Walk. Bike. Safe. Texas

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Statewide Pedestrian and Bicycle Crash Analysis

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Introduction

As part of the Walk. Bike. Safe. Texas initiative, the Texas A&M Transportation Institute (TTI) has undertaken a statewide analysis of pedestrian and bicycle crashes to identify and understand the who, what, when, where, and why of these crashes. This information will guide strategic messaging for the project and provide data on the problem areas for pedestrian and bicycle safety.

The analysis includes TxDOT reportable crashes involving bicyclists and pedestrians from the Crash Records Information System (CRIS), extracted on 2/3/2022. A TxDOT reportable crash is a crash that occurs on a public roadway and results in a fatality, injury or $1,000 in property damages. The analysis examined all fatal, suspected serious injury and suspected minor injury crashes (KAB) for calendar years 2016 through 2020 using descriptive statistics. Therefore, all data presented is for fatal, suspected serious injury and suspected minor injury crashes (in this report referred to as KAB), unless otherwise indicated. There will be some comparisons of the KAB crashes to fatal crashes to highlight differences, where appropriate.

This report is divided into five sections: one on pedestrian crash details, one on bicycle crash details, one on vehicle type, a combined discussion of why pedestrian and bicycle crashes are occurring and a summary of the issue for each road user. Within the pedestrian and bicycle crash details sections, the report is structured to answer each of the who, what, when, and where questions:

- Who is involved in these crashes?
- What were the circumstances surrounding the crashes?
- When did the crashes occur?
- Where did the crashes occur?

Then there is a combined discussion of vehicle type followed by why pedestrian and bicycle crashes are occurring. At the end is a summary of the key findings from the analysis for pedestrians and bicyclists.

This report is a precursor for the creation of infographics to illustrate the main issues identified in this analysis for effective communication to the Texas public.

Pedestrian Crashes

Who is Involved in Pedestrian Crashes?

The “who” in pedestrian crashes includes the pedestrians that are involved in crashes, as well as the drivers. This section will look at the demographics of each independently.

Drivers

Whites made up the largest group of drivers involved in pedestrian crashes, followed by Hispanics, Blacks and Other races (Figure 1). As Table 1 shows, Blacks are overrepresented as drivers in pedestrian crashes compared to their portion of the population. **Note: 22.9 percent** of pedestrian crash reports were either missing information about the driver’s race or ethnicity or it was unknown.

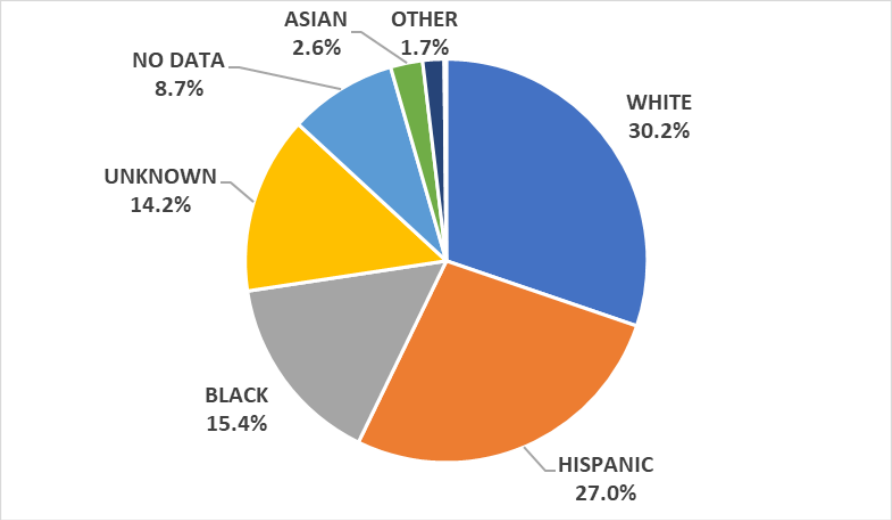

Figure 1. Driver Race/Ethnicity in Pedestrian Crashes

Table 1. Driver Race/Ethnicity in Pedestrian Crashes vs. Population

Race/Ethnicity	**Population**	**Drivers in Pedestrian Crashes**
White	41.4%	30.2%
Hispanic	39.4%	27.0%
Black	11.8%	15.4%
Asian	4.9%	2.6%
American Indian/Alaska Native/Native Hawaiian/Pacific Islander	0.3%	0.2%
Other	0.2%	1.7%
Two or more	2.0%	n/a
Unknown/No Data	n/a	22.9%

Half of drivers involved in pedestrian crashes were male, **28 percent** were female, and **22 percent** were of unknown gender (Figure 2).

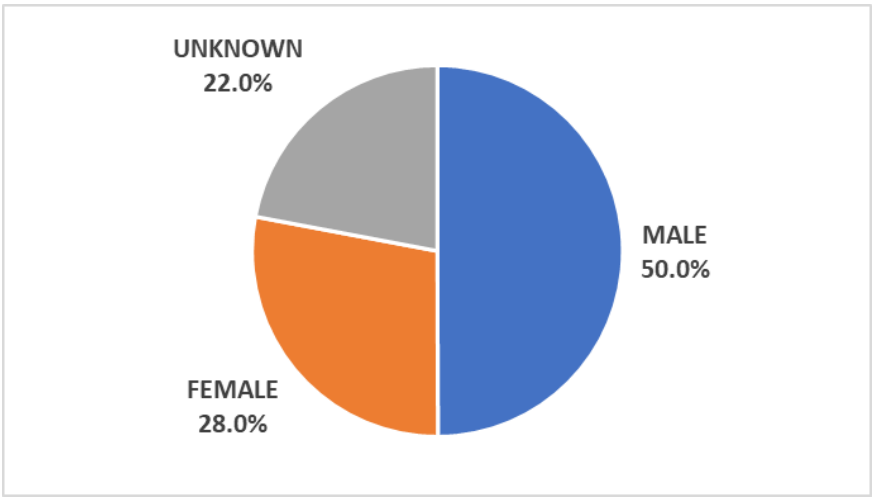

Figure 2. Driver Gender in Pedestrian Crashes

In terms of driver age in pedestrian crashes, Table 2 shows that drivers in the 20-39 year age range represented the highest percentages of drivers, accounting for nearly half (**47.1 percent**) of drivers involved in pedestrian crashes.

Table 2. Driver Age in Pedestrian Crashes

Age Group	Drivers
14 and Under	0.2%
15-19	6.7%
20-24	13.2%
25-29	12.9%
30-34	11.0%
35-39	10.0%
40-44	8.2%
45-49	7.6%
50-54	7.3%
55-59	7.2%
60-64	5.9%
65-69	4.0%
70-74	2.6%
75-79	1.7%
80-84	1.0%
85-89	0.5%
90-94	0.1%
95+	0.0%

Pedestrians

Figure 3 shows the Race/Ethnicity of pedestrians involved in pedestrian crashes. Whites account for the highest percentage of pedestrians involved in crashes, followed closely by Hispanics and then Blacks. Asians and other races make up less than **5 percent** of these crashes.

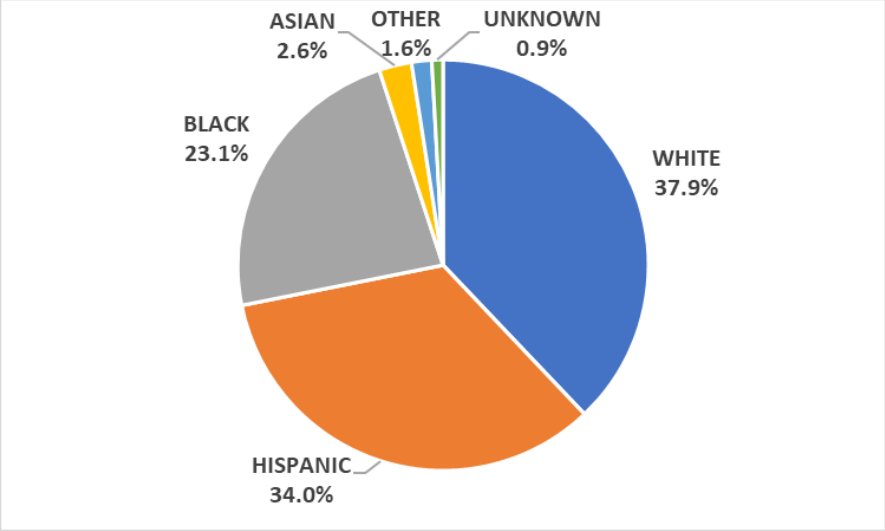

Figure 3. Pedestrian Race/Ethnicity

Table 3 shows the race/ethnicity of pedestrians involved in pedestrian crashes, compared to its portion of the population. This shows that Blacks are highly overrepresented in pedestrian crashes, making up **23.1 percent** of crashes, but just **11.8 percent** of the population. Other races are also overrepresented making up **1.6 percent** of crashes, but just **0.5 percent** of the population.

Table 3. Pedestrian Race/Ethnicity vs. Population

Race/Ethnicity	Population	Pedestrians in Pedestrian Crashes
White	41.4%	37.9%
Hispanic	39.4%	34.0%
Black	11.8%	23.1%
Asian	4.9%	2.6%
Other	0.5%	1.6%
Two or more	2.0%	n/a
Unknown/No Data	n/a	0.9%

As Figure 4 shows, the majority of pedestrians involved in crashes are male at **65.9 percent**.

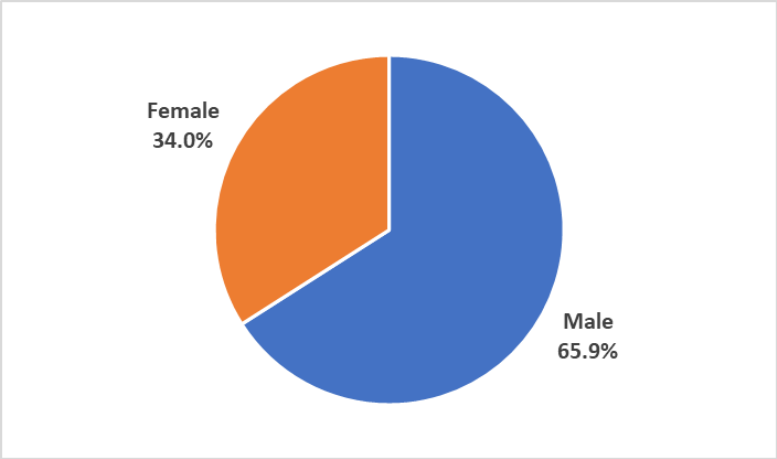

Figure 4. Pedestrian Gender

Table 4 shows pedestrian age broken down into age groups. The left side shows pedestrian age and the population of that same age group in the Texas population. The age groups with the highest percentage of crashes are from ages 15-39. These groups account for **44.8 percent** of pedestrian crash victims.

On the right are the same age groups broken down by gender. This figure clearly shows the overrepresentation of males in pedestrian crashes in all age groups, compared to females, with males making up at least **60 percent** of pedestrian crash victims in every age group.

Table 4. Pedestrian Age

Age Group	Pedestrian Crashes	Population
0-4	1.8%	6.9%
5-9	3.4%	7.2%
10-14	5.4%	7.1%
15-19	9.0%	7.1%
20-24	9.8%	7.2%
25-29	9.2%	7.5%
30-34	8.7%	7.1%
35-39	8.0%	7.0%
40-44	6.9%	6.4%
45-49	6.6%	6.4%
55-59	7.5%	6.0%
50-54	7.5%	5.9%
60-64	6.2%	5.4%
65-69	4.2%	4.4%
70-74	2.6%	3.4%
75-79	1.6%	2.3%
80-84	0.9%	1.5%
85-89	0.5%	0.9%
90-94	0.2%	0.4%
95+	0.1%	0.1%

Age Group	Female	Male
0-4	30.5%	69.5%
5-9	33.1%	66.9%
10-14	39.5%	60.4%
15-19	37.9%	62.1%
20-24	34.7%	65.2%
25-29	32.3%	67.6%
30-34	33.3%	66.7%
35-39	33.1%	66.9%
40-44	34.2%	65.8%
45-49	33.6%	66.4%
50-54	31.6%	68.4%
55-59	29.5%	70.5%
60-64	32.3%	67.6%
65-69	35.7%	64.3%
70-74	38.8%	61.2%
75-79	38.6%	61.4%
80-84	40.0%	60.0%
85-89	38.3%	61.7%
90-94	27.3%	72.7%
95+	35.7%	64.3%

When looking at the race/ethnicity and age of pedestrians (Table 5), an interesting finding emerges. Hispanic seniors in the 65-69 age group are overrepresented in pedestrian crashes compared to their portion of the population. Similarly, Asians 65 and older are also overrepresented compared to their portion of the population.

Table 5. Pedestrian Age Group and Race/Ethnicity

	All Races/Ethnicities		White		Hispanic		Black		Asian	
Person Age Group	% Persons in Crashes	% Population	% Persons in Crashes	% Population	% Persons in Crashes	% Population	% Persons in Crashes	% Population	% Persons in Crashes	% Population
Age 0-4	1.8%	6.9%	1.0%	5.0%	2.6%	8.7%	1.9%	6.9%	2.2%	5.6%
Age 5-9	3.4%	7.2%	1.8%	5.3%	4.5%	8.9%	4.4%	6.9%	4.0%	6.5%
Age 10-14	5.4%	7.1%	3.7%	5.4%	6.6%	8.9%	6.4%	7.1%	4.8%	6.2%
Age 15-19	9.0%	7.1%	7.4%	5.7%	10.7%	8.6%	9.4%	7.3%	6.0%	6.6%
Age 20-24	9.8%	7.2%	8.8%	6.0%	10.3%	8.1%	10.3%	7.7%	10.6%	7.3%
Age 25-29	9.2%	7.5%	9.2%	6.6%	9.1%	7.9%	9.2%	8.6%	9.8%	8.1%
Age 30-34	8.7%	7.1%	9.0%	6.6%	7.9%	7.2%	9.2%	7.6%	9.6%	8.6%
Age 35-39	8.0%	7.0%	8.3%	6.6%	7.5%	7.2%	7.9%	7.2%	8.0%	8.8%
Age 40-44	6.9%	6.4%	7.6%	6.0%	6.4%	6.7%	6.7%	6.5%	4.6%	8.0%
Age 45-49	6.6%	6.4%	7.3%	6.3%	6.3%	6.2%	6.1%	6.5%	5.2%	8.0%
Age 50-54	7.5%	5.9%	8.5%	6.4%	6.7%	5.4%	7.5%	6.0%	4.8%	6.4%
Age 55-59	7.5%	6.0%	8.8%	7.4%	5.9%	4.7%	8.0%	6.0%	6.2%	5.5%
Age 60-64	6.2%	5.4%	6.7%	7.2%	5.5%	3.8%	6.5%	5.3%	5.6%	4.7%
Age 65-69	4.2%	4.4%	4.8%	6.2%	4.0%	2.8%	3.4%	3.9%	6.2%	3.8%
Age 70-74	2.6%	3.4%	3.3%	5.2%	2.4%	2.0%	1.8%	2.7%	3.0%	2.6%
Age 75-79	1.6%	2.3%	1.8%	3.6%	1.7%	1.3%	0.8%	1.6%	4.2%	1.6%
Age 80-84	0.9%	1.5%	1.1%	2.3%	1.1%	0.8%	0.2%	1.0%	2.6%	1.0%
Age 85-89	0.5%	0.9%	0.6%	1.4%	0.5%	0.5%	0.2%	0.6%	2.2%	0.5%
Age 90-94	0.2%	0.4%	0.1%	0.7%	0.2%	0.2%	0.1%	0.3%	0.6%	0.2%
Age 95+	0.0%	0.1%	0.1%	0.2%	0.1%	0.1%		0.1%		0.1%

What are the Causes of Pedestrian Crashes?

