Distracted Driving Related Crashes in Michigan: 2016-2019

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1.0 Executive Summary

This report examines distracted-driving crash patterns in Michigan from 2016 through 2019. Key findings include:

- About 5.6% of police-reported crashes from 2016-2019 involved at least one distracted motor vehicle driver.
- Crashes involving distracted drivers tended to be more severe than crashes involving non-distracted drivers.
- About 56.4% of distracted drivers were involved in rear-end collisions, compared with 36.4% of non-distracted drivers.
- Distracted drivers who were involved in rear-end crashes were overwhelmingly the striking vehicle rather than the struck vehicle.
- Distracted driving occurred more often in less demanding driving situations, such as in daylight and clear weather conditions.
- Distracted driving was more prevalent among drivers under the age of 35 compared with drivers 35 and older.
- Crash-involved drivers age 16 to 19 had a higher incidence of distracted driving (7.8%) than any other driver age group.
- Relatively more distracted drivers were reported to have been drinking at the time of the crash compared with non-distracted drivers.

2.0 Introduction

This report examines distracted-driving traffic crash patterns in Michigan from 2016 through 2019. 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. Prior to 2016, Michigan crash data included one variable to indicate whether the driver was distracted and another to indicate whether the driver was using a cell phone. In 2016, a new variable was added to show whether the driver was distracted and to specify the type of distraction for those drivers who were distracted, thus replacing the previous distracted driving variables. With this coding change, the number of distracted-driving crashes rose from about 4,000-5,000 a year to nearly 13,000 in 2016. The variable changes make it difficult to compare the number of distracted-driving crashes before and after the changes, so this report only focuses on distracted-driving crashes from 2016 through 2019.

Distracted driving is often underreported, as it is difficult to determine driver behaviors and actions at the time of the crash unless they are reported by involved parties or witnesses. Given that Michigan laws prohibit texting while driving and any cell phone use by teen drivers with Level 1 or Level 2 Graduated Driver Licenses, people may be reluctant to report distraction. However, cell phone use and general distracted driving contribute to many crashes, particularly for young drivers. The National Highway Traffic Safety Administration (NHTSA) estimates that 938,000 crashes (14% of all police-reported crashes) in 2018 involved a distracted driver (*Traffic Safety Facts Research Note*, "Distracted Driving 2018," April 2020). NHTSA further reports that 2,841 people were killed in 2018 and an estimated additional 400,000 were injured in distracted-driving crashes. The 15-19 year-old driver age group had the largest proportion of distracted drivers in fatal crashes.

While pedestrians and bicyclists may also be coded as being distracted, this report is confined to driver distraction for drivers of motor vehicles. The report analyzes police-reported crashes in Michigan from 2016-2019 and considers distracted-driving crashes to be those where at least one driver of a motor vehicle was coded under a type of distraction on the driver distraction variable. The UD-10 Instruction Manual notes that "distractions are actions or sources that may have influenced driver or non-motorist performance." The driver distraction variable has the following code levels:

- Not distracted
- Manually operating an electronic communications device (texting, typing, dialing)
- Talking on hands-free device
- Talking on hand-held device
- Other activity, electronic device (book player, navigation aid)
- Passenger
- Other activity inside vehicle (eating, personal hygiene, reaching for object, reading the paper, dog on lap, etc.)
- Activity outside vehicle (includes unspecified external distractions)
- Unknown (officer cannot determine if driver was distracted at the time of the crash)
- Uncoded & errors

Distracted drivers are those coded as any level except not distracted, unknown, and uncoded & errors. The analyses in this report aim to highlight factors that are associated with distracted-driving crashes.

3.0 Distracted Driver Crash Counts, Types, and Severity

3.1 Crash Counts

Table 1 shows the number of crashes from 2016-2019 that involved at least one distracted motor vehicle driver. The percentage of distracted-driving crashes out of all crashes rose from 4.1% in 2016 to 6.4% in 2017 before falling slightly to 6.1% in 2018 and down to 5.8% in 2019. The apparent rise in the percentage of distracted-driving crashes from 2016 to 2017 may partly reflect issues with recording the distracted driving variable, since it was new in 2016. This will be examined further in the discussion of Table 2 on the following page.

