



**Street Coaching for Pedestrians and Cyclists:  
Putting Laws into Practice  
on University Campus  
(University of Texas Austin)**

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This study focuses on a data set of bicyclist- and/or pedestrian-involved crashes at the University of Texas at Austin (UT Austin) over a span of 4 years (2017 – 2020). Due to the geographic nature of campus parking and student housing spread outside the defined boundaries of campus area (shown in Figure 1), additional crashes that were within a half mile of campus, which is a reasonable biking and walking distance, were included in the analysis. Between 2017 – 2020, there were 2,434 crashes reported at UT Austin and the surrounding area, of which 179 involved a bicyclist or pedestrian. Of these, 100 (56%) were bicyclist-involved crashes and 79 (44%) were pedestrian-involved crashes. Those crashes include 100 bicyclists and 81 pedestrians. This crash analysis examines various factors and potential causes of these bicyclist- and pedestrian-involved crashes.

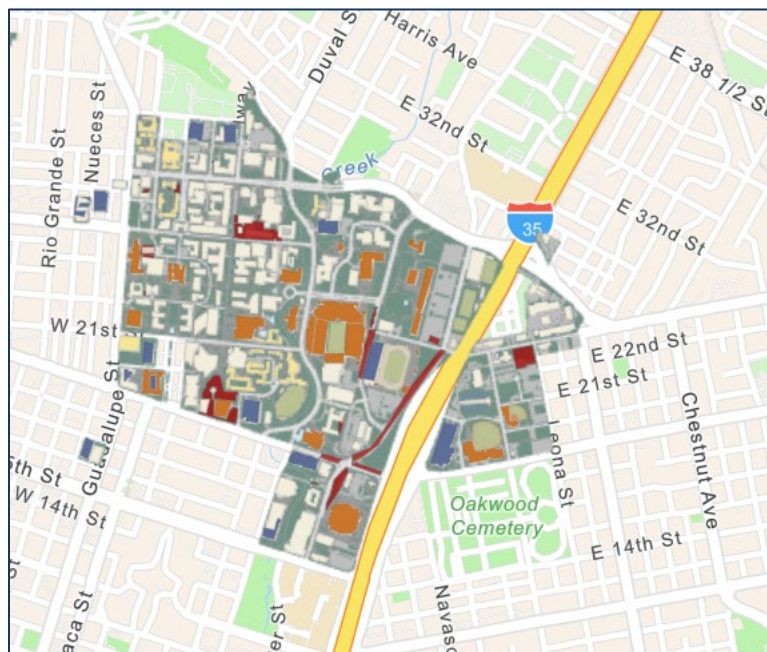


Figure 1. Campus map of the University of Texas Austin (UT Austin)

## Severity of Crashes

The crash data involving bicyclist- and pedestrian- involved crashes was assessed over various categories of severity. The majority (n=105; 59%) of crashes resulted in non-incapacitating injuries (Figure 2), followed by possible injuries (n=47; 26%) and suspected serious injuries (n=19; 11%). There were 4 (2%) crashes that resulted in a fatality and 4 (2%) crashes that did not result in an injury.

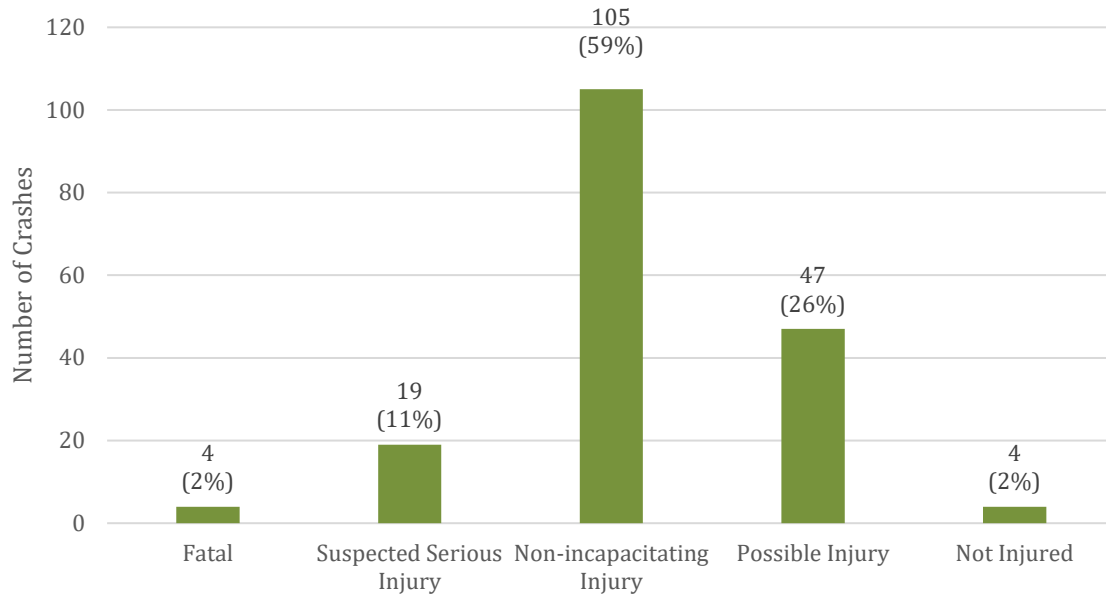


Figure 2. Crash Severity for Bicyclist- and/or Pedestrian-Involved Crashes within/around the Vicinity of UT Austin, 2017-2020

Personal injury severity was assessed individually for bicyclist- and pedestrian-involved crashes (Figure 3). The comparison shows that the bicyclists and pedestrian involved crashes were more likely to sustain non-incapacitating injuries. Bicycle and pedestrian involved crashes were less likely to sustain fatal injuries, suspected serious injury, possible injury, or not injured classifications. Crash severity comparisons between bicycle and pedestrian are illustrated in Figure 3.

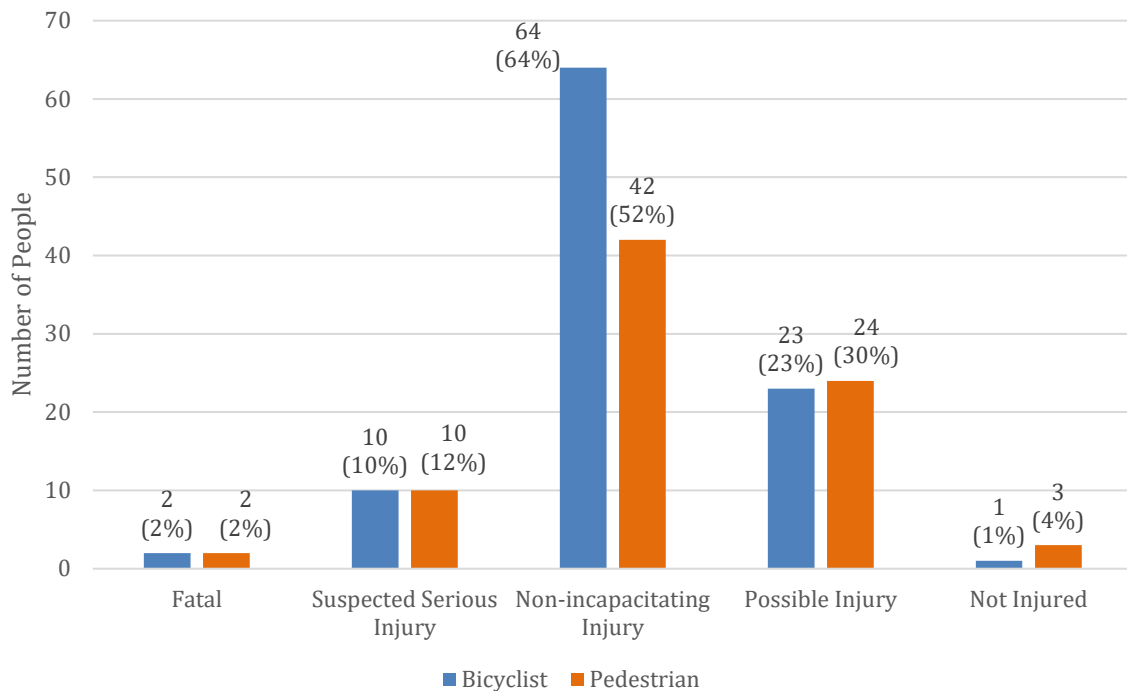


Figure 3. Crash Severity Comparison Between Bicyclist- and Pedestrian-Involvement within/around the Vicinity of UT Austin, 2017-2020

