACH TO CONSTRUCTION ZONES	Count	4	92	148	244	8	86	141	235	-50.0%	7.0%	5.0%	3.8%
	Per 100K Day-Miles	1.1	25.2	40.5	66.8	8.2	88.5	145.0	241.7	-86.7%	-71.5%	-72.1%	-72.4%

Using crashes that are marked both on the crash report as both (Work Zone Indicator "Yes" and a Road Condition field "Construction Repair" or "Construction No Warning"), the number of fatal crashes in the approach to the construction zones was zero (0) in 2015 and 2016, since the crashes in the approaches are not to be counted as work zone crashes according to the crash manual unless the crash falls within the first warning signs. Table 7b therefore does not report crashes before or after construction zones. The number of fatal CMV crashes based on the crash report was only 1 in 2015 and 2 in 2016.

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Table 7b: Work-Zone CMV Crashes on Interstates (2015-2016)
(Based on Crash Report)

Within 5 miles of construction zone refers to 2 times 5 miles plus the 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

		2016				2015				Percent Change			
	WHERE	FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL	FATAL	INJ.	PDO	ALL
ALL CMV CRASHES	Count	27	455	790	1272	25	424	761	1210	8.0%	7.3%	3.8%	5.1%
ON INTER-STATES	Per 100K Day-Miles	8.0	134.4	233.3	375.7	7.4	125.2	224.8	357.4	8.0%	7.3%	3.8%	5.1%
CONSTRUCTION	Count	2	22	21	45	1	28	23	52	100.0%	-21.4%	-8.7%	-13.5%
ZONES	Per 100K Day-Miles	1.0	11.5	11.0	23.5	1.8	51.6	42.4	95.9	-43.4%	-77.8%	-74.2%	-75.5%
WITHIN 5 MILES OF	Count	2	22	21	45	1	28	23	52	100.0%	-21.4%	-8.7%	-13.5%
CONSTRUCTION ZONES*	Per 100K Day-Miles	0.4	6.0	5.7	12.3	1.0	28.8	23.7	53.5	-46.8%	-79.1%	-75.7%	-77.0%
IN 5 MILES TO APPROACH	Count	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%
TO CONSTRUCTION ZONE**	Per 100k Day-Miles	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%

**Same As within construction zones; **Not available based on the crash report.*

Seat Belt Usage

Seat belt usage is one of the most important factors preventing death in a crash. Table 8 shows that in 2016, 71.43% of CMV drivers killed in a crash did not wear a seat belt while 57.34% of all drivers killed in all motor vehicle crashes were not wearing a seat belt. However, since the number of CMV drivers killed is relatively small, these percentages vary more than the percentages for all drivers. The five-year average shows that CMV drivers killed had a higher rate of seat belt usage than drivers of passenger vehicles. The 5-year average of CMV drivers killed not wearing a seat belt was 44.71% compared to 60.55% for passenger vehicles.

Table 8: Seat Belt Usage

This includes only drivers with known seat belt use.

Year	CMV Drivers						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
2012	5	14	35.71%	3	8	37.50%	209	358	58.38%	214	633	33.81%
2013	5	12	41.67%	3	9	33.33%	235	389	60.41%	198	627	31.58%
2014	6	13	46.15%	3	13	23.08%	235	372	63.17%	199	621	32.05%
2015	2	7	28.57%	2	10	20.00%	262	413	63.44%	209	631	33.12%
2016	5	7	71.43%	3	9	33.33%	211	368	57.34%	209	623	33.55%
Year Total	23	53	44.71%	14	49	29.45%	1152	1900	60.55%	1029	3135	32.82%

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 6 years, from 2011 to 2016, on average, about 15.7% of crashes involving hazardous material resulted in a release of the hazardous material. This percentage was 14.0% in 2016. 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.

