Michigan's Upper Peninsula Crash Experience: 2015-2019

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Contents

1.0 Executive Summary

This report analyzes police-reported traffic crashes in the Upper Peninsula of Michigan (the UP), primarily from 2015-2019. Key findings include:

- Of the 9,140 police-reported crashes in the UP in 2019, 37 were fatal (0.4%) and 200 (2.2%) involved a suspected serious injury.
- From 1982 to 2019, the number of police-reported crashes in the UP decreased 17.9%, the number of fatalities declined 31.0%, and the number of injuries dropped 56.3%.
- Marquette, Delta, Chippewa, and Houghton Counties had the highest crash counts, accounting for about 55% of all police-reported crashes in the UP from 2015 through 2019.
- All police-reported crashes peak in November (11.6%), December (11.0%), and January (10.5%) in the UP. Crashes involving a fatality, suspected serious injury, or suspected minor injury (KAB crashes) have the highest counts in August (12.3%), July (11.1%), and June (10.0%).
- From 2015-2019 in the UP, 55.9% of all crashes and 66.7% of KAB crashes occurred in daylight conditions.
- More than a third (38.3%) of all police-reported crashes in the UP involved a deer, but 98.0% of the deer crashes were property damage only.
- Over the past five years, the UP experienced an average of 2,521 winter weather crashes, defined as those occurring under icy, snowy, or slushy road conditions.
- From 2015-2019 in the UP, 59.2% of the crash involvements of motorcycles were in crashes where at least one person was killed or sustained suspected serious or suspected minor injuries (KAB injuries).
- Speed too fast was the most common hazardous action among crash-involved drivers in the UP. An average of 145 KAB injuries occurred per year as a result of speeding crashes.
- Alcohol was involved in 3.7% of crashes in the UP, but 17.2% of KAB injuries occurred in crashes involving alcohol.
- Among crash-involved drivers 65 and older in the UP, 63.7% were male and 36.3% were female.

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. This report looks at the traffic crash experience of the fifteen counties in Michigan's Upper Peninsula (the UP). Compared with the rest of Michigan, the UP is more rural, skews older in population, and has harsher winters, all of which affect the nature of traffic crashes. Most of the analyses in the report are focused on police-reported crashes from the most recent five years of data, 2015-2019. Crashes are examined in terms of a variety of factors, including month, light condition, vehicle type, hazardous action, impairment, and more.

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, with "property damage only" (PDO) referring to crashes where no one was killed or injured. A special emphasis is placed on KAB crashes in this report, including mileage-based rates of KAB injuries by county and crash type.

3.0 UP Crashes over Time and by County

3.1 Crash Trends

To help put crash statistics from recent years in an historical context, Figure 1 on the following page charts trends in the number of crashes, fatalities, and injuries in the Upper Peninsula from 1982 through 2019. The black solid line in Figure 1 (plotted against the left-axis) charts the total count of police-reported crashes each year. Crashes generally rose from 11,137 in 1982 to a peak of 18,656 in 1995 before trending back down again. The 2019 crash count of 9,140 was an increase of 2.1% from 8,948 in 2018 but was down 17.9% from 1982 and down 51.0% from the high-point in 1995.

The blue dashed line in Figure 1 (plotted against the right-axis) charts annual fatalities. This number has vacillated, but after spiking in 1993 the general trend has been downward. Fatalities decreased 31.0% from 58 in 1982 to 40 in 2019, and the 2019 number is a drop of 52.4% since the high count of 84 in 1993. However, the 2019 fatality total of 40 represented a rise of 14.3% from the 35 fatalities in 2018.

The green dashed line in Figure 1 (plotted against the left-axis) tracks the number of people injured in crashes each year. From 3,546 injuries in 1982, this number rose to 4,124 in 1989 and has generally fallen since. The number injured has stayed below 2,000 every year since 2010. The 1,548 injuries in 2019 is down 56.3% from 1982 and down 62.5% from the high-point in 1989.