## Collision Type

Bicyclist- and pedestrian involved crashes most frequently occurred when a motor vehicle was going straight. This collision type accounted for 44% (n=44) of bicyclist-involved crashes and 56% (n=44) of pedestrian-involved crashes (see Table 1. Bicyclist and Pedestrian Involved Crashes by Collision Type within/around the Vicinity of UT Austin, 2017-2020). The second most frequent crash type was a collision when the motor vehicle was turning left. Notably, motor vehicle and bicyclist-involved crashes occurred more frequently when the motor vehicle was turning right. Table 1 provides an illustration of bicycle and pedestrian collision type frequencies in and around the UT Austin Campus.

*Table 1. Bicyclist and Pedestrian Involved Crashes by Collision Type within/around the Vicinity of UT Austin, 2017-2020*

Collision Type	Bicyclist-Involved	Pedestrian-Involved
One Motor Vehicle - Going Straight	44 (44%)	44 (56%)
One Motor Vehicle - Turning Left	28 (28%)	22 (28%)
One Motor Vehicle - Turning Right	26 (26%)	8 (10%)
One Motor Vehicle - Backing	1 (1%)	2 (3%)
One Motor Vehicle - Other	1 (1%)	1 (1%)
Angle - Both Going Straight	0 (0%)	1 (1%)
Same Direction -Both Going Straight - Sideswipe	0 (0%)	1 (1%)
Total	100	79

## Demographic Factors

### Gender

Assessment of all bicycle and pedestrian crashes by gender and associated severity level shows that 66% (n=119) of crash victims were males and 34% (n=62) were females. Non-incapacitating injuries were higher for males (n=69; 65%) when compared to females (n=37; 35%).

A comparison of crash data was drawn between male and female bicyclists involved in crashes (see Figure 4). Sixty-six cyclists (66%) involved in the crashes were male and 34 cyclists (34%) were female. A similar comparison for pedestrian involvement shows 53 pedestrians (65%) were male and 28 pedestrians (35%) were female (see Figure 5). For fatal crashes involving pedestrians, there were 2 males (4%).

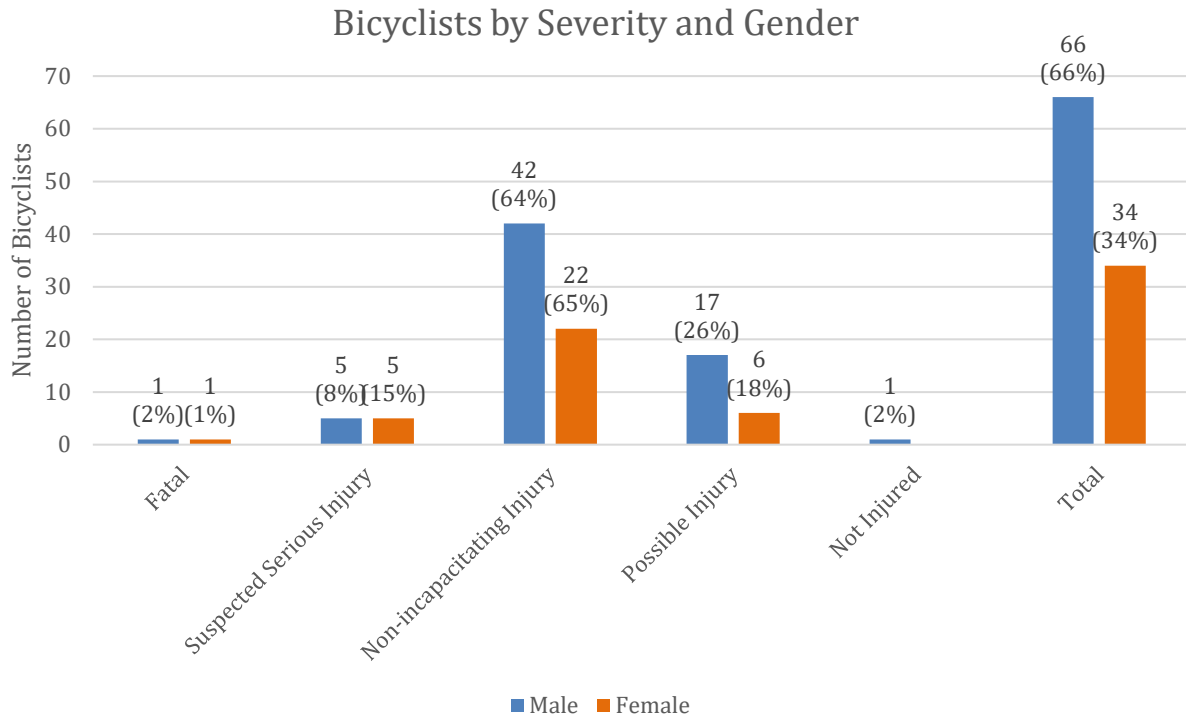


Figure 4. Severity Comparison Between Genders Involving Bicyclist within/around the Vicinity of UT Austin, 2017-2020

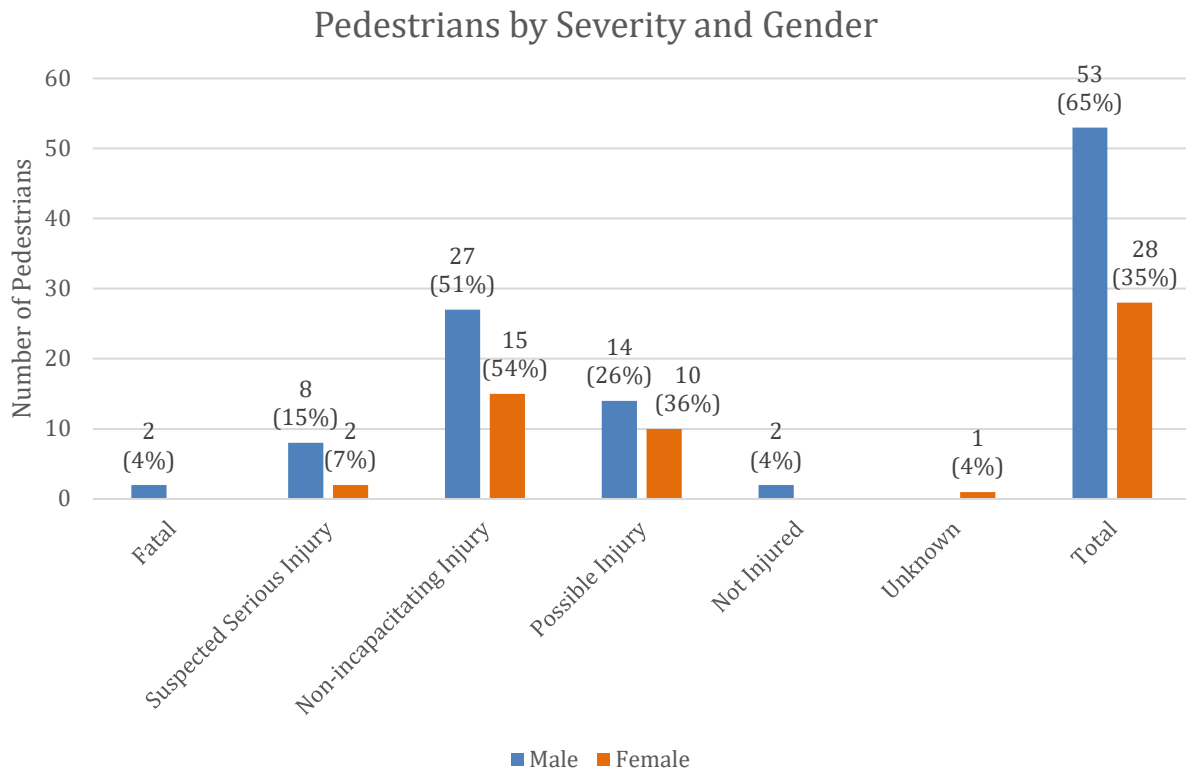


Figure 5. Severity Comparison Between Genders Involving Pedestrians within/around the Vicinity of UT Austin, 2017-2020

## Helmet Use

Regarding bicyclist-involved crashes, 48% of bicycle riders did not wear a helmet while 39% wore a helmet (see Table 2).

