

# **Pedestrian-Involved Crashes in Michigan: 2016-2020**

**Jason Parks, Patrick Bowman, Carol Flannagan, Colleen Peterson**



**University of Michigan Transportation Research Institute**

## Contents

1.0 Executive Summary .....	2
2.0 Introduction .....	3
3.0 Crash Trends and Injury Severity .....	3
3.1 Crash Count Trends .....	3
3.2 Crash Severity .....	4
4.0 Temporal Variables .....	6
4.1 Month of Year .....	6
4.2 Day of Week .....	6
4.3 Time of Day .....	7
5.0 External/Environmental Conditions.....	9
5.1 Light Conditions .....	9
5.2 Weather Conditions .....	11
5.3 Speed Limit.....	11
6.0 Pedestrian and Driver Elements .....	12
6.1 Pedestrian Age .....	12
6.2 Driver Age.....	14
6.3 Pedestrian Actions .....	14
6.4 Driver Actions.....	16
7.0 Impairment-Related Crashes .....	19
8.0 Summary .....	22

## **Special Note**

The Michigan Office of Highway Safety Planning and the University of Michigan Transportation Research Institute acknowledge the differences in traffic and commuting patterns in 2020 due to the COVID-19 pandemic. Travel restrictions from the “Stay Home, Stay Safe” Executive Order (EO 2020-21) were initially in place starting on March 24, 2020. That order was then extended through additional executive orders. The stay-at-home order was officially lifted June 1, 2020.

Overall, the total number of police-reported crashes on Michigan roadways decreased by 21.93 percent, declining from 314,376 in 2019 to 245,432 in 2020. The 2020 fatality count was 1,083, up 9.95 percent from the 2019 figure of 985. Compared with 2019, people sustaining injuries were down 18.65 percent. Vehicle miles traveled, licensed drivers, and vehicle registrations decreased in 2020: vehicle miles traveled decreased 15.53 percent to 86.31 billion, motor vehicle registrations were down 0.49 percent to 9.04 million, and the number of licensed drivers was down 1.86 percent to 7.12 million. The increased fatality count in combination with the reduction of the exposure factors contributed to the fatality rate of 1.25 per 100 million miles of travel, a 30.16 percent increase from 2019 (0.96 per 100 million miles). The 2020 fatality rate is also above the 10-year (2011-2020) average of 1.01 fatalities per 100 million miles.

## 1.0 Executive Summary

This report provides an analysis of police-reported motor vehicle crashes involving pedestrians on public roadways in Michigan from 2016 through 2020. Key findings include:

- The number of pedestrian-involved crashes had been fairly steady from 2016-2019 (2,200-2,400 crashes), but in 2020 there was a decrease (1,682).
- The number of pedestrian fatalities in 2020 was the highest amount of the past 5 years (175).
- A total of 87.0% of pedestrian-involved crashes involved any level of injury or fatality (KABC), compared to 17.5% of motor-vehicle-only crashes.
- About 25.2% of all crash-involved pedestrians were fatal or involved suspected serious injuries (KA). This rose to 29.5% of pedestrians age 65-74, 36.1% of pedestrians age 75 to 84, and 42.5% of pedestrians age 85 and over.
- Dark conditions were a factor in 42.5% of all pedestrian-involved crashes and 74.6% of fatal pedestrian-involved crashes.
- Impairment due to alcohol and/or drugs occurs more often in pedestrian-involved crashes than motor-vehicle-only crashes. In pedestrian-involved crashes involving alcohol, 75.4% of the pedestrians and 25.7% of the motor-vehicle drivers were reported to have been drinking.
- Among pedestrian-involved crashes occurring between midnight and 4 a.m., 36.8% involved alcohol use by the pedestrian and/or the driver, while the overall percentage of pedestrian and alcohol use involved crashes is 10.9%.
- The top pedestrian action prior to crash for pedestrians in non-fatal crashes was crossing at an intersection (40.7%), while for pedestrians in fatal crashes it was crossing but not at an intersection (34.1%).
- The most common action prior to crash for drivers in pedestrian-involved crashes was going straight ahead (57.6%), followed by turning left (15.9%), and turning right (8.4%).
- No hazardous action was indicated in 47.5% for drivers in pedestrian-involved crashes with known actions. The most common hazardous action reported was failed to yield (23.4%).
- The most common posted speed limit for pedestrian-involved crashes was 25 mph.
- At posted speed limits under 50 mph, 5.6% of pedestrian crashes had a fatality, while at speed limits of 50+ mph, 19.7% of pedestrian crashes had a fatality.
- Pedestrian-involved crashes varied somewhat across the months of the year, with the fewest pedestrian crashes occurring in April and the most in October.
- Friday was the most common day for pedestrian-involved crashes (16.3% of the total).

## 2.0 Introduction

Michigan traffic crashes are defined as taking place on public roadways in Michigan, involving at least one motor vehicle in transport, and resulting in death, injury, or property damage of \$1,000 or more. The Michigan State Police *UD-10 Traffic Crash Report Instruction Manual* defines a pedestrian as a:

- Person on foot
- Person on skis, skates, or roller blades
- Rider of a horse
- Horse and buggy (each occupant, including the driver, will be listed as a separate pedestrian unit)
- Non-motorized wheelchair

The report describes pedestrian-involved crashes in terms of severity, temporal patterns, and roadway and environmental variables. One section examines pedestrian and motor-vehicle driver attributes, including age, action prior to the crash, and hazardous actions committed by drivers. The incidence of alcohol and drugs in pedestrian-involved crashes is considered, by the pedestrians or motor vehicle drivers.

In this report, injury severity of people involved in crashes is frequently categorized according to the KABCO scale:

- K - Fatal Injury
- A - Suspected Serious Injury
- B - Suspected Minor Injury
- C - Possible Injury
- O - No Apparent Injury

Similarly, crashes are sometimes classified according to the most severe injury suffered by anyone involved in the crash. Again, the KABCO scale is used, but for O-level severity this refers to crashes with property damage only (PDO) instead of no injury or fatality.

## 3.0 Crash Trends and Injury Severity

### 3.1 Crash Count Trends

Table 1 shows the counts of motor vehicle crashes involving pedestrians in Michigan over the past five years, both for all police-reported crashes and for those involving a fatality. The table also indicates the number of pedestrian fatalities each year. After a general downward trend in the number of pedestrian fatalities in the previous 4 years (falling from 165 to 149), there was an increase to 175 in 2020.

Table 1. Pedestrian-Involved Crashes

Year	Pedestrian-Involved Crashes	Pedestrian-Involved Fatal Crashes	Pedestrian Fatalities
2016	2,232	164	165
2017	2,285	156	158
2018	2,203	145	145
2019	2,260	143	149
2020	1,682	173	175
<b>Total</b>	<b>10,662</b>	<b>781</b>	<b>792</b>

Figure 1 shows the five-year trend for pedestrian-involved crashes. The peak number for all pedestrian-involved crashes (2,285) occurred in 2017, and peak fatal pedestrian-involved crashes (173) occurred in 2020. The lowest number of all pedestrian-involved crashes (1,682) took place in 2020, while the low for fatal pedestrian-involved crashes (143) occurred in 2019. There is some evidence at the national level that more people were walking during the pandemic<sup>1</sup>, suggesting a possible change in both crash and fatality rates for pedestrians in 2020.

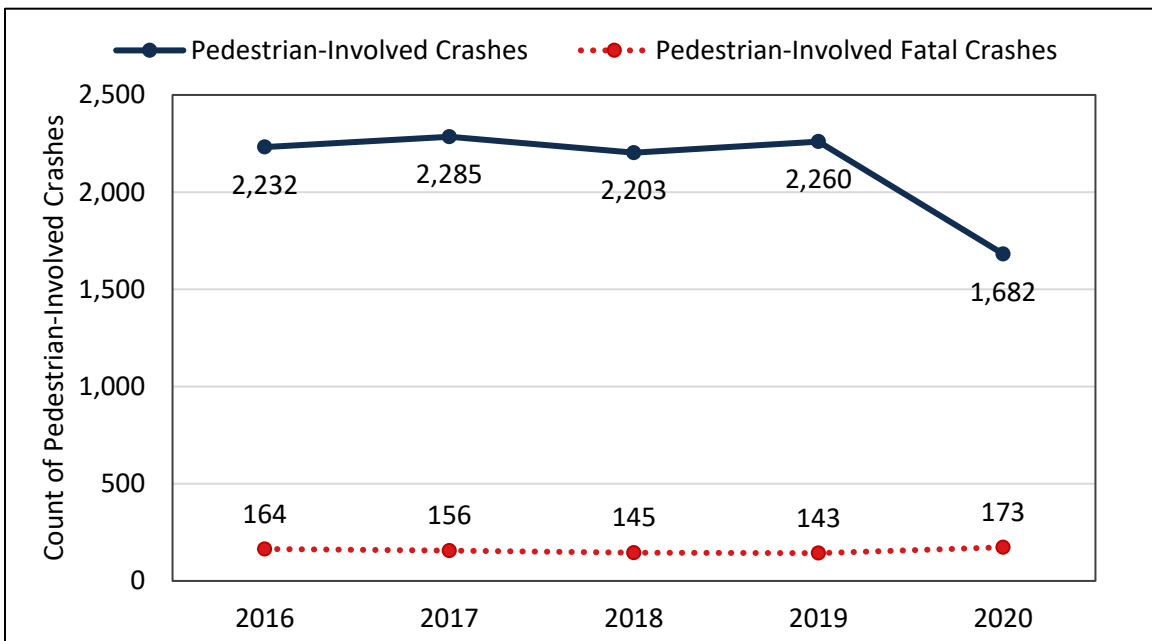


Figure 1 – Pedestrian-Involved Crashes by Year

### 3.2 Crash Severity

Table 2 compares crash severities for crashes involving a pedestrian and crashes involving only motor vehicles, with all non-motorist crashes excluded. Of pedestrian crashes, 7.3% involved a fatality and