Table 1. Distracted-Driving Crashes, 2016-2019

Year	Distracted Crashes	All Crashes	Percent Distracted
2016	12,788	312,172	4.1%
2017	20,115	314,921	6.4%
2018	18,927	312,798	6.1%
2019	18,096	314,376	5.8%
Total	69,926	1,254,267	5.6%

Table 2 on the following page shows counts of all motor vehicle drivers involved in crashes from 2016-2019, categorized according to the different levels of the driver distraction variable. The 69,926 distracted-driving crashes in 2016-2019 involved a total 70,832 distracted drivers—one crash can potentially have more than one driver who is distracted. Cell phone use is captured by the code levels communication device, hands-free device, and hand-held device. Of all drivers in crashes from 2016-2019 who were reported to be distracted, cell phone use was the type of distraction for 15.1% of these drivers. In comparison, the type of distraction was other electronic devices for 10.8% of the distracted drivers, passengers for 6.4%, other activities in the vehicles for 34.2%, and activities outside the vehicles for 33.6%.

Table 2. Drivers in Crashes by Driver Distraction, 2016-2019. Percentages in parentheses exclude unknown and uncoded & errors.

Driver Distraction	2016	2017	2018	2019	Total
Not Distracted	221,214 (94.5%)	401,872 (95.2%)	402,646 (95.5%)	406,268 (95.7%)	1,432,000
Communication Device	1,228 (0.5%)	2,146 (0.5%)	2,050 (0.5%)	1,981 (0.5%)	7,405
Hands-Free Device	133 (0.1%)	172 (0.0%)	177 (0.0%)	187 (0.0%)	669
Hand-Held Device	532 (0.2%)	758 (0.2%)	690 (0.2%)	614 (0.1%)	2,594
Electronic Device - other	1,331 (0.6%)	2,161 (0.5%)	2,165 (0.5%)	2,001 (0.5%)	7,658
Passenger	976 (0.4%)	1,353 (0.3%)	1,105 (0.3%)	1,071 (0.3%)	4,505
Other Activity Inside Vehicle	4,258 (1.8%)	7,046 (1.7%)	6,536 (1.5%)	6,392 (1.5%)	24,232
Activity Outside Vehicle	4,529 (1.9%)	6,728 (1.6%)	6,444 (1.5%)	6,068 (1.4%)	23,769
Unknown	57,801	107,277	110,459	110,724	386,261
Uncoded & Errors	246,410	10,874	1,951	415	259,650
Total	538,412	540,387	534,223	535,721	2,148,743

One notable feature of Table 2 is the large number of drivers in the "uncoded and errors" category of distraction in 2016 compared with 2017, 2018, and 2019. The new reporting form was introduced at the beginning of 2016 and it is clear from the data (see also the "month of the year" section on p. 7) that police were learning to use this field throughout 2016. However, when we remove unknown and uncoded and errors, the relative proportion of each distraction is very similar between 2016 and 2017-2019. Thus, the remaining analyses exclude drivers marked unknown or uncoded and errors on the driver distraction variable.

3.2 Crash Severity

Table 3 shows drivers involved in crashes according to the different levels of the driver distraction variable (with "unknown" and "uncoded and errors" levels excluded). The crash involvements are tabulated according to the worst injury in the crash. Each cell of the table shows the count of drivers and the row percent. For example, the top left cell indicates that there were 2,506 drivers coded as not distracted who were involved in fatal crashes. These fatal crash involvements made up 0.2% of all crash involvements of non-distracted drivers. The crash severity column headed PDO stands for property damage only, meaning no injuries were reported in the crash.

Table 3 indicates that crash severity distributions were more severe for distracted drivers than non-distracted drivers for every type of distraction coded. For example, about 70.0% of drivers who were coded as being distracted by a communication device were in PDO crashes, while 30.0% of these

distracted drivers were in injury or fatal crashes. For non-distracted drivers, 80.5% were PDO crashes and only 19.5% were injury or fatal crashes.