Table 2 Helmet Use at Bicyclist Involved Crashes within/around the Vicinity of UT Austin, 2017-2020

Helmet Use	Bicyclist-Involved	Percentage
Worn, Damaged	4	4%
Worn, Not Damaged	23	23%
Worn, Unknown Damage	12	12%
Not Worn	48	48%
Unknown if Worn	13	13%

## Age Group

Crash distribution over age for bicyclists-involved crashes shows that the bicyclists between the ages of 21 to 25 are involved in comparatively more crashes than other age groups. Thirty-seven bicyclists (37%) within this age group were involved in the crashes, with the majority (n=26) being non-incapacitating injury crashes as shown in Figure 6. Bicyclists in the 26- to 30-year-old (n=20; 20%) and 31- to 35-year-old (n=13; 13%) age groups were the second and third age groups most likely to be involved in a crash, respectively.

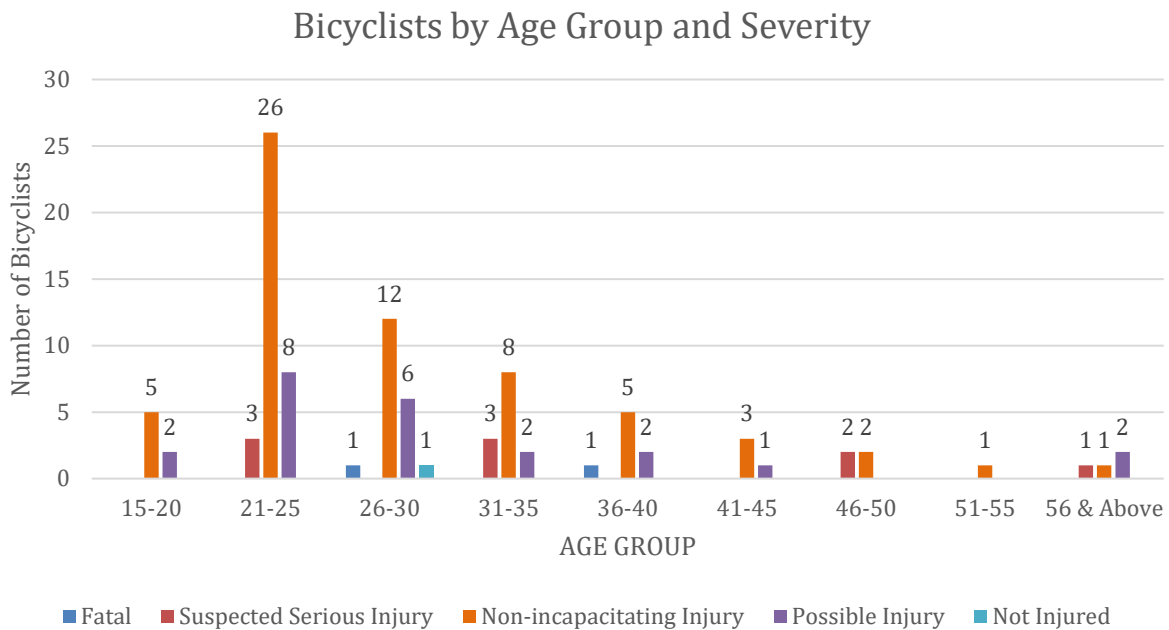


Figure 6. Age Category for Bicyclist Involved in Bicyclist-Involved Crashes within/around the Vicinity of UT Austin, 2017-2020

A similar comparison drawn for pedestrians shows that pedestrians between the ages of 15 to 20 years old were most frequently involved in crashes. There were 20 pedestrians involved in the crashes and accounted for 25% of total pedestrian-involved crashes (see Figure 7).

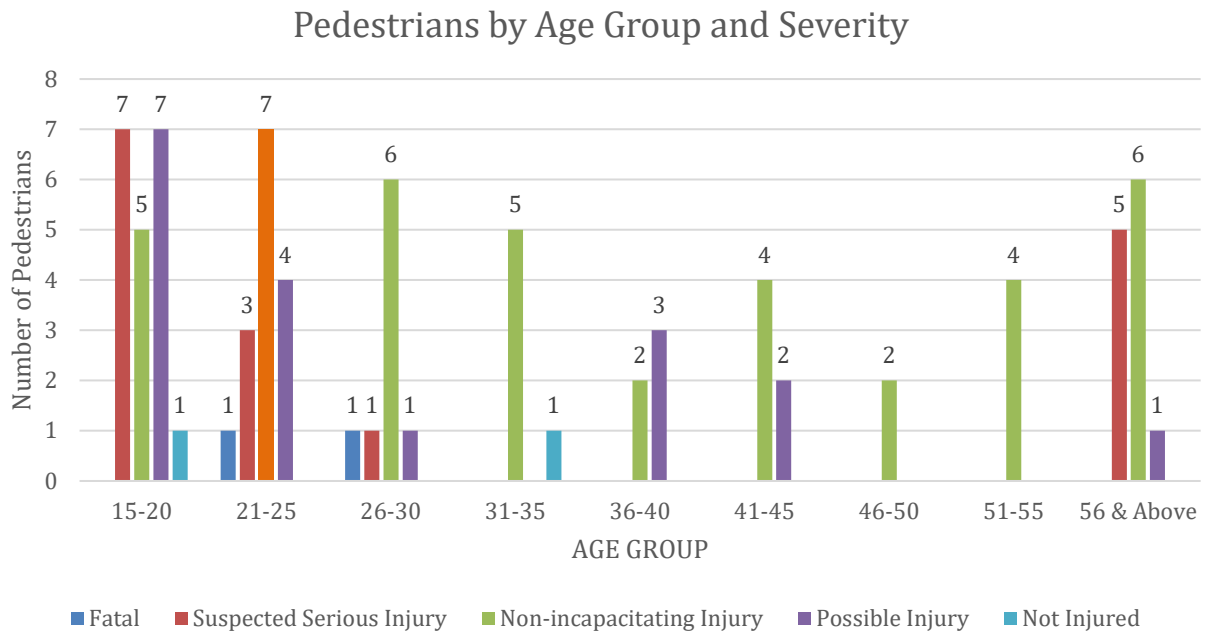


Figure 7. Age Category for Pedestrians Involved in Pedestrian-Involved Crashes within/around the Vicinity of UT Austin, 2017-2020

## Environmental Factors

### Weather Conditions

According to the reported data for weather conditions at the time of the crash, it was discovered that the majority of bicyclist- and pedestrian-involved crashes occurred in clear weather (n=145; 81%), followed by cloudy weather (n=26; 15%) (see Figure 8).

A comparison was made between bicyclist- and pedestrian-involved crashes for various weather conditions (see Figure 9). Clear conditions were present in 80% of bicyclist and 82% of pedestrian-involved crashes. Bicyclist were more likely than pedestrians to experience crashes in cloudy weather (18% - bicyclist, 10% - pedestrian) whereas pedestrians were more likely to experience crashes in rain (5% - pedestrian, 2% - bicyclist).