The interstates accounted for 57.0% of all crashes involving hazardous materials in 2016. Specifically, Interstate 10 accounts for 61.2% of all hazardous material crashes on interstates in 2016. US highways account for 11.6% of all hazardous material crashes in 2016, with US 90 and US 190 accounting for 50.0% of hazardous material crashes on US highways. State highways accounted for 27.9% of all hazardous crashes in 2016.

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

Year	Transport	Released	% Released	Fatal Crash	Fatalities
2011	108	16	12.90%	8	13
2012	105	12	10.26%	11	12
2013	107	15	12.30%	6	7
2014	129	23	15.13%	1	1
2015	119	25	17.36%	3	4
2016	86	12	12.24%	4	4

The types of hazardous material reported in CMV crashes are displayed in Table 10. On average, 16% involve corrosive material, 2% involve flammable gasses, and 51% 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

Year	2011		2012		2013		2014		2015		2016	
Material	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.	Transp.	Rel.
CORROSIVE MATERIALS	22	0	16	2	15	1	20	2	22	1	14	1
EXPLOSIVES WITH A MASS EXPLOSION HAZARD	0	0	1	0	0	0	0	0	0	0	1	0
FLAMMABLE GASES	13	0	16	1	14	0	19	0	14	0	2	0
FLAMMABLE LIQUIDS	51	2	50	1	68	4	66	9	58	2	44	2
FLAMMABLE SOLIDS	1	0	5	0	1	0	4	0	2	0	1	0
GASES	3	0	0	0	3	0	1	0	3	0	0	0
GASES TOXIC BY INHALATION	0	0	2	0	0	0	1	0	0	0	3	0
MISC DANGEROUS GOODS	5	0	7	0	3	0	7	1	8	0	8	1
NON-FLAMMABLE, NON-TOXIC COMPRESSED GASES	9	1	5	0	1	0	6	0	8	1	2	0
ORGANIC PEROXIDES	0	0	0	0	0	0	1	0	2	0	1	0
RADIOACTIVE MATERIALS	1	0	0	0	1	0	1	0	0	0	0	0
SPONTANEOUSLY COMBUSTIBLE MATERIALS	0	0	0	0	0	0	0	0	0	0	0	0
TOXIC MATERIALS	2	0	0	0	0	0	2	0	1	0	4	0
TOXIC MATERIALS and INFECTIOUS SUBSTANCES	1	0	1	0	1	0	1	1	1	0	0	0
TOTAL	108	3	103	4	107	5	129	13	119	4	80	4

(Includes only known Chemicals Transported)