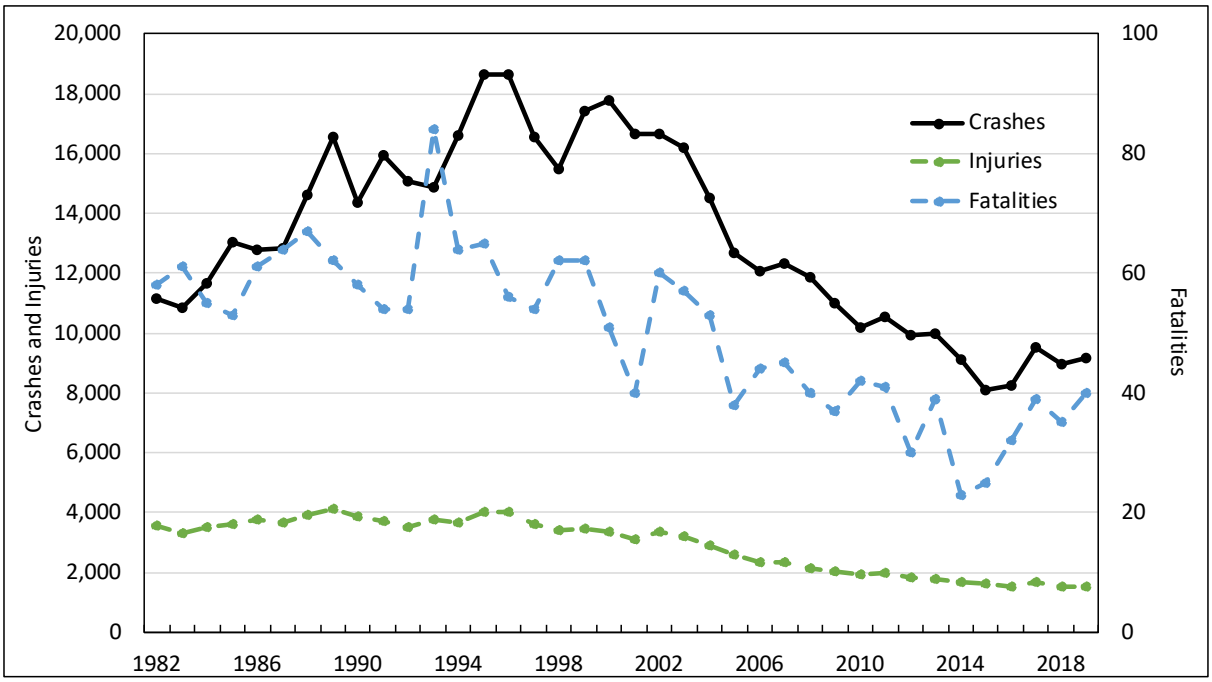

Figure 1 – Crashes, Injuries, and Fatalities in the UP from 1982-2019

Table 1 shows the number of crashes in the UP from 2015-2019 according to the worst degree of injury suffered in the crash. About 86.3% of all crashes during this time resulted in property damage only. A fatality occurred in 0.4% of all crashes, while the worst degree of injury was A in 2.1% of crashes, B in 3.7%, and C in 7.6%.

Table 1. Severity of Crashes in the UP

Crashes in the Upper Peninsula						
Worst Injury in the Crash	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**
Fatal (K)	25	29	35	33	37	159
Suspected Serious Injury (A)	166	166	195	182	200	909
Suspected Minor Injury (B)	286	349	333	338	318	1,624
Possible Injury (C)	735	648	706	633	612	3,334
Property Damage Only (O)	6,887	7,072	8,273	7,762	7,973	37,967
Total	8,099	8,264	9,542	8,948	9,140	43,993

3.2 Crash Distributions by County

Crash counts from 2015 to 2019 for each of the fifteen counties in the UP are shown in Table 2. Given that the UP counties vary in population, it is not surprising that they also vary in number of crashes. With a total of 8,828, Marquette had the greatest number of crashes, and Keweenaw had the lowest

number with 370. While crashes typically occurred at the rate of nearly five per day in Marquette County, crashes took place at the average rate of just over one every five days in Keweenaw County.

Table 2. Crashes in the UP by County

Crashes in the Upper Peninsula						
County	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**
Alger	248	280	314	316	285	1,443
Baraga	259	285	349	323	290	1,506
Chippewa	867	890	980	924	934	4,595
Delta	1,148	1,153	1,334	1,237	1,316	6,188
Dickinson	781	793	957	851	899	4,281
Gogebic	219	228	226	258	234	1,165
Houghton	836	946	996	858	863	4,499
Iron	395	423	556	490	476	2,340
Keweenaw	64	79	93	73	61	370
Luce	165	140	192	181	180	858
Mackinac	428	414	578	633	660	2,713
Marquette	1,772	1,704	1,820	1,729	1,803	8,828
Menominee	428	390	427	361	428	2,034
Ontonagon	253	259	322	329	289	1,452
Schoolcraft	236	280	398	385	422	1,721
Total	8,099	8,264	9,542	8,948	9,140	43,993

Figure 2 shows the share of crashes from 2015-2019 in each of the UP counties. Marquette County had the highest share with 20.1% of all police-reported crashes in the UP. About 55% of the crashes occurred in the four counties of Marquette, Delta, Chippewa, and Houghton combined. Adding in the counties with the next four highest totals—Dickinson, Mackinac, Iron, and Menominee—accounts for 80.6% of all crashes in the UP.