<sup>1</sup> Hunter, R. F., Garcia, L., de Sa, T. H., Zapata-Diomedí, B., Millett, C., Woodcock, J., & Moro, E. (2021). Effect of COVID-19 response policies on walking behavior in US cities. *Nature communications*, 12(1), 1-9.

18.6% involved suspected serious injuries. Only 13.0% of pedestrian-involved crashes were without injury, compared with 82.5% of crashes involving only motor vehicles.

Table 2. Crash Severity of Pedestrian-Involved and Motor-Vehicle-Only Crashes, 2016-2020

Crash Severity – Worst Injury in Crash	Pedestrian-Involved Crashes	Motor Vehicle Only Crashes
Fatal Injury (K)	7.3%	0.3%
Suspected Serious Injury (A)	18.6%	1.4%
Suspected Minor Injury (B)	30.1%	4.8%
Possible Injury (C)	31.0%	11.0%
No Injury - Property Damage Only (O)	13.0%	82.5%
<b>Total</b>	<b>100%</b>	<b>100%</b>

Figure 2 illustrates the difference in crash severity distributions between pedestrian-involved crashes and motor-vehicle-only crashes. Both crash types are categorized according to the worst injury in the crash—fatal, injury (serious, minor, or possible), or no injury - property damage only (PDO). Pedestrian-involved crashes result in death or injury much more often than crashes involving only motor vehicles. These differences in police-reported crashes highlight the vulnerability of pedestrians compared with motor vehicle occupants.

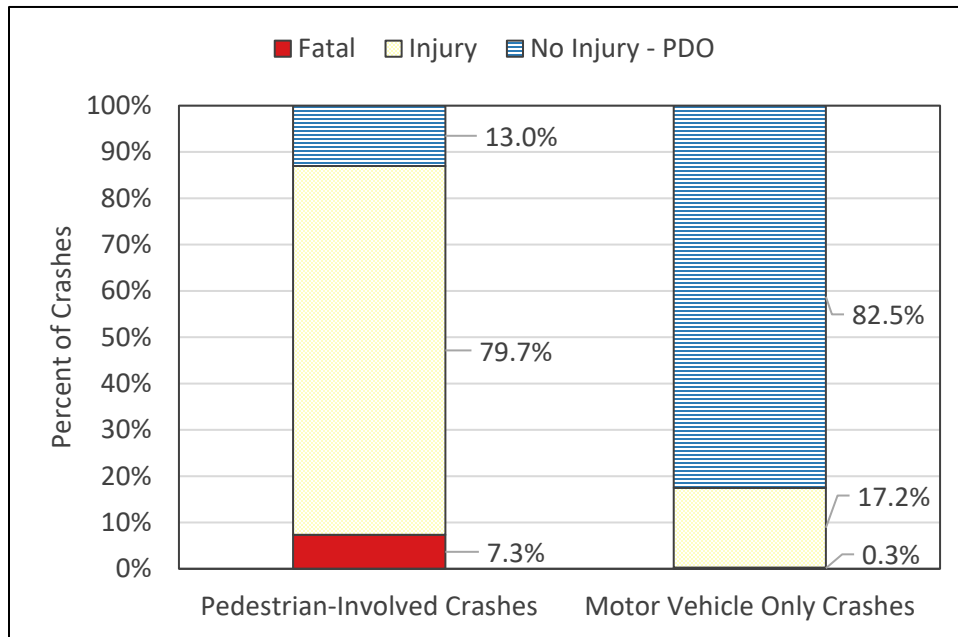


Figure 2 – Crash Severity of Pedestrian-Involved and Motor-Vehicle-Only Crashes, 2016-2020

## 4.0 Temporal Variables

### 4.1 Month of Year

Figure 3 shows the number of pedestrian-involved crashes across different months of the year. October was the peak month with 10.8% of the total, while April had the lowest percentage of pedestrian-involved crashes (6.0%). One might expect the number of pedestrian-involved crashes to be the highest in the warmest months when more people are out walking; however, the high numbers of pedestrian-involved crashes taking place during colder months suggests that other factors may also be relevant. For example, while there are likely fewer pedestrians out in colder months, those months also have more hours of darkness. The risk of pedestrian-involved crashes is much higher in the dark, so this also probably contributes to the observed seasonal pattern.

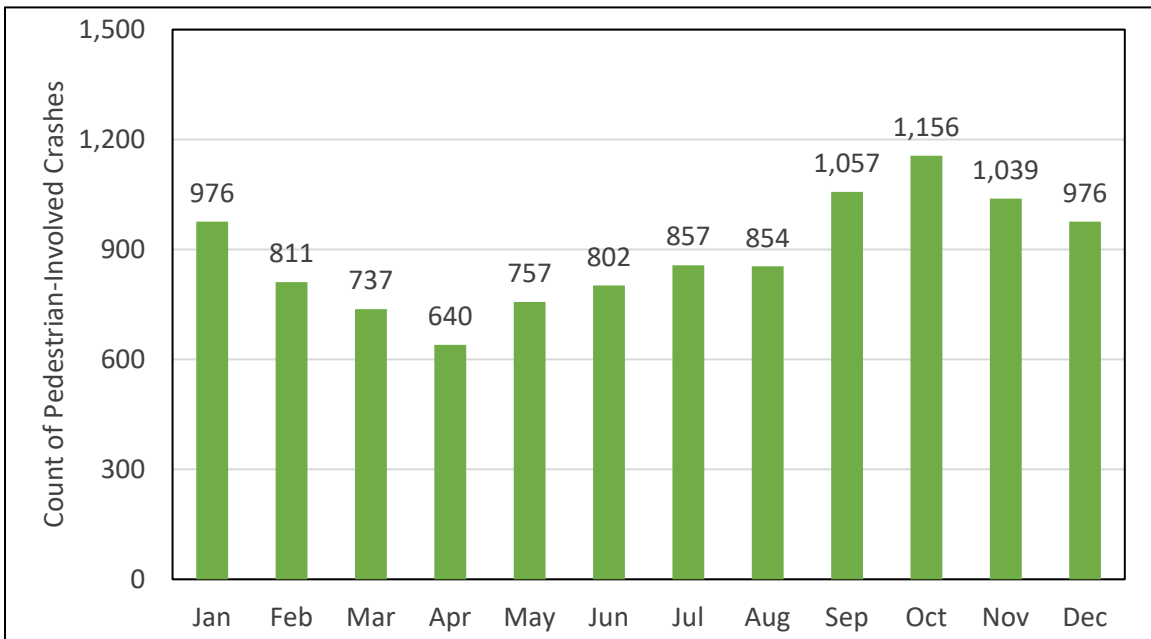


Figure 3 – Pedestrian-Involved Crashes by Month, 2016-2020

### 4.2 Day of Week

Figure 4 shows the number of pedestrian-involved crashes on each day of the week. The number of pedestrian-involved crashes steadily increased from Monday through Friday, with 16.3% taking place on Friday, the peak day of the week. About 23.2% of pedestrian-involved crashes occurred on the weekends.



