



Analysis of Fatal Impaired Driving Crashes (2017)

Technical Memorandum

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Overall, fatal impaired driving crashes remained quite stable from 2010 to 2017.

Introduction

In 2017, there were 3,342 Texas Department of Transportation (TxDOT) reportable fatal vehicular crashes, which resulted in 3,722 fatalities. Of those fatal crashes, 36 percent (1,219 crashes) involved at least one driver classified as driving under the influence (DUI) or impaired.¹ For this analysis, the Texas A&M Transportation Institute (TTI) examined 2017 Crash Records Information System (CRIS) crash data, particularly looking at trends and patterns in fatal impaired driving crash events.² Additionally, TTI identified fatal impaired driving crashes where pedestrians were involved and explored the specific nature of those crashes. Crashes involving impaired pedestrians has been an emerging area of concern in Texas.

Figure 1 illustrates the trends over the past eight years comparing total fatal crashes with fatal impaired driving crashes. There was an increasing trend in fatal crashes from 2010 to 2016. Compared to 2016, a small decrease in fatal crashes was observed in 2017. Overall, fatal impaired driving crashes remained quite stable from 2010 to 2017.

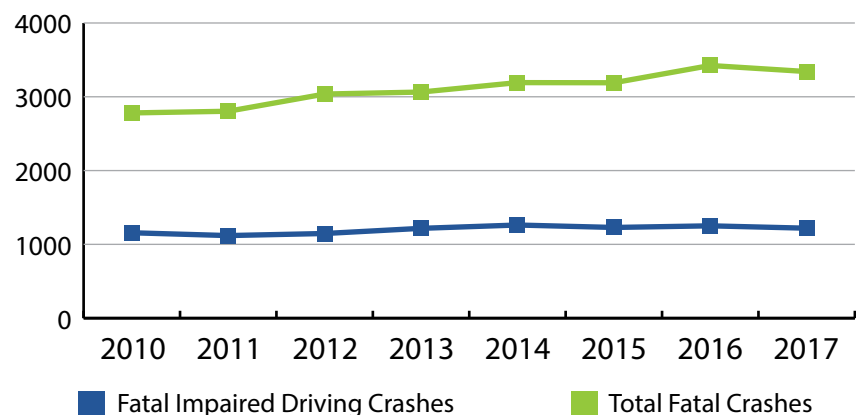


Figure 1. Total Fatal Crashes vs. Fatal Impaired Driving Crashes, 2010 - 2017.

¹An impaired driver is a driver who has a blood alcohol concentration (BAC) result of greater than 0.00 g/dL, or had a positive alcohol test, or had a positive drug test, or had a contributing factor of "had been drinking", "under the influence – alcohol", "under the influence – drugs", or "taking medication" flagged on a crash report.

²Crash data extracted from Texas Department of Transportation (TxDOT) Crash Record Information System CRIS on May 28, 2018.

Figure 2 illustrates the trends over the past eight years, comparing total fatalities with impaired driving-related fatalities. As with fatal crashes, fatalities from 2010 to 2016 had an increasing trend, but decreased slightly from 2016 to 2017. Overall, impaired driving fatalities remained quite stable from 2010 to 2017.

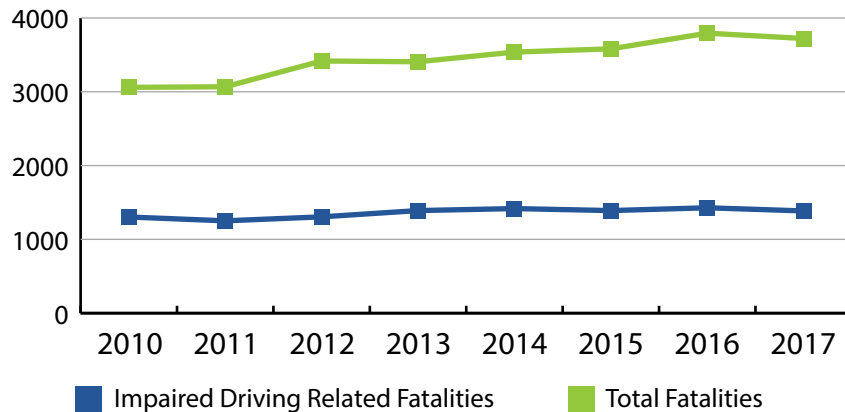


Figure 2. Total Fatalities vs. Impaired Driving-Related Fatalities, 2010 - 2017.