Upper Peninsula: 2015-2019

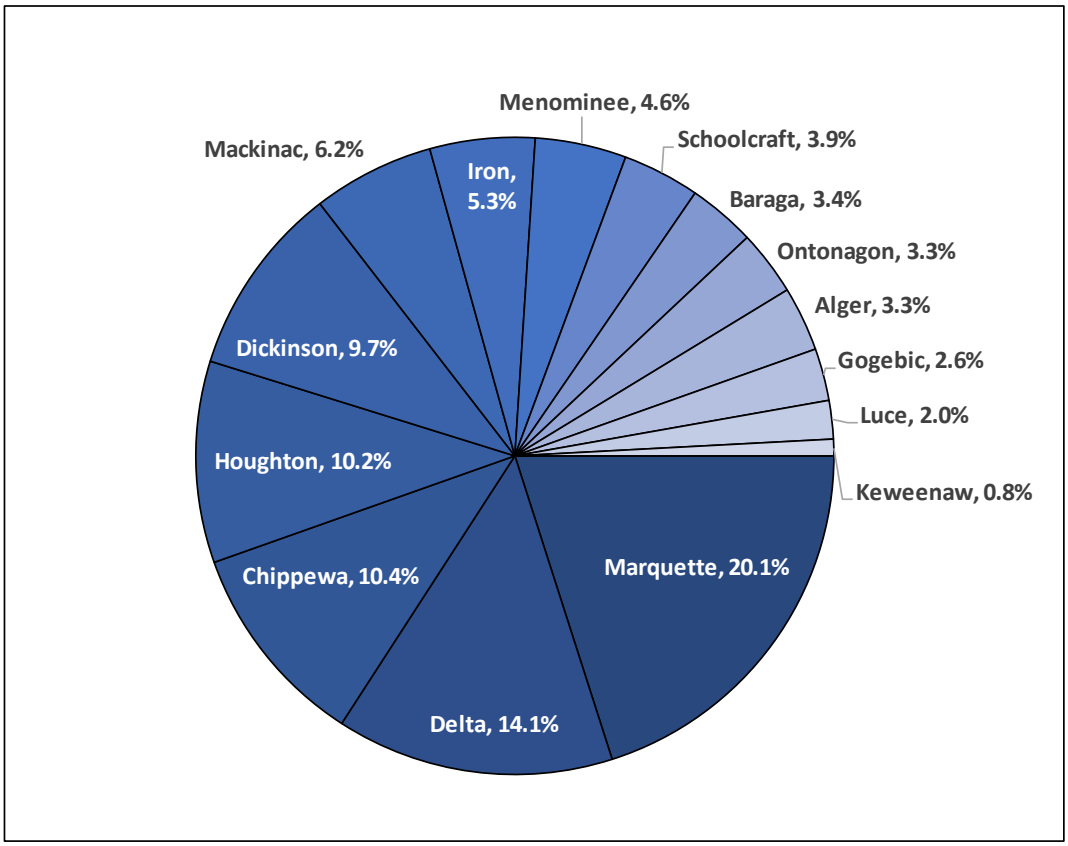

Figure 2 – Distribution of UP Crashes by County, 2015-2019

4.0 Crashes by Month

Table 3 shows the distribution by month of all police-reported crashes and crashes of KAB severity in the UP from 2015-2019. Figure 3 compares the percentage distributions by month between all crashes and KAB crashes. The two crash groups have distinctly different seasonal patterns. All police-reported crashes have the highest concentration in November (11.6%), December (11.0%), and January (10.5%). In contrast, only 7-8% of KAB crashes occur in each of those three months. KAB crashes peak in August with 12.3%, followed by July (11.1%) and June (10.0%).

Table 3. Crashes in the UP by Month, 2015-2019

Month	All Crashes		KAB Crashes	
	Crashes	Percent Distribution	Crashes	Percent Distribution
January	4,612	10.5%	201	7.5%
February	4,100	9.3%	212	7.9%
March	2,988	6.8%	157	5.8%
April	2,759	6.3%	156	5.8%
May	2,530	5.8%	201	7.5%
June	3,330	7.6%	270	10.0%
July	3,243	7.4%	300	11.1%
August	3,021	6.9%	331	12.3%
September	3,262	7.4%	247	9.2%
October	4,186	9.5%	214	7.9%
November	5,109	11.6%	208	7.7%
December	4,853	11.0%	195	7.2%
Total Crashes	43,993	100.0%	2,692	100.0%

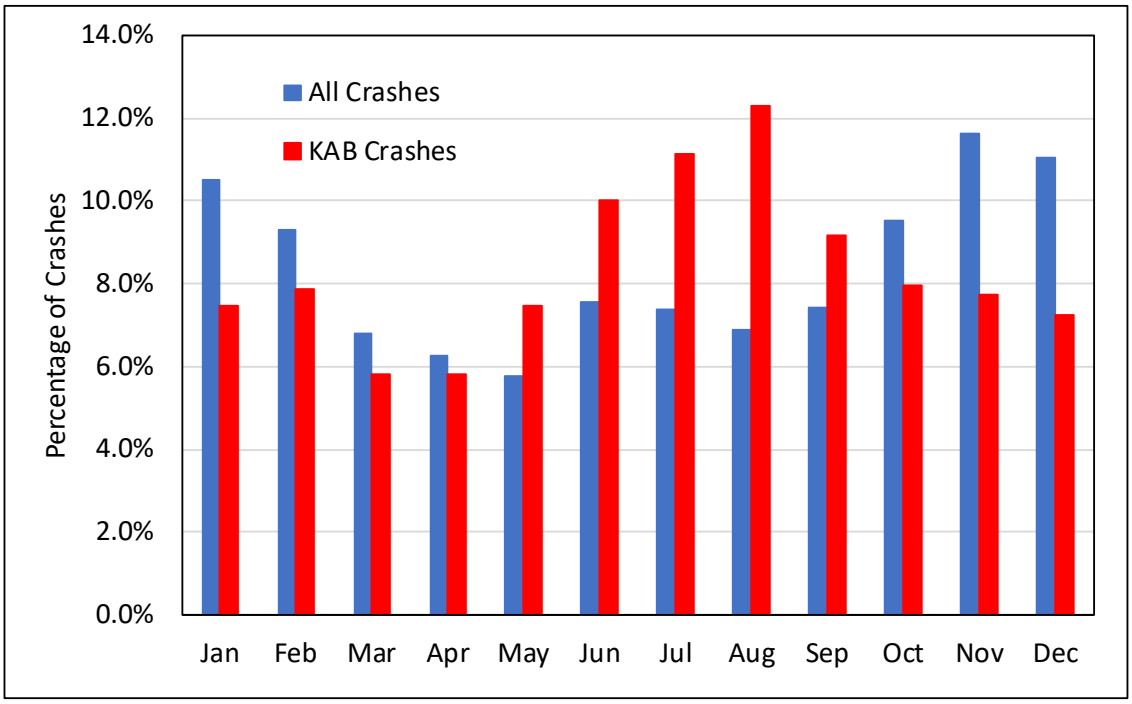

Figure 3 – Distribution of UP Crashes by Month, 2015-2019

There are likely several factors that contribute to the different seasonal patterns of all crashes vs. KAB crashes in the UP. One that can be identified in the crash data involves motorcycles. While only 1.1% of all crashes in the UP involved motorcycles, 10.4% of KAB crashes in the UP involved motorcycles. Conversely, while only 6.1% of all UP crashes were of KAB severity, 58.8% of all motorcycle crashes were of KAB severity. About 66% of the motorcycle crashes in the five-year time period occurred in the months of June, July, and August, so this is one reason KAB crashes are concentrated more in these months.