Contributing Factors

To better understand the causes of pedestrian crashes, the contributing factors of crashes were examined. Contributing factors are opinions the officer has made related to the crash and included in the crash report. Contributing factors may be assigned to each unit (driver, pedestrian, bicyclist) involved in a crash. Also, more than one contributing factor may be applied to each unit so there may be several contributing factors for each crash. The following tables related to the contributing factors represents the assignment of the contributing factor.

For pedestrian KAB crashes, Table 6 shows the top four contributing factors assigned to the driver while Table 7 shows the top four contributing factors assigned to the pedestrian. Failure to yield right-of-way to the pedestrian and driver inattention were at the top for drivers, while pedestrian failure to yield right-of-way to vehicle was the top pedestrian contributing factor, followed by impairment-related contributing factors.

Table 6. Driver Contributing Factors in KAB Pedestrian Crashes.

FAILED TO YIELD RIGHT OF WAY - TO PEDESTRIAN
DRIVER INATTENTION
FAILED TO CONTROL SPEED
FAILED TO DRIVE IN SINGLE LANE

Table 7. Pedestrian Contributing Factors in KAB Crashes.

PEDESTRIAN FAILED TO YIELD RIGHT OF WAY TO VEHICLE
UNDER INFLUENCE - ALCOHOL
HAD BEEN DRINKING
UNDER INFLUENCE - DRUG

For fatal pedestrian crashes, Table 8 shows the top four contributing factors assigned to the driver while Table 9 shows the top four contributing factors assigned to the pedestrian. The main difference here is that under the influence of alcohol makes the top four of driver contributing factors for fatal pedestrian crashes.

Table 8. Driver Contributing Factors in Pedestrian Fatal Crashes.

DRIVER INATTENTION
FAILED TO DRIVE IN SINGLE LANE
UNDER INFLUENCE - ALCOHOL
FAILED TO CONTROL SPEED

Table 9. Pedestrian Contributing Factors in Pedestrian Fatal Crashes.

PEDESTRIAN FAILED TO YIELD RIGHT OF WAY TO VEHICLE
UNDER INFLUENCE - ALCOHOL
UNDER INFLUENCE - DRUG
HAD BEEN DRINKING

Distraction

Distraction in KAB pedestrian crashes was recorded for **13.3 percent** of drivers and **1.0 percent** of pedestrians. These numbers were lower for fatal pedestrian crashes. This includes cell phone use as well as other distractions and driver inattention. This was most often recorded for those in the 20-24 age group. Distracted drivers in pedestrian crashes were **49.3 percent** male, **31.3 percent** female, and **19.4 percent** were not assigned a gender code.

Impairment

In KAB pedestrian crashes, **2.3 percent** of drivers involved were impaired and **9.8 percent** of pedestrians were impaired. In fatal pedestrian crashes **5.1 percent** of drivers were impaired and **37.2 percent** of pedestrians were impaired. This is predominately a male issue with **76.1 percent** of impaired drivers in pedestrian crashes being male and **78.3 percent** of impaired pedestrians being male. Impairment includes those that were under the influence of drugs or alcohol, taking medication, had been drinking, had a BAC greater than zero, or had a positive drug test.

Speeding

Speeding was recorded as a contributing factor for **2.0 percent** of crashes involving pedestrians. This includes speeding over the limit or driving at an unsafe speed. However, for pedestrian fatal crashes, driver speeding was a factor in **4.6 percent** of crashes. Table 10 shows the number of drivers that had a contributing factor of speeding by year. The left column shows the number of drivers in KAB pedestrian crashes that were assigned a contributing factor for speeding. In 2020, the number of drivers exceeded one hundred, and was a **24.7 percent** increase over 2019. In pedestrian fatal crashes (middle column) the increase in the number of speeding drivers was **86.9 percent** from 2019 to 2020. This is not only an issue in pedestrian crashes, however. The far-right column shows the number of drivers speeding in all fatal crashes, where there was a **26.5 percent** increase from 2019 to 2020.

Table 10. Drivers Speeding in Pedestrian Crashes

Year	Speeding Drivers in KAB Pedestrian Crashes	Speeding Drivers in Fatal Pedestrian Crashes	Speeding Drivers in ALL Fatal Crashes
2016	85	28	680
2017	75	24	690
2018	83	28	674
2019	81	23	649
2020	101	43	821

Failure to Yield Right-of-Way

The failed to yield right-of-way contributing factor is a common one assigned to pedestrian and bicycle crashes. This section includes an analysis of failing to yield in pedestrian crashes.

Drivers Involved in Pedestrian Crashes

Table 11 shows the top failed to yield right-of-way contributing factors assigned to drivers involved in KAB pedestrian crashes. The top failure to yield right-of-way assigned to drivers

was “to pedestrian.” There were also some more specific failures to yield right-of-way such as when making turns, at intersections or when entering or exiting a private driveway. The types of failure to yield right-of-way were similar in fatal pedestrian crashes compared to KAB crashes.

Table 11. Driver FTYROW Contributing Factors in Pedestrian KAB Crashes.

FAILED TO YIELD RIGHT OF WAY - TO PEDESTRIAN
FAILED TO YIELD RIGHT OF WAY - TURNING LEFT
FAILED TO YIELD RIGHT OF WAY - STOP SIGN
FAILED TO YIELD RIGHT OF WAY - PRIVATE DRIVE
FAILED TO YIELD RIGHT OF WAY - TURN ON RED

Pedestrians

The top failed to yield right-of-way contributing factors in KAB crashes on the part of the pedestrian are shown in Table 12. The types of failure to yield right-of-way are much the same for pedestrian fatal crashes.

Table 12. Pedestrian FTYROW Contributing Factors in Pedestrian KAB Crashes.

PEDESTRIAN FAILED TO YIELD RIGHT OF WAY TO VEHICLE
FAILED TO YIELD RIGHT OF WAY - OPEN INTERSECTION
FAILED TO YIELD RIGHT OF WAY - PRIVATE DRIVE

When are Pedestrian Crashes Occurring?

Crashes by Year

Figure 5 shows the number of KAB pedestrian crashes by year. The number of crashes in these three categories was much lower in 2020, due to reduced driving during the COVID-19 pandemic. However, as Figure 6 shows, the number of fatalities in 2020 reached a new high of over 700 pedestrians. So, while the number of pedestrian crashes went down (a **13.5 percent** decrease from 2019-2020) the number of fatalities rose by **7.8 percent** from 2019 to 2020.

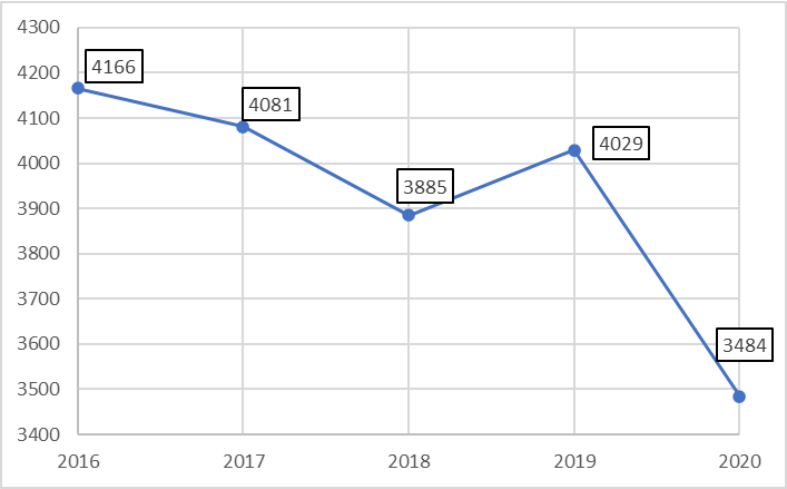

Figure 5. Pedestrian Crashes by Year (KAB)

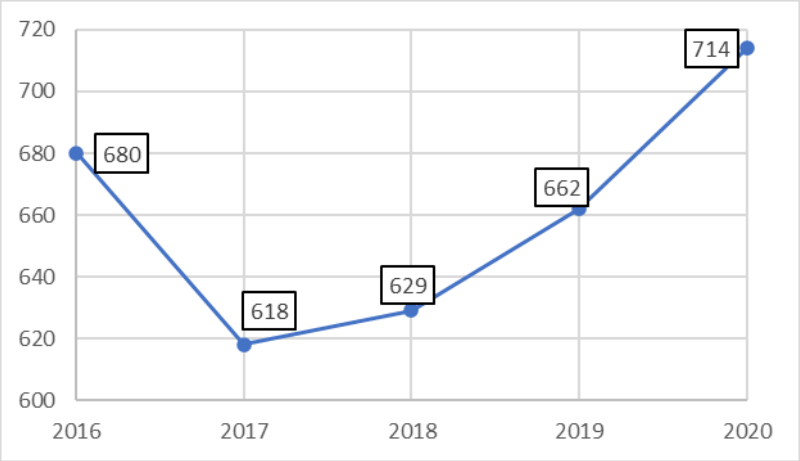

Figure 6. Pedestrian Fatal Crashes by Year

Figure 7 shows the number of pedestrian crashes by severity category and provides another look at how the severity of pedestrian crashes changed significantly in 2020, with a reduction in suspected minor injuries and suspected serious injuries, but an increase in fatal injuries.

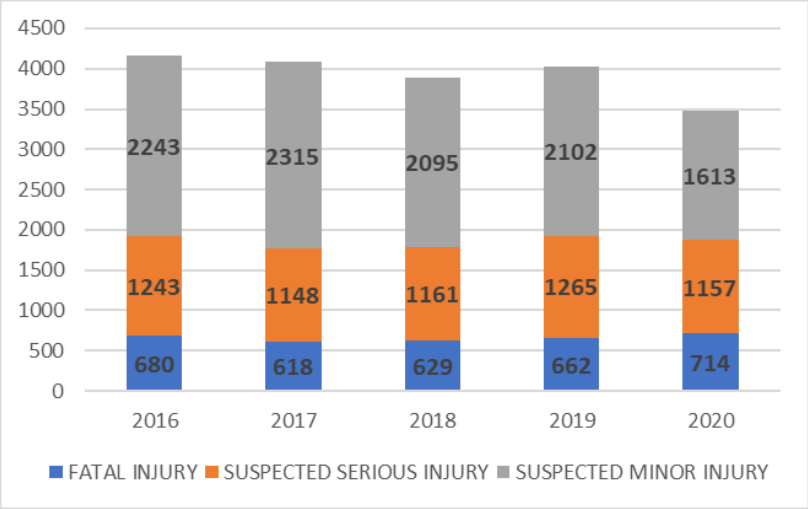

Figure 7. Pedestrian Crashes by Year and Injury Severity

Crashes by Month

Figure 8 shows the number of KAB pedestrian crashes for each month of the year. The month of October had the highest number of crashes whereas the months of June and July had the lowest number of crashes. Initially, it might be easy to say that some of this could be due to exposure, with more people walking in the cooler month of October and less people walking in the warmer months of June and July.

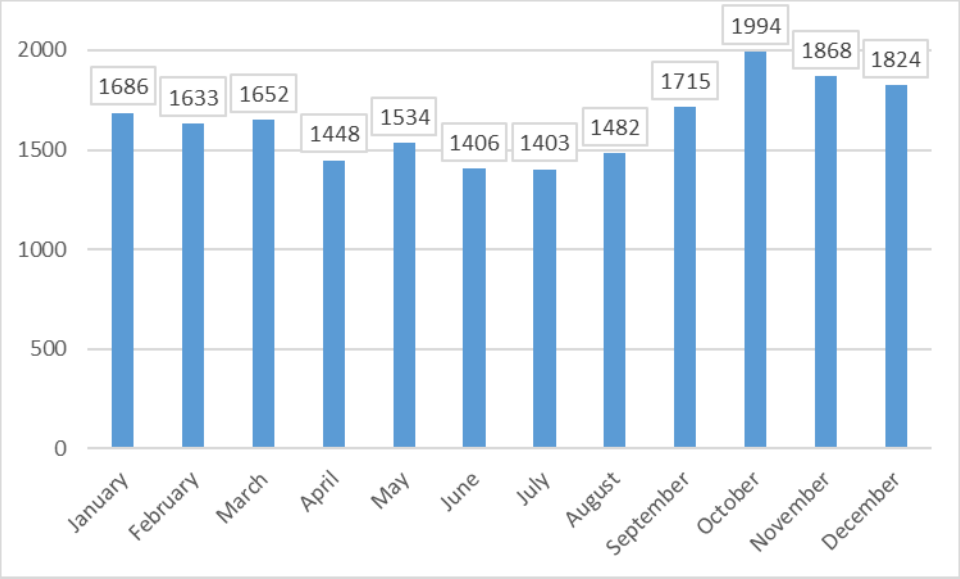

Figure 8. Pedestrian Crashes by Month

However, when factoring in a measure of exposure the data show this may not be the case. Figure 9 shows the number of pedestrian KAB crashes by month, compared to the pedestrian crash rate for each month. The crash rate is a function of the number of crashes and the percentage of people walking compared to the annual average, as obtained from the Texas Bicycle and Pedestrian Count Exchange. The data show that while a higher number of crashes occurred in October the likelihood of a pedestrian being in a crash is potentially higher in December when factoring in the number of pedestrians walking in that month. This means that factors other than the number of people walking could be affecting the likelihood of a pedestrian being involved in a crash.

Month	Pedestrian KAB Crashes	Pedestrian Crash Rate
Jan	1686	1951
Feb	1633	1705
Mar	1652	1464
Apr	1448	1246
May	1534	1319
Jun	1406	1363
Jul	1403	1534
Aug	1482	1687
Sep	1715	1616
Oct	1994	1713
Nov	1868	1943
Dec	1824	2558

Figure 9. Pedestrian Crashes Compared to Pedestrian Crash Rate.

Crashes by Time of Day/Lighting Conditions

As Figure 10 shows, **53.7 percent** of pedestrians in KAB crashes occurred in the dark, while **79.3 percent** of pedestrian fatalities occurred in the dark.