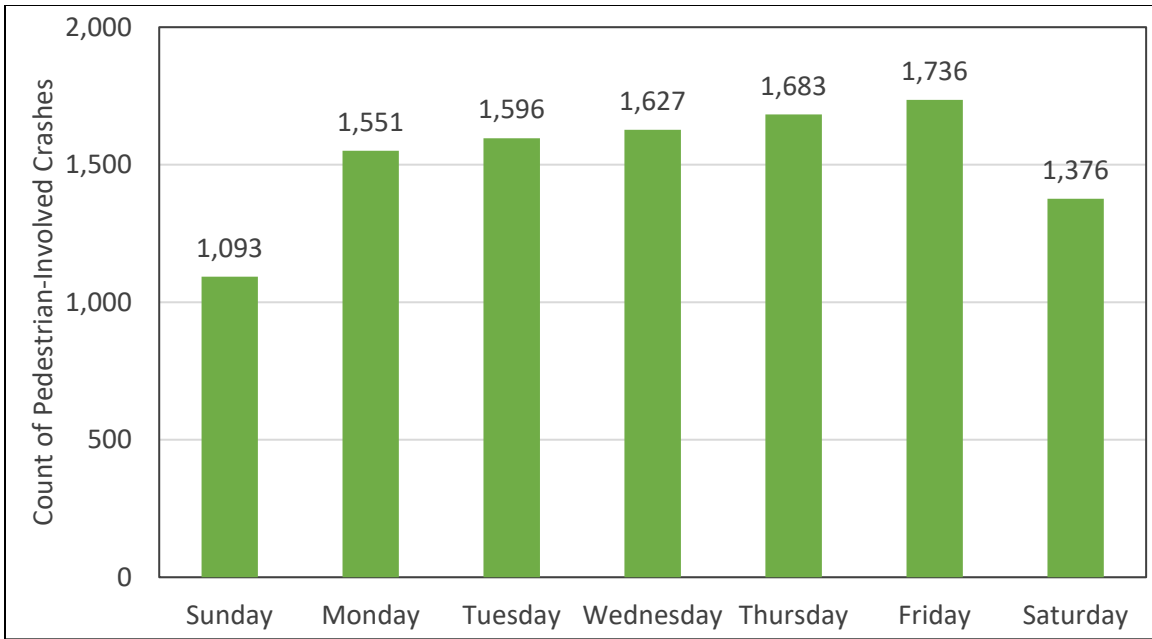


Figure 4 – Pedestrian-Involved Crashes by Day of Week, 2016-2020

#### 4.3 Time of Day

Figure 5 shows the number of pedestrian-involved crashes across the hours of the day. Pedestrian-involved crashes were concentrated around and at the 6:00 p.m. hour (8.1%). High numbers of pedestrian-involved crashes persisted into the late evening hours. Across the first twelve hours of the day, a smaller peak of pedestrian-involved crashes occurred during the 7:00 a.m. hour, with 5.7% of all pedestrian-involved crashes. This likely corresponds to both more traffic during the morning rush hour and more pedestrians heading to school or work at that time.

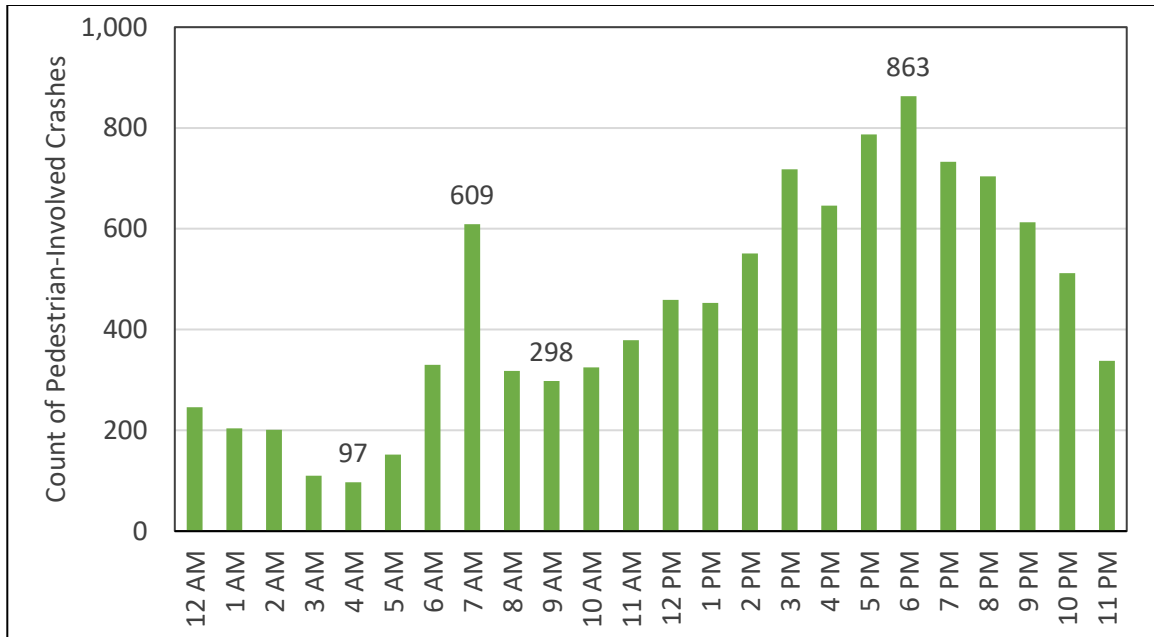


Figure 5 – Pedestrian-Involved Crashes by Time of Day, 2016-2020

Figure 6 shows pedestrians in crashes divided into two age groups, those 17 and younger and those 18 and older, excluding cases with unknown ages. The 17-and-under pedestrian group shows distinct peaks during the 7:00 a.m. and 3:00 p.m. hours, corresponding to the start and end of the school day. Pedestrians 18 and older involved in crashes show a small peak in the 7:00 a.m. hour, but are more concentrated in the later hours of the day, with a peak at 6 p.m. Nearly half (48.7%) of pedestrians 18 and older were involved in crashes between 4:00 p.m. and 11:59 p.m. Of the 4,286 18-and-older pedestrians involved in crashes during these evening hours, 16.1% involved alcohol.

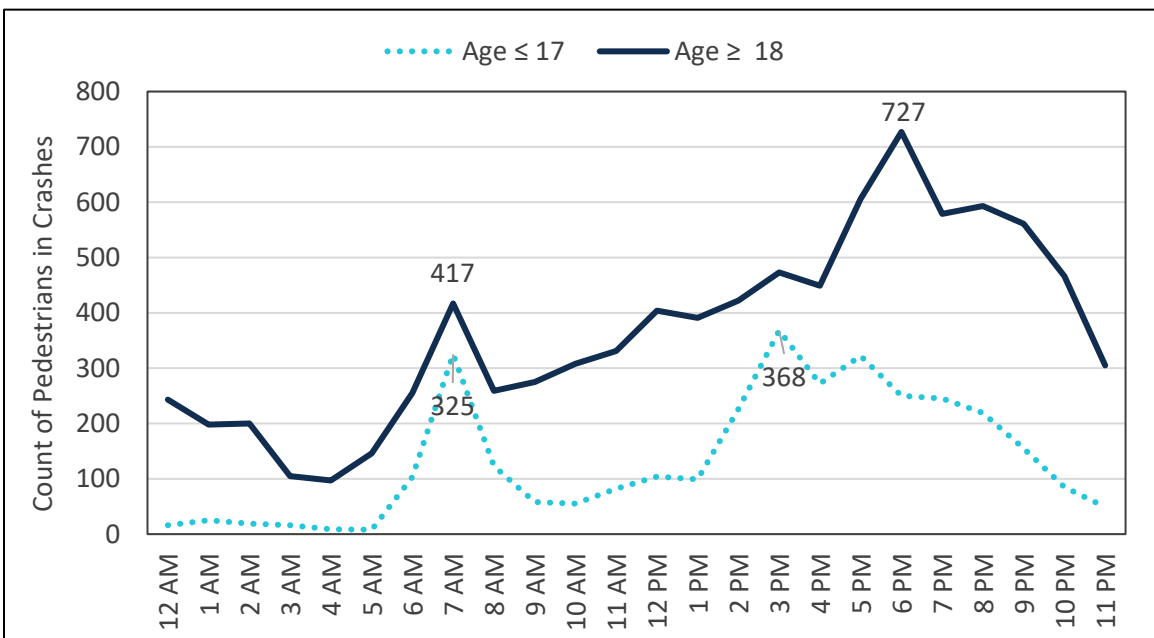


Figure 6 – Pedestrians in Crashes by Time of Day and Age Group, 2016-2020

*Pedestrian-Involved Crashes in Michigan: 2016-2020*

## 5.0 External/Environmental Conditions

### 5.1 Light Conditions

Figure 7 shows crash counts by light condition for pedestrian-involved crashes. About 52% of pedestrian-involved crashes occurred in daylight conditions. A substantial proportion took place in dark/lighted (27.8%) and dark/unlighted (14.7%) conditions. While bicyclists who ride in the dark are required by state law to have a front white light and rear red reflector, no similar requirements exist for pedestrians. The generally low visibility of pedestrians at nighttime puts them at higher risk of crashes in dark conditions.