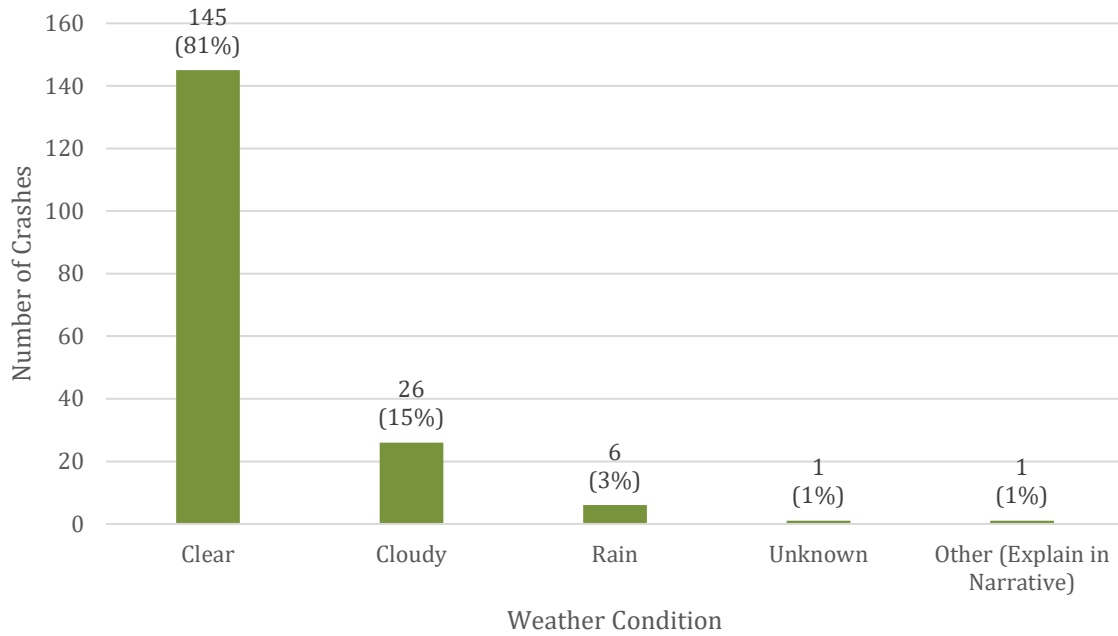


Figure 8. Weather Conditions of Pedestrian- and Bicyclist-Involved Crashes within/around the Vicinity of UT Austin, 2017-2020

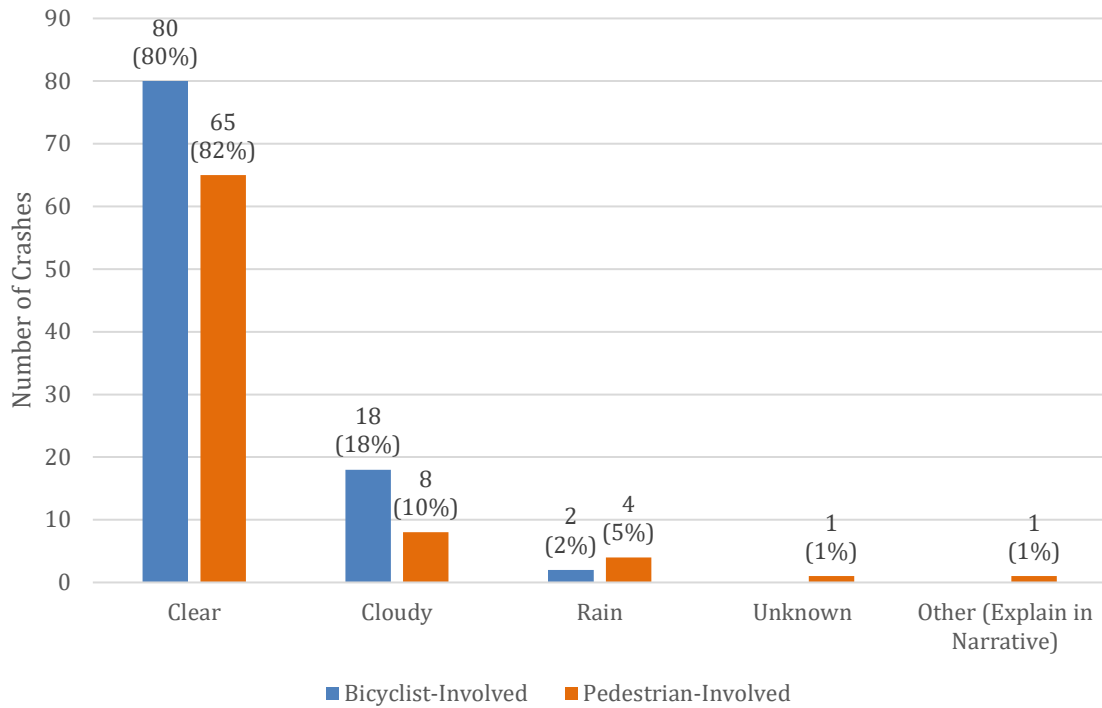


Figure 9. Comparison of Bicyclist- and Pedestrian-Involved Crashes by Weather Conditions within/around the Vicinity of UT Austin, 2017-2020



**Traffic Control Type**

Bicycle and pedestrian crashes were distributed over traffic control variables as shown in Figure 10 and Figure 11. Higher crash frequencies were associated with signal lights (n=42; 23%) and marked lanes (n=38; 21%). Twenty-three crashes (13%) occurred where there were no traffic control measures present, 21 crashes (12%) occurred at stop sign controlled intersections, and 19 crashes (11%) occurred at crosswalk-controlled locations respectively.

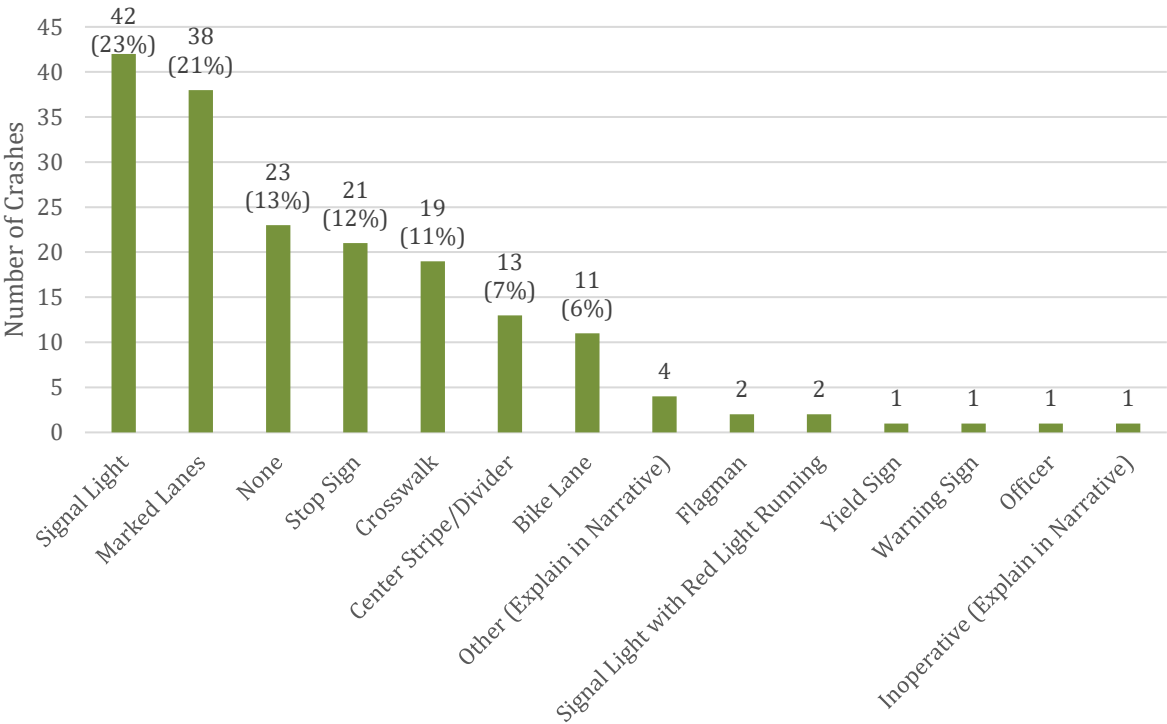


Figure 10. Traffic Control Type of Bicyclist- and/or Pedestrian-Involved Crashes within/around the Vicinity of UT Austin, 2017-2020

Bicyclist- and pedestrian-involved crashes were individually examined by traffic control types (see Figure 11). The results show higher pedestrian-involved crashes for signal lights (n=24; 30% of 79 pedestrian-involved crashes) and for crosswalk (n=17; 26% of 79 pedestrian-involved crashes). Bicyclist-involved crashes were more prevalent in marked lanes (n=26; 26% of 100 bicyclist-involved crashes) and for signal light (n=18; 18% of 100 bicyclist-involved crashes). Figure 11 provides a comparison of bicycle and pedestrian crashes by traffic control type.