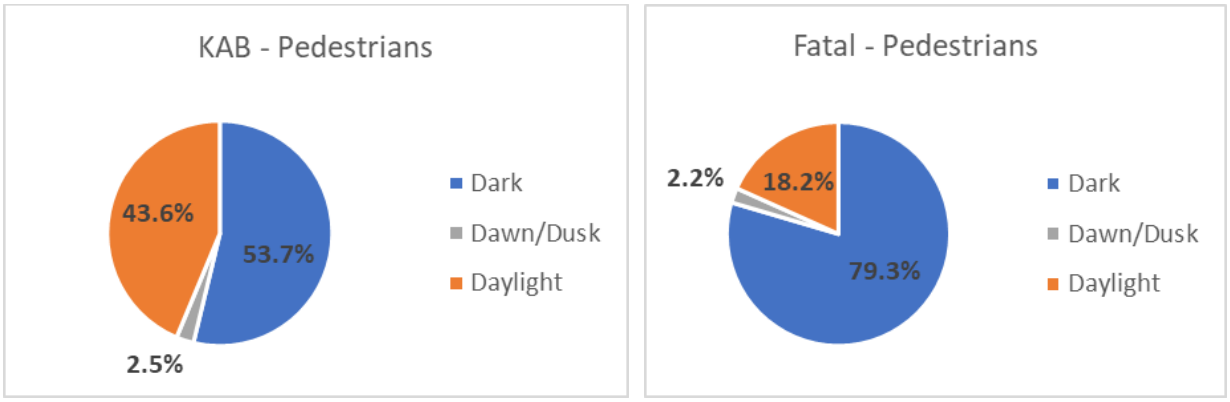

Figure 10. Pedestrian Crashes – Lighting Conditions

In terms of hours of the day when pedestrians are being struck, the highest number of pedestrian KAB injuries occurred between 8:00 p.m. and 10:00 p.m. as shown in Table 13. There were somewhat higher occurrences of pedestrians aged 5-14 being involved in crashes during afternoon hours from 3:00 p.m.-6:00 p.m. and in the mornings from 7:00 a.m.-8:00 a.m., as shown in Table 14.

Table 13. Pedestrian KAB Crashes by Light Condition and Time of Day.

Crash Hour	DARK	DAWN & DUSK	DAYLIGHT	OTHER/ UNKNOWN	Total
00:00 - 00:59	2.9%	0.0%	0.0%	0.0%	**2.9%**
01:00 - 01:59	2.6%	0.0%	0.0%	0.0%	**2.6%**
02:00 - 02:59	3.0%	0.0%	0.0%	0.0%	**3.0%**
03:00 - 03:59	1.7%	0.0%	0.0%	0.0%	**1.7%**
04:00 - 04:59	1.6%	0.0%	0.0%	0.0%	**1.6%**
05:00 - 05:59	2.1%	0.0%	0.1%	0.0%	**2.2%**
06:00 - 06:59	3.1%	0.5%	0.5%	0.0%	**4.2%**
07:00 - 07:59	0.7%	0.5%	3.1%	0.0%	**4.3%**
08:00 - 08:59	0.1%	0.0%	3.3%	0.0%	**3.4%**
09:00 - 09:59	0.1%	0.0%	2.4%	0.0%	**2.5%**
10:00 - 10:59	0.1%	0.0%	2.4%	0.0%	**2.5%**
11:00 - 11:59	0.1%	0.0%	2.9%	0.0%	**2.9%**
12:00 - 12:59	0.1%	0.0%	3.1%	0.0%	**3.2%**
13:00 - 13:59	0.0%	0.0%	2.9%	0.0%	**2.9%**
14:00 - 14:59	0.0%	0.0%	3.3%	0.0%	**3.3%**
15:00 - 15:59	0.0%	0.0%	4.6%	0.0%	**4.7%**
16:00 - 16:59	0.1%	0.0%	5.3%	0.0%	**5.4%**
17:00 - 17:59	0.8%	0.3%	4.2%	0.0%	**5.4%**
18:00 - 18:59	4.6%	0.3%	3.0%	0.0%	**7.9%**
19:00 - 19:59	5.2%	0.4%	1.9%	0.0%	**7.6%**
20:00 - 20:59	7.3%	0.3%	0.6%	0.0%	**8.2%**
21:00 - 21:59	7.8%	0.0%	0.1%	0.0%	**8.0%**
22:00 - 22:59	5.4%	0.0%	0.0%	0.0%	**5.5%**
23:00 - 23:59	4.2%	0.0%	0.0%	0.0%	**4.2%**
Total	**53.6%**	**2.5%**	**43.6%**	**0.3%**	**100.0%**

Table 14. Pedestrian KAB Crashes (Ages 5-14) by Light Condition and Time of Day.

Crash Hour	DARK	DAWN & DUSK	DAYLIGHT	OTHER/ UNKNOWN	Total
00:00 - 00:59	0.2%	0.0%	0.0%	0.0%	**0.2%**
01:00 - 01:59	0.4%	0.0%	0.0%	0.0%	**0.4%**
02:00 - 02:59	0.2%	0.0%	0.0%	0.0%	**0.2%**
03:00 - 03:59	0.1%	0.0%	0.0%	0.0%	**0.1%**
04:00 - 04:59	0.2%	0.0%	0.0%	0.0%	**0.2%**
05:00 - 05:59	0.4%	0.0%	0.0%	0.0%	**0.4%**
06:00 - 06:59	2.1%	0.5%	0.6%	0.0%	**3.3%**
07:00 - 07:59	0.9%	1.1%	7.7%	0.0%	**9.7%**
08:00 - 08:59	0.1%	0.1%	3.6%	0.0%	**3.8%**
09:00 - 09:59	0.0%	0.0%	1.0%	0.0%	**1.0%**
10:00 - 10:59	0.1%	0.0%	1.0%	0.0%	**1.1%**
11:00 - 11:59	0.0%	0.0%	1.7%	0.0%	**1.7%**
12:00 - 12:59	0.0%	0.0%	2.5%	0.0%	**2.5%**
13:00 - 13:59	0.0%	0.0%	2.1%	0.0%	**2.1%**
14:00 - 14:59	0.0%	0.0%	3.9%	0.0%	**3.9%**
15:00 - 15:59	0.0%	0.0%	13.0%	0.1%	**13.1%**
16:00 - 16:59	0.1%	0.1%	16.1%	0.0%	**16.2%**
17:00 - 17:59	1.0%	0.4%	9.6%	0.0%	**11.0%**
18:00 - 18:59	3.3%	0.7%	5.8%	0.1%	**9.8%**
19:00 - 19:59	3.6%	0.6%	3.6%	0.1%	**7.9%**
20:00 - 20:59	4.0%	0.5%	0.9%	0.0%	**5.4%**
21:00 - 21:59	3.2%	0.2%	0.0%	0.0%	**3.4%**
22:00 - 22:59	1.6%	0.1%	0.0%	0.0%	**1.7%**
23:00 - 23:59	1.0%	0.0%	0.0%	0.0%	**1.0%**
Total	**22.4%**	**4.4%**	**73.0%**	**0.2%**	**100.0%**

Additionally, on weekends, pedestrian fatalities increase in the evening, similar to the rest of the week. However, unlike on weekdays, there is a second spike in pedestrian fatalities very late at night, at around 2:00 a.m. (which is when many bars close). These show up as early morning crashes on Saturdays and Sundays, as shown in Table 15 and Table 16. Pedestrian fatalities also increase between 8:00 p.m. and 11:00 p.m. on Sunday evenings.

Table 15. Pedestrian Fatal Crashes - Saturday (starting late Friday night/early Saturday morning).

Crash Hour	DARK	DAWN & DUSK	DAYLIGHT	OTHER/ UNKNOWN	Total
00:00 - 00:59	5.5%	0.0%	0.0%	0.0%	**5.5%**
01:00 - 01:59	7.1%	0.0%	0.0%	0.0%	**7.1%**
02:00 - 02:59	8.9%	0.0%	0.0%	0.0%	**8.9%**
03:00 - 03:59	4.3%	0.0%	0.0%	0.0%	**4.3%**
04:00 - 04:59	3.9%	0.0%	0.0%	0.0%	**3.9%**
05:00 - 05:59	3.6%	0.0%	0.2%	0.0%	**3.8%**
06:00 - 06:59	2.5%	0.2%	0.2%	0.0%	**2.9%**
07:00 - 07:59	0.4%	0.4%	0.4%	0.0%	**1.1%**
08:00 - 08:59	0.2%	0.0%	1.1%	0.0%	**1.3%**
09:00 - 09:59	0.2%	0.0%	1.6%	0.2%	**2.0%**
10:00 - 10:59	0.0%	0.0%	1.6%	0.0%	**1.6%**
11:00 - 11:59	0.2%	0.0%	0.7%	0.0%	**0.9%**
12:00 - 12:59	0.2%	0.0%	0.9%	0.0%	**1.1%**
13:00 - 13:59	0.0%	0.0%	1.1%	0.0%	**1.1%**
14:00 - 14:59	0.0%	0.0%	1.4%	0.0%	**1.4%**
15:00 - 15:59	0.0%	0.0%	1.3%	0.0%	**1.3%**
16:00 - 16:59	0.0%	0.0%	0.7%	0.0%	**0.7%**
17:00 - 17:59	0.5%	0.4%	0.9%	0.0%	**1.8%**
18:00 - 18:59	4.3%	0.5%	0.7%	0.0%	**5.5%**
19:00 - 19:59	6.6%	0.0%	0.7%	0.0%	**7.3%**
20:00 - 20:59	9.6%	0.0%	0.0%	0.0%	**9.6%**
21:00 - 21:59	10.4%	0.0%	0.0%	0.0%	**10.4%**
22:00 - 22:59	9.1%	0.0%	0.0%	0.0%	**9.1%**
23:00 - 23:59	7.5%	0.0%	0.0%	0.0%	**7.5%**
Total	**85.0%**	**1.4%**	**13.4%**	**0.2%**	**100.0%**

Table 16. Pedestrian Fatal Crashes - Sunday (starting late Saturday night/early Sunday morning).

Crash Hour	DARK	DAWN & DUSK	DAYLIGHT	OTHER/ UNKNOWN	Total
00:00 - 00:59	6.4%	0.0%	0.0%	0.0%	**6.4%**
01:00 - 01:59	4.3%	0.0%	0.0%	0.0%	**4.3%**
02:00 - 02:59	10.5%	0.0%	0.0%	0.0%	**10.5%**
03:00 - 03:59	8.0%	0.0%	0.0%	0.0%	**8.0%**
04:00 - 04:59	5.6%	0.0%	0.0%	0.0%	**5.6%**
05:00 - 05:59	3.7%	0.0%	0.4%	0.0%	**4.1%**
06:00 - 06:59	2.7%	0.2%	0.4%	0.0%	**3.3%**
07:00 - 07:59	0.8%	0.4%	0.6%	0.0%	**1.9%**
08:00 - 08:59	0.2%	0.2%	0.4%	0.2%	**1.0%**
09:00 - 09:59	0.2%	0.0%	0.4%	0.0%	**0.6%**
10:00 - 10:59	0.4%	0.0%	1.2%	0.0%	**1.6%**
11:00 - 11:59	0.0%	0.0%	0.6%	0.0%	**0.6%**
12:00 - 12:59	0.2%	0.0%	0.6%	0.0%	**0.8%**
13:00 - 13:59	0.0%	0.0%	0.6%	0.0%	**0.6%**
14:00 - 14:59	0.0%	0.0%	0.8%	0.0%	**0.8%**
15:00 - 15:59	0.0%	0.0%	1.2%	0.0%	**1.2%**
16:00 - 16:59	0.0%	0.0%	2.1%	0.0%	**2.1%**
17:00 - 17:59	0.8%	0.0%	1.6%	0.0%	**2.5%**
18:00 - 18:59	5.3%	0.0%	0.4%	0.0%	**5.8%**
19:00 - 19:59	4.9%	0.4%	1.0%	0.0%	**6.4%**
20:00 - 20:59	8.6%	0.0%	0.6%	0.0%	**9.3%**
21:00 - 21:59	10.3%	0.0%	0.0%	0.0%	**10.3%**
22:00 - 22:59	8.0%	0.0%	0.0%	0.0%	**8.0%**
23:00 - 23:59	4.3%	0.0%	0.0%	0.0%	**4.3%**
Total	**85.4%**	**1.2%**	**13.2%**	**0.2%**	**100.0%**

Crashes by Day of Week

As Table 17 shows, KAB pedestrian injuries were less frequent on Sundays (**12.2 percent**) and more frequent on Fridays (**16.6 percent**) compared to the rest of the week. However, pedestrian fatalities were more frequent on Saturdays compared to other days of the week.

Table 17. Pedestrian Crashes by Day of Week

Day of Week	KAB	Fatal
Sunday	12.2%	14.7%
Monday	13.7%	13.4%
Tuesday	14.1%	12.3%
Wednesday	14.4%	13.6%
Thursday	14.3%	13.7%
Friday	16.6%	15.3%
Saturday	14.7%	17.0%

Where are Pedestrian Crashes Occurring?

Geographic Location

Pedestrian crashes occurred most frequently in Texas' five highest-population counties (Harris, Dallas, Bexar, Travis, and Tarrant). However, as Table 18 shows, the relative populations of these counties do not entirely predict the percentages of pedestrians involved in KAB crashes. Tarrant County comprised **7.2 percent** of the Texas population in 2020 (U.S. Census Bureau), and approximately the same percentage of crash-involved pedestrians (**6.7 percent**). The other

four counties were overrepresented in KAB crash-involved persons for their populations, as shown in Table 18 (U.S. Census Bureau, 2020).

Table 18. Pedestrian Crashes Compared to Population

County	% of State's Population in 2020	% of State's Crash-Involved Pedestrians
Harris	16.2%	20.0%
Dallas	9.0%	13.9%
Bexar	6.9%	11.6%
Travis	4.4%	6.8%
Tarrant	7.2%	6.7%

Intersections vs. Non-Intersections

Over one-third (**33.6 percent)** of KAB injured pedestrians occurred at intersections (see Figure 11) and almost two-thirds (**62.1 percent**) occurred at non-intersections. Fatal crashes are even more likely to occur away from intersections, with **83.9 percent** of pedestrian fatalities occurring at non-intersections.

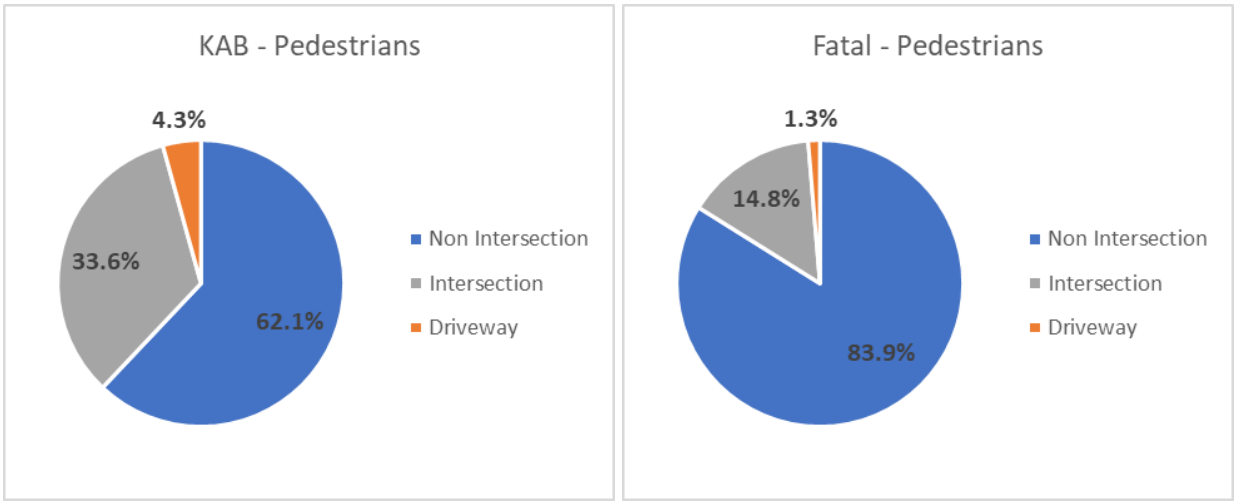

Figure 11. Pedestrian Crashes – Intersection Relation

Speed Limit of Road

The posted speed limit is a factor in terms of crash severity for pedestrians as seen in Figure 12 as compared to Figure 13. Roadways with posted speed limits of 35, 40, 45, 55 and 60 mph make up the highest percentages of KAB crash victims. When looking at fatalities alone, roadways with posted speed limits of 55, 60 and 65 mph have the highest percentages. This is likely due to a couple of factors: first, roadways with these speed limits include many types of local roads, in both urban and rural areas, where pedestrians are likely to be traveling. Secondly, these are speeds at which any crash involving a pedestrian is very likely to result in a fatality. It is also important to note that pedestrians on the higher speed roadways may also be unintended

pedestrians that are in that location due to having been involved in a crash or having motor vehicle problems.