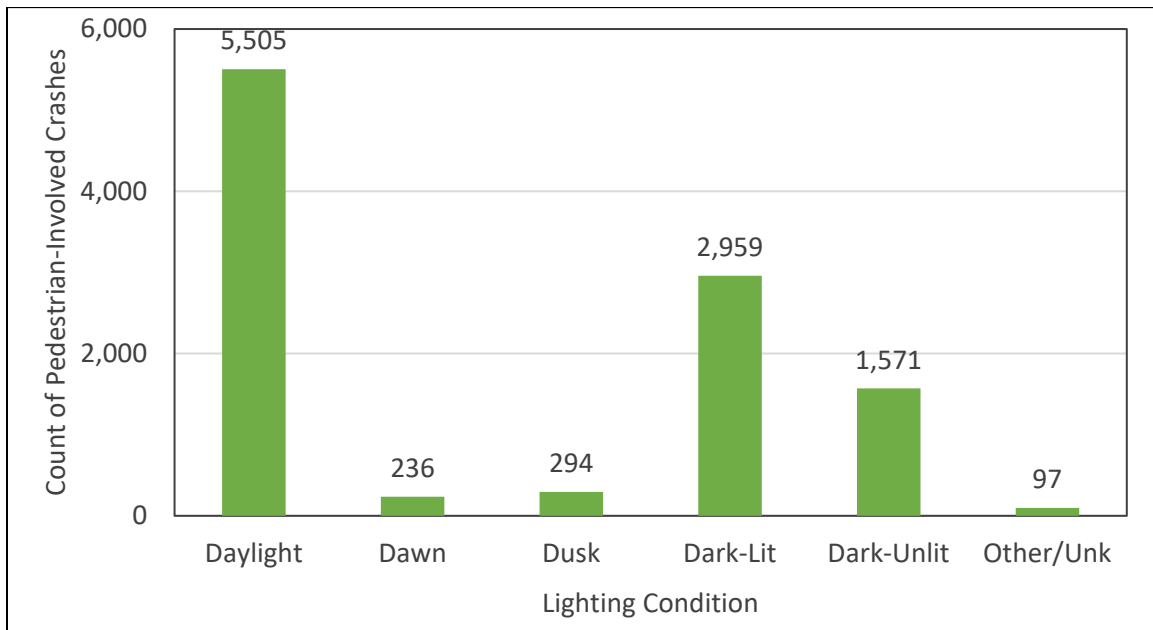


Figure 7 – Pedestrian-Involved Crashes by Light Condition, 2016-2020

Table 3 shows the number of pedestrian-involved crashes by light condition and severity. The column percentages show that the more severe the pedestrian crash, the greater the chance it took place under dark conditions. While only 34.6% of pedestrian-involved crashes with no injury occurred in either dark-lighted or dark-unlighted conditions, the same was true of 51.7% of suspected serious injury crashes and 74.6% of fatal pedestrian-involved crashes. Conversely, 58.7% of the no-injury pedestrian-involved crashes occurred in daylight, compared with 42.7% of suspected serious injury crashes and only 20.7% of fatal pedestrian-involved crashes.

Table 3. Pedestrian-Involved Crashes by Light Condition and Crash Severity, 2016-2020

Lighting Conditions	Crash Severity					
	Fatal	Suspected Serious Injury	Suspected Minor Injury	Possible Injury	No Injury	Total
Daylight	162 20.7%	845 42.7%	1,742 54.3%	1,941 58.7%	815 58.7%	<b>5,505</b> <b>51.6%</b>
Dawn	11 1.4%	50 2.5%	70 2.2%	76 2.3%	29 2.1%	<b>236</b> <b>2.2%</b>
Dusk	22 2.8%	48 2.4%	95 3.0%	85 2.6%	44 3.2%	<b>294</b> <b>2.8%</b>
Dark - Lighted	318 40.7%	620 31.3%	837 26.1%	828 25.0%	356 25.6%	<b>2,959</b> <b>27.8%</b>
Dark - Unlighted	265 33.9%	404 20.4%	435 13.6%	343 10.4%	124 8.9%	<b>1,571</b> <b>14.7%</b>
Other / Unknown	3 0.4%	14 0.7%	27 0.8%	33 1.0%	20 1.4%	<b>97</b> <b>0.9%</b>
<b>Total</b>	<b>781</b> <b>100.0%</b>	<b>1,981</b> <b>100.0%</b>	<b>3,206</b> <b>100.0%</b>	<b>3,306</b> <b>100.0%</b>	<b>1,388</b> <b>100.0%</b>	<b>10,662</b> <b>100.0%</b>

The impact of lighting conditions on crash severity is also highlighted in Figure 9, which displays the crash severity percentages for the three most common lighting conditions (daylight, dark/lighted, dark/unlighted). Dawn, dusk, other, and unknown light conditions account for only about 6% of all crashes. While 2.9% of all daylight crashes included a fatality, 10.7% of fatalities occurred in dark lighted conditions, and 16.9% of fatalities occurred in dark unlit conditions.

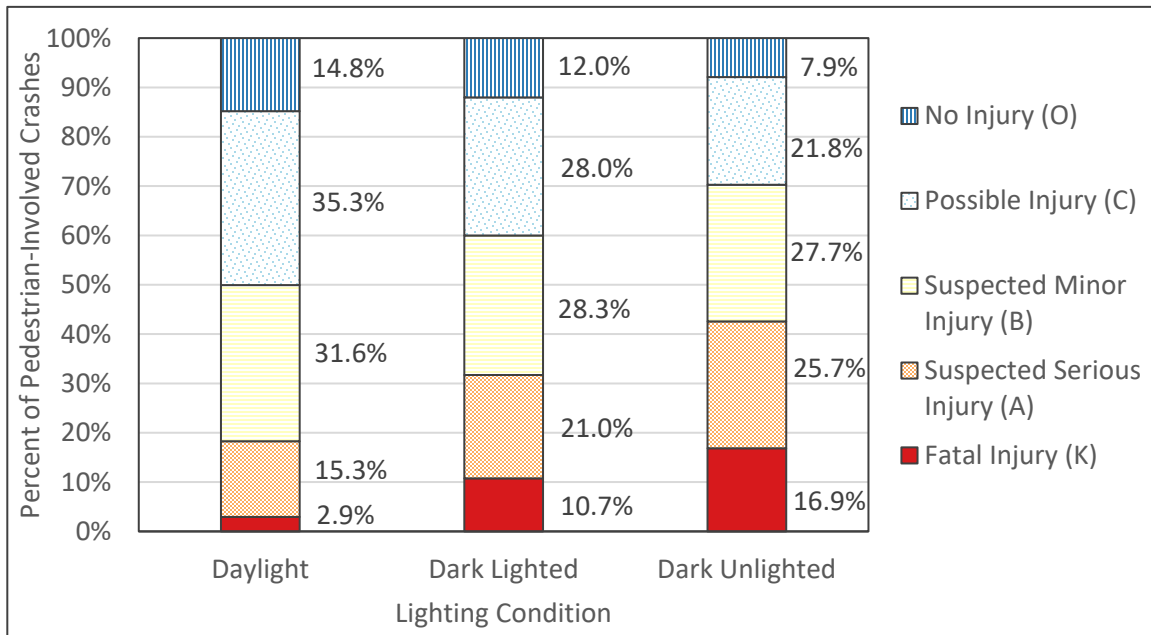


Figure 8 – Pedestrian-Involved Crashes by Crash Severity within Lighting Condition, 2016-2020

### 5.2 Weather Conditions

Figure 9 depicts weather conditions at the time of pedestrian-involved crashes. 82.9% occurred in clear or cloudy conditions, 10.9% took place when it was raining, and 3.9% occurred in snow (which includes blowing snow). The “Other” category includes fog, severe crosswind, sleet/hail, blowing sand, and smoke. This weather-related crash pattern is likely related to exposure, with pedestrians less likely to be out during bad weather compared with favorable weather.