Table 3. Drivers in Crashes by Driver Distraction and Crash Severity, 2016-2019

Driver Distraction	Fatal	Injury	PDO	Total
Not Distracted	2,506 (0.2%)	277,026 (19.3%)	1,152,468 (80.5%)	1,432,000 (100.0%)
Communication Device	33 (0.4%)	2,188 (29.5%)	5,184 (70.0%)	7,405 (100.0%)
Hands-Free Device	6 (0.9%)	186 (27.8%)	477 (71.3%)	669 (100.0%)
Hand-Held Device	19 (0.7%)	675 (26.0%)	1,900 (73.2%)	2,594 (100.0%)
Electronic Device - Other	22 (0.3%)	2,213 (28.9%)	5,423 (70.8%)	7,658 (100.0%)
Passenger	26 (0.6%)	1,468 (32.6%)	3,011 (66.8%)	4,505 (100.0%)
Other Activity Inside Vehicle	64 (0.3%)	6,823 (28.2%)	17,345 (71.6%)	24,232 (100.0%)
Activity Outside Vehicle	69 (0.3%)	5,360 (22.6%)	18,340 (77.2%)	23,769 (100.0%)
Total	2,745 (0.2%)	295,939 (19.7%)	1,204,148 (80.1%)	1,502,832 (100.0%)

Note: Drivers coded “unknown” or “uncoded & errors” on driver distraction are excluded from Table 3.

3.3 Crash Type

In Table 4, the levels of the driver distraction variable are categorized according to crash type. Table 4 has counts of driver involvements, and the “unknown” and “uncoded and errors” levels of driver distraction are excluded. Additionally, three code levels of crash type—rear-end, rear-end right turn, and rear-end left turn—have been combined into a “rear-end” category, and cases coded “other,” “unknown,” or “uncoded and errors” on crash type have been excluded. Each row of the table lists how many drivers with a particular distraction level were involved in each type of crash, as well as the distribution of the crash types.

Table 4 indicates that a higher proportion of distracted drivers were involved in rear-end crashes compared with non-distracted drivers. About 36.4% of non-distracted drivers were involved in rear-end crashes. Distracted drivers in each of the different distraction categories had a higher percentage of rear-end crash involvements, including 59.2% for drivers distracted by other electronic devices and 63.5% for drivers distracted by other activity inside the vehicle. For all distracted drivers together, 56.4% were involved in rear-end collisions. If we look at the first impact point on vehicles driven by distracted drivers in rear-end crashes, we find that 94.3% of the vehicles had front damage, 5.0% had rear damage, and 0.7% had damage to another area. This suggests that distracted drivers in rear-end collisions were overwhelmingly the striking vehicle rather than the struck vehicle.

Table 4. Drivers in Crashes by Driver Distraction and Crash Type, 2016-2019

Driver Distraction	Single Vehicle	Head-on	Head-on/ Left Turn	Angle	Rear-end	Side-swipe Same Dir.	Side-swipe Opp. Dir.	Back-ing	Total
Not Distracted	309,130 (22.7%)	15,751 (1.2%)	44,861 (3.3%)	258,935 (19.0%)	496,161 (36.4%)	185,827 (13.6%)	26,164 (1.9%)	27,301 (2.0%)	1,364,130 (100.0%)
Communication Device	1,604 (22.3%)	165 (2.3%)	115 (1.6%)	683 (9.5%)	3,914 (54.3%)	541 (7.5%)	158 (2.2%)	27 (0.4%)	7,207 (100.0%)
Hands-Free Device	115 (18.1%)	8 (1.3%)	18 (2.8%)	120 (18.8%)	277 (43.5%)	82 (12.9%)	12 (1.9%)	5 (0.8%)	637 (100.0%)
Hand-Held Device	421 (17.0%)	48 (1.9%)	75 (3.0%)	463 (18.7%)	1,070 (43.2%)	309 (12.5%)	56 (2.3%)	37 (1.5%)	2,479 (100.0%)
Electronic Device - other	1,214 (16.2%)	110 (1.5%)	90 (1.2%)	835 (11.2%)	4,426 (59.2%)	625 (8.4%)	132 (1.8%)	40 (0.5%)	7,472 (100.0%)
Passenger	904 (20.7%)	56 (1.3%)	82 (1.9%)	744 (17.0%)	2,113 (48.4%)	348 (8.0%)	53 (1.2%)	69 (1.6%)	4,369 (100.0%)
Other Activity Inside Vehicle	4,522 (19.1%)	411 (1.7%)	176 (0.7%)	1,620 (6.8%)	15,080 (63.5%)	1,278 (5.4%)	523 (2.2%)	125 (0.5%)	23,735 (100.0%)
Activity Outside Vehicle	2,971 (13.3%)	335 (1.5%)	529 (2.4%)	2,692 (12.0%)	11,604 (51.8%)	2,852 (12.7%)	467 (2.1%)	943 (4.2%)	22,393 (100.0%)
Total	320,881 (22.4%)	16,884 (1.2%)	45,946 (3.2%)	266,092 (18.6%)	534,645 (37.3%)	191,862 (13.4%)	27,565 (1.9%)	28,547 (2.0%)	1,432,422 (100.0%)

Note: Drivers coded "unknown" or "uncoded & errors" on driver distraction are excluded from Table 4 as are drivers in crash types coded "other," "unknown," or "uncoded & errors".