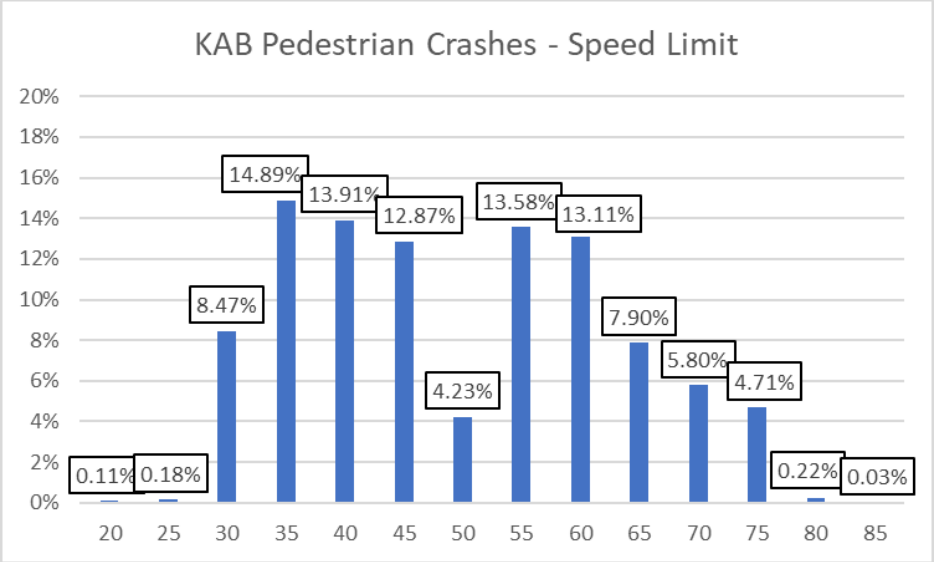

Figure 12. Pedestrians Involved in KAB Crashes by Posted Speed Limit.

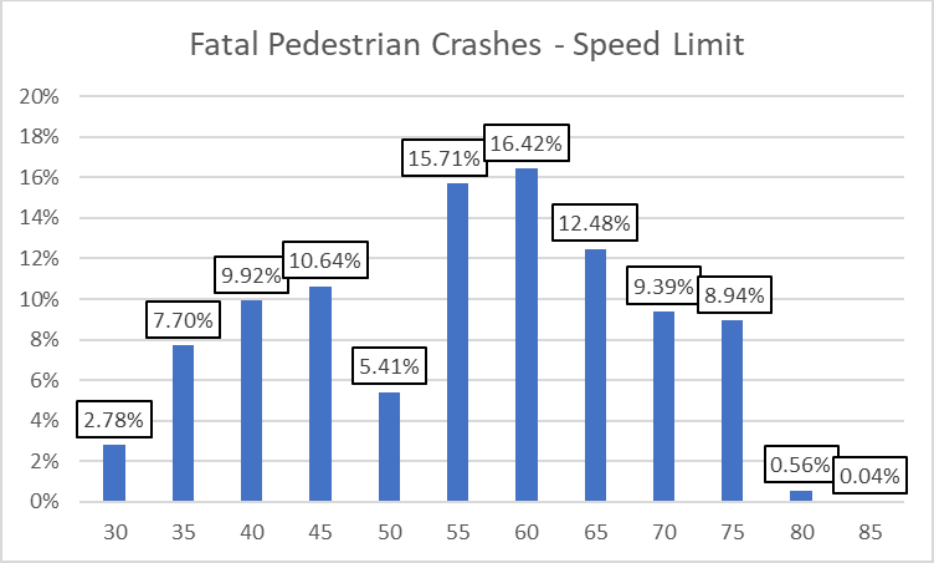

Figure 13. Pedestrians Involved in Fatal Crashes by Posted Speed Limit.

On-System vs. Off-system

Most KAB crashes for pedestrians occurred on roads that are part of the TxDOT roadway system; **61.3 percent** of pedestrian KAB injuries happened on-system. As shown in Figure 14, on-system crashes for KAB pedestrian injuries occurred on roads with speed limits between 30 mph and 85 mph, including local roads, FM roads, State and U.S. Highways, interstates, state loops, and U.S. Business roads. This is likely because most on-system roadways (interstates, highways, freeways, major and minor arterials) have higher speed limits than most off-system roads, which are likely to include a larger percentage of local residential and business streets.

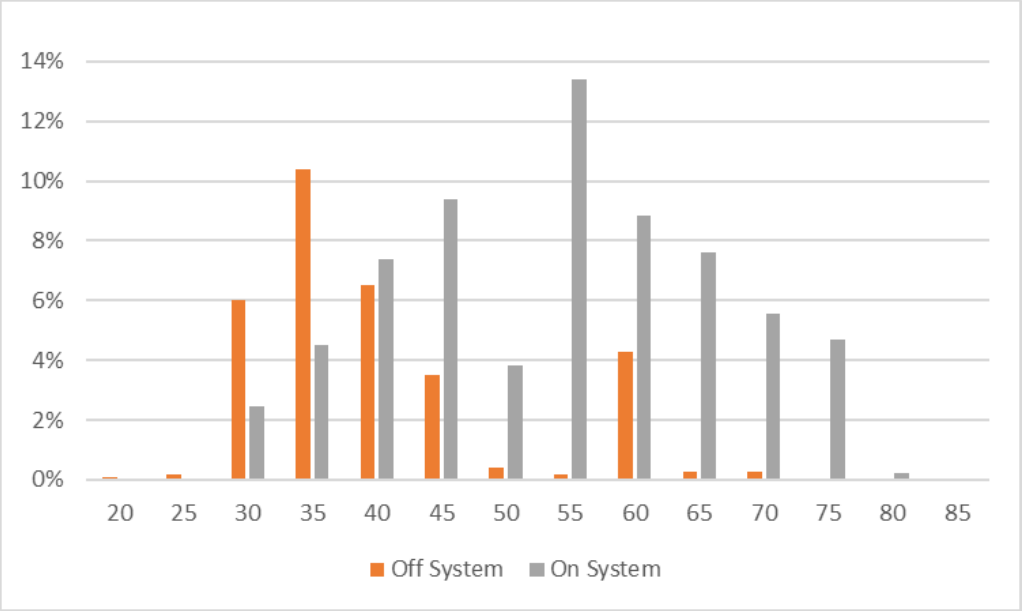

Figure 14. Pedestrian Crashes – On System vs Off System.

Urban vs. Rural

Pedestrian crashes were more likely to occur in urban areas, with **83.3 percent** of KAB injuries and **71.5 percent** of fatalities occurring in urban areas (see Figure 15). However, just over a quarter of pedestrian fatalities occurred in rural areas.

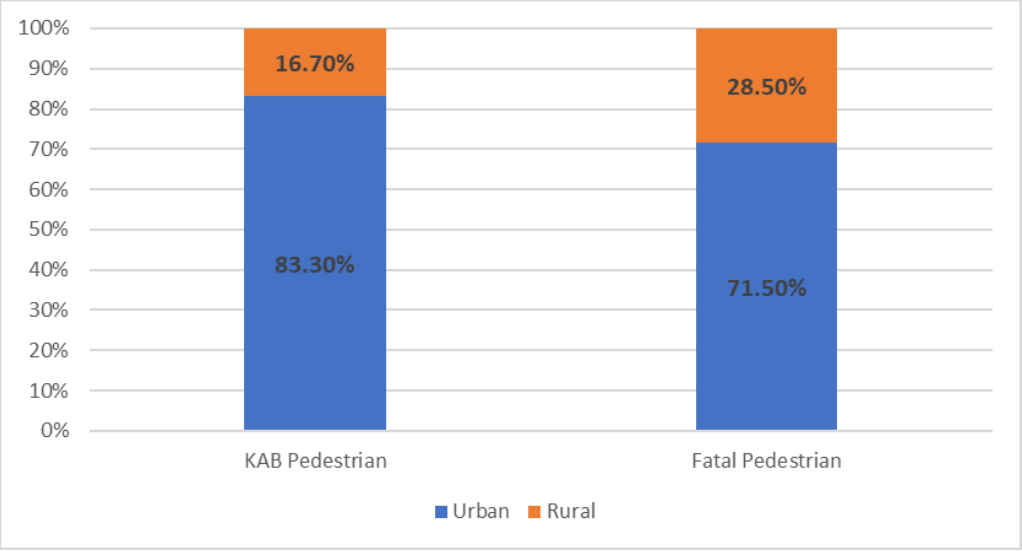

Figure 15. Pedestrian Crashes - Urban vs. Rural.

Bicycle Crashes

Who is Involved in Bicycle Crashes?

The "who" in bicycle crashes includes the bicyclists that are involved in crashes, as well as motor vehicle drivers, hereafter referred to as drivers. This section will look at the demographics of each independently.

Drivers

As Figure 16 shows, Whites make up the largest percentage of drivers involved in bicycle crashes at **38.8** percent. This is followed by Hispanics and Blacks. **Note:** In **14.9** percent of the crashes the race/ethnicity of the driver was unknown or missing. The figure does not show the 0.1% that were of American Indian/Alaska Native/Native Hawaiian/Pacific Islander.

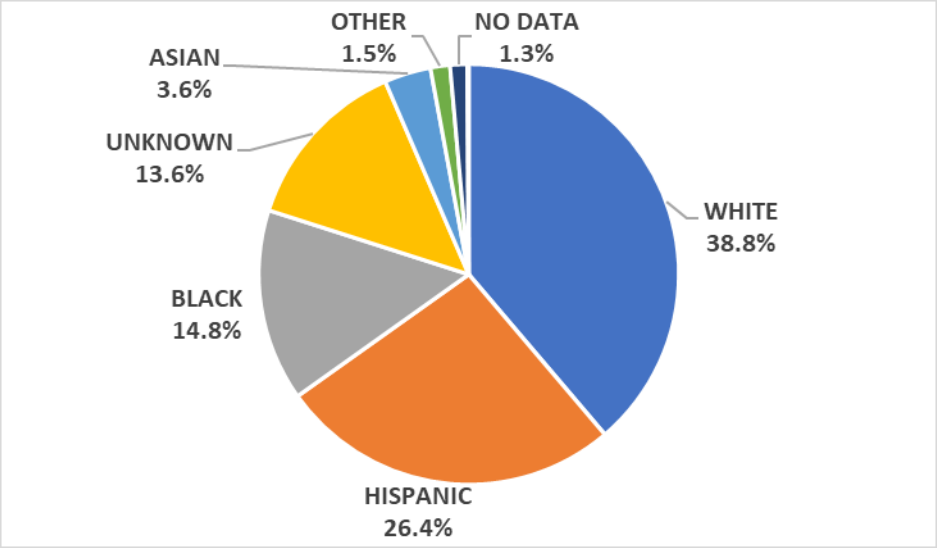

Figure 16. Driver Race/Ethnicity in Bicycle Crashes

As Table 19 shows, Blacks are overrepresented as drivers in bicycle crashes compared to their portion of the population, making up **14.8 percent** of drivers in bicycle crashes, but just **11.8 percent** of the population. Those of other races are also overrepresented.

Table 19. Driver Race/Ethnicity in Bicycle Crashes vs. Population

Race/Ethnicity	Population	Drivers in Bicycle Crashes
White	41.4%	38.8%
Hispanic	39.4%	26.4%
Black	11.8%	14.8%
Asian	4.9%	3.6%
American Indian/Alaska Native/Native Hawaiian/Pacific Islander	0.3%	0.1%
Other	0.2%	1.5%
Two or more	2.0%	n/a
Unknown/No Data	n/a	14.9%

Similar to pedestrian crashes, males accounted for half of the drivers in bicycle crashes, with **36.2 percent** being female and **13.8 percent** being of unknown gender (Figure 17).

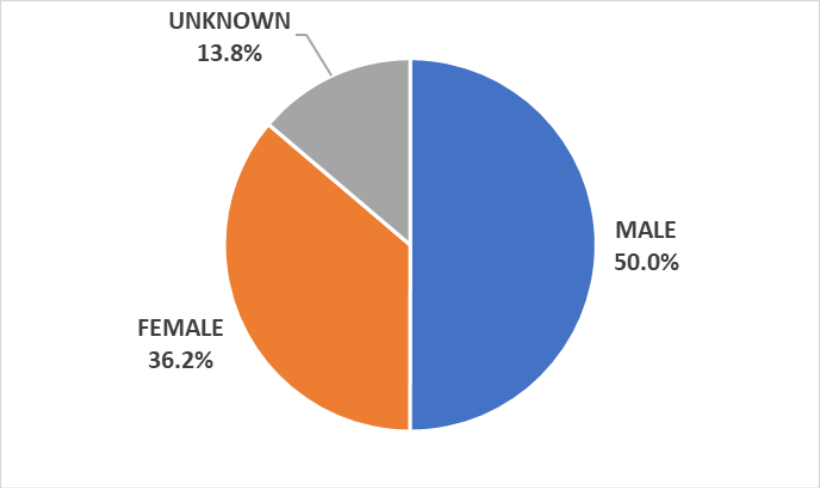

Figure 17. Driver Gender in Bicycle Crashes

Table 20 shows the age groups of drivers involved in bicycle crashes. The age groups of 20-49 years of age accounted for **60.1 percent** of the drivers involved in these crashes, with 20-24 year olds being the age group with the highest percentage of crashes.

Table 20. Driver Age in Bicycle Crashes

Age Group	Drivers
14 and Under	0.1%
15-19	6.6%
20-24	12.1%
25-29	10.9%
30-34	10.5%
35-39	9.2%
40-44	8.6%
45-49	8.8%
50-54	7.5%
55-59	7.3%
60-64	6.0%
65-69	4.5%
70-74	3.8%
75-79	2.0%
80-84	1.4%
85-89	0.6%
90-94	0.1%
95+	0.0%

Bicyclists

Figure 18 shows the race/ethnicity of bicyclists involved in bicycle crashes. Whites account for just over half of bicycle crash victims, followed by Hispanics, Blacks, Asians, other and unknown.