Figure 3 illustrates the trends over the past eight years, comparing overall crash rate to the fatal impaired driving crash rate in Texas. In 2017, the overall fatal crash rate for Texas was 11.6 fatal crashes per 100,000 people, which is a small decrease compared to 2016.³ The fatal impaired driving crash rate for 2017 was 4.2 deaths per 100,000 people. This rate represents a slight downtick from 2016, which registered at 4.4 deaths per 100,000 people. The fatal impaired driving crash rate in 2017 was the lowest rate recorded for the past eight years in Texas.

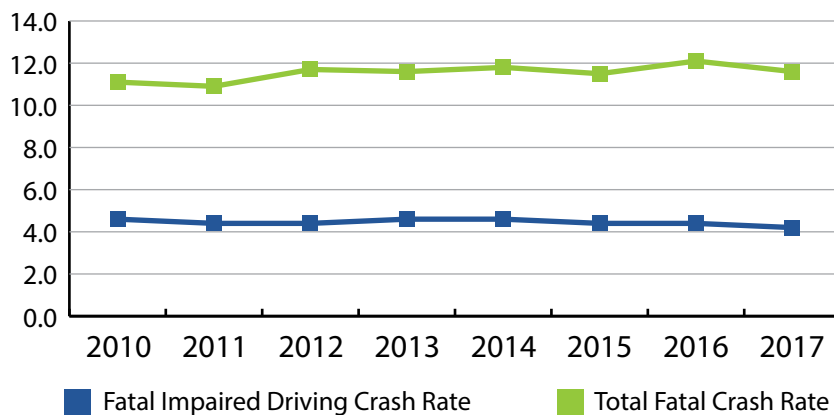


Figure 3. Total Fatal Crash Rate vs. Fatal Impaired Driving Crash Rate, 2010 - 2017.

As with fatal crashes, fatalities from 2010 to 2016 had an increasing trend, but decreased slightly from 2016 to 2017.

³Crash rates were calculated using population estimates from the Department of State Health Services (DSHS). The 2010-2017 population data estimates are based off the 2010 DSHS census and can be obtained via <https://www.dshs.texas.gov/chs/popdat/>.

Figure 4 depicts fatal impaired driving crash rates for the top 15 counties in Texas by county population for 2017.⁴ Milam County had the highest fatal impaired driving crash rate at 38.2 per 100,000 people, followed by Pecos County (36.0 per 100,000 people), and Cass County (25.3 per 100,000 people).

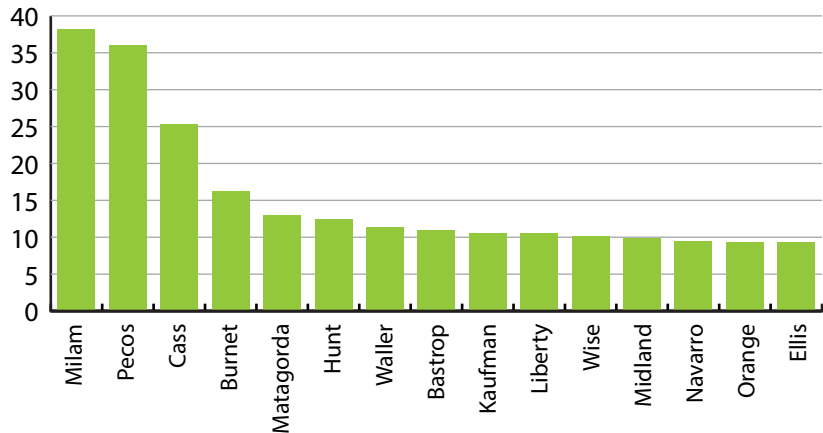


Figure 4. Top 15 Counties with Highest Fatal Impaired Driving Crash Rate (Per 100,000 Population), 2017⁵

Figure 5 plots in a map the top 15 counties with the highest fatal impaired driving crash rate in Texas. Only three of the top 15 counties with the highest fatal impaired driving crash rate have populations greater than 100,000 people – Kaufman (114,690), Midland (161,077), and Ellis (163,632).