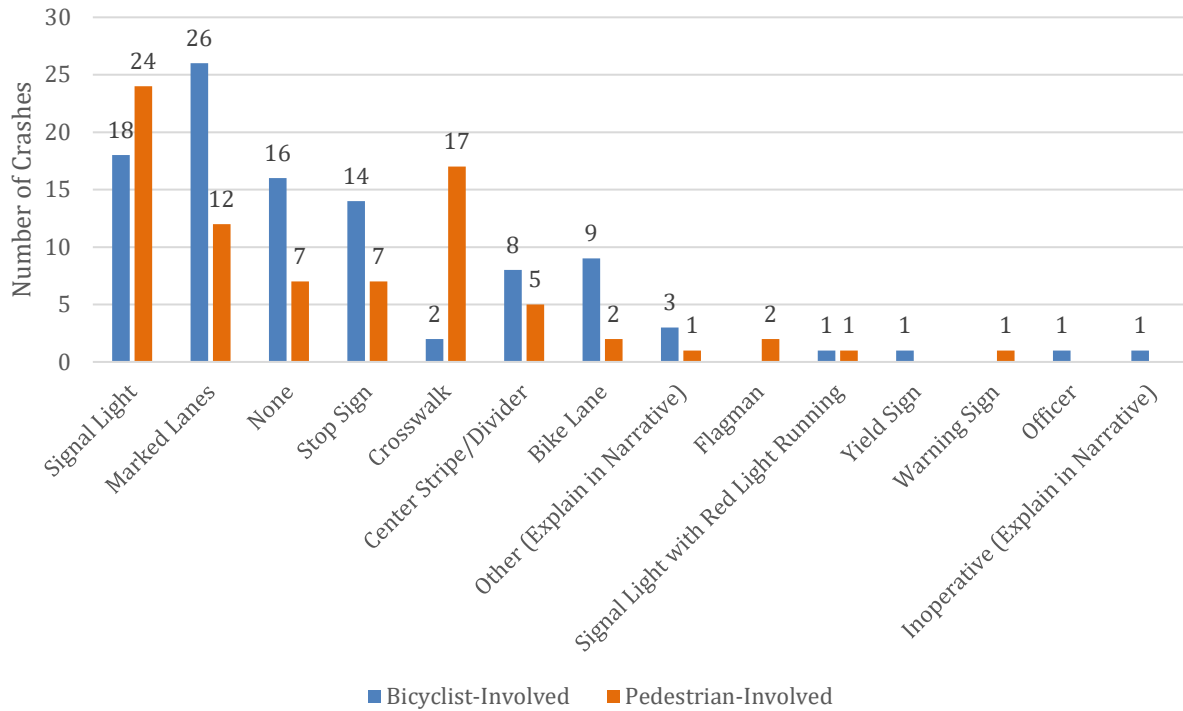


Figure 11. Comparison of Bicyclist- and Pedestrian-Involved Crashes by Traffic Control Type within/around the Vicinity of UT Austin, 2017-2020

## Surface Conditions

93% (n=166) of all bicyclist- and pedestrian- involved crashes were associated with dry surface conditions versus 7% (n=12) on wet surface conditions. When split individually for bicyclist- and pedestrian-involved crashes, the findings show that pedestrian-involved crashes occur more frequently in wet conditions than bicyclist-involved crashes did (see Figure 12).

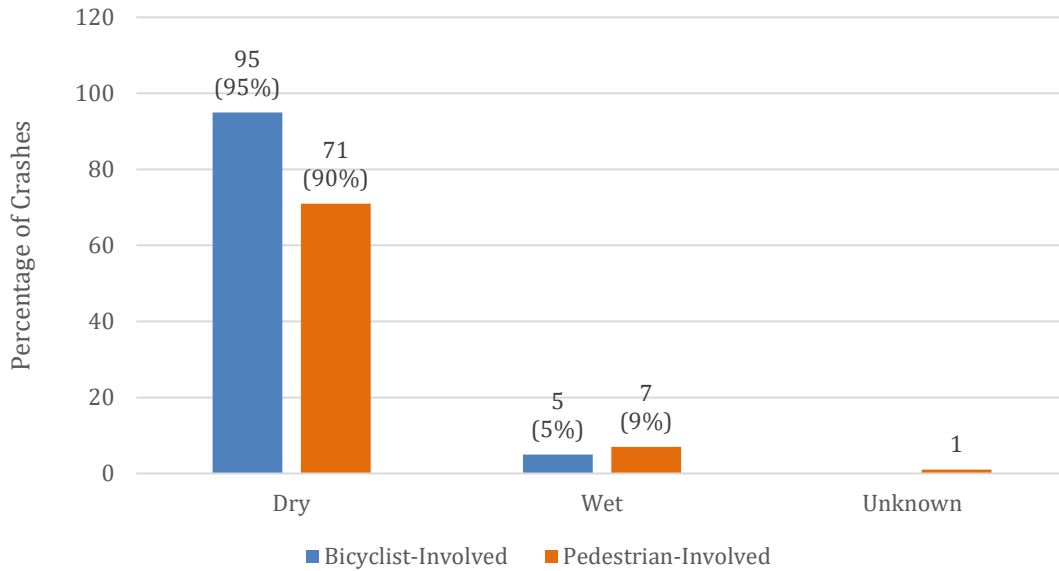


Figure 12. Comparison of Bicyclist- and Pedestrian-Involved Crashes by Surface Conditions within/around the Vicinity of UT Austin, 2017-2020

## Roadway Classification

Bicycle and pedestrian crashes split over categories of roadways show higher frequencies associated with city streets (n=164; 92%) and interstates (n=12; 7%) as shown in Figure 13. 95% (n=95) of bicyclist-involved crashes occurred on a city street versus 87% (n=69) of pedestrian-involved crashes. Pedestrian-involved crashes were more likely to take place on an interstate highway than bicycle-involved crashes were (pedestrian: 11%, n=9; bicyclist: 3%, n=3).