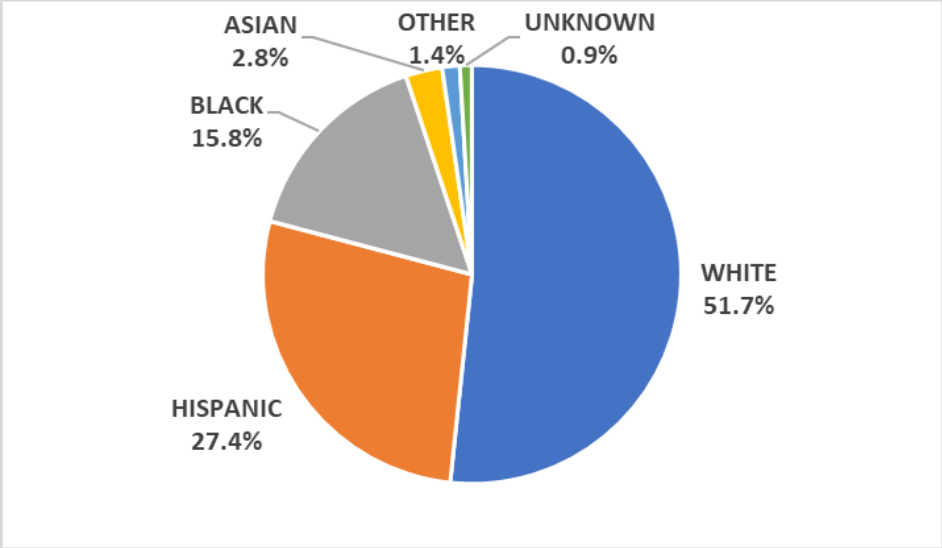

Figure 18. Bicyclist Race/Ethnicity in Bicycle Crashes

Table 21 shows the race/ethnicity of bicyclists involved in bicycle crashes compared to their portion of the population. Whites and Blacks are both overrepresented in bicycle crashes, compared to their portion of the population, as are those of other races.

Table 21. Bicyclist Race/Ethnicity Compared to Population

Race/Ethnicity	Population	Bicyclists in Bicycle Crashes
White	41.4%	51.7%
Hispanic	39.4%	27.4%
Black	11.8%	15.8%
Asian	4.9%	2.8%
Other	0.5%	1.4%
Two or more	2.0%	n/a
Unknown/No Data	n/a	0.9%

Males are significantly overrepresented in bicycle crashes (Figure 19), making up **82.3** percent of bicycle crash victims.

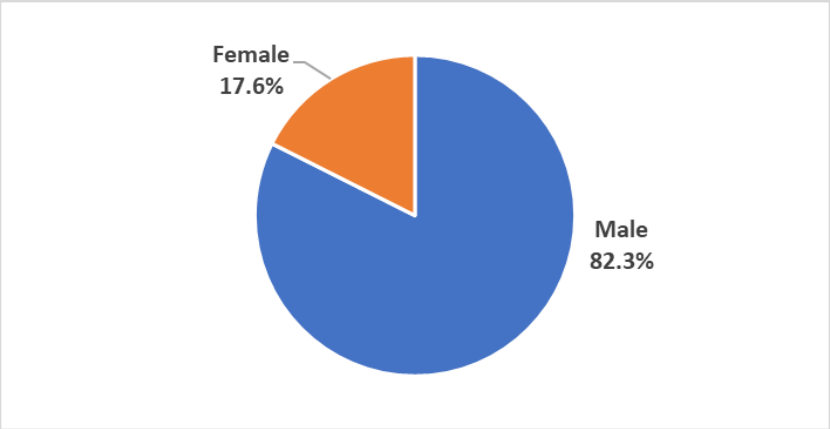

Figure 19. Bicyclist Gender

Table 22 shows the age groups of the bicyclists involved in bicycle crashes. On the left the age groups are compared to the population, where the 10-19 year old age range shows up as being overrepresented in crashes. The 20-34 years olds are also overrepresented, to a lesser degree.

The right side shows the age groups broken down by gender. This table further highlights the overrepresentation of males in bicycle crashes. Males accounted for at least **68 percent** of crash victims in every age category (except 95+), and at least **75 percent** of those 5-94 years of age.

Table 22. Bicyclist Age

Age Group	Bicyclist Crashes	Population
0-4	0.5%	6.9%
5-9	4.6%	7.2%
10-14	10.1%	7.1%
15-19	11.4%	7.1%
20-24	9.6%	7.2%
25-29	9.0%	7.5%
30-34	8.3%	7.1%
35-39	6.7%	7.0%
40-44	5.5%	6.4%
45-49	6.9%	6.4%
55-59	7.6%	6.0%
50-54	7.8%	5.9%
60-64	6.0%	5.4%
65-69	2.9%	4.4%
70-74	1.7%	3.4%
75-79	0.8%	2.3%
80-84	0.4%	1.5%
85-89	0.2%	0.9%
90-94	0.0%	0.4%
95+	0.0%	0.1%

Age Group	Female	Male
0-4	31.4%	68.6%
5-9	24.2%	75.2%
10-14	16.9%	82.5%
15-19	16.7%	83.2%
20-24	23.1%	76.8%
25-29	23.2%	76.8%
30-34	22.3%	77.7%
35-39	20.7%	79.3%
40-44	16.2%	83.8%
45-49	17.1%	82.9%
50-54	13.1%	86.7%
55-59	12.1%	87.9%
60-64	11.1%	88.6%
65-69	7.2%	92.8%
70-74	9.7%	90.3%
75-79	8.8%	91.2%
80-84	7.1%	92.9%
85-89	n/a	100.0%
90-94	n/a	100.0%
95+	50.0%	50.0%

What are the Causes of Bicycle Crashes?

Contributing Factors

To better understand the causes of bicycle crashes, the contributing factors of crashes were examined. Contributing factors are opinions the officer has made related to the crash and included in the crash report. Contributing factors may be assigned to each unit (driver, pedestrian, bicyclist) involved in a crash. Also, more than one contributing factor may be applied to each unit so there may be several contributing factors for each crash. The following tables related to the contributing factors represents the assignment of the contributing factor.

For bicycle KAB crashes, Table 23 shows the top five contributing factors assigned to the driver while Table 24 shows the top five contributing factors assigned to the bicyclist. Driver inattention shows up as the top driver contributing factor along with various failed to yield right-of-way issues. The top contributing factor attributed to bicyclists was failure to yield right-of-way, followed by inattention and disregarding stop signs or signals. **Note:** "bicyclist failed to yield right-of-way to vehicle" is actually coded in the crash data as "pedestrian failed to yield right-of-way to vehicle," since there is no "bicyclist failed to yield right-of-way to vehicle" option. It was changed for the purposes of this report to better explain the crash situation.

Table 23. Driver Contributing Factors in Bicycle KAB Crashes.

DRIVER INATTENTION
FAILED TO YIELD RIGHT OF WAY - TO BICYCLIST
FAILED TO CONTROL SPEED
FAILED TO YIELD RIGHT OF WAY - TURNING LEFT
FAILED TO YIELD RIGHT OF WAY - STOP SIGN

Table 24. Bicyclist Contributing Factors in Bicycle KAB Crashes.

BICYCLIST FAILED TO YIELD RIGHT OF WAY TO VEHICLE
DRIVER INATTENTION
DISREGARD STOP SIGN OR LIGHT
FAILED TO YIELD RIGHT OF WAY - STOP SIGN
DISREGARD STOP AND GO SIGNAL

For fatal bicycle crashes, Table 25 shows the top four contributing factors assigned to the driver while Table 26 shows the top four contributing factors assigned to the bicyclist. In fatal crashes, failure to control speed is new to this list and moves to the top on the driver's side, and under the influence of drugs is new to the list on the bicyclist side.

Table 25. Driver Contributing Factors in Fatal Bicycle Crashes.

FAILED TO CONTROL SPEED
DRIVER INATTENTION
FAILED TO DRIVE IN SINGLE LANE
UNDER INFLUENCE - ALCOHOL

Table 26. Bicyclist Contributing Factors in Bicycle Fatal Crashes.

BICYCLIST FAILED TO YIELD RIGHT OF WAY TO VEHICLE
UNDER INFLUENCE - DRUG
DRIVER INATTENTION
DISREGARD STOP SIGN OR LIGHT

Distraction

Distraction was recorded for **16.4 percent** of drivers involved in bicycle crashes and **7.4 percent** of bicyclists. The percentages were lower for fatal bicyclist crashes. This was most often seen in the 20-24 year old age group for drivers and the 25-29 year old age group for bicyclists. Distraction was **49.2 percent** male, **33.4 percent** female and **17.3 percent** of unknown gender.

Impairment

Impairment was recorded for **1.8 percent** of drivers involved in bicycle crashes and **3.0 percent** of bicyclists. However, impairment was recorded for **13.4 percent** of drivers involved in fatal bicyclist crashes and **31.4 percent** of bicyclists. This is predominantly a male issue, with impairment on the driver side being **75.6 percent** male and **89.1 percent** male on the bicyclist side. Impairment includes those that were under the influence of drugs or alcohol, taking medication or had been drinking.

Speeding

Of drivers involved in KAB bicycle crashes, **1.0 percent** of drivers were speeding, but in fatal bicycle crashes **5.3 percent** of drivers were speeding. This includes speeding over the limit or driving at an unsafe speed.

Failed to Yield Right of Way

The failed to yield right-of-way contributing factor is often assigned to pedestrian and bicycle crashes. This section includes an analysis of failing to yield.

Driver Involved in Bicycle Crashes

Table 27 shows the top failed to yield right-of-way contributing factors assigned to drivers involved in KAB bicycle crashes. This gives a little more detail on the types of failure to yield right-of-way such as when turning, at an intersection or private driveway. The factors are very similar for fatal bicycle crashes.

Table 27. Driver FTYROW Contributing Factors in Bicycle KAB Crashes.

FAILED TO YIELD RIGHT OF WAY - TO BICYCLIST
FAILED TO YIELD RIGHT OF WAY - TURNING LEFT
FAILED TO YIELD RIGHT OF WAY - STOP SIGN
FAILED TO YIELD RIGHT OF WAY - PRIVATE DRIVE
FAILED TO YIELD RIGHT OF WAY - TURN ON RED

Bicyclist

In bicycle KAB crashes, the top failed to yield right-of-way contributing factors on the part of the bicyclist is shown in Table 28. This also gives some more detail about the types of failure to yield right-of-way including at intersections, private driveways, and when making turns. The factors are very similar for bicycle fatal crashes.

Table 28. Bicycle FTYROW Contributing Factors in Bicycle KAB Crashes.

BICYCLIST FAILED TO YIELD RIGHT OF WAY TO VEHICLE
FAILED TO YIELD RIGHT OF WAY - STOP SIGN
FAILED TO YIELD RIGHT OF WAY - PRIVATE DRIVE
FAILED TO YIELD RIGHT OF WAY - OPEN INTERSECTION
FAILED TO YIELD RIGHT OF WAY - TURNING LEFT

When are Bicycle Crashes Occurring?

Crashes by Year

As Figure 20 shows, the total number of KAB bicycle crashes was lower in 2020 than in previous years. This is likely due to the reduced amount of driving during the beginning of the COVID-19 pandemic. However, as Figure 21 shows, the number of fatal bicycle crashes reached a new high of 80 in 2020. Therefore, in 2020, the number of bicycle crashes were reduced, but the number of fatalities increased.

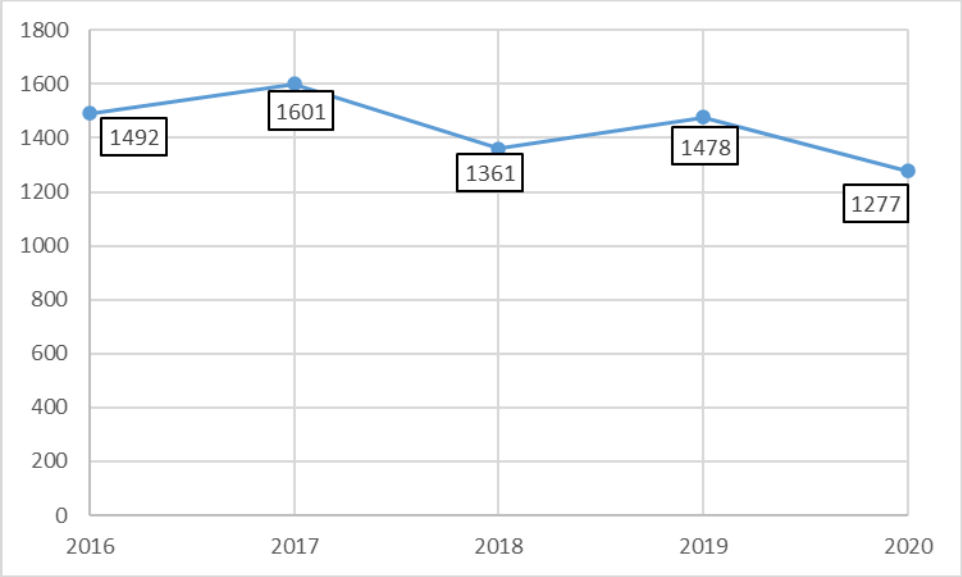

Figure 20. Bicycle Crashes by Year (KAB)

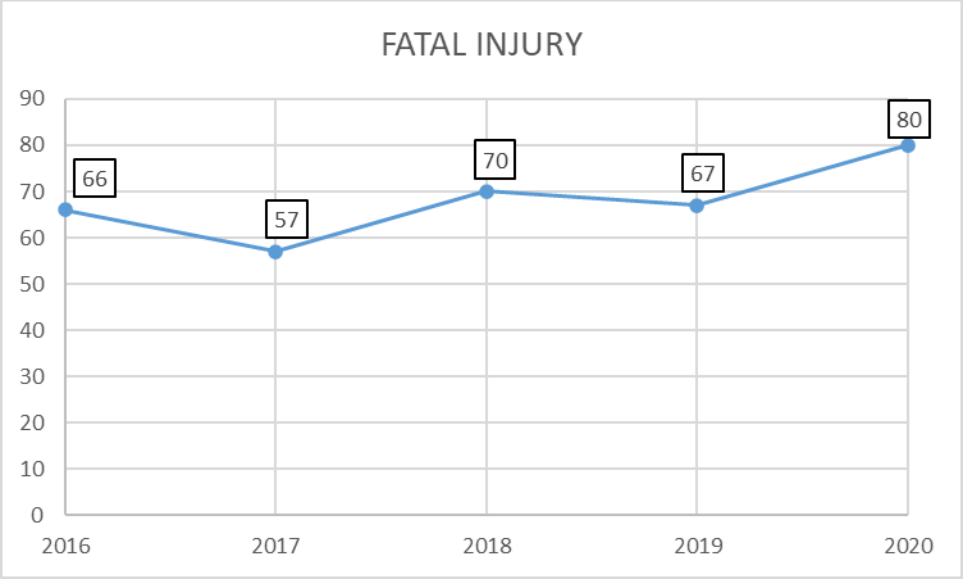

Figure 21. Bicycle Fatal Crashes by Year

Figure 22 shows all the bicycle crashes by year and severity and further highlights how the number of minor injuries decreased, but fatalities increased in 2020.