Distractions

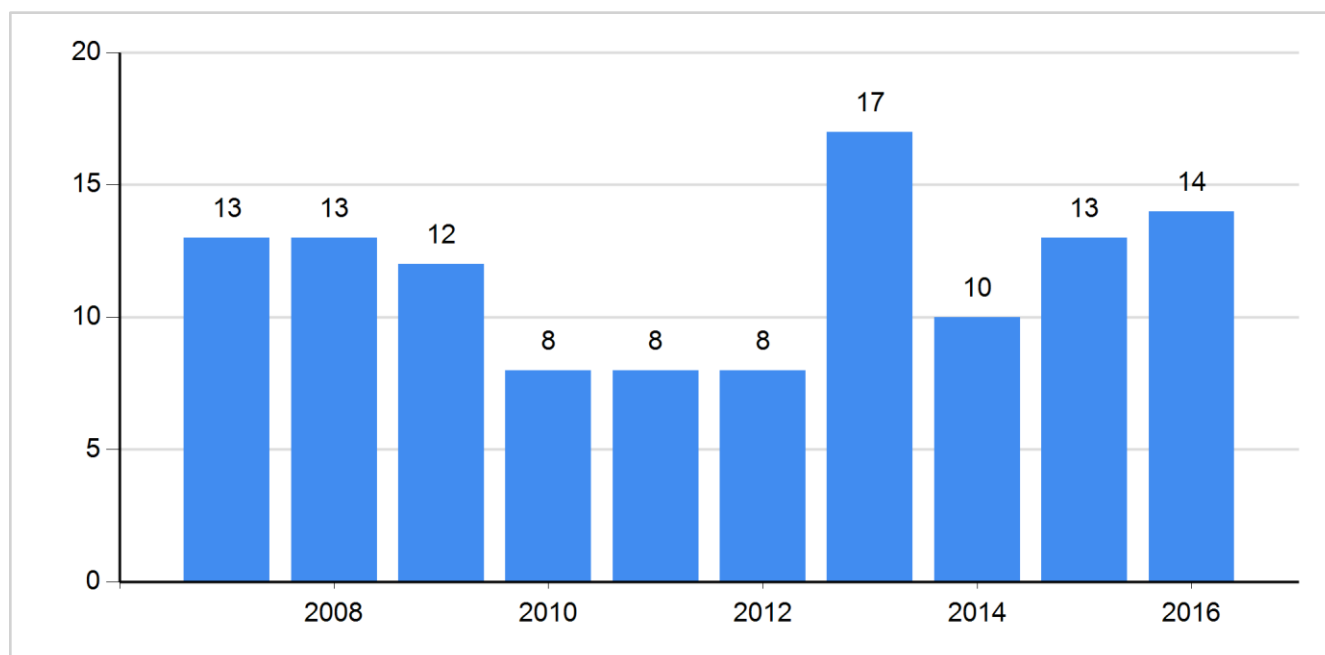
Although distractions play an important role in all crashes, including CMV crashes, no fatal CMV crashes were reported in 2016 in which cell phone usage was the cause of distraction. Table 11 shows the breakdown of crashes by type of distraction for CMV crashes.

Table 11: Distractions

Driver Distraction Description	Fatal	Injury	PDO	Total
CELL PHONE	0	6	8	14
NOT DISTRACTED	79	1863	1427	3369
OTHER ELECTRONIC DEVICE	0	10	3	13
OTHER INSIDE THE VEHICLE	1	36	18	55
OTHER OUTSIDE THE VEHICLE	0	41	36	77
UNKNOWN	18	415	331	764

The number of CMV crashes with cell phone usage has varied between 13 in 2008 to a low of 8 in 2010 to 2012 and was 14 in 2016.

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



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. From 2015 to 2016, Louisiana experienced a significant increase in all CMV crashes along the I10/I12 corridor and I20: Lafayette (19%), Ascension (18%), and Bossier (15%). Ouachita (13%) and St. Tammany (10%) also had considerable increases in CMV crashes. Thus, the I10/I12 corridor and I20 are candidates for increased enforcement to counteract the increasing trend in crashes.

Table 12: CMV Crashes by Parishes

PARISH	FATAL CRASHES		TOTAL CRASHES		TOTAL CRASHES	
	2016	2015	2016	2015	Diff	% Change
East Baton Rouge	5	3	364	366	-2	-1%
Orleans	6	6	327	344	-17	-5%
Lafayette	1	5	236	199	37	19%
Jefferson	4	4	212	210	2	1%
Calcasieu	8	4	254	255	-1	0%
Caddo	4	2	138	139	-1	-1%
St. Tammany	2	6	182	165	17	10%
Tangipahoa	6	2	154	143	11	8%
Terrebonne	1	0	65	83	-18	-22%
Ouachita	1	0	149	132	17	13%
Ascension	1	1	114	97	17	18%
Livingston	2	3	135	128	7	5%
Rapides	3	3	91	133	-42	-32%
Lafourche	2	2	95	117	-22	-19%
Bossier	1	2	90	78	12	15%
TOTAL	47	43	2606	2589	17	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 decreased by 3 or 12% from 2015 to 2016, the fatal CMV crashes on state highways increased by 7 (25%), and the fatal CMV crashes on interstates increased by 2 or 8%.

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The injury crashes during the same period exhibit an increase of 7% on interstates, a decrease of 3% on state highways and an increase of 7% on US highways.