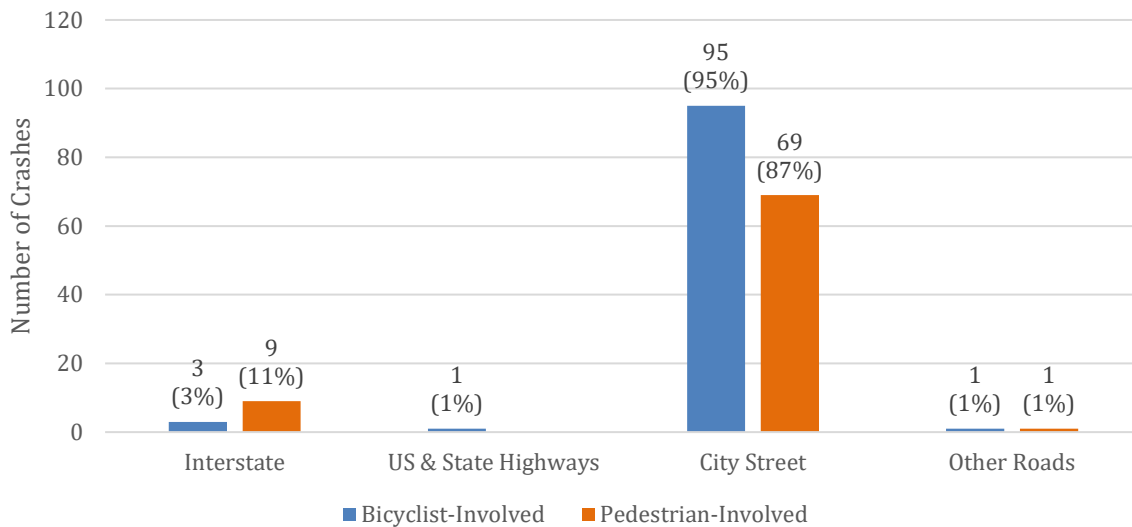


Figure 13. Comparison of Bicyclist or Pedestrian Involved Crashes by Roadway Classification within/around the Vicinity of UT Austin, 2017-2020

## Time of the day

All bicycle and pedestrian crashes split by time of the day show that 58 (32%) crashes occurred between 12:01 to 17:00 hours, followed by 7:01 to 12:00 hours (n=44; 25%). Figure 14 provides a comparison of bicycle and pedestrian involved crashes by time of day.

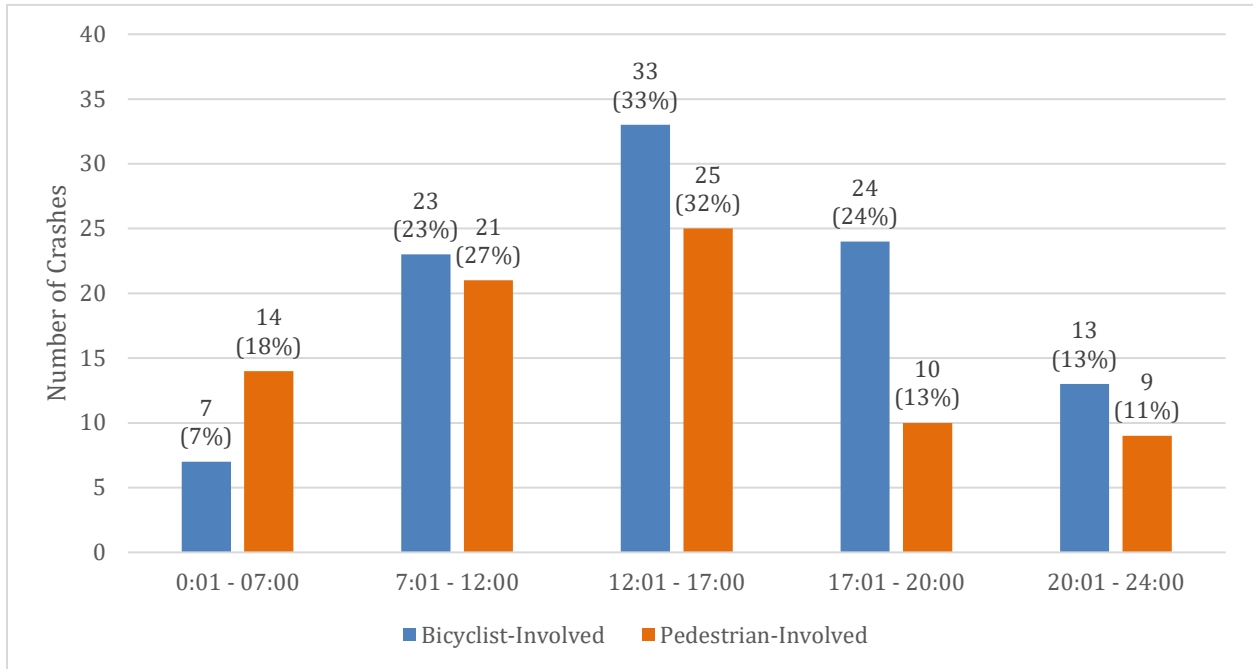


Figure 14. Comparison of Bicyclist and Pedestrian Involved Crashes by Time of the Day within/around the Vicinity of UT Austin, 2017-2020

The crash frequency of bicyclist- and pedestrian-involved crashes by individual hours between 7:01 to 18:00 was shown in Figure 15. The bicyclist-involved crashes were more likely to occur during late afternoon. There were 27 crashes (27%) involving a bicyclist between 16:01 to 18:00. Compared to the bicyclist-involved crashes, the pedestrian-involved crashes were evenly distributed during the hours although more crashes occurred between 13:01 and 14:00.

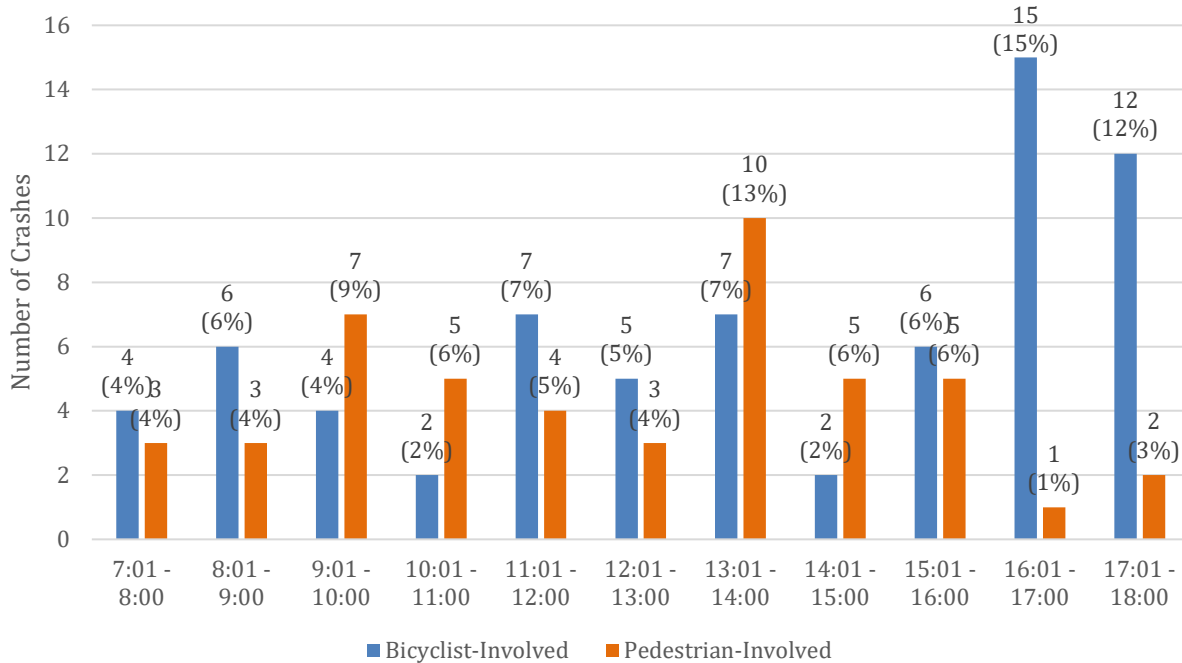


Figure 15. Comparison of Bicyclist and Pedestrian Involved Crashes by Hours between 7 am to 5 pm within/around the Vicinity of UT Austin, 2017 to 2020

The crash frequency was broken down by quarter hour to investigate if the crash events closer to the top or bottom of the hour would indicate that the likelihood of the crash is nearer to the transitional period where students are going to and from classes. For bicyclist-involved crashes, the most frequent quarter hour was found between 16:46 and 17:00 hours (see Figure 16). For pedestrian-involved crashes, they were more likely to occur between 13:16 to 13:45 hours (see Figure 17). While interesting, the data does not show a clear relationship between the likelihood of the crash and the transitional period between classes due to the low sample size of crashes reviewed. Figures 16 and 17 provide the distribution of crashes between bicycle and pedestrians by quarter hour time intervals.