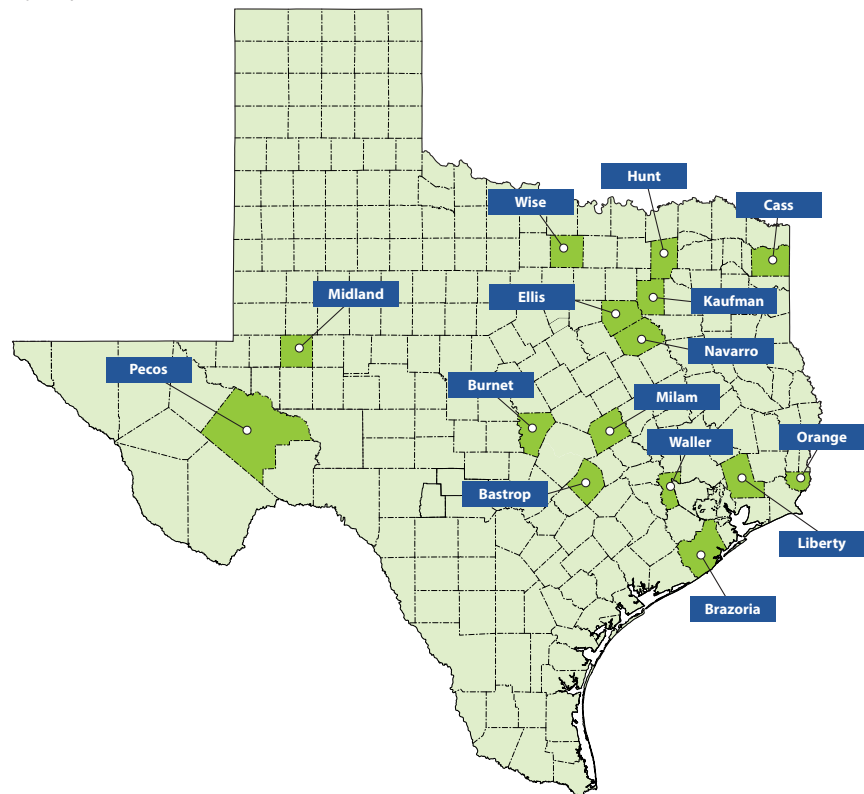


Figure 5. Top 15 Counties with Highest Fatal Impaired Driving Crash Rate (Per 100,000 Population)⁶

⁴2017 county data was obtained from DSHS and can be accessed <https://www.dshs.texas.gov/chs/popdat/>.

⁵Only counties with five or more fatal impaired driving crashes were included in this ranking.

⁶Only counties with five or more fatal impaired driving crashes were included in this ranking.



Crash Characteristics

Table 1 presents information on crash characteristics like collision type, light condition, and weather condition by total fatal crashes and fatal impaired driving crashes. The rate of single-vehicle crashes (58 percent) versus multiple vehicle crashes (42 percent) for the total fatal crashes and fatal impaired driving crashes are similar. Fifty-four percent of all fatal crashes occurred in the dark in comparison to 66 percent of fatal impaired driving crashes that occurred in the dark. The weather condition at the time of crash were similar for both the total fatal crashes and fatal impaired driving crashes.

Table 1. Crashes by Collision Type, Light Condition, and Weather Condition, 2017

Crash Characteristics	Fatal Crash	%	Fatal Impaired Driving Crash	%
Total	3,342	100%	1,219	100%
Collision Type				
Single Vehicle	1,955	58%	704	58%
Multiple Vehicle	1,387	42%	515	42%
Light Condition				
Dark	1,797	54%	803	66%
Dawn/Dusk	408	3%	19	2%
Daylight	1,423	43%	365	30%
Other	4	<1%	1	0%
Unknown	10	<1%	5	0%
Weather Condition				
Clear	2,481	74%	910	75%
Cloudy	525	16%	205	17%
Fog	64	2%	27	2%
Other	6	<1%	3	0%
Rain	241	7%	62	5%
Wind/Sleet/Hail/Snow/Blowing Sand	16	<1%	8	1%
Unknown	9	<1%	4	0%

The weather condition at the time of crash were similar for both the total fatal crashes and fatal impaired driving crashes.

More impaired driving occurred between 2:00 AM and 2:59 AM than any hour of the day.

Figure 6 illustrates fatal impaired driving crashes by day of the week. More fatal impaired driving crashes occurred on Sundays than any other day. Additionally, 44 percent of all fatal impaired driving crashes occurred on a Saturday or Sunday.