Two other factors observed in the crash data that drive the seasonal patterns are deer and winter road conditions. As will be discussed in Section 5.0, deer crashes are relatively common (38.3% of all UP crashes) but rarely severe (5.2% of all KAB crashes in the UP). November and October have the most deer crashes, thus boosting the relative share of all crashes in those months. Crashes with icy/snowy/slushy road conditions are also common (28.7% of all UP crashes, as will be described in Section 6.0), but they are less severe than crashes overall (23.2% of all KAB crashes in the UP). Crashes with wintry road conditions peak in January and are also high in December and February, again increasing the concentration of all crashes during these months.

5.0 Deer Crashes

Given the prevalence of deer in the Upper Peninsula, it is worth examining the incidence and nature of deer crashes in the UP. From 2015-2019, deer were involved in more than one out of three of all police-reported crashes in the UP. A total of 16,841 deer crashes took place during this time, which is 38.3% of the 43,993 total crashes. The annual average number of deer crashes was 3,368, ranging from a low of 2,751 in 2015 to a high of 3,973 in 2017 (Figure 4).

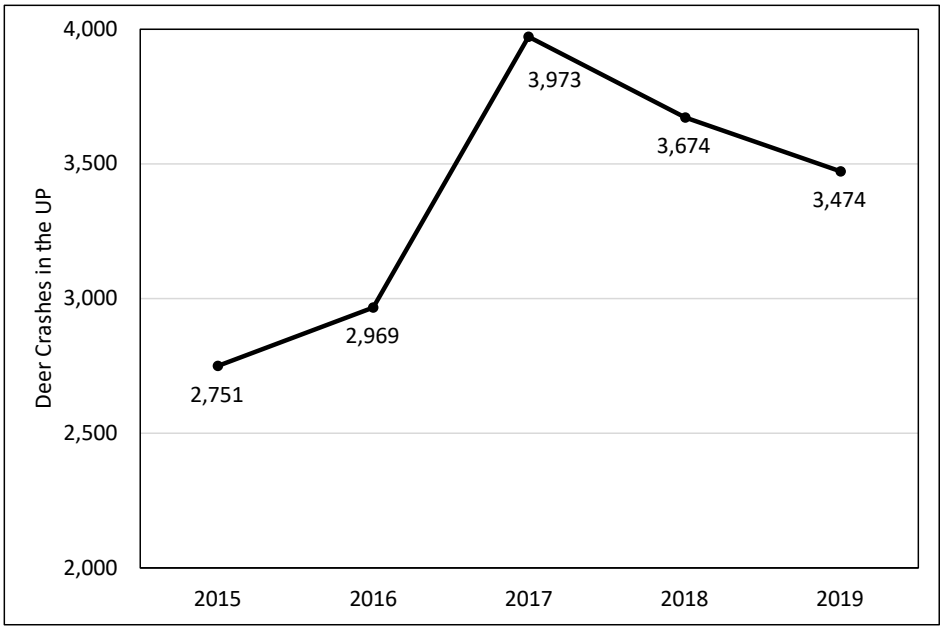

Figure 4 – Deer Crashes in the UP

Upper Peninsula: 2015-2019

On the other hand, 98.0% of the deer crashes involved property damage only. Over the five-year period, there were five fatal deer crashes in the UP, 35 A-injury crashes (0.2%), and 100 B-injury (0.6%) crashes. A motorcycle was involved in 56 (40.0%) of these 140 KAB deer crashes. Nearly one-third of the KAB deer crashes in the UP in the five-year period occurred in two counties, Delta with 23 KAB deer crashes and Menominee with 21.

6.0 Winter Weather Crashes

6.1 Winter Weather Crashes by County

Figure 5 shows the number of winter weather crashes each year from 2015-2019. A winter weather crash is defined as one where road conditions at the time of the crash were reported to have been either icy, snowy, or slushy. There were an average of about 2,521 winter weather crashes per year in the UP from 2015-2019. The peak year was 2019 with 2,966 winter weather crashes, up 24.2% from 2,388 crashes in 2018. From 2015-2019, winter weather crashes made up 28.7% of all crashes in the UP. In 2019, winter weather crashes were 32.5% of the total.

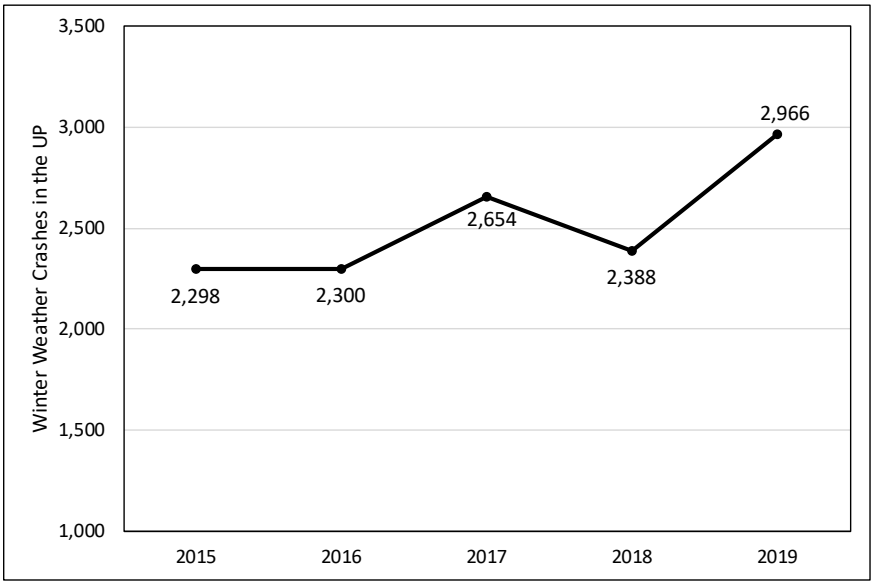

Figure 5 – Winter Weather Crashes in the UP

Table 4 shows counts of winter weather crashes in the UP by county. Marquette County had the greatest number of winter weather crashes, accounting for 23.8% of the UP total. Next was Houghton County with 14.6% of all winter weather crashes in the UP.