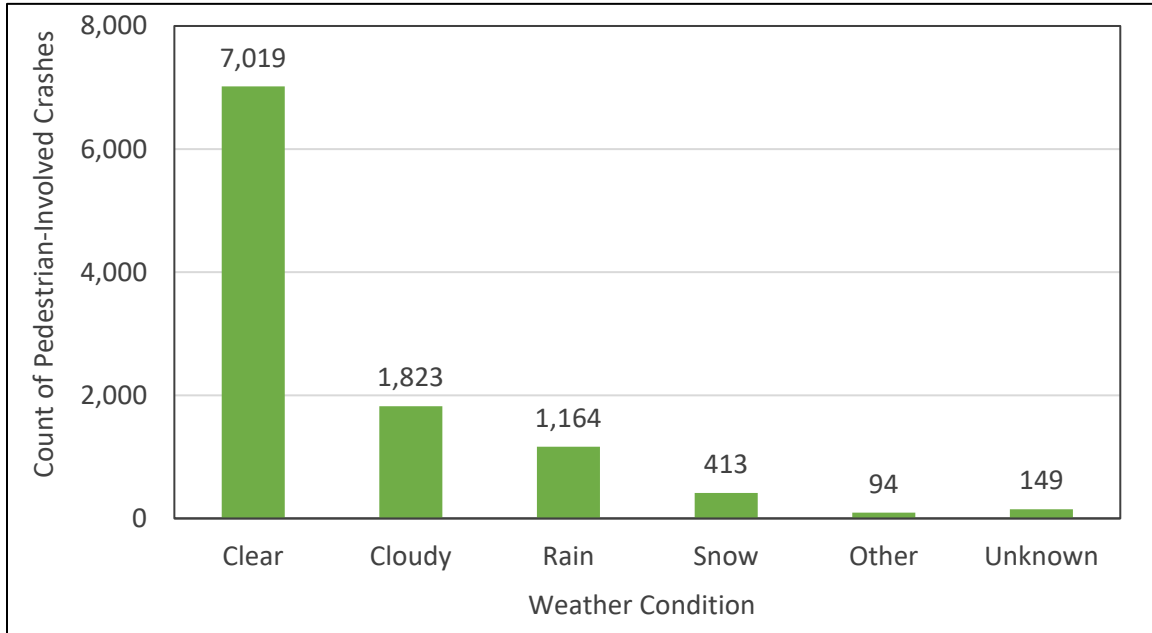


Figure 9 – Pedestrian-Involved Crashes by Weather Condition, 2016-2020

### 5.3 Speed Limit

To examine speed limit at the crash site, pedestrian-involved crashes were split into three groups according to levels of the KABCO scale of crash severity: fatal injury (K), all injuries (serious - A, minor - B, possible - C), and no injury with property damage only (O). Figure 10 shows the percentage of these three groups of crashes according to posted speed limit ranges at the crash site. Crashes with an unknown speed limit, about 3% of the total, were excluded.

There are relatively few crashes at posted speed limits of 15 mph or less (1.7%) and 60+ mph (2.1%). A majority of crashes occur within 20-35 mph (64.4%) and 40-55 mph (31.8%) posted speed limits. For the O-level crashes, 73.6% occurred at posted speeds of 35 mph or less. In contrast, 67.6% of A/B/C-level crashes and just 36.0% of crashes involving a fatality took place at posted speeds of 35 mph or less. The percentage of fatalities increased with increases in posted speed limits: 1.7% of crashes at posted speeds of 25 mph or less involved a fatal injury, 10.4% of crashes at posted speeds of 30 mph or higher involved a fatality, and 19.7% of crashes involved a fatality at speeds of 50 mph or higher. In general, pedestrians are more likely to use roadways in the lower speed limit ranges, but, unsurprisingly, when pedestrian-involved crashes occur in higher speed limit zones they are much more likely to be severe.

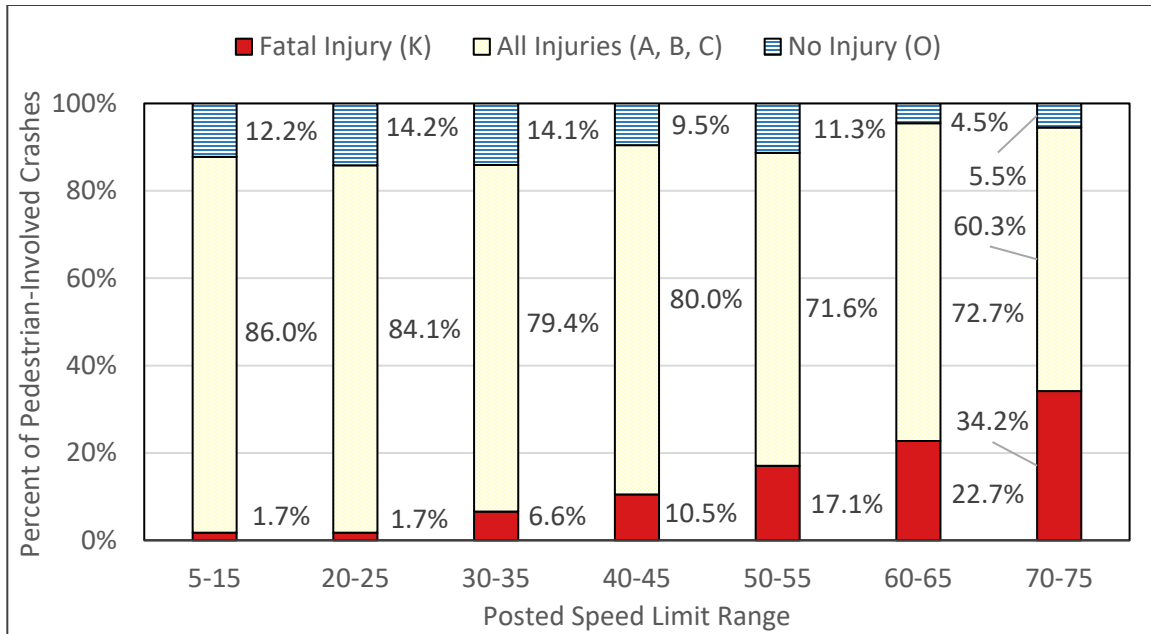


Figure 10 – Distribution of Pedestrian-Involved Crashes by Speed Limit at Crash Site, 2016-2020

## 6.0 Pedestrian and Driver Elements

### 6.1 Pedestrian Age

From 2016-2020, 11,264 pedestrians were involved in crashes on Michigan roadways. Table 4 shows the age group distribution of these pedestrians. Most pedestrians were in the age range from teenager through late middle age—74.4% of crash-involved pedestrians were age 15 to 64. About 20.0% were age 15 to 24. People age 65 and over made up just 9.5% of pedestrian crash involvements. Age was unknown for 2.4% of pedestrians, but some of the pedestrians coded 0 on age (less than 1 year) may also be pedestrians of unknown age.

Table 4. Age Groups and KA Injuries of Pedestrians Involved in Crashes, 2016-2020

Age Group	Pedestrians Involved in Crashes	Percent of All Pedestrians Involved in Crashes
0	187	1.7%
1-8	516	4.6%
9-14	832	7.4%
15-20	1,344	11.9%
21-24	907	8.1%
25-34	1,866	16.6%
35-44	1,343	11.9%
45-54	1,429	12.7%
55-64	1,494	13.3%
65-74	729	6.5%
75-84	266	2.4%
85+	80	0.7%
Unknown	271	2.4%
<b>Total</b>	<b>11,264</b>	<b>100%</b>

Table 5 shows the number and percent of pedestrians with fatal (K) or suspected serious (A) injuries out of all crash-involved pedestrians as a function of age. The probability that a pedestrian suffered KA injuries varies according to age group. While 23.6% of pedestrians age 1 to 8 suffered KA injuries, this declined to 16.0% of pedestrians age 9-14 and then rose slightly to 18.8% of pedestrians age 15-20. The percentage of pedestrians with KA injuries then generally rose with age, reaching 36.1% of pedestrians age 75-84 and 42.5% of pedestrians 85 and over.

Table 5. Age Groups and KA Injuries of Pedestrians Involved in Crashes, 2016-2020

Age Group	KA Injured Pedestrians	Pedestrians Involved in Crashes	Percent KA Injured Pedestrians within Age Group
0	30	187	16.0%
1-8	122	516	23.6%
9-14	133	832	16.0%
15-20	253	1,344	18.8%
21-24	205	907	22.6%
25-34	486	1,866	26.0%
35-44	391	1,343	29.1%
45-54	442	1,429	30.9%
55-64	423	1,494	28.3%
65-74	215	729	29.5%
75-84	96	266	36.1%
85+	34	80	42.5%
Unknown	9	271	3.3%
<b>Total</b>	<b>2,839</b>	<b>11,264</b>	<b>25.2%</b>

## 6.2 Driver Age

The age groups of motor vehicle drivers in pedestrian-involved crashes are shown in Table 6. Age was unknown for more than a quarter (26.8%) of drivers, and 80.9% of these unknown-age drivers were in hit-and-run pedestrian-involved crashes. Because age was unknown for such a large share of drivers, the rightmost column of Table 6 shows the adjusted age distribution based only on drivers of known age. When age was known, about 18.9 % of drivers in pedestrian-involved crashes were age 15-24, 66.1% were age 25-64, and 14.9% were age 65 and over. Drivers in pedestrian-involved crashes are rarely seriously injured as only 9 of the 11,471 drivers (0.1%) were killed and just 60 (0.5%) received suspected serious injuries.