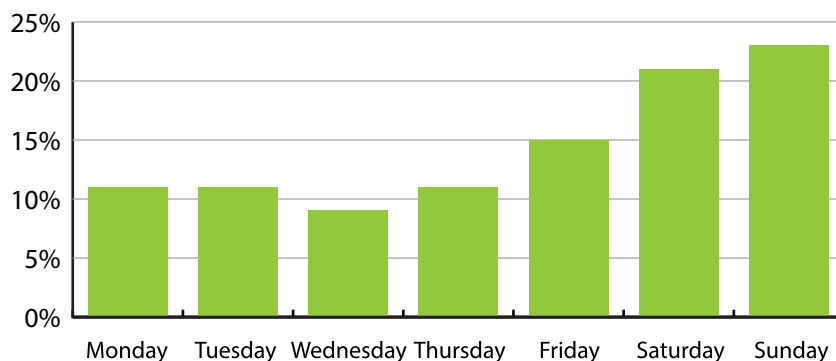


Figure 6. Fatal Impaired Driving Crashes by Day of Week, 2017

Figure 7 graphs fatal impaired driving crashes by time of day. More impaired driving occurred between 2:00 AM and 2:59 AM than any hour of the day. Additionally, 36 percent of all fatal impaired driving crashes occurred between a five-hour window, 10:00 PM to 2:59 AM.

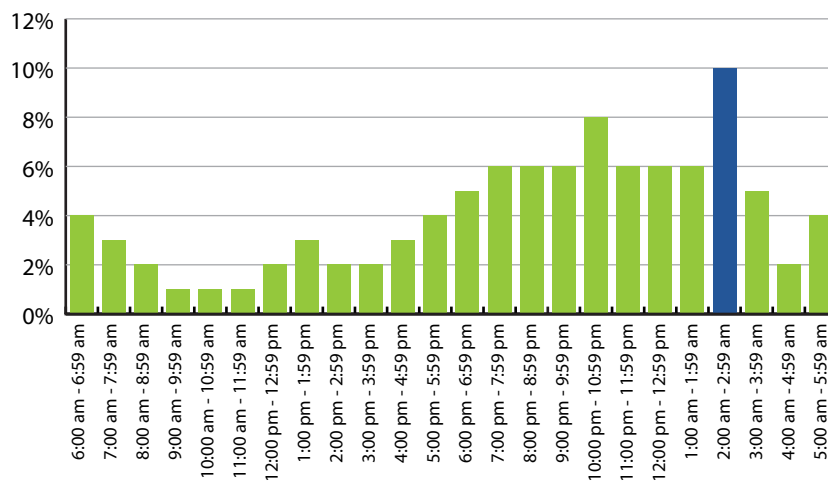


Figure 7. Fatal Impaired Driving Crashes by Time of Day, 2017

Driver Characteristics

In total, 5,222 drivers were involved in fatal crashes in 2017. Of this number, 1,891 drivers were involved in fatal impaired driving crashes. Furthermore, of the 1,891 drivers involved in impaired driver fatal crashes, 1,278 were impaired.

Table 2 presents crash characteristics like collision type, time of day, and day of week, with further breakdowns by driver blood alcohol concentration (BAC) level. The rate of impairment among drivers involved in fatal crashes was two times higher at night than during the day (33 percent vs. 15 percent). Considering only drivers with BAC 0.08 g/dL or higher, the rate of impairment among drivers involved in fatal crashes was five times higher at night than during the day (20 percent vs. 5 percent). Twenty percent of all drivers involved in fatal crashes during the week were impaired compared to 33 percent on weekends. Considering only drivers with BAC 0.08 g/dL or higher, nine percent of all drivers involved in fatal crashes during the week were impaired compared to 20 percent on weekends. Furthermore, 33 percent of all drivers involved in single-vehicle fatal crashes were impaired, compared to 18 percent in multiple-vehicle fatal crashes.

Table 2. Crash Characteristics by Driver Impairment, 2017

Crash Characteristics	All Drivers In Fatal Crashes	All Impaired Drivers In Fatal Crashes		Drivers Bac > 0.08 In Fatal Crashes	
		Frequency	%	Frequency	%
Total	5,222	1,278	36%	677	13%
Drivers By Collision Type And Time Of Day					
Single-Vehicle Crash					
Total	2,131	710	33%	421	20%
Daytime	805	200	25%	88	11%
Nighttime	1,326	510	38%	333	25%
Multiple-Vehicle Crash					
Total	3,091	568	18%	256	8%
Daytime	1,735	185	11%	42	2%
Nighttime	1,356	383	28%	214	16%
Drivers By Time Of Day					
Daytime	2,540	385	15%	130	5%
Nighttime	2,682	893	33%	547	20%
Drivers By Day Of Week And Time Of Day					
Weekday	3,480	710	20%	326	9%
Daytime	1,850	255	14%	71	4%
Nighttime	1,630	455	28%	255	16%
Weekend	1,742	568	33%	351	20%
Daytime	690	130	19%	59	9%
Nighttime	21,052	438	2%	292	1%

The rate of impairment among drivers involved in fatal crashes was two times higher at night than during the day (33 percent vs. 15 percent).