Table 13a: CMV Crashes by Highway Type 2016

HIGHWAY TYPE	FATAL CRASHES			INJURY CRASHES			PDO			TOTAL		
	2016 CRASH	2015 CRASH	DIFFERENCE	2016 CRASH	2015 CRASH	DIFFERENCE	2016 CRASH	2015 CRASH	DIFFERENCE	2016 CRASH	2015 CRASH	DIFFERENCE
INTERSTATE	27	25	8.0%	455	424	7.3%	790	761	3.8%	1272	1210	5.1%
US HIGHWAY	22	25	-12.0%	340	317	7.3%	418	398	5.0%	780	740	5.4%
STATE ROAD	35	28	25.0%	531	548	-3.1%	733	757	-3.2%	1299	1333	-2.6%
PARISH ROAD	0	3	-100.0%	87	90	-3.3%	155	154	0.6%	242	247	-2.0%
CITY/LOCAL ROADS	5	4	25.0%	213	219	-2.7%	259	285	-9.1%	477	508	-6.1%
OTHERS	0	0	0.0%	10	6	66.7%	10	13	-23.1%	20	19	5.3%
ALL ROADWAYS	89	85	4.7%	1636	1604	2.0%	2365	2368	-0.1%	4090	4057	0.8%
% Interstates	30.3%	29.4%	0.9%	28.0%	26.5%	1.4%	33.5%	32.3%	1.2%	31.3%	30.0%	1.3%
% US	24.7%	29.4%	-4.7%	20.9%	19.8%	1.1%	17.7%	16.9%	0.8%	19.2%	18.3%	0.8%
% State	39.3%	32.9%	6.4%	32.7%	34.3%	-1.6%	31.1%	32.1%	-1.0%	31.9%	33.0%	-1.1%
% State, US, & Interstate	94.4%	91.8%	2.6%	81.5%	80.7%	0.9%	82.4%	81.4%	1.1%	82.3%	81.3%	1.0%

The crash report does not indicate if a crash was urban or rural besides the city code which is not a reliable indicator. Because of urban sprawl over the years there are many urbanized areas outside the city limits.

Table 13b shows the percentage of crashes by severity and highway type 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 70% of the fatal interstate CMV crashes occurred in rural areas and about 55% of the injury interstate CMV crashes occurred in rural areas. Overall, 65% of fatal CMV crashes and 55% of all CMV crashes occur in rural areas. Thus, rural interstates, US highways, and state highways should continue to be the focus of enforcement.

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Table 13b: Percentage of CMV Crashes Outside City Limits 2016

HWY Type	Fatal	Injury	PDO	Total
INTERSTATE	70.4%	54.7%	61.0%	59.0%
US HIGHWAY	54.5%	53.5%	51.4%	52.4%
STATE ROAD	77.1%	70.6%	66.0%	68.2%
PARISH ROAD	0.0%	82.8%	84.5%	83.9%
CITY/LOCAL ROADS AND STREETS	0.0%	0.9%	1.5%	1.3%
ALL ROADWAYS	65.2%	54.0%	55.7%	55.3%

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 2016, there were 108 large bus crashes where 294 passengers were injured inside the bus. There were 38 small bus crashes with 1 person killed but 37 passengers were injured. There were 206 school bus crashes with 479 passengers injured. Overall, in 2016, there were 9 people killed in 352 bus crashes and 810 injured. The number of bus crashes has increased from 324 in 2015 to 352 in 2016, and the number of injuries has increased from 695 in 2015 to 810 in 2016. The number of school bus crashes has increased by 4.6%, while small bus crashes have increased by 2.7%, and large bus crashes have increased by 20.0%.