Table 4. Winter Weather Crashes in the UP by County

Winter Weather Crashes in the Upper Peninsula						
County	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**
Alger	88	110	89	128	125	540
Baraga	56	72	90	83	79	380
Chippewa	325	302	354	303	382	1,666
Delta	202	211	277	188	290	1,168
Dickinson	101	127	170	115	196	709
Gogebic	100	97	96	93	87	473
Houghton	339	362	403	351	385	1,840
Iron	72	95	129	104	99	499
Keweenaw	27	24	28	27	25	131
Luce	65	50	62	45	63	285
Mackinac	107	117	157	167	204	752
Marquette	628	538	557	561	714	2,998
Menominee	60	63	83	81	113	400
Ontonagon	72	68	70	78	89	377
Schoolcraft	56	64	89	64	115	388
Total	2,298	2,300	2,654	2,388	2,966	12,606

Figure 6 shows the distribution of winter weather crashes in the UP by month of the year. Nearly 27% of winter weather crashes occurred in January and about 23% in both December and February. Next was November with 14% of the winter weather crashes and March with 8%.

Upper Peninsula: 2015-2019

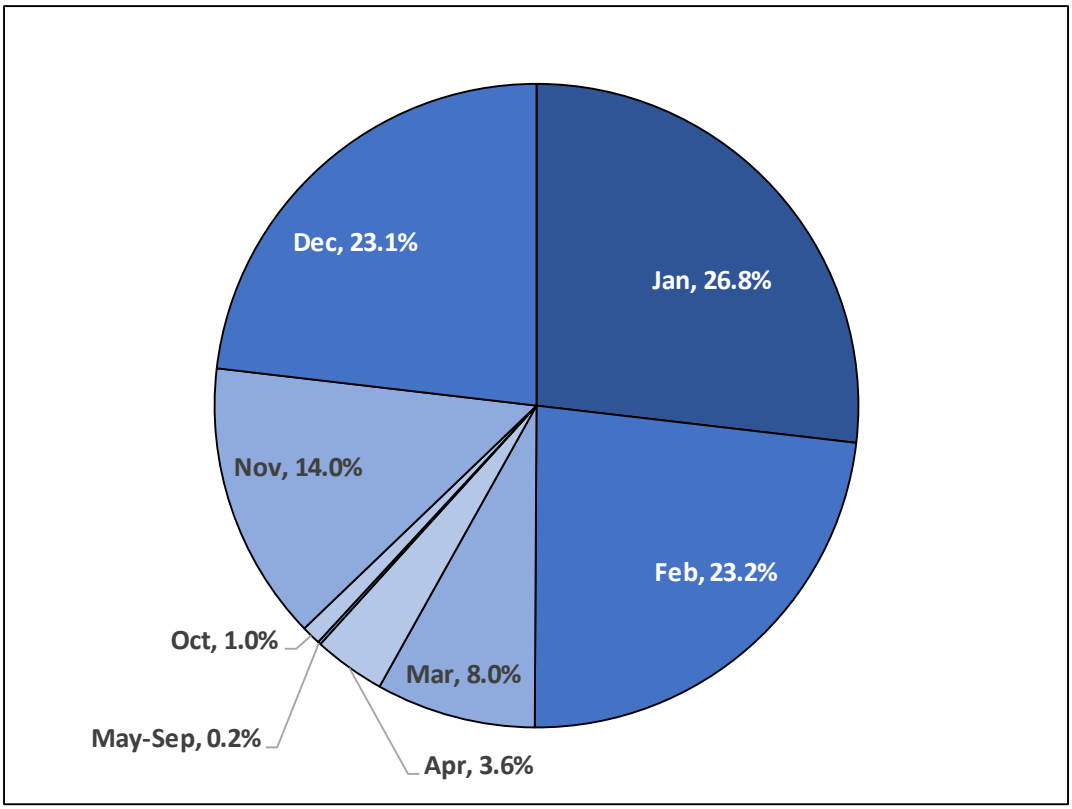

Figure 6 – Winter Weather Crashes in the UP by Month, 2015-2019

6.2 Winter Weather Crashes by Driver Age Group

Crashes involving drivers of different ages are compared in Figure 7 according to road condition at the time of the crash. Road condition is classified as dry, wet, winter weather (snowy/slushy/icy), or other/unknown. Crashes are grouped into those involving at least one driver age 14 to 18, 19 to 24, 25 to 64, and 65 and older. The four driver age categories of crashes are not mutually exclusive because a crash can involve drivers from different age groups. About 37% of both crashes involving drivers 14-18 and crashes involving drivers 19-24 were winter weather crashes. This percentage was lower for the other two age groups of crashes—28.4% for crashes with drivers 25-64 and 23.2% for crashes with drivers 65 and over. Inexperience with driving on slippery roads is likely a factor in the higher percentage of winter weather crashes for crashes involving the two youngest groups of drivers. The fact that crashes with drivers 65 and over have the lowest percentage of winter weather crashes may reflect more experience and caution, as well as less exposure to winter weather conditions, for that age group.