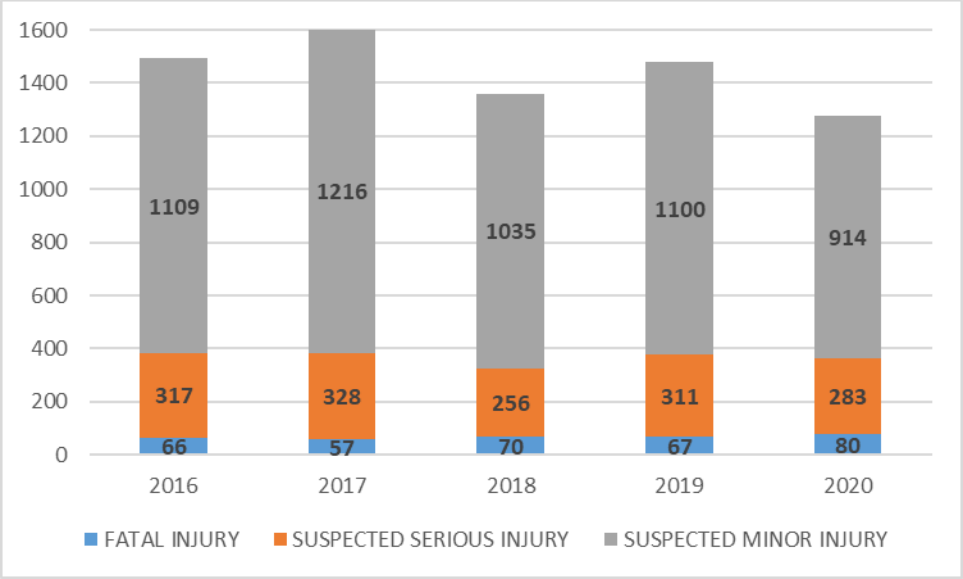

Figure 22. Bicycle Crashes by Year and Severity

Crashes by Month

As Figure 23 shows, the month with the lowest number of bicycle crashes is in December, with September having the highest number of crashes. Initially, this could be seen as a function of exposure, with a lower number of people choosing to bike in the colder month of December and more people choosing to bike in September when the temperatures can be more moderate. Additionally, the increase beginning in August could be attributed to the return of students to schools and universities for the fall semester.

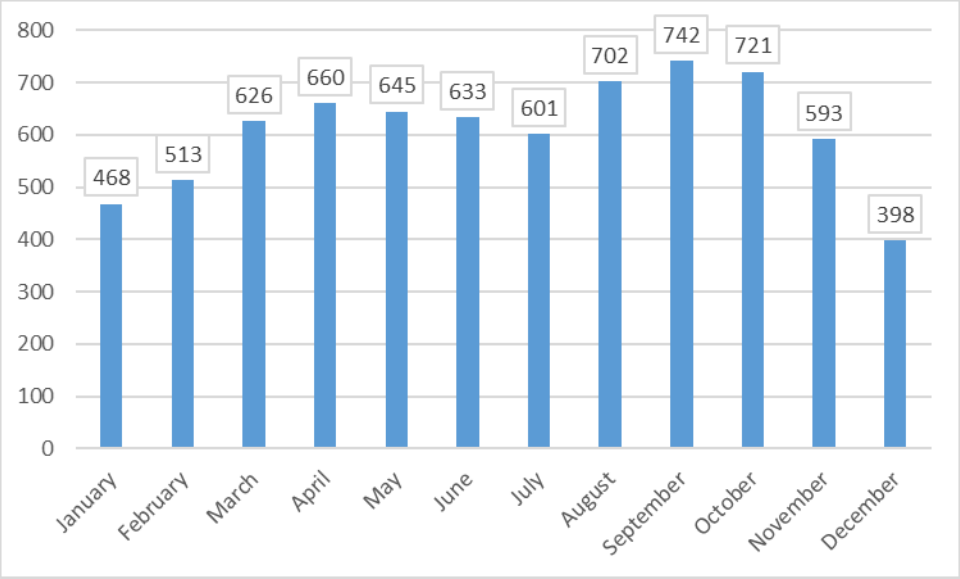

Figure 23. Bicycle Crashes by Month

However, when factoring in data on exposure from the Texas Bicycle and Pedestrian Count Exchange, Figure 24 shows that the likelihood of a bicycle being involved in a crash (the crash rate) is highest in the months with the lowest number of crashes. The crash rate displayed is a function of the number of bicycle crashes and the percentage of people biking compared to the annual average. Therefore, there are factors other than the number of people biking influencing the likelihood of being involved in a crash, and there may in fact be safety in numbers.

Month	Bicycle KAB Crashes	Bicycle Crash Rate
Jan	468	763
Feb	513	698
Mar	626	628
Apr	660	595
May	645	528
Jun	633	505
Jul	601	464
Aug	702	604
Sep	742	612
Oct	721	680
Nov	593	727
Dec	398	763

Figure 24. Bicycle Crashes Compared to Bicycle Crash Rate.

Crashes by Time of Day and Lighting Conditions

Daylight vs. Darkness

The majority of bicyclist KAB injuries **(68.6 percent)** occurred in daylight as seen in Figure 25, while bicyclist fatalities were more likely to occur in the dark with **60.8 percent** of fatalities occurring in the dark.

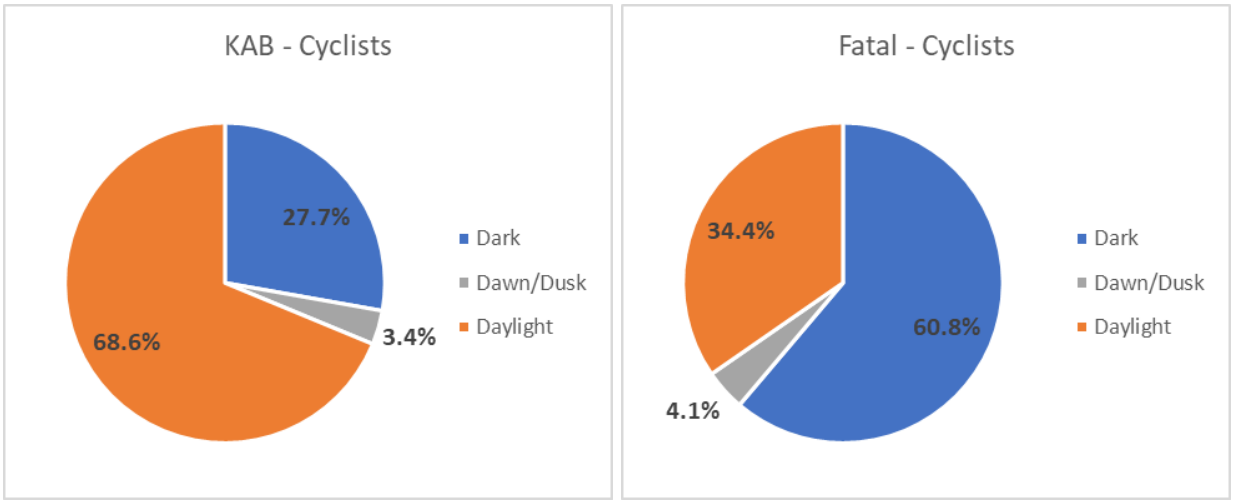

Figure 25. Bicycle Crashes – Lighting Conditions

The highest number of bicycle crashes occurred between 3:00 p.m. and 7:00 p.m. (see Table 29). Bicycle KAB crashes involving children aged 5-14 (Table 30) similarly peaked during afternoon hours (3:00 p.m.-7:00 p.m.) and also in the mornings from 7:00 a.m.-8:00 a.m. The hours of 6:00 p.m. to midnight accounted for **45.3 percent** of bicyclist fatalities.

Table 29. Bicycle Crashes by Light Condition and Time of Day.

Crash Hour	DARK	DAWN & DUSK	DAYLIGHT	OTHER/ UNKNOWN	Total
00:00 - 00:59	1.2%	0.0%	0.0%	0.0%	**1.2%**
01:00 - 01:59	1.0%	0.0%	0.0%	0.0%	**1.0%**
02:00 - 02:59	1.1%	0.0%	0.0%	0.0%	**1.1%**
03:00 - 03:59	0.4%	0.0%	0.0%	0.0%	**0.4%**
04:00 - 04:59	0.5%	0.0%	0.0%	0.0%	**0.5%**
05:00 - 05:59	1.3%	0.1%	0.1%	0.0%	**1.5%**
06:00 - 06:59	1.7%	0.4%	0.5%	0.0%	**2.7%**
07:00 - 07:59	0.3%	0.5%	4.5%	0.0%	**5.4%**
08:00 - 08:59	0.0%	0.0%	4.8%	0.0%	**4.9%**
09:00 - 09:59	0.1%	0.0%	3.6%	0.0%	**3.7%**
10:00 - 10:59	0.0%	0.0%	3.7%	0.0%	**3.8%**
11:00 - 11:59	0.1%	0.0%	4.2%	0.0%	**4.3%**
12:00 - 12:59	0.0%	0.0%	4.2%	0.0%	**4.3%**
13:00 - 13:59	0.0%	0.0%	4.5%	0.0%	**4.5%**
14:00 - 14:59	0.0%	0.0%	4.8%	0.0%	**4.8%**
15:00 - 15:59	0.0%	0.0%	6.6%	0.0%	**6.6%**
16:00 - 16:59	0.0%	0.1%	8.1%	0.0%	**8.2%**
17:00 - 17:59	0.5%	0.6%	8.6%	0.0%	**9.6%**
18:00 - 18:59	2.6%	0.5%	6.0%	0.0%	**9.1%**
19:00 - 19:59	3.2%	0.8%	3.7%	0.0%	**7.6%**
20:00 - 20:59	4.2%	0.4%	0.6%	0.0%	**5.2%**
21:00 - 21:59	4.3%	0.1%	0.1%	0.0%	**4.5%**
22:00 - 22:59	3.0%	0.0%	0.0%	0.0%	**3.0%**
23:00 - 23:59	2.3%	0.0%	0.0%	0.0%	**2.3%**
Total	**27.7%**	**3.4%**	**68.6%**	**0.3%**	**100.0%**

Table 30. Bicycle Crashes (Ages 5-14) by Light Condition and Time of Day.

Crash Hour	DARK	DAWN & DUSK	DAYLIGHT	OTHER/ UNKNOWN	Total
00:00 - 00:59	0.00%	0.00%	0.00%	0.00%	0.00%
01:00 - 01:59	0.00%	0.00%	0.00%	0.00%	0.00%
02:00 - 02:59	0.00%	0.00%	0.00%	0.00%	0.00%
03:00 - 03:59	0.1%	0.0%	0.0%	0.0%	**0.1%**
04:00 - 04:59	0.1%	0.0%	0.0%	0.0%	**0.1%**
05:00 - 05:59	0.1%	0.0%	0.0%	0.0%	**0.1%**
06:00 - 06:59	0.7%	0.3%	0.4%	0.0%	**1.3%**
07:00 - 07:59	0.4%	0.8%	6.0%	0.0%	**7.1%**
08:00 - 08:59	0.0%	0.1%	3.2%	0.0%	**3.3%**
09:00 - 09:59	0.1%	0.0%	1.1%	0.0%	**1.2%**
10:00 - 10:59	0.0%	0.0%	1.7%	0.0%	**1.7%**
11:00 - 11:59	0.0%	0.0%	2.4%	0.0%	**2.4%**
12:00 - 12:59	0.0%	0.0%	3.2%	0.0%	**3.2%**
13:00 - 13:59	0.0%	0.1%	3.3%	0.0%	**3.4%**
14:00 - 14:59	0.0%	0.0%	4.5%	0.1%	**4.6%**
15:00 - 15:59	0.1%	0.0%	10.9%	0.0%	**11.0%**
16:00 - 16:59	0.0%	0.1%	14.4%	0.0%	**14.5%**
17:00 - 17:59	0.4%	0.9%	12.8%	0.0%	**14.0%**
18:00 - 18:59	1.8%	0.8%	11.3%	0.0%	**13.9%**
19:00 - 19:59	2.8%	1.0%	7.5%	0.2%	**11.5%**
20:00 - 20:59	2.0%	1.0%	1.2%	0.0%	**4.3%**
21:00 - 21:59	1.6%	0.0%	0.0%	0.0%	**1.6%**
22:00 - 22:59	0.8%	0.0%	0.0%	0.0%	**0.8%**
23:00 - 23:59	0.00%	0.00%	0.00%	0.00%	0.00%
Total	**10.9%**	**5.0%**	**83.8%**	**0.3%**	**100.0%**

Crashes by Day of Week

As shown in Table 31, bicyclist KAB injuries occurred less frequently on Sundays (**11.0 percent**) and slightly more frequently on Tuesdays (**15.2 percent**) and Thursdays (**15.7 percent**) than on other days of the week. Bicyclist fatalities occurred most often on Saturdays.

Table 31. Bicycle Crashes – Day of Week

Day of Week	KAB	Fatal
Sunday	11.0%	12.9%
Monday	14.6%	14.7%
Tuesday	15.2%	12.6%
Wednesday	14.9%	14.1%
Thursday	15.7%	14.1%
Friday	14.8%	13.8%
Saturday	13.8%	17.6%

Where are Bicycle Crashes Occurring?

Geographic Location

Bicyclist injuries occurred most frequently in Texas' five highest-population counties, but are unevenly distributed in those counties (see Table 32). The highest percentage of bicyclists involved in KAB crashes (**17.9 percent**) were in Harris county, which represented approximately **16.2 percent** of the state's population in 2020 (U.S. Census Bureau); the second-highest

percentage (**12.8 percent**) were in Travis County (**4.4 percent** of the state's population), and the third-highest percentage (**9.9 percent**) were in Bexar County (**6.9 percent** of the state's population). Dallas County, which contained approximately **9.0 percent** of the state's population in 2020, accounted for **9.1 percent** of the bicyclists involved in KAB crashes; Tarrant County accounted for a relatively smaller percentage of KAB bicyclists (**5.6 percent**, in a county with **7.2 percent** of the state's population).

Table 32. Bicycle Crashes Compared to Population

County	% of State's Population in 2020	% of State's Crash-Involved Bicyclists
Harris	16.2%	17.9%
Travis	4.4%	12.8%
Bexar	6.9%	9.9%
Dallas	9.0%	9.1%
Tarrant	7.2%	5.6%

Intersections vs. Non-Intersections

As Figure 26 shows, over half (**56.7 percent**) of bicyclist KAB injuries occurred at intersections. However, bicyclist fatalities are more likely to occur away from intersections with **72.9 percent** of fatal bicycle crashes occurring at non-intersections.

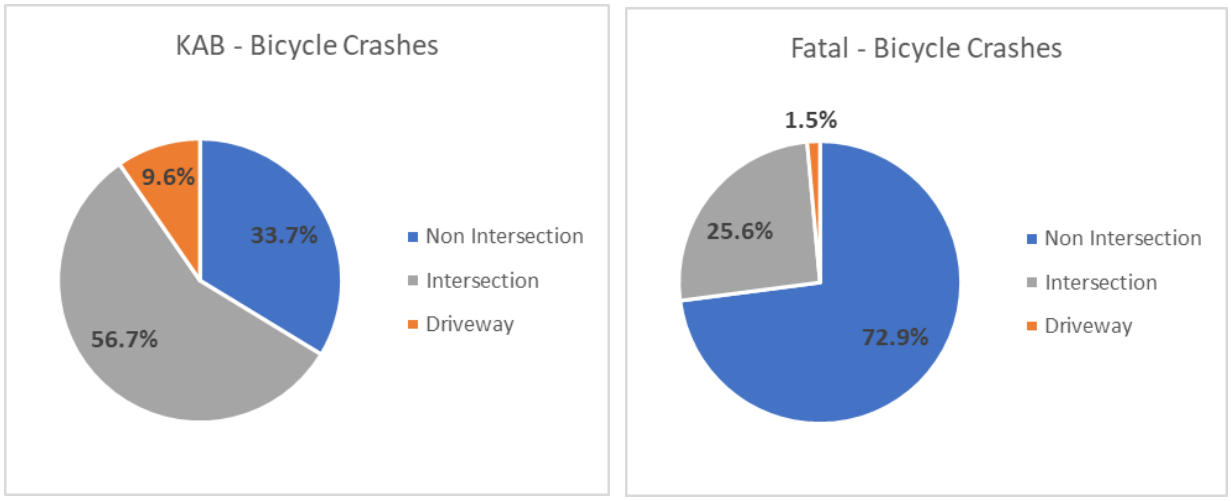

Figure 26. Bicycle Crashes – Intersection Relation

Speed Limit of Road

The posted speed limit is also a major factor of crash severity for bicyclists as seen in Figure 27 as compared to Figure 28. Roadways with posted speed limits of 35, 40, and 45 mph make up the highest percentages of KAB crash victims. In terms of fatalities, roadways with posted speed limits of 55 and 60 mph have the highest percentages.