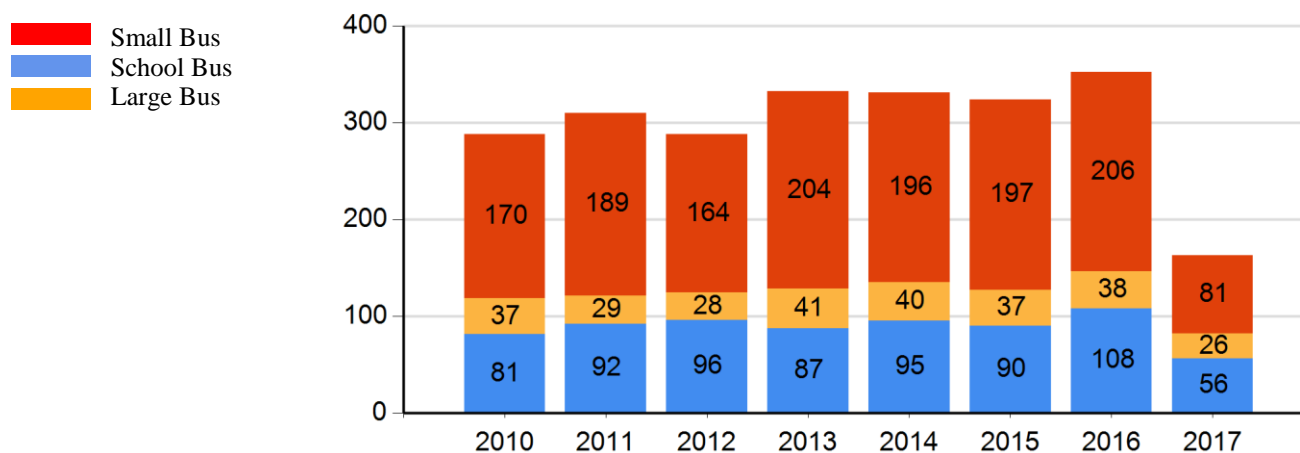
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Table 14: CMV Bus Crashes in 2015-6/29/2017

Year		Count	SCHOOL BUS	SMALL BUS	LARGE BUS	TOTAL
2015	Bus Crash	Number of Crashes	197	37	90	324
		Number of Fatal Crashes	1	1	1	3
		Number Total Killed	1	0	1	2
		Number Killed Inside Bus	0	1	0	1
		Number Injured Inside Bus	431	47	217	695
2016	Bus Crash	Number of Crashes	206	38	108	352
		Number of Fatal Crashes	4	1	1	6
		Number Total Killed	5	1	3	9
		Number Killed Inside Bus	0	0	0	0
		Number Injured Inside Bus	479	37	294	810
2017	Bus Crash	Number of Crashes	81	26	56	163
		Number of Fatal Crashes	0	0	0	0
		Number Total Killed	0	0	0	0
		Number Killed Inside Bus	0	0	0	0
		Number Injured Inside Bus	283	45	151	479

Figure 14 shows the trend in bus crashes. The graph shows that the total number of bus crashes have increased from 324 in 2015 to 352 in 2016.