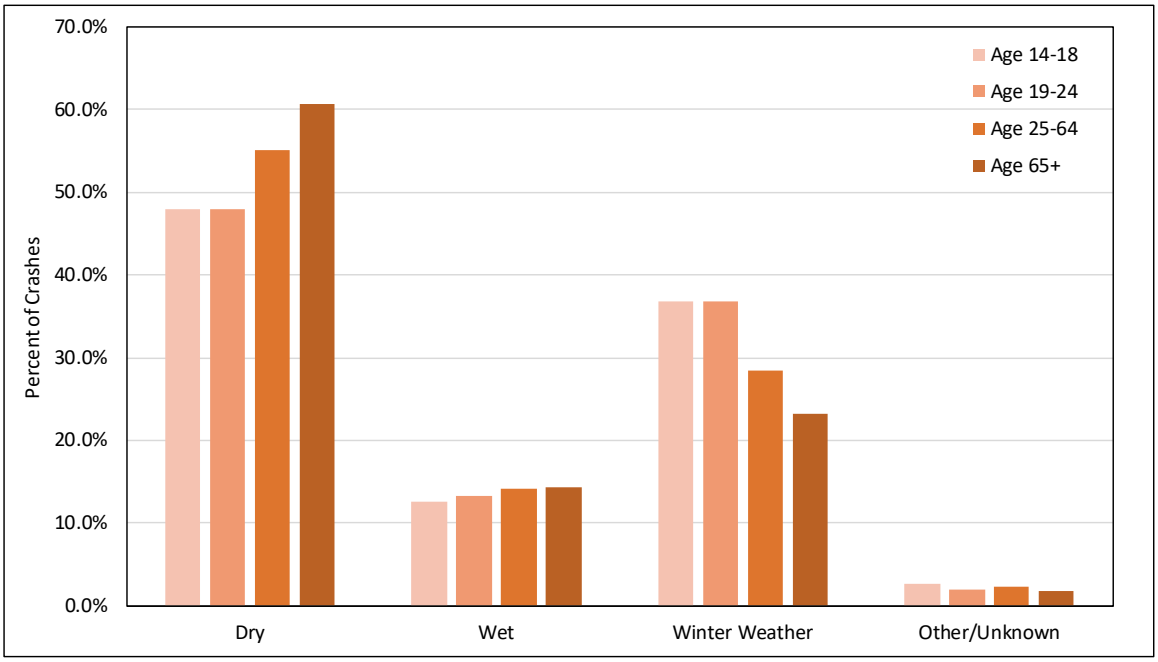

Figure 7 – Distribution of Road Conditions in UP Crashes by Driver Age Group, 2015-2019

Table 5 shows winter weather crash counts by crash severity for crashes with the same driver age groups. Table 6 shows the percentage of winter weather crashes that were of KAB severity for crashes with each of the driver age groups. For comparison, the percentage of KAB crashes on dry roads is also shown.

Table 5. Winter Weather Crashes in the UP by Driver Age and Crash Severity, 2015-2019

Driver Age	Fatal (K)	Suspected Serious (A)	Suspected Minor (B)	Possible (C)	PDO (O)	Total
Age 14-18	6	16	43	123	1,170	1,358
Age 19-24	8	36	100	260	2,562	2,966
Age 25-64	39	164	261	748	7,593	8,805
Age 65+	11	32	65	192	1,745	2,045

The share of crashes that were of KAB severity was lower for winter weather crashes than for crashes on dry roads, and this was true for crashes involving all four of the driver age groups. Crashes with drivers 14-18 and crashes with drivers 19-24 had slightly lower shares of KAB crashes on winter weather roads compared with crashes involving drivers 25-64 and 65 and over. Interestingly, on dry roads, crashes with the two youngest sets of drivers had higher percentages of KAB crashes than crashes with drivers 25-64 and 65 and over. In Figure 7 we saw that crashes involving the two youngest age groups of drivers had relatively more winter weather crashes than crashes with the other driver age groups. Younger drivers may be involved in more winter weather crashes due to lack of experience, but Table 6 suggests that

their winter weather crashes are slightly less severe than winter weather crashes in general and notably less severe than young driver crashes on dry roads.

Table 6. Percent KAB Crashes for Driver Age Groups
According to Road Condition, 2015-2019

	Winter Weather Crashes			Dry Road Crashes		
Driver Age	KAB	All	Percent KAB	KAB	All	Percent KAB
Age 14-18	65	1,358	4.8%	202	1,774	11.4%
Age 19-24	144	2,966	4.9%	324	3,869	8.4%
Age 25-64	464	8,805	5.3%	1,083	17,084	6.3%
Age 65+	108	2,045	5.3%	368	5,366	6.9%

7.0 Light Condition

Table 7 compares all crashes and KAB crashes in the UP according to light condition at the time of the crash. Over half of both crashes overall and KAB crashes occurred during daylight, but KAB crashes had a higher percent of daylight (66.7%) than all crashes (55.9%). KAB crashes were relatively less likely to occur during dark/unlighted conditions (20.5%) than all crashes (27.4%). In Section 4.0 we saw that KAB crashes in the UP were more concentrated during the summer months compared with crashes overall. It appears that the seasonal crash patterns correlate with the light condition patterns. The months of the year with more KAB crashes also have more daylight hours in the UP.

Table 7. Crashes in the UP by Light Condition, 2015-2019

Light Condition	All Crashes		KAB Crashes	
	Crashes	Percent Distribution	Crashes	Percent Distribution
Daylight	24,588	55.9%	1,796	66.7%
Dawn	1,877	4.3%	73	2.7%
Dusk	1,928	4.4%	83	3.1%
Dark/Lighted	3,156	7.2%	182	6.8%
Dark/Unlighted	12,052	27.4%	552	20.5%
Other/Unknown	392	0.9%	6	0.2%
Total Crashes	43,993	100.0%	2,692	100.0%

8.0 Vehicle Type

The first two columns of Table 8 show the breakdown of vehicle type for all motor vehicles involved in police-reported crashes in the UP from 2015-2019. The next two columns show vehicle involvements for the subset of KAB crashes. Among all crashes, 92.0% of the vehicle involvements were either passenger

cars/SUVs/vans or pickup trucks, but this was true of only 77.8% of the vehicle involvements in KAB crashes.