Eighty-two percent of drivers in fatal impaired driving crashes were male.

Table 3 presents information on driver characteristics like age, gender, and race/ethnicity by drivers involved in all fatal crashes and drivers involved in fatal impaired driving crashes. Forty-nine percent of drivers in fatal impaired driving crashes were White. Eighty-two percent of drivers in fatal impaired driving crashes were male. Additionally, 47 percent of drivers in fatal impaired driving crashes were between the ages of 25 and 44. These two age groups represent potential target demographic areas for impaired driving messaging.

Table 3. Drivers by Age, Gender, and Race/Ethnicity, 2017

Driver Characteristics	All Drivers In Fatal Crashes	%	All Impaired Drivers In Fatal Crashes	%
Total	5,222	100%	1,278	100%
Age				
<16	14	0%	0	0%
16-20	458	9%	101	8%
21-24	534	10%	210	16%
25-34	1,206	23%	360	28%
35-44	877	17%	244	19%
45-54	832	16%	193	15%
55-64	630	12%	126	10%
65-74	300	6%	30	2%
>=75	218	4%	13	1%
Unknown	153	3%	1	0%
Gender				
Female	1,285	25%	230	18%
Male	3,800	73%	1,047	82%
Unknown	137	3%	1	0%
Race/Ethnicity				
American Indian/Alaskan Native	9	0%	3	0%
Asian	66	1%	4	0%
Black	749	14%	195	15%
Hispanic	1,484	28%	430	34%
White	2,662	51%	621	49%
Other	95	2%	20	2%
Unknown	157	3%	5	0%

Table 4 provides information on driver characteristics like driver age, driver race/ethnicity, and vehicle type, with further breakdowns by driver BAC level. In 2017 fatal crashes, drivers in the 21-24 year age group had the highest percentage of impairment (39 percent) and the highest percentage with a BAC level 0.08 g/dL or higher (23 percent). This age group was followed by drivers in the 25-34 year age group, with impairment at 30 percent and a BAC level of 0.08 g/dL or higher at 17 percent. The percentage of impaired drivers involved in fatal crashes was 28 percent among males and 18 percent among females. There were four male impaired drivers involved for every female impaired driver involved (1,047 vs. 230) in fatal crashes. Considering only drivers with BAC 0.08 g/dL or higher, there were six male drivers involved for every female driver involved (585 vs. 91) in fatal crashes.

The rate of impairment was highest among motorcycle operators (42 percent), followed by drivers of passenger cars (27 percent), and drivers of pickups (26 percent). In fatal crashes, BAC of .08 g/dL or higher was also found to be highest among motorcycle operators (23 percent).

Table 4. Drivers Characteristics by Impairment, 2017

Driver Characteristics	Total Drivers In Fatal Crashes	All Impaired Drivers In Fatal Crashes		Drivers Bac > 0.08 In Fatal Crashes	
		Frequency	%	Frequency	%
Total	5,222	1,278	24%	677	13%
Drivers By Age Group (Years)					
<16	14	0	0%	0	0%
16-20	458	101	22%	36	8%
21-24	534	210	39%	123	23%
25-34	1,206	360	30%	210	17%
35-44	877	244	28%	134	15%
45-54	832	193	23%	100	12%
55-64	630	126	20%	60	10%
65-74	300	30	10%	9	3%
>75	218	13	6%	4	2%
Unknown	153	1	1%	1	1%
Drivers By Gender					
Female	1,285	230	18%	91	7%
Male	3,800	1,047	28%	585	15%
Unknown	137	1	1%	1	1%
Drivers By Race/Ethnicity					
American Indian/Alaskan Native	9	3	33%	1	11%
Asian	66	4	6%	2	3%
Black	749	195	26%	85	11%
Hispanic	1,484	430	29%	275	19%
White	2,662	621	23%	299	11%
Other	95	20	21%	11	12%
Unknown	157	5	3%	4	3%
Drivers By Vehicle Type					
Passenger Cars	1,738	471	27%	247	14%
Pickups	1,254	324	26%	185	15%
Suvs	899	203	23%	105	12%
Vans	135	21	16%	9	7%
Truck Or Truck Tractors	523	37	7%	9	2%
Motorcycles	500	211	42%	114	23%
Bus, Yellow School Bus	25	0	0%	0	0%
Other (Including Ambulance, Fire Truck, Police Car, Farm Equipment)	64	11	17%	8	13%
Unknown	64	0	0%	0	0%

The rate of impairment was highest among motorcycle operators (42 percent).