Table 6. Age Groups of Drivers in Pedestrian-Involved Crashes, 2016-2020

Age Group	Driver Count	Percent of All Driver Injuries	Percent Excluding Unknown Age
0-14	9	0.1%	0.1%
15-20	824	7.2%	9.8%
21-24	764	6.7%	9.1%
25-34	1,683	14.7%	20.0%
35-44	1,305	11.4%	15.5%
45-54	1,338	11.7%	15.9%
55-64	1,225	10.7%	14.6%
65-74	795	6.9%	9.5%
75-84	354	3.1%	4.2%
85+	104	0.9%	1.2%
Unknown	3,070	26.8%	--
<b>Total</b>	<b>11,471</b>	<b>100%</b>	<b>100%</b>

## 6.3 Pedestrian Actions

Table 7 and Figure 11 compare the action of the pedestrian prior to the crash for pedestrians involved in fatal and non-fatal crashes. Table 7 shows distributions of known pedestrian actions prior to the crash and the percentages represent the pedestrian actions within all fatal or non-fatal crashes. The variable used has one set of code levels intended for drivers and cyclists and another set intended for pedestrians. A few pedestrians were coded with driver/cyclist actions, so these cases were excluded, and cases coded “other” and “unknown” were also excluded, so altogether about 9% of the crash-involved pedestrians from 2016-2020 are omitted from Table 7 and Figure 11.



Table 7. Pedestrian Action Prior to Crash, 2016-2020

Pedestrian Action Prior to Crash	Fatal Crash Involvements	Non-Fatal Crash Involvements	Total Crash Involvements
Crossing at Intersection	115 14.5%	3,833 40.7%	3,948 38.7%
Crossing Not at Intersection	270 34.1%	2,183 23.2%	2,453 24.0%
Getting On/Off Vehicle	5 0.6%	117 1.2%	122 1.2%
In Roadway With Traffic	111 14.0%	935 9.9%	1,046 10.2%
In Roadway Against Traffic	18 2.3%	171 1.8%	189 1.9%
Standing/Lying in Roadway	90 11.4%	566 6.0%	656 6.4%
Pushing/Working on Vehicle	16 2.0%	92 1.0%	108 1.1%
Other Work in Roadway	10 1.3%	136 1.4%	146 1.4%
Playing in Roadway	3 0.4%	118 1.3%	121 1.2%
In Roadway Other Reason	99 12.5%	820 8.7%	919 9.0%
Not in Roadway	54 6.8%	450 4.8%	504 4.9%
<b>Total</b>	<b>791</b> <b>100.0%</b>	<b>9,421</b> <b>100.0%</b>	<b>10,212</b> <b>100.0%</b>

The most common action for pedestrians involved in fatal crashes was crossing not at an intersection (34.1%), followed by crossing at an intersection (14.5%), and in roadway walking with traffic (14.0%). In contrast, the most common action prior to crash for pedestrians in non-fatal crashes was crossing at an intersection, with 40.7% of the cases over the five-year period. This was followed by crossing not at an intersection (23.2%) and in roadway walking with traffic (9.9%). The table illustrates the dangers for pedestrians crossing mid-block, walking with traffic as opposed to against it, and standing or laying in the roadway. Figure 11 focuses on four actions and shows the proportion of crashes resulting in a fatality vs. non-fatality which highlights the decreased likelihood of a fatal crash for crossing at an intersection (2.9%) in contrast to crossing not at an intersection (11.0%). It also shows the combined seven pedestrian actions occurring within the roadway (10.9%) compared to not in roadway or other (9.4%).

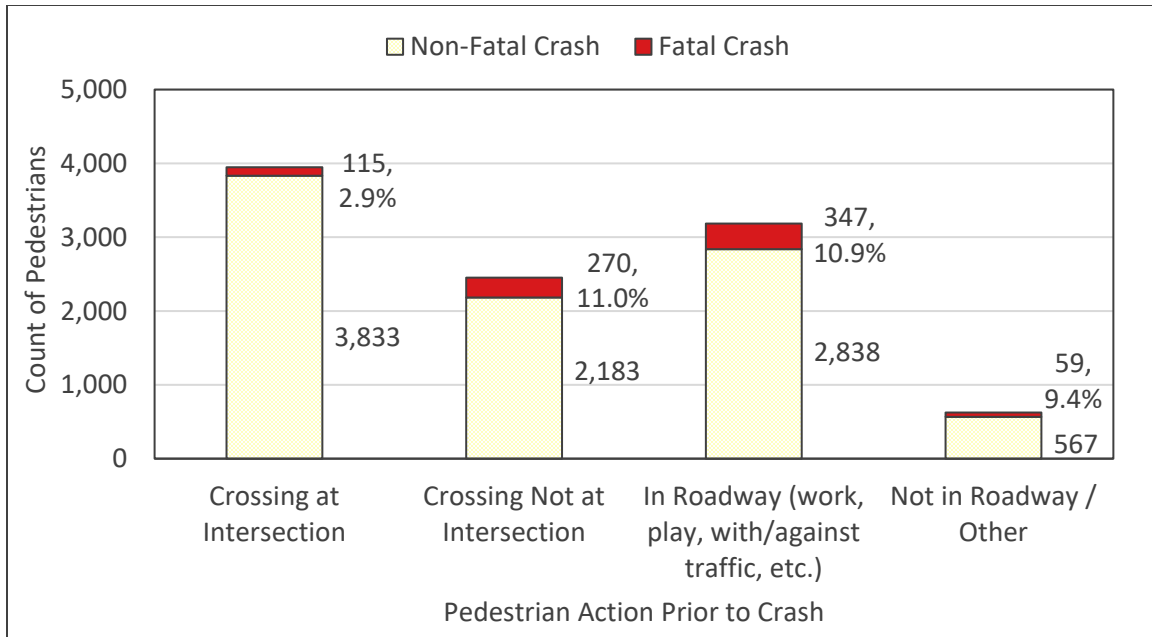


Figure 11 – Pedestrian Crash Involvements by Action Prior to Crash in Pedestrian-Involved Crashes, 2016-2020

#### 6.4 Driver Actions

Table 8 and Figure 12 show the action prior to the crash for motor-vehicle drivers in pedestrian-involved crashes. Driver actions that were unknown or that were coded as pedestrian actions (a total of 3.5%) are excluded from the table and chart. The percentages in the table represent the driver actions for all fatal or non-fatal crashes.

The most common driver action was simply going straight ahead, which represented 57.6% of vehicle involvements in all pedestrian-involved crashes. The next four most common driver actions were turning left (15.9%), turning right (8.4%), parked (3.4%), and backing (3.1%). It may seem counterintuitive that being parked was the fourth most common driver action in pedestrian-involved crashes, but there is usually at least one other vehicle in these crashes apart from the parked vehicle. A common scenario is a passing vehicle strikes both a pedestrian and a disabled vehicle on the side of the roadway. Typically, the pedestrian is associated with the disabled vehicle as a driver, passenger, police officer, tow-truck operator, etc.

Among fatal pedestrian-involved crashes, the most common driver action was going straight, with 77.7% of the fatal involvements, compared with just 55.8% of non-fatal involvements. The next two most common driver actions in fatal pedestrian-involved crashes were parked (5.1%) followed by avoiding pedestrian (2.5%). Again, pedestrian-involved crashes where one vehicle was stopped on the roadway typically involved at least one other vehicle in the crash. Occasionally, however, a pedestrian (usually intoxicated) collided with a single stopped vehicle. It is notable that turning left, the second-most common driver action overall in pedestrian-involved crashes, was represented in only 2.2% of driver involvements in fatal pedestrian-involved crashes, compared with 17.1% of involvements in non-fatal pedestrian-involved crashes.

Table 8. Driver Action Prior to Crash, 2016-2020

Driver Action Prior to Crash	Fatal Crash Involvements	Non-Fatal Crash Involvements	Total Crash Involvements
Going Straight Ahead	701 77.7%	5,674 55.8%	6,375 57.6%
Turning Left	20 2.2%	1,736 17.1%	1,756 15.9%
Turning Right	10 1.1%	921 9.1%	931 8.4%
Stopped on Roadway	20 2.2%	163 1.6%	183 1.7%
Involved in Prior Crash at Same Location	5 0.6%	25 0.2%	30 0.3%
Changing Lanes	11 1.2%	66 0.6%	77 0.7%
Backing	9 1.0%	336 3.3%	345 3.1%
Slowing/Stopping on Roadway	18 2.0%	248 2.4%	266 2.4%
Slowing/Stopping Other Area	1 0.1%	13 0.1%	14 0.1%
Starting Up on Roadway	7 0.8%	233 2.3%	240 2.2%
Starting Up in Other Area	0 0.0%	8 0.1%	8 0.1%
Entering Parking	0 0.0%	20 0.2%	20 0.2%
Leaving Parking	2 0.2%	38 0.4%	40 0.4%
Entering Roadway	6 0.7%	90 0.9%	96 0.9%
Leaving Roadway	1 0.1%	15 0.1%	16 0.1%
Making U-Turn	0 0.0%	12 0.1%	12 0.1%
Overtaking or Passing	5 0.6%	49 0.5%	54 0.5%
Avoiding Object	1 0.1%	8 0.1%	9 0.1%
Avoiding Pedestrian	23 2.5%	86 0.8%	109 1.0%
Avoiding Vehicle (front/back)	6 0.7%	22 0.2%	28 0.3%
Avoiding Vehicle (angle)	0 0.0%	13 0.1%	13 0.1%
Driverless Moving	6 0.7%	49 0.5%	55 0.5%
Parked	46 5.1%	328 3.2%	374 3.4%
Avoiding Animal	0 0.0%	1 0.0%	1 0.0%
Negotiating a Curve	4 0.4%	18 0.2%	22 0.2%
<b>Total</b>	<b>902</b> <b>100.0%</b>	<b>10,172</b> <b>100.0%</b>	<b>11,074</b> <b>100.0%</b>

Figure 12 depicts how going straight ahead is the driver action with most crashes. The percent of fatal crashes are highest while being parked (12.3%), going straight ahead (11.0%), and the actions grouped as “other” (9.0%). Actions with a lower percentage of fatal crashes are backing at 2.6% and turning left/right at 1.1%.