Motorcycles, mopeds/gopeds, go-carts/golf carts, snowmobiles, and ORVs/ATVs all had a proportionately higher presence among KAB crashes than all crashes. For example, while motorcycles represented just 0.8% of all vehicles in crashes, they made up 7.3% of vehicles in KAB crashes. The right-most column in Table 8 shows the percentage of KAB crash involvements out of all crash involvements for each vehicle type. While only 5.3% of crash involvements of passenger cars and 6.1% of crash involvements of pickup trucks were in KAB crashes, 59.2% of motorcycle crash involvements were in KAB crashes.

Table 8. Crash Involvements by Vehicle Type in the UP, 2015-2019

Vehicle Type	All Crashes		KAB Crashes		Percent KAB out of All
	Crash Involvements	Percent Distribution	Crash Involvements	Percent Distribution	
Passenger car, SUV, van	43,426	70.3%	2,298	57.4%	5.3%
Motor home	627	1.0%	34	0.8%	5.4%
Pickup truck	13,396	21.7%	815	20.4%	6.1%
Small truck under 10,000 lbs. GVWR	564	0.9%	34	0.8%	6.0%
Motorcycle	495	0.8%	293	7.3%	59.2%
Moped/goped	50	0.1%	30	0.7%	60.0%
Go-cart/golf cart	6	0.0%	1	0.0%	16.7%
Snowmobile	256	0.4%	130	3.2%	50.8%
ORV/ATV	278	0.4%	187	4.7%	67.3%
Other	298	0.5%	21	0.5%	7.0%
Truck/bus over 10,000 lbs.	1,533	2.5%	144	3.6%	9.4%
Uncoded & errors	865	1.4%	15	0.4%	1.7%
Total Vehicles	61,794	100.0%	4,002	100.0%	6.5%

9.0 Hazardous Actions

The top three hazardous actions for crash-involved drivers in the UP from 2015-2019 were speed too fast (8.9% of all drivers), failed to yield (7.6% of all drivers), and unable to stop in assured clear distance (7.3% of all drivers). Figure 8 shows the number of people with K, A, or B injuries that resulted from crashes involving each of these three types of hazardous actions each year. About 21.5% of all KAB injuries in the UP over this time period occurred in crashes with a speeding driver. About 18.2% occurred in crashes where a driver failed to yield, and 7.3% took place when a driver was unable to stop. Some overlap between crashes defined by the three types of hazardous actions is possible because occasionally more than one driver in a crash is assigned a hazardous action.

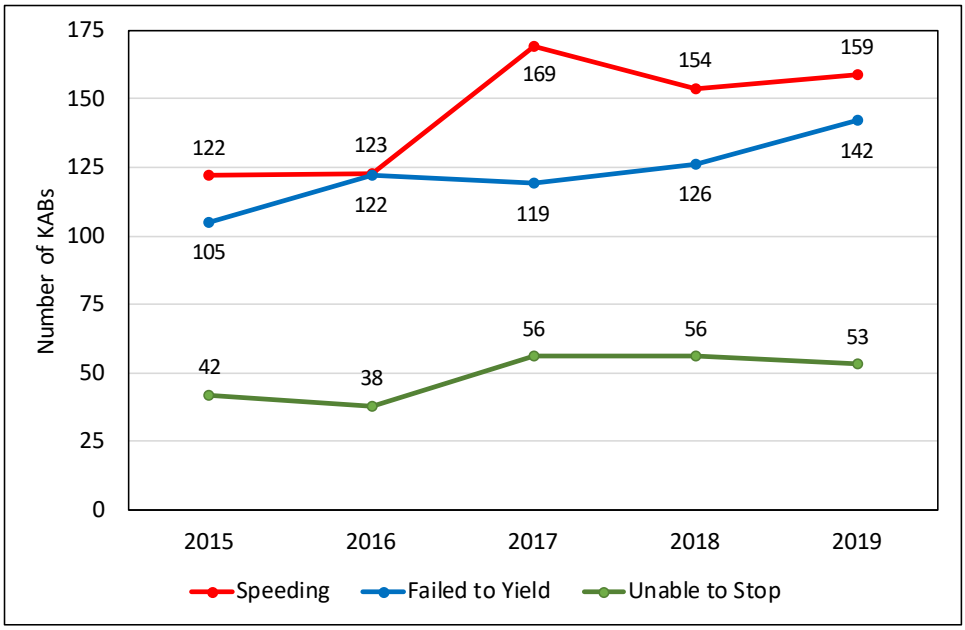

Figure 8 – KABs in the UP Resulting from Three Types of Hazardous Action Crashes

10.0 Impairment

The data in Table 9 indicate that crashes involving alcohol tend to be more severe than crashes generally. In each of the five years of crash data in the UP, alcohol-involved crashes made up less than 4% of the total number of crashes, but 17.2% of all KAB injuries during the five years occurred in crashes involving alcohol. From 2015-2019, 58 people were killed in alcohol-involved crashes, 238 received A injuries, and 284 received B injuries.

Table 9. Role of Alcohol in Crashes in the UP

Metric	2015	2016	2017	2018	2019	Total
Alcohol-Involved Crashes	304	319	365	309	313	1,610
All Crashes	8,099	8,264	9,542	8,948	9,140	43,993
Percent Crashes Involving Alcohol	3.8%	3.9%	3.8%	3.5%	3.4%	3.7%
KABs in Alcohol Crashes	101	99	138	112	130	580
All KABs	590	667	727	693	698	3,375
Percent KABs Involving Alcohol	17.1%	14.8%	19.0%	16.2%	18.6%	17.2%

A similar pattern is seen in crashes involving drugs (Table 10). For the five years combined, drugs were involved in 1.1% of all crashes, but 6.7% of all KAB injuries resulted from crashes involving drugs. There were 35 fatalities, 90 A injuries, and 100 B injuries in drug-involved crashes from 2015-2019.