Table 4 also indicates that involvements in head-on and sideswipe/opposite direction crashes are slightly more common for distracted drivers than non-distracted drivers. About 1.2% of the crash involvements of non-distracted drivers were in head-on crashes, compared with 1.7% for all distracted drivers. Sideswipe/opposite direction crashes represented 1.9% of the non-distracted driver involvements and 2.1% of the distracted driver involvements. While head-on and sideswipe/opposite direction crashes are much less common than rear-end crashes, they tend to be more severe than rear-end crashes (especially head-on crashes).

4.0 Temporal Factors

4.1 Month of Year

To facilitate the comparison of distracted and non-distracted drivers, the 1,432,000 non-distracted drivers in crashes in 2016-2019 were compared with the 70,832 drivers coded with any of the seven possible types of distraction to see if their crash involvements varied according to different factors. Table 5 shows the count and percentage of distracted and not-distracted drivers by month for 2016-2019. The 2016 data year is shown separately from 2017-2019 because the patterns in 2016 reflect the gradually increasing use of the distraction codes by police officers through the year, whereas the 2017-2019 data reflect the actual patterns of distraction. In general, the number of non-distracted drivers

peaks in the later months (October through December), whereas distracted drivers are in crashes most often in the warmer months (May through October).

Table 5. Drivers in Crashes by Driver Distraction and Crash Month, 2016-2019

Month	2016				2017-2019			
	Not Distracted		Distracted		Not Distracted		Distracted	
January	1,283	0.6%	81	0.6%	111,864	9.2%	3,787	6.5%
February	2,314	1.0%	116	0.9%	92,068	7.6%	3,777	6.5%
March	2,855	1.3%	167	1.3%	91,548	7.6%	4,399	7.6%
April	7,653	3.5%	583	4.5%	82,734	6.8%	4,446	7.7%
May	14,042	6.3%	1,006	7.7%	97,026	8.0%	5,284	9.1%
June	16,000	7.2%	1,192	9.2%	98,218	8.1%	5,553	9.6%
July	17,277	7.8%	1,286	9.9%	90,263	7.5%	5,417	9.4%
August	20,133	9.1%	1,447	11.1%	92,047	7.6%	5,541	9.6%
September	30,553	13.8%	1,897	14.6%	94,792	7.8%	5,264	9.1%
October	33,547	15.2%	1,920	14.8%	120,019	9.9%	5,531	9.6%
November	34,768	15.7%	1,735	13.4%	122,623	10.1%	4,504	7.8%
December	40,789	18.4%	1,557	12.0%	117,584	9.7%	4,342	7.5%

4.2 Day of Week

Table 6 shows the breakdown of day of the week for crash-involved distracted and non-distracted drivers. The day of the week distributions are very similar between distracted and non-distracted drivers.

Table 6. Drivers in Crashes by Driver Distraction and Day of Week, 2016-2019

	Not Distracted		Distracted	
Day	**Count**	**Percent**	**Count**	**Percent**
Sunday	127,166	8.9%	6,734	9.5%
Monday	215,905	15.1%	10,628	15.0%
Tuesday	225,488	15.7%	10,931	15.4%
Wednesday	229,120	16.0%	11,081	15.6%
Thursday	228,189	15.9%	10,844	15.3%
Friday	242,995	17.0%	12,217	17.2%
Saturday	163,137	11.4%	8,397	11.9%
Total	1,432,000	100.0%	70,832	100.0%

4.3 Time of Day

Figure 1 plots the percentage of crash involvements according to the hour of the day for distracted and non-distracted drivers in 2016-2019. The two groups had generally similar crash involvement patterns across the hours of the day. Compared to involvements of non-distracted drivers, distracted-driver

involvements were slightly more likely to occur between 3 PM and 6 PM and slightly less likely to occur between 5 AM and 8 AM.