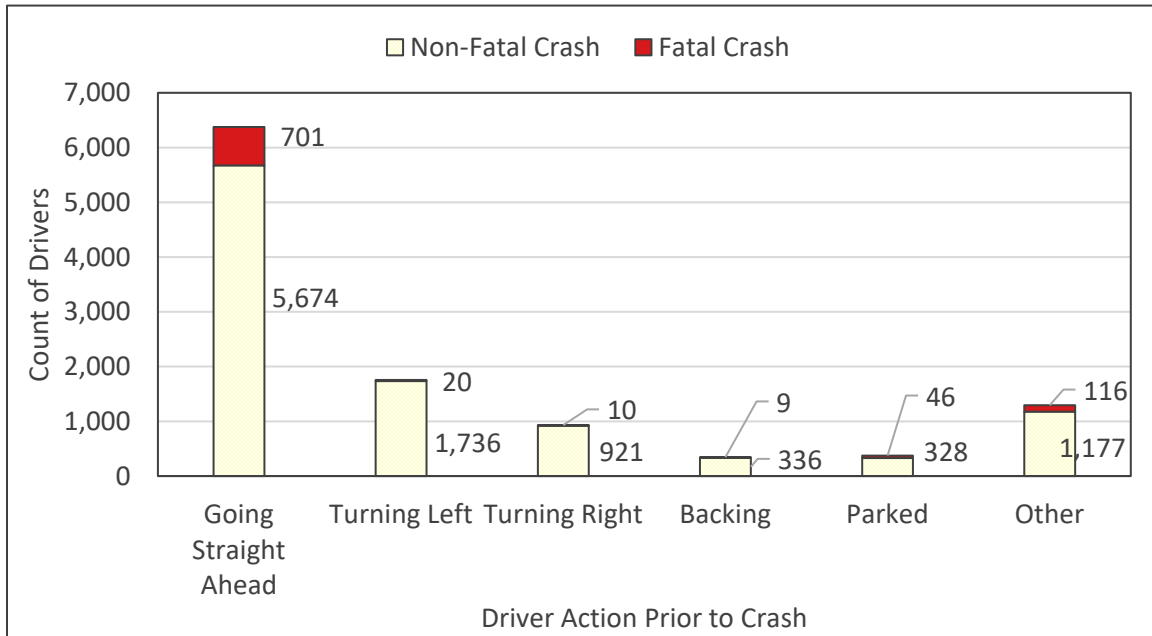


Figure 12 – Driver Crash Involvements by Action Prior to Crash in Pedestrian-Involved Crashes, 2016-2020

Table 9 has counts and percentages of hazardous actions by motor-vehicle drivers in pedestrian-involved crashes for both fatal and non-fatal crashes. Hazardous action was unknown or missing for 19.2% of the driver involvements in pedestrian-involved crashes, and these are excluded from Table 9. When hazardous action for drivers was known, no hazardous action was recorded for 47.5% of driver involvements overall, 45.9% of non-fatal involvements, and 66.2% of fatal involvements. For non-fatal involvements, the most common hazardous actions recorded were failed to yield (25.3%), “other” (8.4%), careless/negligent driving (6.0%), and unable to stop in assured clear distance (4.3%). The most common hazardous actions indicated in fatal involvements were “other” (8.9%), careless/negligent driving (6.5%), speed too fast (4.8%), and reckless driving (3.8%).

Table 9. Hazardous Action, 2016-2020

Hazardous Action	Fatal Crash Involvements	Non-Fatal Crash Involvements	Total Crash Involvements
None	511 66.2%	3,896 45.9%	4,407 47.5%
Speed Too Fast	37 4.8%	220 2.6%	257 2.8%
Speed Too Slow	0.0%	1 0.0%	1 0.0%
Failed to Yield	25 3.2%	2,147 25.3%	2,172 23.4%
Disregard Traffic Control	9 1.2%	151 1.8%	160 1.7%
Drove Wrong Way	0.0%	11 0.1%	11 0.1%
Drove Left of Center	3 0.4%	29 0.3%	32 0.3%
Improper Passing	2 0.3%	30 0.4%	32 0.3%
Improper Lane Use	8 1.0%	85 1.0%	93 1.0%
Improper Turn	2 0.3%	57 0.7%	59 0.6%
Improper/No Signal	0.0%	2 0.0%	2 0.0%
Improper Backing	3 0.4%	127 1.5%	130 1.4%
Unable to Stop in Assured Clear Distance	24 3.1%	365 4.3%	389 4.2%
Other	69 8.9%	710 8.4%	779 8.4%
Reckless Driving	29 3.8%	158 1.9%	187 2.0%
Careless/Negligent Driving	50 6.5%	508 6.0%	558 6.0%
<b>Total</b>	<b>772</b> <b>100.0%</b>	<b>8,497</b> <b>100.0%</b>	<b>9,269</b> <b>100.0%</b>

### 7.0 Impairment-Related Crashes

Table 10 compares impairment distributions for pedestrian-involved crashes and crashes involving only motor vehicles (no pedestrians or bicycles involved). Impairment status is based on what is reported by the police officer at the time of the crash for both pedestrians and drivers. The crashes are categorized into those not involving alcohol or drugs, involving alcohol-only, involving drugs-only, and crashes involving both alcohol and drugs. Pedestrian-involved crashes had higher levels of all three kinds of impairment compared with motor-vehicle-only crashes. About 9.2% of pedestrian-involved crashes involved alcohol only, 1.4% involved drugs only, and 1.7% involved both alcohol and drugs.

Table 10. Impairment Distributions for Pedestrian-Involved and Motor-Vehicle-Only Crashes, 2016-2020

Impairment	Pedestrian-Involved Crashes	Motor-Vehicle-Only Crashes
Alcohol Only	9.2%	2.8%
Drugs Only	1.4%	0.5%
Alcohol & Drugs	1.7%	0.4%
None	87.7%	96.3%
<b>Total</b>	<b>100%</b>	<b>100%</b>

In the five-year period, there were 1,164 pedestrian-involved crashes involving alcohol. Figure 13 shows the drinking status for the pedestrians and motor vehicle drivers in those crashes (33 drivers with unknown alcohol use were excluded). Of the 1,242 pedestrians in these crashes, 936 (75.4%) were drinking, while 324 (25.7%) of the 1,263 drivers were drinking.