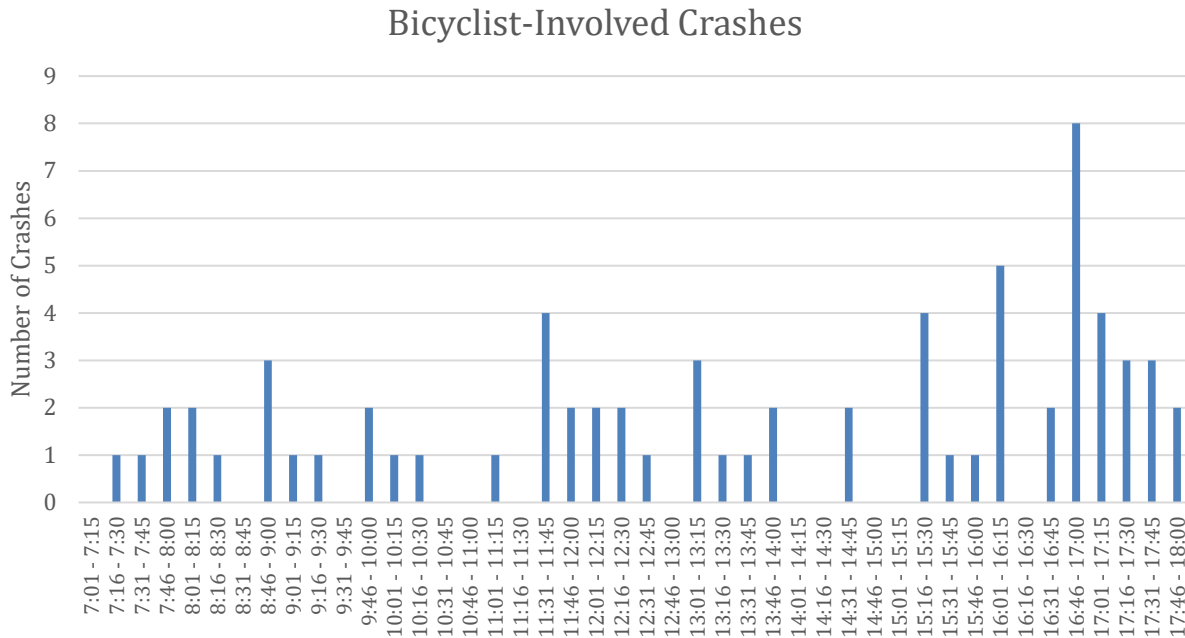


Figure 16. Distribution of Bicyclist Involved Crashes by Quarter Hour between 7:01 to 18:00

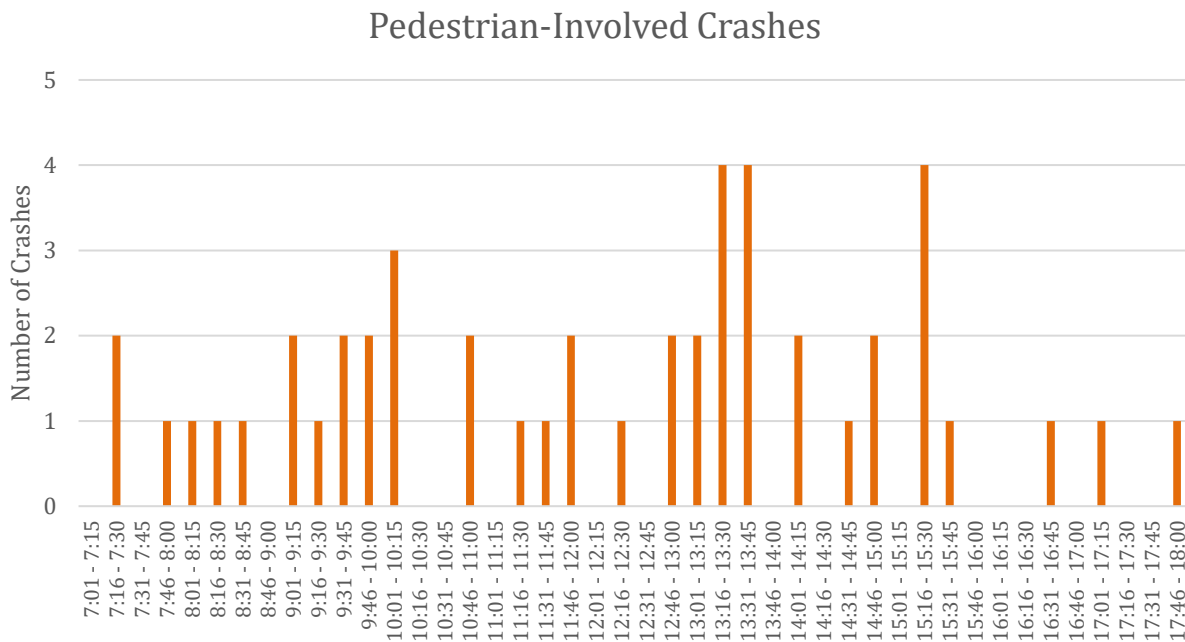


Figure 17. Distribution of Pedestrian Involved Crashes by Quarter Hour between 7:01 to 18:00

## Light Conditions

On observation of the crash data (see Figure 18) discovered that the majority of bicyclist- and pedestrian crashes occurred in daylight hours (bicyclist-involved: 76%, n=76; pedestrian-involved: 66%, n=52), followed by dark, lighted conditions (bicyclist-involved: 20%, n=20; pedestrian-involved: 28%, n=22).

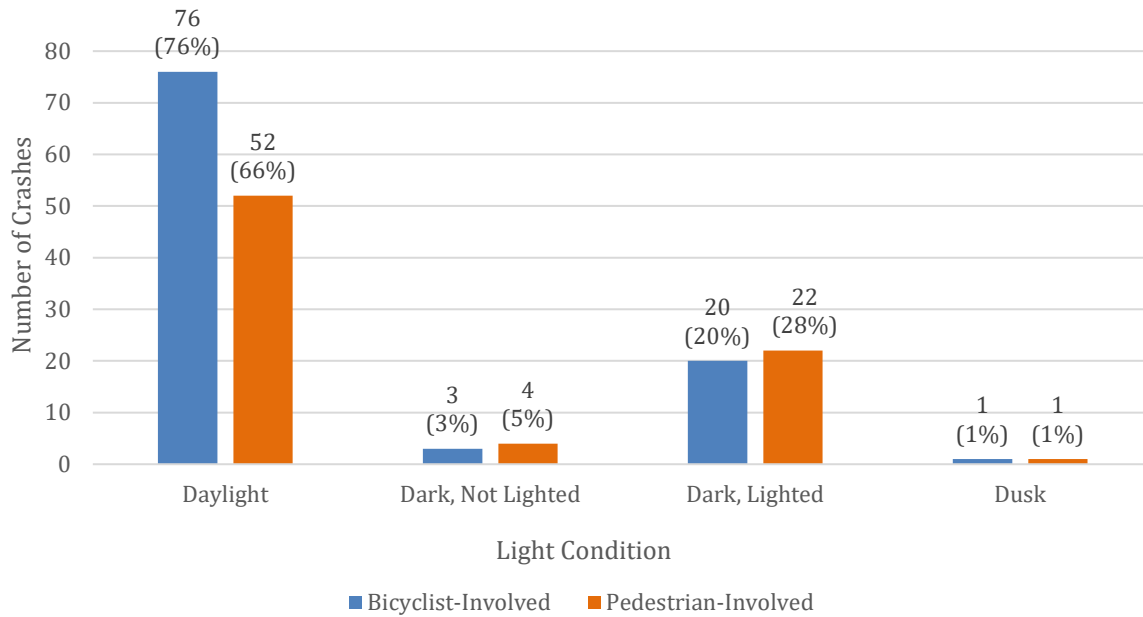


Figure 18. Comparison of Bicyclist- and Pedestrian-Involved Crashes by Light Conditions within/around the Vicinity of UT Austin, 2017-2020

## Road Alignment

Crashes were further examined by road alignment. The data showed that 75 (75%) crashes involved a bicyclist and 62 (78%) of the crashes involved a pedestrian using straight and level roads (see Figure 19). Straight and graded roads had the greatest frequency of crashes; 20 (20%) for bicyclist-related and 11 (14%) for pedestrian-related crashes.