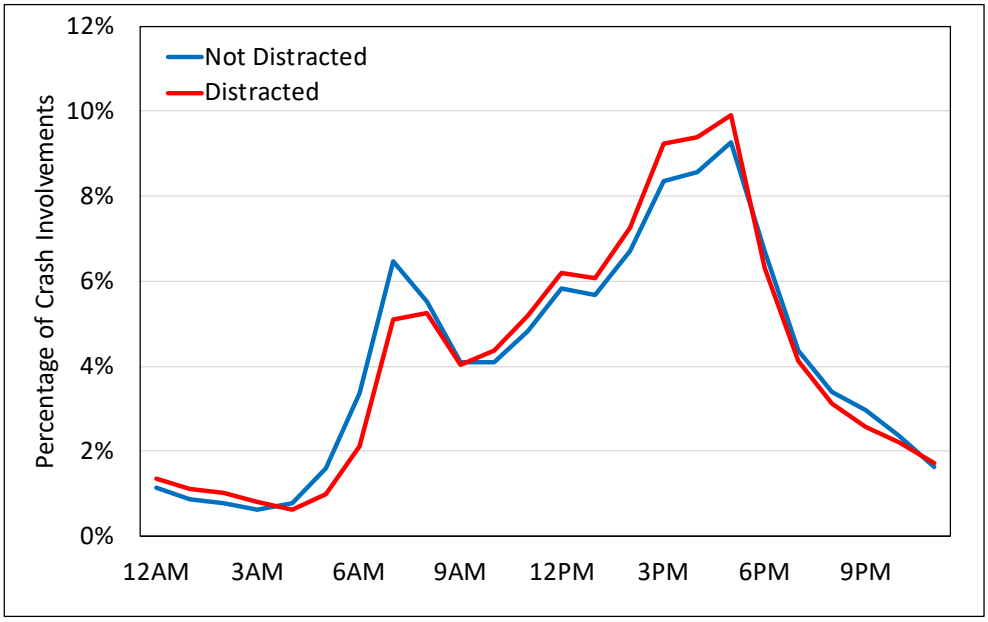

Figure 1 – Distracted and Non-Distracted Drivers in Crashes by Time of Day

5.0 External/Environmental Conditions

5.1 Light Conditions

Table 7 compares the two groups of drivers according to light condition at the time of the crash. A total of 74.9% of the distracted drivers were involved in crashes in daylight, compared with 68.9% of the non-distracted drivers. In contrast, 13.8% of the non-distracted drivers were involved in crashes during dark, unlighted conditions, compared with 8.9% of the distracted drivers. The data do not allow us to determine why the two distributions differ. It may be that drivers are less likely to engage in distracting activities during more challenging driving conditions such as darkness. Alternatively, a much greater share of crashes in dark, unlighted conditions are single-vehicle crashes, so distracted driving may be less likely to be reported for these crashes.

Table 7. Drivers in Crashes by Driver Distraction and Light Condition, 2016-2019

	Not Distracted		Distracted	
Light Condition	**Count**	**Percent**	**Count**	**Percent**
Daylight	987,123	68.9%	53,022	74.9%
Dawn	50,015	3.5%	1,681	2.4%
Dusk	36,745	2.6%	1,694	2.4%
Dark Lighted	158,085	11.0%	7,931	11.2%
Dark Unlighted	197,202	13.8%	6,294	8.9%
Other/Unknown	2,830	0.2%	210	0.3%
Total	1,432,000	100.0%	70,832	100.0%

5.2 Weather Conditions

In a similar vein, Table 8 suggests that drivers are self-regulating to avoid distractions when the weather is worse. Compared with non-distracted drivers, distracted drivers were more likely to be involved in crashes in clear or cloudy weather and less likely to be involved in crashes when it was raining or snowing.

Table 8. Drivers in Crashes by Driver Distraction and Weather Condition, 2016-2019

Weather Condition	Not Distracted		Distracted	
	Count	Percent	Count	Percent
Clear	828,550	57.9%	44,871	63.3%
Cloudy	319,699	22.3%	17,310	24.4%
Rain	138,479	9.7%	5,454	7.7%
Snow	111,905	7.8%	2,083	2.9%
Other/unknown	33,367	2.3%	1,114	1.6%
Total	1,432,000	100.0%	70,832	100.0%

5.3 Speed Limit

Figure 2 shows the distributions of crash involvements for distracted and non-distracted drivers according to the speed limit at the crash site. The two distributions are similar, but the distribution for distracted drivers skews slightly towards lower speed limits. For example, while 15.7% of distracted driver crash involvements occurred in speed limit areas of 25 mph, this was the case for only 11.3% of non-distracted driver crash involvements. The non-distracted drivers had slightly higher percentages of crash involvements in 45 and 55 mph areas compared with the distracted drivers. Interestingly, crash involvements in 70 mph zones made up about 11% of the crash involvements of both groups of drivers.