BAC levels for drivers involved in fatal impaired driving crashes with a recorded BAC ranged from 0.003 g/dL to 0.437 g/dL.

BAC LEVEL

In 2017, 1,278 impaired drivers were involved in fatal crashes. Of the 1,278 drivers, 822 (64%) had a BAC greater than 0.00 g/dL. Additionally, of the 822 with a recorded BAC, 677 (82%) had BAC greater than the legal limit of 0.08 g/dL. Furthermore, 69% (468 drivers) of those at or above the legal limit reported BAC levels of 0.15 g/dL or greater. Twenty-four percent of drivers in fatal impaired driving crashes with BAC greater than 0.00 g/dL also had a positive substance test. The most common substance other than alcohol for drivers with a positive substance test was multiple drugs (34 percent), followed by cannabis (32 percent), and CNS stimulants (22 percent).

BAC levels for drivers involved in fatal impaired driving crashes with a recorded BAC ranged from 0.003 g/dL to 0.437 g/dL. Figure 8 illustrates the distribution of BAC levels found in drivers in fatal impaired driving crashes.

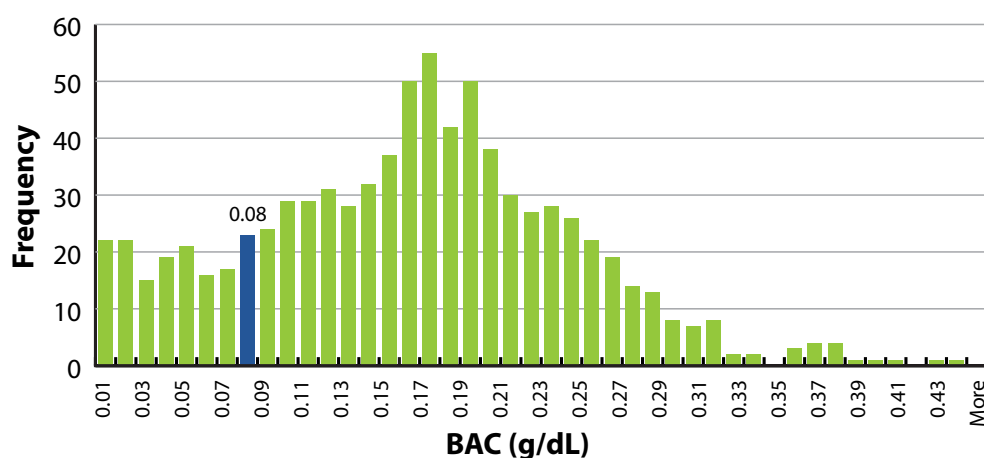


Figure 8. BAC Levels of Drivers in Fatal Impaired Driving Crashes, 2017

RESTRAINT USE AND LICENSING

Table 5 shows the restraint use among passenger vehicle drivers involved in fatal crashes in 2017. Out of the 1,278 impaired drivers involved in fatal crashes, 211 were motorcycle operators. Of the remaining 1,063 impaired passenger vehicle drivers, 40 percent were unrestrained. In comparison, among all passenger vehicle drivers involved in fatal crashes, 18 percent were unrestrained.

Table 5. Restraint Use by Passenger Vehicle Drivers Involved in Fatal Crashes, 2017

Restraint Use	All Drivers In Fatal Crashes	%	Impaired Drivers In Fatal Crashes	%	Drivers With Bac > 0.00 & Bac < 0.08	%	Drivers With Bac >= 0.08	%
Restrained	3,430	73%	510	48%	71	62%	232	41%
Unrestrained	844	18%	428	40%	35	31%	266	48%
Not Applicable	13	<1%	1	<1%	0	0%	1	<1%
Other	5	<1%	3	<1%	0	0%	1	<1%
Unknown	422	9%	121	11%	8	7%	60	11%
Total Passenger Vehicle Drivers	4,714	100%	1,063	100%	114	100%	560	100%
Motorcycle Riders	508		211		31		117	
Total	5,222		1,278		145		677	

Examining restraint use by BAC level, 31 percent of passenger vehicle drivers with a BAC greater than 0.00 g/dL and less than 0.08 g/dL were unrestrained in fatal crashes. Forty-eight percent of passenger vehicle drivers with a BAC 0.08 g/dL or more were unrestrained in fatal crashes in fatal crashes.