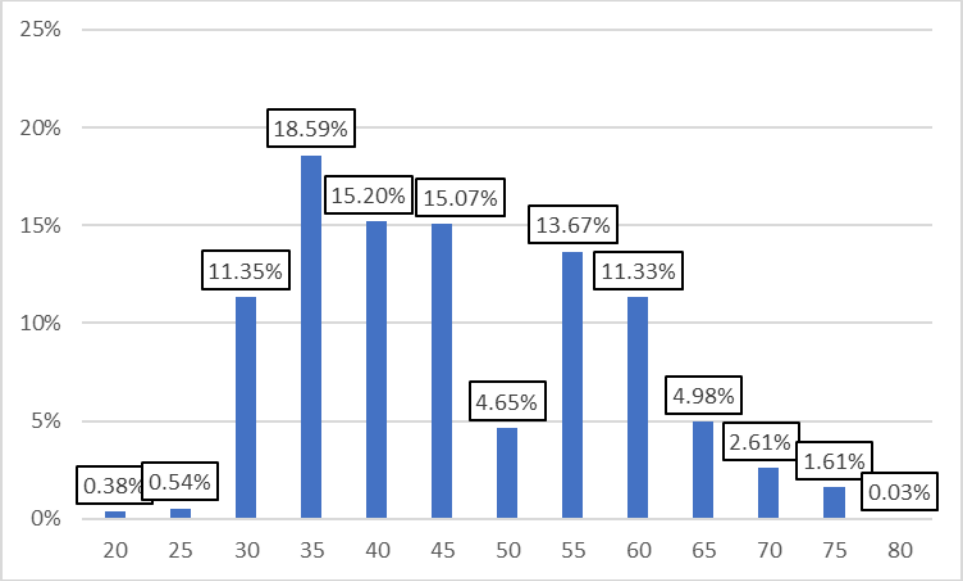

Figure 27. Bicyclists Involved in KAB Crashes by Posted Speed Limit.

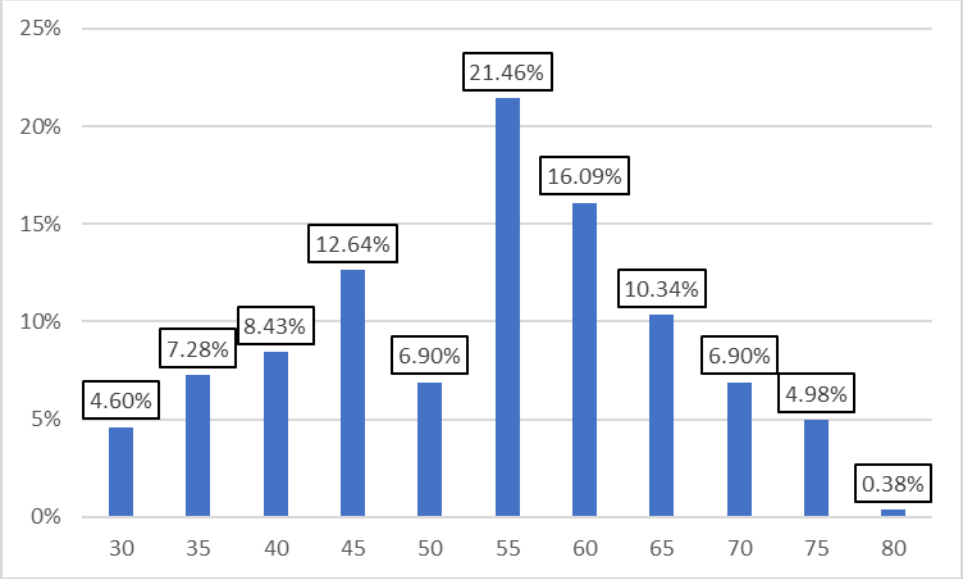

Figure 28. Bicyclists Involved in Fatal Crashes by Posted Speed Limit.

On-System vs. Off-system

Most bicyclist injuries **(71.4 percent)** happened on the TxDOT system. As shown in Figure 29, on-system bicyclist KAB injuries occurred on roads with speed limits between 30 mph and 75 mph, including local roads, FM roads, State and U.S. Highways, interstates, state loops, and U.S. Business roads. This difference in speed representation is likely because most on-system roadways (interstates, highways, freeways, major and minor arterials) have higher speed limits than most off-system roads, which are likely to include a larger percentage of local residential and business streets.

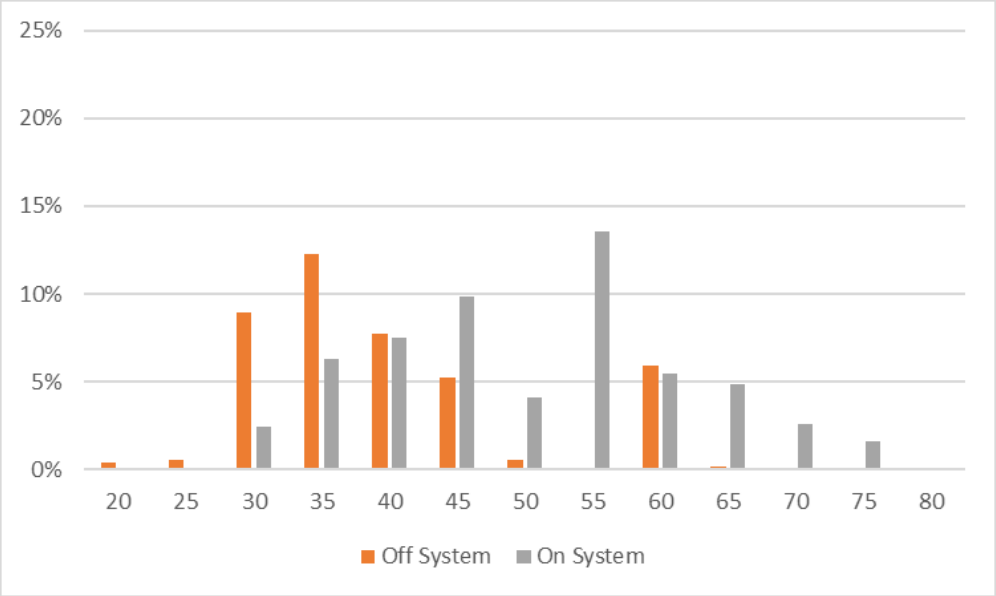

Figure 29. Bicycle Crashes - On System vs Off System

Urban vs. Rural

As Figure 30 shows, bicyclist injuries were more likely to occur in urban areas, with **85.2 percent** of bicyclist KAB injuries and **65.9 percent** of fatalities occurring in urban areas. However, it also shows that when looking at bicyclist fatalities a larger percentage of them are in rural areas.

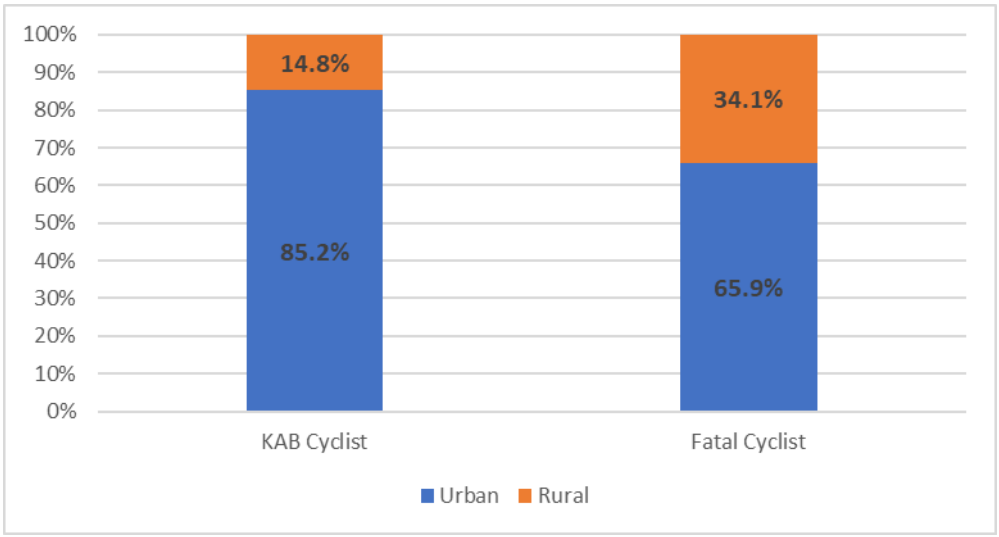

Figure 30. Bicycle Crashes - Urban vs. Rural

Vehicle Type/Body Style in Pedestrian and Bicycle Crashes

The role of vehicle type and body style is one area of concern that has been discussed by safety organizations to explain the increase in pedestrian and bicycle fatalities in recent years, including in a study by the Insurance Institute for Highway Safety (Hu & Cicchino, 2018). This study

posits that the increase in pedestrian fatalities from 2009-2016 could be partially explained by the increase in SUV sales.

In this Texas analysis, a comparison of vehicle types involved in KAB pedestrian crashes (Figure 31) vs. fatal pedestrian crashes (Figure 32) shows the higher percentage of pickups in the vehicle mix for fatal pedestrian crashes (**25.1 percent**) compared to KAB crashes (**20.9 percent**).

This same finding is also seen in Texas bicycle crashes. Figure 33 shows the vehicle types involved in KAB bicycle crashes and Figure 34 shows the vehicle types in fatal bicycle crashes. A comparison of the two shows that pickups were involved in **18.2 percent** of KAB bicycle crashes, but **26.1 percent** of fatal bicycle crashes.

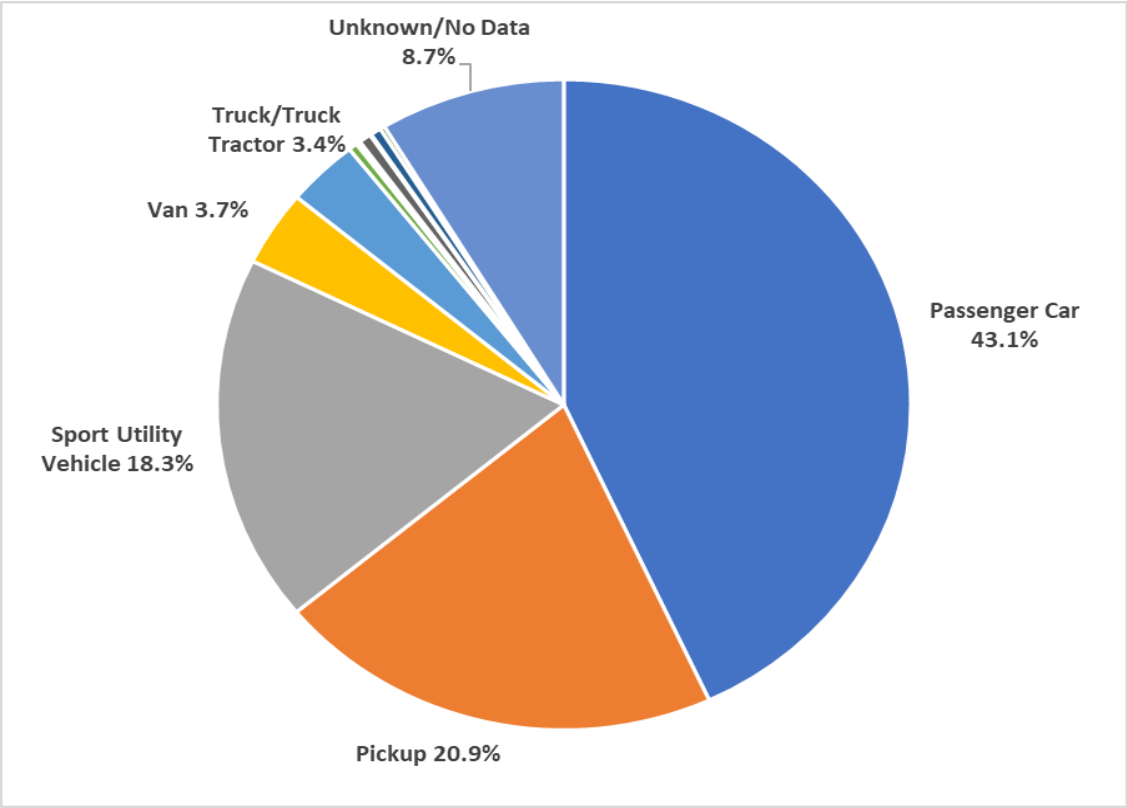

Figure 31. Vehicle Type in KAB Pedestrian Crashes

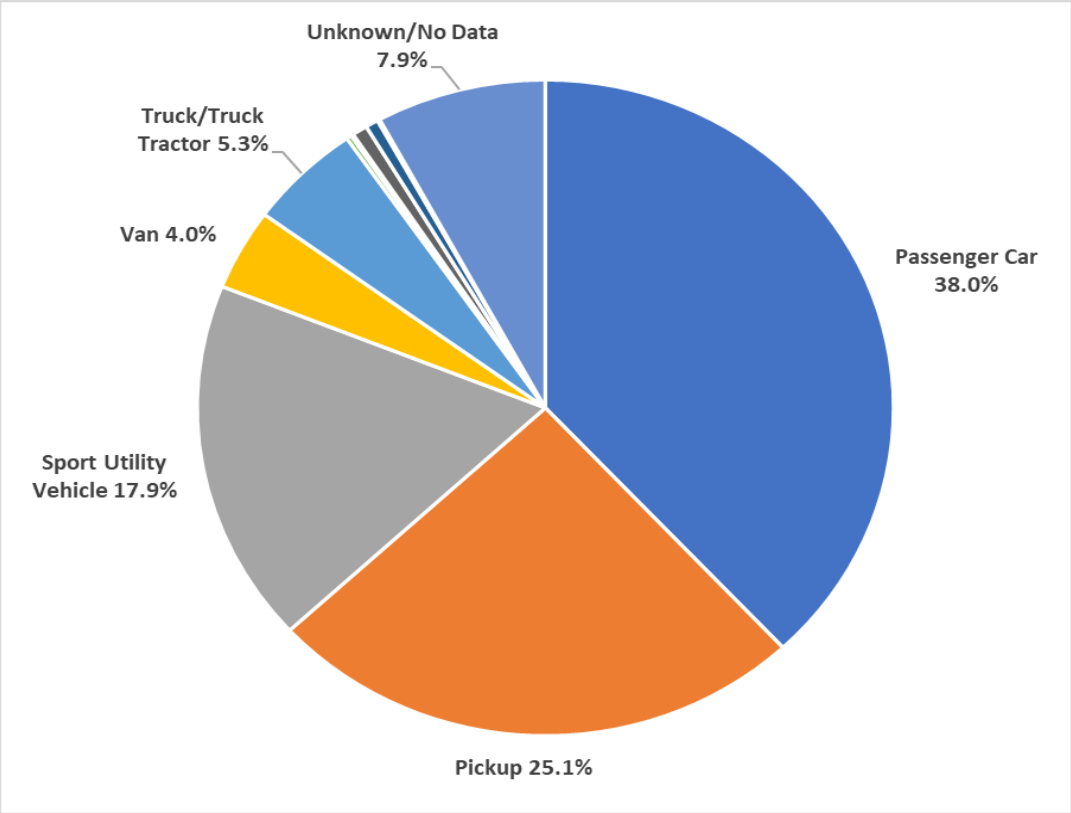

Figure 32. Vehicle Type in Fatal Pedestrian Crashes.