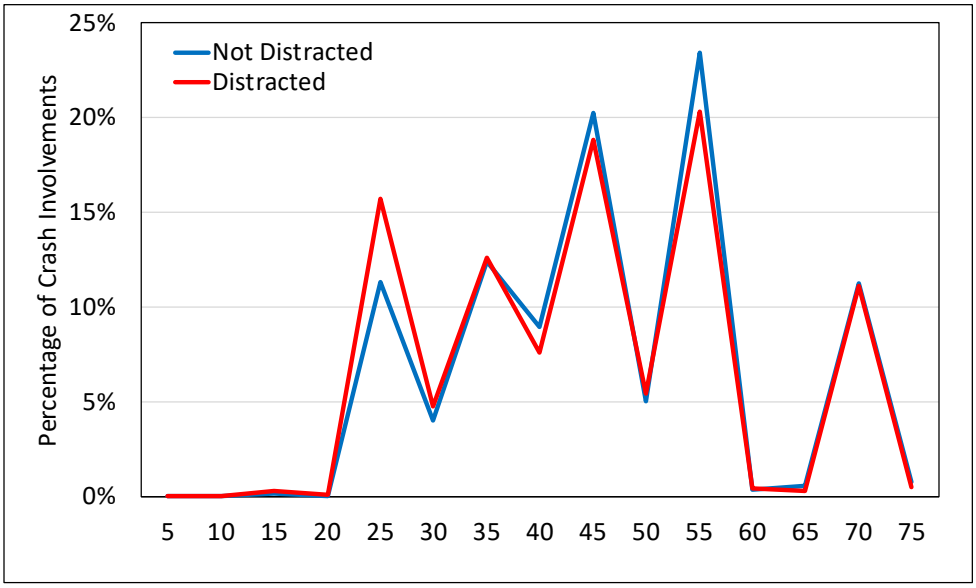

Figure 2 – Crash Involvements by Posted Speed Limit

6.0 Driver Factors

6.1 Driver Age

Table 9 categorizes drivers of known age in terms of whether or not the drivers were reported to have been distracted. The distracted group of drivers has a younger age distribution than the non-distracted drivers. A total of 14.7% of the distracted drivers were in the 16-19 age group compared with 8.4% of the non-distracted drivers. Similarly, drivers 20-24 comprised 18.1% of the distracted group but just 12.4% of the non-distracted group. In contrast, drivers 65 and older accounted for 11.6% of non-distracted drivers and just 7.8% of distracted drivers.

Table 9. Crash Involvements by Driver Age and Distraction, 2016-2019

	Not Distracted		Distracted	
Driver Age	**Count**	**Percent**	**Count**	**Percent**
<16	2,138	0.2%	128	0.2%
16-19	119,938	8.4%	10,130	14.7%
20-24	177,190	12.4%	12,485	18.1%
25-34	293,140	20.6%	16,542	24.0%
35-44	231,712	16.3%	9,771	14.1%
45-64	435,426	30.6%	14,657	21.2%
65+	164,541	11.6%	5,353	7.8%
Total	1,424,085	100.0%	69,066	100.0%

Note: Drivers of unknown age are excluded from Table 9.

Figure 3 shows the percentage of crash-involved drivers in each age group who were reported to be distracted. Drivers 16-19 had the highest percent of distracted drivers at 7.8%. Next were drivers age 20-24 (6.6%), followed by drivers under age 16 (5.6%). The lowest percentages of distracted drivers were found among drivers 65 and older (3.2%) and drivers 45-64 (3.3%).