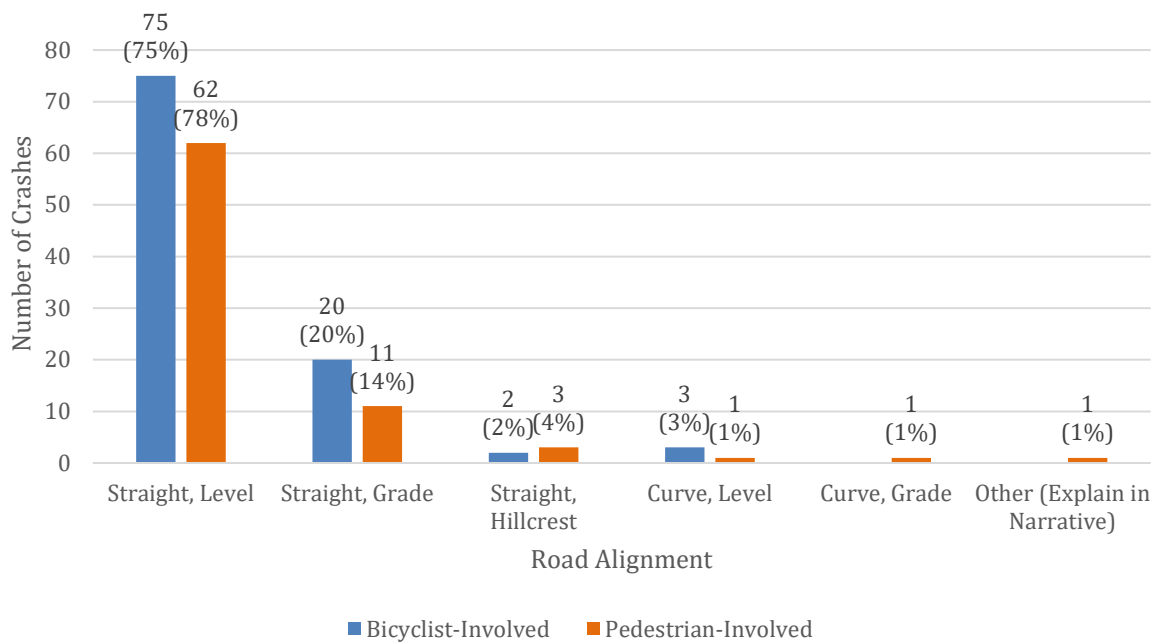


Figure 19. Comparison of Bicyclist- and Pedestrian-Involved Crashes by Road Alignments within/around the Vicinity of UT Austin, 2017-2020

## Road Location

Crashes were examined by road location. Bicyclist- and pedestrian-involved crashes were more likely to occur at intersections or be intersection-related. There were 55 crashes (55%) involving a bicyclist and 51 crashes (64%) involving a pedestrian at intersection/-related locations (see Table 3).

*Table 3. Comparison of Bicyclist and Pedestrian Involved Crashes by Intersection-related*

Road Location	Bicyclist-Involved	Pedestrian-Involved
Intersection	41 (41%)	12 (15%)
Intersection-related	14 (14%)	39 (49%)
Driveway Access	16 (16%)	2 (3%)
Non-Intersection	29 (29%)	26 (33%)
Total	100	79

## Contributing Factors

Finally, crash contributing factors by person type (driver, bicyclist, and pedestrian) were analyzed (see Table 4). For drivers, inattention was the most frequent listed contributing factor assigned to the crash. A total of 36 crashes were attributed to this factor, accounting for 20% of total 179 crashes (100 bicyclist-involved and 79 pedestrian-involved crashes). The second most frequent factor listed was failure to yield right of way to pedestrian (n=31; 17%). For bicyclists, inattention (n=5; 5%) was the factor most frequently assigned. For pedestrians, “Pedestrian failed to yield right of way to vehicle” was most frequently listed. A total of 12 crashes involving a pedestrian failing to yield right of way to a vehicle were assigned which accounted for 16% of 79 total crashes.

*Table 4. Top 3 Contributing Factors of Drivers, Bicyclists, and Pedestrians*

Person Type	Top 1 Contributing Factor	Top 2 Contributing Factor	Top 3 Contributing Factor
Driver	Inattention (n=36; 20%)	Failed to Yield Right of Way - To Pedestrian (n=31; 17%)	Failed to Yield ROW - Turning Left (n=12; 7%)
Bicyclist	Inattention (n=5; 5%)	Failed to Yield ROW - Turning Left (n=4; 4%)	Other (Explain in Narrative) (n=4; 4%)
Pedestrian	Pedestrian Failed to Yield Right of Way to Vehicle (n=12; 16%)	Other (Explain in Narrative) (n=7; 9%)	Had Been Drinking (n=4; 5%)



## Conclusions

This study focused on a data set of bicycle and pedestrian involved crashes at the University of Texas-Austin between 2017 and 2020. Based upon the analysis, the majority of bicycle and pedestrian crashes resulted in non-incapacitating injuries however, there was a strong relationship to injury classification across all crashes. While non-incapacitating injury crashes represented 59% of all bicycle and pedestrian crashes occurring on or near the University of Texas- Austin campus, some form of injury was sustained in 98% of bicycle crashes and 96% of pedestrian crashes.

Regarding collision types, 54% of all bicycle and pedestrian crashes that occur in and around the University of Texas- Austin involve a right or left turning vehicle. Another 44% involve a motor vehicle going straight. Motor vehicles turning right, left, or traveling straight make up 98% of all crash types involving bicycles and pedestrians.

Gender differences and injury severity data indicates that males are over-represented, as compared to females, in both bicycle and pedestrian crash frequency and injuries. For every bicycle and pedestrian crash that occurs on or near the University of Texas-Austin, males were twice as likely to be involved and injured than their female counterparts.

Bicycle and Pedestrian crash distributions over age groups suggest that persons between the age of 21 and 35 are most susceptible to being involved and injured. Most at risk include those individuals between 21 and 25 years of age followed by those between 26 and 30.

Regarding roadway and environmental conditions, bicycle and pedestrian crashes are more likely to occur on clear day and on dry roadways. These conditions represent approximately 80% of those crashes in which a bicycle and pedestrian is involved.

Traffic controlled intersections account for 44% of the total number of bicycle and pedestrian crashes. While pedestrian crashes are more prone to occur at a signal lights and in a crosswalks, bicyclists were more prone to crashes on straight roadway segments, in marked traffic lanes, at signal lights, and on city streets.

Factors contributing to crashes involving motor vehicle drivers were mostly attributed to inattention, failure to yield right of way to pedestrians, or unsafe turning (left). Bicyclists were more prone to being inattentive and failing to yield right of way while turning left. Pedestrians were more likely to fail to yield right of way to motor vehicles.

Finally, higher bicycle and pedestrian crash frequencies were also found to exist at intersections that have controlled signalization and stop sign traffic controls. While intersection and intersection related crashes for bicycle and pedestrians represent 55% and 51%, non-intersection

bicycle and pedestrian crashes account for one-third (1/3<sup>rd</sup>) of the crashes in and around the University campus area. This would suggest that there are issues with mid-block crossing or other risky crossing behaviors.