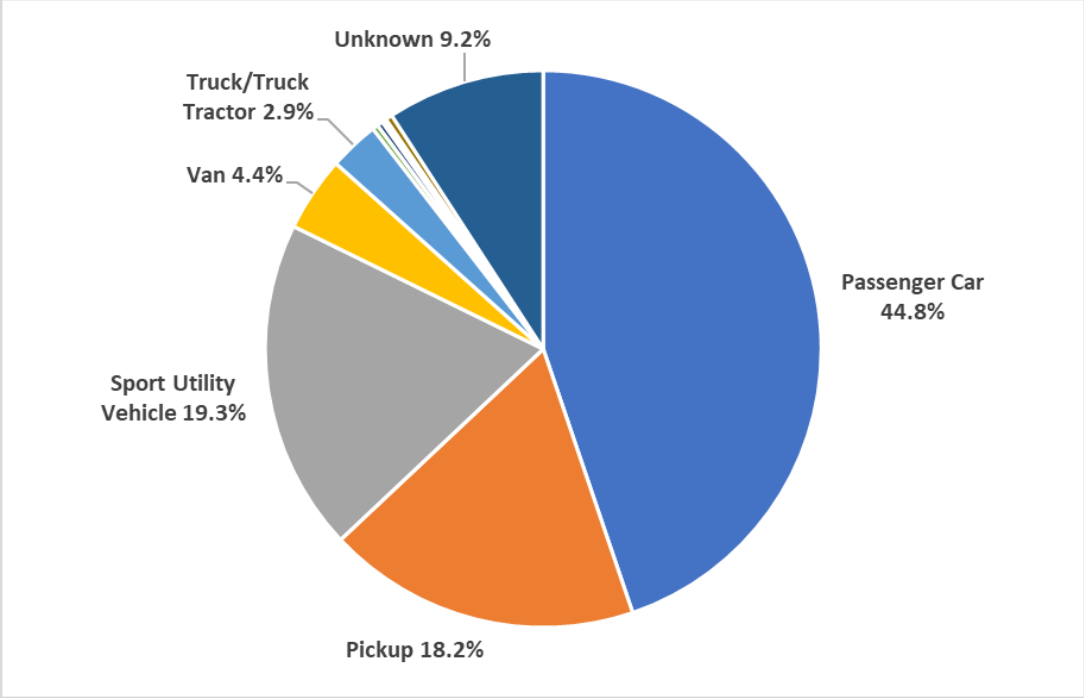

Figure 33. Vehicle Type in KAB Bicycle Crashes.

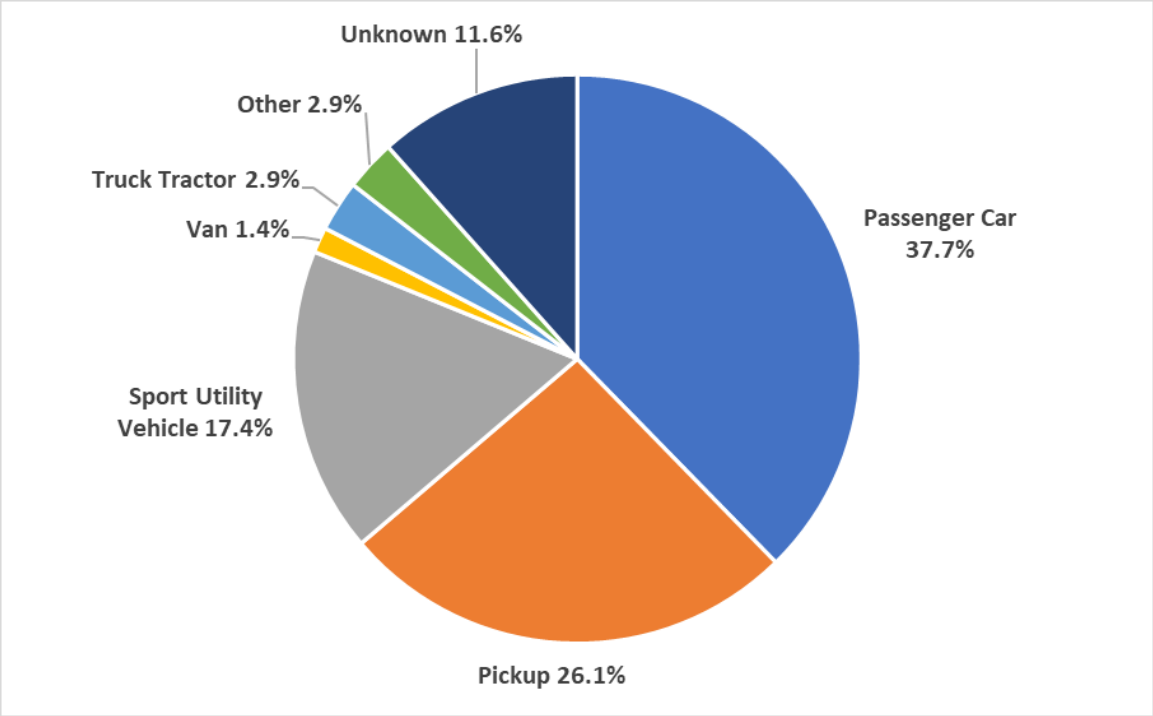

Figure 34. Vehicle Type in Fatal Bicycle Crashes

Why are Pedestrian and Bicycle Crashes Occurring?

Discussed below are the issues raised in the crash analysis:

- Why are certain demographic groups overrepresented in pedestrian and bicycle crashes?
- Why does distraction seem lower than would be expected?
- Why is driver and bicyclist inattention such an issue?
- Why did we see a decrease in pedestrian and bicycle crashes, but an increase in fatalities?
- Why are dark conditions such an issue for pedestrians?
- Why are there more fatal bicycle crashes in the dark, at non-intersections and in rural areas?
- Why are many pedestrian crashes (especially fatal crashes) occurring away from intersections?
- Why does vehicle type matter in pedestrian crashes?
- Why are there so many "unknowns" in the data?

Why are some demographic groups overrepresented in pedestrian and bicycle crashes?

The reasons that some demographic groups are overrepresented in crashes can be due to exposure factors (i.e., that demographic group tends to walk or bike more or drive in areas where more people are walking and biking). This can explain the overrepresentation of males in bicycle crashes since rider demographics tend to skew male. In addition, the overrepresentation of Whites in bicycle crashes is also explained by the race/ethnicity make-up of bicycle riders.

The overrepresentation of some demographic groups can also point to where investment in infrastructure for those who walk and bike has been allocated. This could mean areas where there are fewer sidewalks (or sidewalks that are in poor condition to walk on), fewer marked crosswalks, and traffic signals that may not be fully functional with pedestrian walking signals. Conversely, bike lanes and other cycling infrastructure tends to be in high socio-economic areas and areas Whites make up larger portions of the population.

Gender and age can also be an exposure issue but can also be due to behavior of those individuals. For example, previous research (Tosi et al., 2020; Turner & McClure, 2003) has shown that males, particularly younger males in their early 20s, tend to take more risks which can translate to their walking, biking, and driving habits.

Why does distraction seem lower than would be expected?

Distracted driving numbers recorded in crash data are likely only a fraction of the drivers that are actually distracted when involved in a crash. It is likely a very underreported behavior. In many cases, unless a driver admits to being distracted a police officer does not have evidence that distraction was a factor in a crash and therefore it is not included in the crash data information. Thus, while distraction is likely happening, the data are not available to support this assumption.

Why is driver and bicyclist inattention such an issue?

Inattention can refer to many different things, including inattention blindness in which the vehicle operator may not have seen another road user because their mind was engaged in another task or not looking for a different type of road user. Special attention is needed to look for people who are on bicycles as they may be either riding on the roadway or on the sidewalk. Also, bicyclists may not be traveling in the same direction as the flow of traffic. Drivers who are looking left on a one-way roadway to find a gap in traffic may miss bicyclists coming from their right on the sidewalk.

People riding bicycles may not be as cognizant of the hazards their own distraction can cause; most distraction outreach to date has been targeted at motor vehicle drivers.

Why are dark conditions such an issue for pedestrians?

Pedestrians are particularly vulnerable in dark lighting conditions where they are harder for drivers to see. Improvements over the years in roadway lighting, the retroreflectivity of signs and pavement markings, and the headlights on motor vehicles have made it easier for drivers to see where they are going on the roadway at night. However, pedestrians can be hard to see in areas without good roadway lighting and if the pedestrian happens to be in darker clothing that blends into dark surroundings. The higher percentage of pedestrian fatalities that occurred in dark conditions may also be a function of operating speed of the vehicle. Drivers may be traveling too fast to stop in the distance lit by their headlights and at higher speeds, the crash impact is more severe for the pedestrian.

Why did we see a decrease in pedestrian and bicycle crashes, but an increase in fatalities in 2020?

The unique circumstances caused by the pandemic in 2020 had a profound effect on traffic safety. There was less traffic delay on Texas roadways in 2020 than in 2019 (TTI, 2021) and vehicle miles travelled (VMT) decreased by **13.2 percent** across the U.S. during 2020 (NHTSA, 2021). American roadway infrastructure is designed for speed, and speed is a decisive factor in crash severity (Bolotnikova, 2021). Therefore, higher speeds due to lower traffic volumes equals more fatal crashes. This is especially concerning for pedestrians and bicyclists who already have a lower likelihood of surviving a crash involving a motor vehicle at higher speeds.

Why are there more fatal bicycle crashes in the dark, at non-intersections and in rural areas?

The short answer is speed. At night, unless the driver saw the bicyclist and was able to react, the driver likely struck the bicyclist at a higher rate of speed making the crash more severe. The same is true for non-intersections. In rural areas, more fatal crashes occur because a driver may not be expecting to come upon a slower moving vehicle and strikes them at a higher rate of speed.

Why are many pedestrian crashes (especially fatal crashes) occurring away from intersections?

Drivers between intersections are more likely to be traveling faster and if they were to strike a pedestrian, it would be much less likely for that pedestrian to survive the crash. Also, unless the mid-block crossing location has a marked crosswalk, pedestrians are required to yield to motor vehicle traffic when crossing at a mid-block location. Therefore, drivers may not be looking for or expecting to see pedestrians at these locations. Conversely, at intersections motor vehicles are more likely to be travelling at a lower rate of speed due to stopping at the traffic signal, slowing down to make turns, or slowing for congestion at the intersection. Additionally, pedestrians are given right-of-way in many instances, especially at intersections. At an intersection not controlled by a traffic signal, the pedestrian has the right-of-way. And at an intersection with a traffic signal, pedestrians have right-of-way on the walk signal.

Why does vehicle type matter in pedestrian and bicycle crashes?

Vehicle type in pedestrian and bicycle crashes can make a difference in terms of the vehicle size and weight and what that can mean for their chances of survival. Vehicles that are larger and weigh more may offer more protection to the vehicle occupants but can lead to more serious injuries when that vehicle is in involved in a collision with someone outside of the vehicle.

Why are there so many “unknowns” in the data?

Officers responding to a crash are required to fill out the information for each road user involved in the crash and all known details of the crash. The driver unknowns for details such as: gender, race/ethnicity, and age, as well as details of the vehicle type involved may be unknown due to the driver leaving the scene of a crash (i.e. a hit and run).

Pedestrian Crashes – Key Findings

Who?

- Half of drivers involved in pedestrian crashes are male.
- **65 percent** of pedestrians were male.
- Nearly half of the drivers were in the 20-39 year age range.
- Most of the pedestrians were in the 15-39 age range.
- Blacks were overrepresented as both drivers and pedestrians in pedestrian crashes.
- **22.0 percent** of drivers in pedestrian crashes were of unknown gender, likely due to hit and run crashes.

What?

- Failure to yield right-of-way was the most commonly cited contributing factor in pedestrian crashes for both the driver and pedestrian.
- In fatal pedestrian crashes, driver inattention became the number one contributing factor.
- Nearly **10 percent** of pedestrian KAB crashes involved impairment on the part of the pedestrian
    - **37.2 percent** of pedestrian fatalities involved an impaired pedestrian
- The number of drivers speeding in pedestrian fatal crashes increased **86.9 percent** from 2019 to 2020.
- The higher percentage of pickups involved in fatal pedestrian crashes points to another issue of safety for pedestrians who are more vulnerable in a crash with a larger vehicle, such as a pickup truck.

When and Where?

- Dark conditions and non-intersections were the biggest issues for pedestrians.
    - Almost **80 percent** of pedestrian fatalities occurred in the dark.
    - Over **80 percent** of pedestrian fatalities occurred at non-intersections.
- On weekend nights, there was a spike in pedestrian crashes at 2am (Saturday and Sunday morning), which coincides with when many bars close.
- While the number of pedestrian crashes decreased **13.5 percent** from 2019-2020 the number of fatalities increased by **7.8 percent** from 2019 to 2020.
- The month of October had the highest number of pedestrian crashes, while June and July had the lowest number of crashes.
    - The number of crashes that occurred in each month may be affected by more than just the number of pedestrians walking in that month.
- **45.3 percent** of all pedestrian injuries and **63.5 percent** of pedestrian fatalities occurred on roads with speed limits of 55 mph or higher.
- The majority of pedestrian crashes were on the TxDOT road system and occurred in urban areas.

Bicycle Crashes – Key Findings

Who?

- Bicyclists in the age range of 10-19 were overrepresented compared to their portion of the population.
- Males were significantly overrepresented in bicycle crashes, at over **82 percent** of bicyclists in crashes.
- **13.8 percent** of drivers involved in bicycle crashes were of unknown gender, likely due to hit and run crashes.
- Both Whites and Blacks were overrepresented as bicyclists in crashes.
- Blacks were also overrepresented as drivers in bicycle crashes compared to their portion of the population.

What?

- Driver inattention was a big issue for bicyclists, in addition to failure to yield right-of-way.
- Failure to control speed was also a large factor in bicycle fatal crashes.
- Impairment was recorded for **13.4 percent** of drivers involved in fatal bicyclist crashes and **31.4 percent** of bicyclists.

When and Where?

- In 2020, the number of bicycle crashes were reduced, but the number of fatalities increased.
- September had the highest number of bicycle crashes, and December had the lowest.
    - The number of crashes seen in each month, may be affected by more than just the number of bicyclists riding in that month.
    - There may be safety in numbers for bicyclists.
- Most KAB bicyclist injuries occurred in the daylight, however, the majority of fatalities occurred in the dark.
- Most KAB bicyclist injuries occurred at intersections, while most fatalities occurred at non-intersections.
- Travis County was highly overrepresented in terms of bicycle crashes, with **12.8 percent** of bicyclist KAB injuries and **4.4 percent** of the 2020 Texas population.
- While most bicycle crashes were on the TxDOT system and occurred in urban areas, just over 1/3 of bicyclist fatalities occurred in rural areas.

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