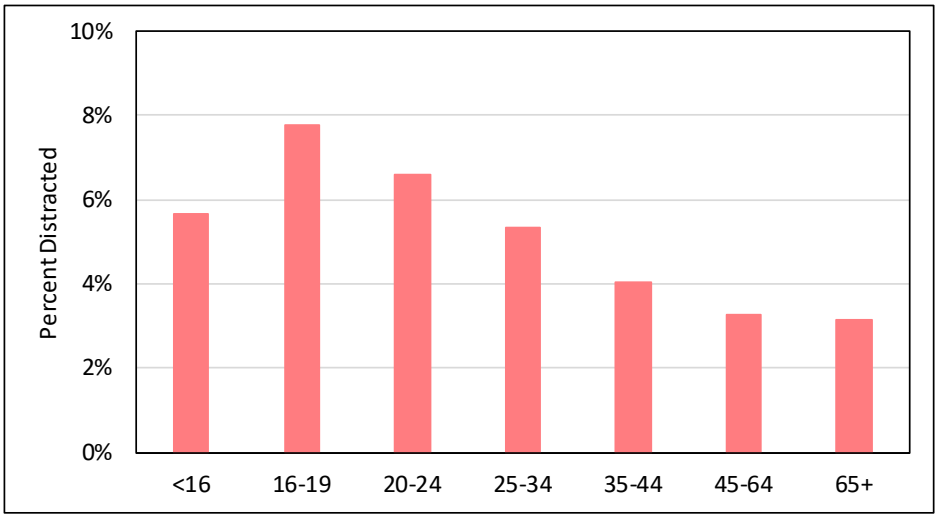

Figure 3 – Percentage of Drivers in Each Age Group Who Were Distracted

6.2 Driver Drinking

Table 10 examines the relationship between driver drinking and driver distraction from two perspectives. The top half of the table shows the percentage of drinking drivers according to their distraction status (column percents). Relatively more distracted drivers were reported to have been drinking at the time of the crash compared with non-distracted drivers. While 3.9% of distracted drivers were reported to have been drinking, this was true of only 1.2% of non-distracted drivers. This means that distracted drivers were 3.3 times more likely to have been drinking compared with non-distracted drivers.

The bottom portion of Table 10 shows the percentage of distracted drivers according to their drinking status (row percents). Drinking drivers were more likely to have been distracted than non-drinking drivers. About 14.1% of drinking drivers were reported to have been distracted, compared with 4.6% of drivers who had not been drinking. Previous research has suggested that drivers under the influence of alcohol are less able to manage divided attention compared with their sober counterparts (Harrison and Fillmore, *Drug and Alcohol Dependence* 117(1):31-37, 2011.

Table 10. Crash Involvements by Driver Drinking and Distraction, 2016-2019

Driver	Not Distracted		Distracted		Total	
Alcohol Use	Count	Percent	Count	Percent	Count	Percent
Driver Not Drinking	1,415,022	98.8%	68,095	96.1%	1,483,117	98.7%
Driver Drinking	16,667	1.2%	2,727	3.9%	19,394	1.3%
Total	1,431,689	100.0%	70,822	100.0%	1,502,511	100.0%
Driver Not Drinking	1,415,022	95.4%	68,095	4.6%	1,483,117	100.0%
Driver Drinking	16,667	85.9%	2,727	14.1%	19,394	100.0%
Total	1,431,689	95.3%	70,822	4.7%	1,502,511	100.0%

Note: Drivers of unknown drinking status are excluded from Table 10.

7.0 Summary

This report examined distracted-driving crashes for the most recent four years of data (2016-2019), rather than five, because of coding changes in Michigan crash reports that were implemented in 2016. The percentage of all police-reported crashes involving at least one driver who was considered to be distracted rose from 4% in 2016 to about 6% in 2017, 2018, and 2019, although the 2016 numbers were influenced by changes in how police used the new variable. Crashes involving distracted drivers were found to be more severe than those without distracted drivers. Distracted drivers were more likely to be in rear-end collisions (overwhelmingly as the striking vehicle) compared with non-distracted drivers, and they were slightly more likely to be involved in head-on and sideswipe/opposite direction crashes.

Compared with non-distracted drivers, distracted drivers were more likely to be involved in crashes during daylight, in favorable weather conditions, on lower speed roads, and during the months of April through September. This suggests that drivers are less prone to distractions when the driving task is more demanding. Younger drivers and drunk drivers were more likely to be distracted than older drivers and non-drinking drivers. Increased awareness, driver education (particularly among young drivers), and strict enforcement of cell phone laws may help to address distracted-driving crashes.