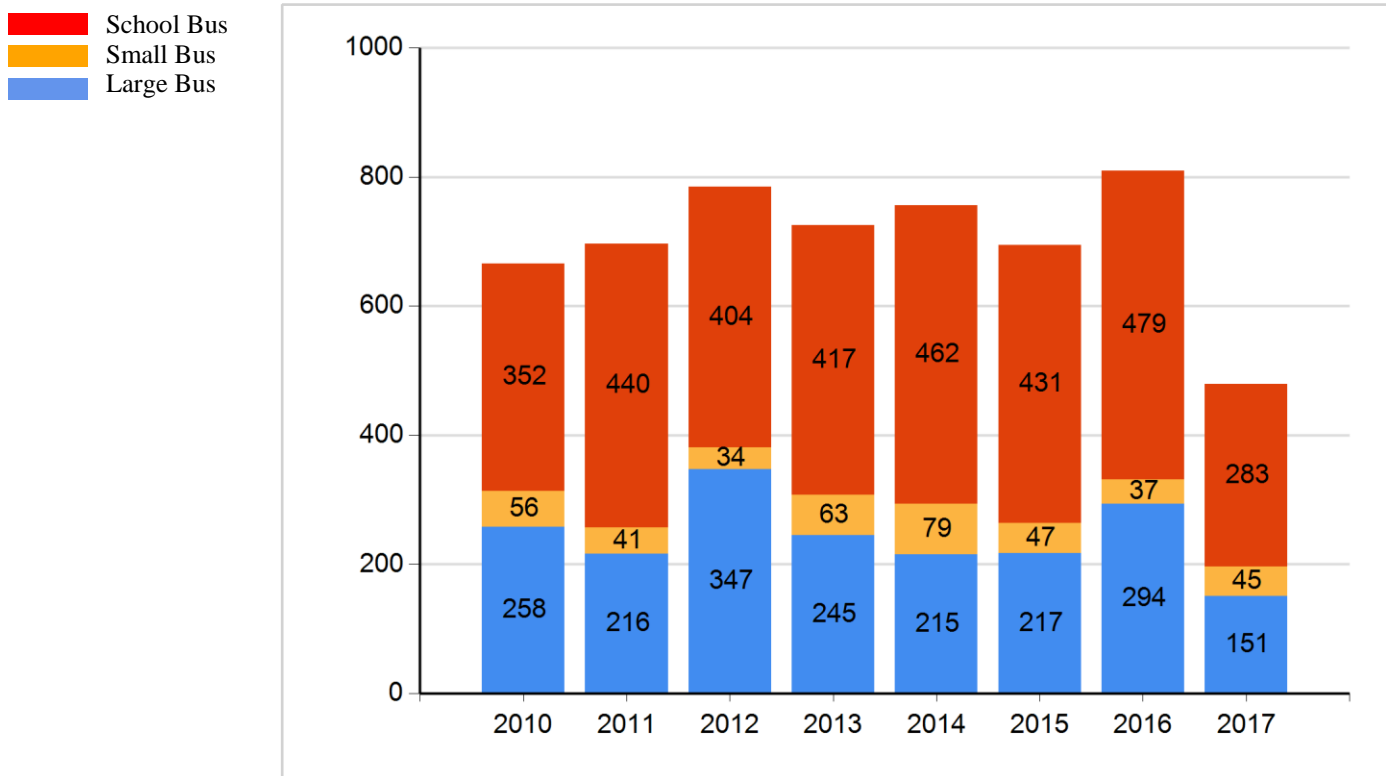
Figure 14: CMV Bus Crashes 2010 to 6/29/2017



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Figure 15 shows that injuries in bus crashes peaked in 2016 with 810 injuries reported.

Figure 15 : Bus-Crash Injuries 2010 to 6/29/2017



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While the number of bus crashes has increased by 7.95% from 2015 to 2016, namely from 324 to 352, the number of injuries have increased by 16.55%, namely from 695 to 810.

2017 YTD Crash Results

The 2017 data is still being collected at this time, but the following Table 15 provides a snapshot of CMV crashes YTD.

Table 15: CMV Crashes YTD 2017

CMV Crashes and Type	2017 YTD*
Total CMV Fatal Crashes	28
Total Fatalities	31
Total Passenger Carrier Crashes	163
Total Passenger Carrier Fatal Crashes	0
Total Passenger Carrier Fatalities (In Crash)	0
Total HazMat Crashes	52
Total HazMat Fatal Crashes	1
Total HazMat Fatalities	1
Total Construction Zone Fatal Crashes (Table 7a)	0
Total in 5 Mile Approach to Construction Zone (Table 7a)	0

***As of Thursday, June 29, 2017, NA: Not available at this time.**

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 GCWR weight of at least 10,001 pounds or above, a motor vehicle that can transport 9 or more people including the driver seat or a vehicle displaying a hazmat placard and one of the three conditions apply: (1) a tow of one of the vehicles, (2) the transportation of an injured person to medical treatment away from the crash scene, or (3) a fatality.