Table 6 presents the license class of all drivers involved in fatal crashes in 2017. Twelve percent of all drivers in fatal crashes were unlicensed at the time of crash compared to 19 percent of impaired drivers in fatal crashes.

Table 6. Driver's License by Drivers Involved in Fatal Crashes, 2017

Driver License Class	All Drivers In Fatal Crashes	%	Impaired Drivers In Fatal Crashes	%
Class A	419	8%	50	4%
Class A & M	87	2%	13	1%
Class B	68	1%	7	1%
Class B & M	9	0%	2	0%
Class C	3,106	59%	783	61%
Class C & M	353	7%	117	9%
Class M	1	0%	1	0%
No Data	29	1%	2	0%
Other/Out Of State	380	7%	56	4%
Unknown	164	3%	6	0%
Unlicensed	606	12%	241	19%
Total	5,222	100%	1,278	100%

Crashes involving impaired pedestrians is an emerging area of concern in Texas.

Pedestrian Involvement

Crashes involving impaired pedestrians is an emerging area of concern in Texas. The National Highway Traffic Safety Administration (NHTSA) defines pedestrians as any person on foot, walking, running, jogging, hiking, sitting, or lying down who is involved in a motor vehicle crash.⁷ Whenever pedestrians are involved in motor vehicle crashes, the consequences can be especially dire because pedestrians are considered vulnerable road users.

Of the 3,342 fatal crashes in 2017, 18 percent involved pedestrians provides a breakdown of all fatal crashes by pedestrian involvement. There were 2,123 fatal non-impaired driver crashes, of which 553 (26 percent) had pedestrian involvement. In comparison, 50 (four percent) of the 1,219 fatal impaired driver crashes had pedestrian involvement.

Table 7. Fatal Crashes by Pedestrian Involvement, 2017

Pedestrian Involved	Fatal Non-Impaired Driving Crash	%	Fatal Impaired Driving Crash	%	Total Fatal Crash	%
No	1,570	74%	1,169	96%	2,739	82%
Yes	553	26%	50	4%	603	18%
Total	2,123	100%	1,219	100%	3,342	100%

⁷National Highway Traffic Safety Administration. 2015 Traffic Safety Facts – Pedestrians. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812375>.

There were a total
67 pedestrians
involved in 50
fatal impaired
driving crashes
with pedestrian
involvement.

Table 8 provides a breakdown of fatal crashes by person type. There were a total 67 pedestrians involved in 50 fatal impaired driving crashes with pedestrian involvement.

Table 8. Fatal Crashes by Person Type, 2017

Person Type	Fatal Non-Impaired Driving Crash	Fatal Impaired Driving Crash	Total
Driver	3,331	1,891	5,222
Passenger/Occupant	1,799	1,084	2,883
Pedestrian	593	67	660
Pedalcyclist	49	9	58
Other	6	2	8
Unknown	4	3	7
Total	5,782	3,056	8,838

Examining only fatal impaired driving crashes with pedestrian involvement, Table 9 shows the breakdown of pedestrian-involved crashes by collision type. Ninety percent of pedestrian crashes were single-vehicle crashes, while the remaining ten percent involved two or more vehicles.

Table 9. Fatal Impaired Driver Crashes with Pedestrian Involvement by Collision Type, 2017

Collision Type	Frequency	%
Single Vehicle	45	90%
Multiple Vehicle	5	10%
Total	50	100%

Table 10 shows the breakdown of fatal impaired driving crashes with pedestrian involvement where at least one pedestrian involved in the crash had a BAC greater than 0.00 g/dL. In 26 percent of such crashes, at least one pedestrian had a BAC of greater than 0.00 g/dL.

Table 10. Fatal Impaired Driver Crashes with Pedestrian Involvement by Pedestrian BAC, 2017

Pedestrian Bac > 0.00	Frequency	%
No	37	74%
Yes	13	26%
Total	50	100%

Table 11 provides a breakdown of BAC levels of all persons involved in fatal impaired driving crashes with pedestrian involvement. Twenty-nine (50 percent) impaired drivers involved in such crashes had a BAC of greater than 0.00 g/dL, 21 (36 percent) impaired drivers had a BAC equal to or greater than 0.08 g/dL, and 9 (16 percent) impaired drivers had a BAC equal to or greater than 0.15 g/dL.⁸ For pedestrians, 14 (26 percent) pedestrians involved in such crashes had BAC of greater than 0.00 g/dL, 10 (19 percent) pedestrians had BAC equal to or greater than 0.08 g/dL, and 7 (13 percent) pedestrians had BAC equal to or greater than 0.15 g/dL.