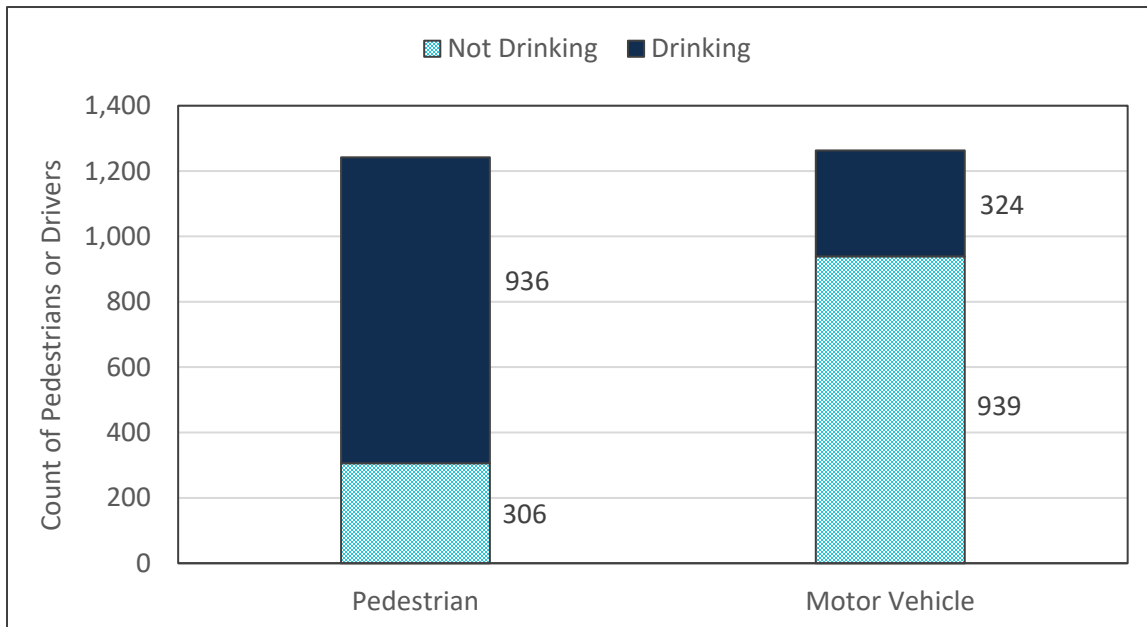


Figure 13 – Pedestrians and Drivers in Alcohol-Involved Pedestrian-Involved Crashes, 2016-2020

Figures 14 and 15 show day and time data for alcohol-involved pedestrian crashes, respectively. Figure 14 shows all pedestrian-involved crashes by day of the week according to whether the crash involved alcohol. Saturday had the highest number of pedestrian-involved crashes involving alcohol (250), followed by Friday (201), and Sunday (198). Pedestrian-involved crashes involving alcohol occurred more frequently on the weekends, with 18.2% on Saturday and 18.1% on Sunday.

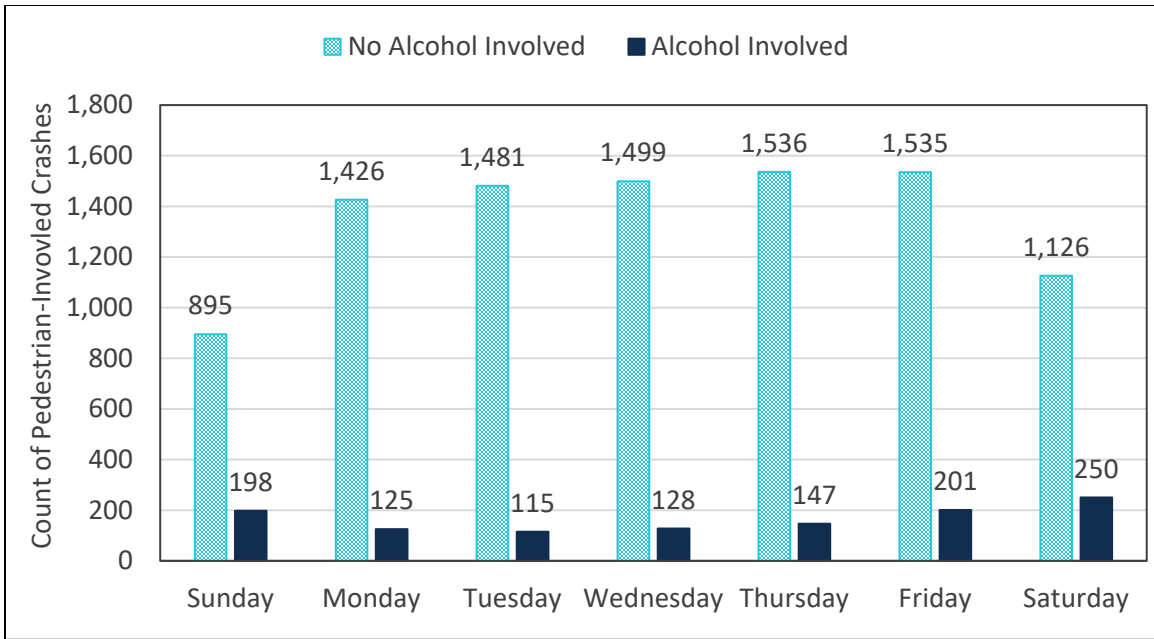


Figure 14 – Pedestrian-Involved Crashes by Day of Week and Alcohol Involvement, 2016-2020

Figure 15 depicts pedestrian-involved crashes by time of day, again split according to whether or not the crash involved alcohol. Late-night hours had the greatest percentages of alcohol-involved pedestrian-involved crashes, starting as early as 5 p.m. and extending until 6 a.m. Between midnight and 4 a.m., about 37% of pedestrian-involved crashes also involved alcohol, where either or both the pedestrian and the driver had been drinking.

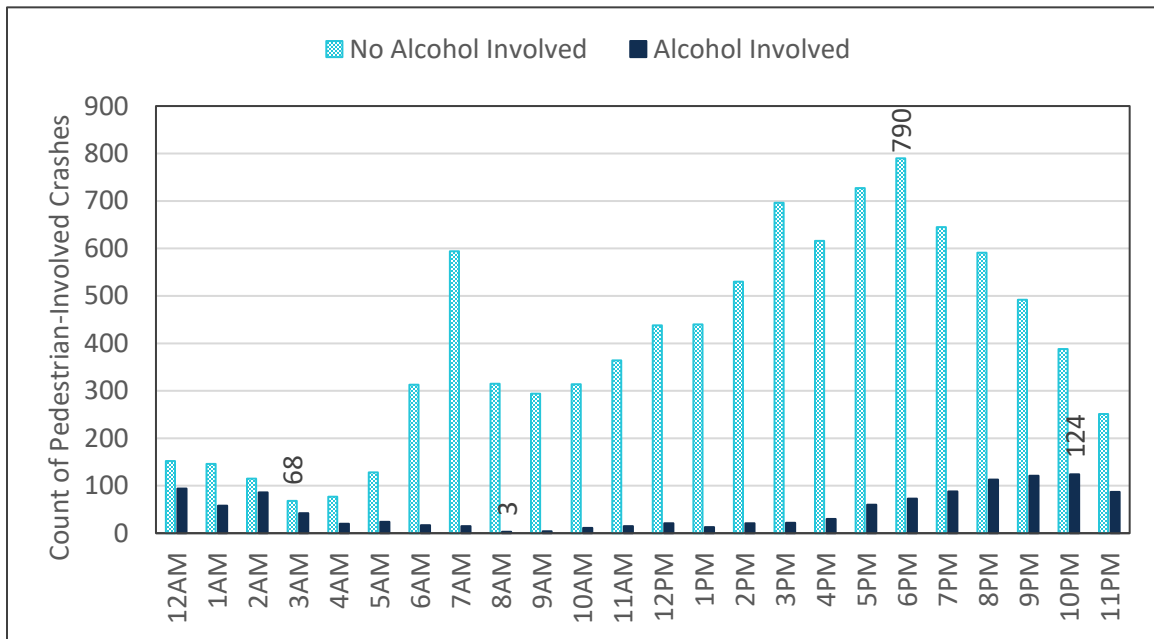


Figure 15 – Pedestrian-Involved Crashes by Time of Day and Alcohol Involvement, 2016-2020

## **8.0 Summary**

From 2016 through 2020 in Michigan, an average of 2,132 motor vehicle crashes involving a pedestrian occurred each year. In a typical year, 156 pedestrian-involved crashes involved at least one fatality. Probability of death or injury in pedestrian-involved crashes is much higher than in crashes involving only motor vehicles. While only 17.5% of crashes involving just motor vehicles resulted in death or injury, 87.0% of pedestrian-involved crashes resulted in death or injury to at least one person (almost always a pedestrian).

Pedestrian-involved crashes commonly occurred during daylight, although 51.7% of suspected serious injury crashes and 74.6% of fatal pedestrian-involved crashes took place under dark conditions. More pedestrian-involved crashes occurred on each of the weekday days than the weekend days. Late afternoon/evening hours and during the 7:00 a.m. hour were peak times for pedestrian-involved crashes.

A comparison of pedestrian actions prior to fatal and non-fatal crashes showed the actions crossing not at intersection, in roadway with traffic, and standing/laying in roadway to be over-represented among fatal pedestrian-involved crashes. For drivers in pedestrian-involved crashes, the actions going straight ahead, changing lanes, avoiding pedestrian, and parked were more common in fatal crashes than non-fatal crashes. Crashes with one parked vehicle typically involved a pedestrian associated with that vehicle in some way and another vehicle that struck both the pedestrian and the parked vehicle.

Impairment was a particular problem in pedestrian-involved crashes. Alcohol and/or drugs were a factor in 12.3% of pedestrian-involved crashes, compared with 3.7% of crashes involving only motor vehicles. For pedestrian-involved crashes that involved alcohol, alcohol use was reported for the pedestrians about three times as often as for the motor vehicle drivers.