⁸ A driver with BAC equal to 0.00 g/dL still means that the driver was drug impaired at the time of crash.

Table 11. BAC of All Person Types in Fatal Impaired Driving Crashes with Pedestrian Involvement, 2017

Person Type	BAC = 0.00	0.00 > BAC < 0.08	0.08 >= BAC < 0.15	BAC >= 0.15	Total
Driver	29	8	12	9	58
Passenger/Occupant	21	0	0	0	21
Pedestrian	53	4	3	7	67
Total	103	12	15	16	146

TTI also reviewed crash reports of all 50 fatal impaired driver crashes with pedestrian involvement, particularly looking at the crash narratives. The descriptions provided in the crash narratives were then grouped into common themes or scenarios, summarized in Table 12. In 24 percent of the crashes, one or more pedestrian was crossing the street. In 10 percent of the crashes, one or more pedestrian was on the roadway or the median, either to work on a disabled vehicle or to render aid. In 24 percent of the crashes, the driver fled the scene or failed to render aid.

Table 12. Crash Scenarios in Fatal Impaired Driver Crashes with Pedestrian Involvement

Crash Scenarios	Frequency	%
Pedestrian	50	100%
Crossing street	12	24%
On crosswalk	6	
Pedestrian crossing sign not in operation, driver disregarded flashing yellow sign	1	
Driver disregarded stop sign	1	
Pedestrian crossed on "Do Not Cross" sign	1	
Driver crossed intersection on a green light	1	
Other	2	
Not on crosswalk	4	
Pedestrian FTYROW	2	
Pedestrian crossing main lane of I-35N	1	
Other	1	
Not known if on crosswalk	2	
Pedestrian in the roadway or median	10	20%
Pushing vehicle that ran out of gas	1	
Pedestrian rendering aid to drivers/passengers from previous crash	4	
Pedestrian rendering aid to driver with flat tire	3	
Pedestrian outside disabled vehicle	2	
Other	28	56%
DRIVER	50	100%
Driver fled scene or failed to render aid	12	24%
Driver ran into building/house and collided with pedestrians inside	2	4%
Other	36	72%

In 24 percent of the crashes, one or more pedestrian was crossing the street.



**Vehicular crashes
resulting from
impaired driving
remain a large
problem in Texas.**

Conclusion

Vehicular crashes resulting from impaired driving remain a large problem in Texas. From 2010 to 2017, the total number of impaired driving fatal crashes and fatalities in Texas did not see significant decline and remained relatively stable. Additionally, the rate of fatal impaired driving crashes in Texas (per 100,000 people) in 2017 showed a small downtick compared to 2016. The year 2017 registered the smallest rate of fatal impaired driving crashes in Texas (per 100,000 people) in the past 8 years.

In this report, TTI analyzed the 2017 impaired driving crash data looking at crash and driver characteristics. In 2017, a majority of fatal impaired driving crashes involved single vehicles (58 percent), occurred on Saturday or Sunday (44 percent), and occurred between the hours of 10:00 PM and 2:59 AM (36 percent). Additionally, a majority of impaired drivers were White/Caucasian (49 percent), were male (82 percent), or were between the ages of 21 and 34 (44 percent).

Of the 1,063 impaired passenger vehicle drivers⁹ involved in fatal crashes, 40 percent were unrestrained at the time of the crash. In comparison, 18 percent of all passenger vehicle drivers involved in fatal crashes were unrestrained. Nineteen percent of the 1,278 impaired drivers involved in fatal crashes were unlicensed, compared to 12 percent of all drivers involved in fatal crashes who were unlicensed.

TTI also reviewed crash report narratives of all fatal impaired driving crashes with pedestrian involvement (n=50). The narrative review found that in 24 percent of the crashes, one or more pedestrian was crossing the street at the time of the crash. In 20 percent of the crashes, one or more pedestrian was on the roadway or median, either to work on a disabled vehicle or to render aid. This finding where pedestrians were in the middle of the road at the time of the crash in one-fifth of the crashes sheds a different light on pedestrian-involved crashes and warrants further exploration.

⁹Excludes motorcycle operators.