Upper Peninsula: 2015-2019

Table 10. Role of Drugs in Crashes in the UP

Metric	2015	2016	2017	2018	2019	Total
Drug-Involved Crashes	76	96	94	92	122	480
All Crashes	8,099	8,264	9,542	8,948	9,140	43,993
Percent Crashes Involving Drugs	0.9%	1.2%	1.0%	1.0%	1.3%	1.1%
KABs in Drug Crashes	23	55	38	42	67	225
All KABs	590	667	727	693	698	3,375
Percent KABs Involving Drugs	3.9%	8.2%	5.2%	6.1%	9.6%	6.7%

There was an increased number of drug-involved crashes in the UP from 2018 to 2019. The number of crashes involving drugs rose 32.6% from 92 in 2018 to 122 in 2019. The number of KAB injuries resulting from these crashes increased 59.5% between the two years, from 42 to 67. This resulted in the percent of drug-involved KABs out of all KABs rising from 6.1% in 2018 to 9.6% in 2019.

11.0 Driver Age and Gender

Table 11 has counts of crash-involved drivers in the UP from 2015-2019 by age group and gender. The table is restricted to drivers age 14 and older with known age and gender. All of the driver age groups shown in the table have more male than female drivers, but the percentage of male drivers increases with each older age group. Among the youngest drivers, those 14 to 18, 53.7% were male and 46.3% were female. Among the oldest drivers, 63.7% were male and 36.3% were female. These differences are illustrated in Figure 9.

Table 11. Crash-Involved Drivers by Age and Gender, 2015-2019

Driver Age	Male		Female	
	Count	Percent	Count	Percent
14-18	2,065	53.7%	1,779	46.3%
19-24	4,939	57.6%	3,632	42.4%
25-64	21,307	58.4%	15,167	41.6%
65+	5,944	63.7%	3,383	36.3%
Total	34,255	58.8%	23,961	41.2%

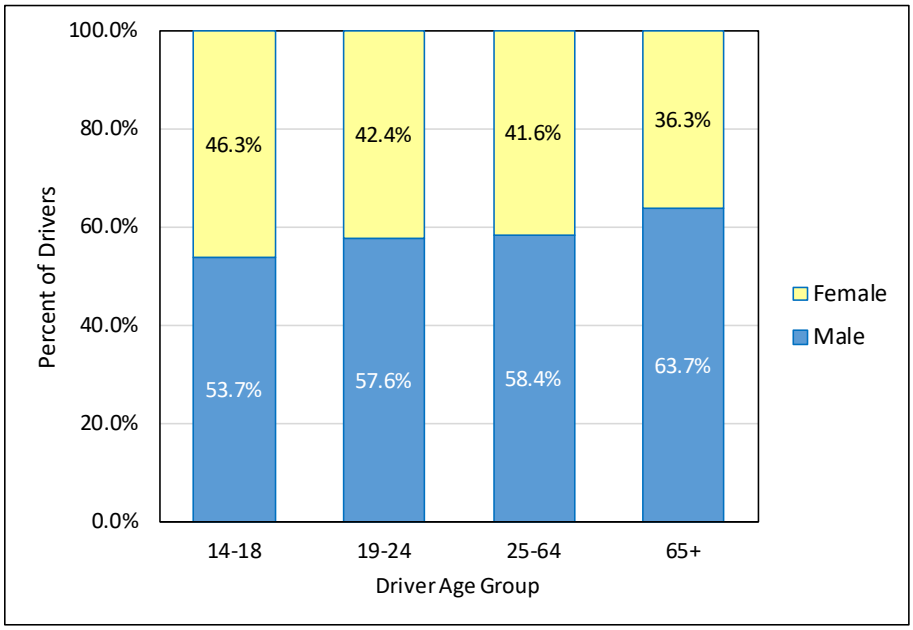

Figure 9 – Driver Gender Distributions by Age Group, 2015-2019

The population in the Upper Peninsula skews older than the population in the Lower Peninsula, and this is apparent in the ages of crash-involved drivers. From 2015-2019, drivers 65 and over made up 16.0% of crash-involved drivers of known age 14 and over in the UP. This compares with 10.9% for the 65 and over group in the Lower Peninsula.

12.0 Non-Motorists

Bicyclists and pedestrians are rarely involved in police-reported crashes in the UP. Of the 43,993 crashes occurring from 2015-2019, 150 (0.3%) involved a bicyclist, and 176 (0.4%) involved a pedestrian. The injury outcomes of the 72,899 people in crashes in the UP from 2015-2019 are shown in Table 12 according to party type. Non-motorists (bicyclists and pedestrians) accounted for 4.7% of all fatalities, 6.7% of all people with A injuries, and 4.4% of all people with B injuries.

Table 12. Distribution of Injury Severity by Party Type, 2015-2019

Party Type	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	No Injury (O)	Unknown Injury	Total
Motor vehicle driver	129	762	1,485	3,407	52,380	3,631	61,794
Motor vehicle passenger	34	273	517	1,167	8,658	107	10,756
Bicyclist	**1**	**19**	**51**	**46**	**29**	**6**	**152**
Pedestrian	**7**	**55**	**42**	**60**	**17**	**3**	**184**
Train engineer	0	0	0	0	13	0	13
Total	171	1,109	2,095	4,680	61,097	3,747	72,899

13.0 Occupant Protection

13.1 Restraint Use in Passenger Vehicles

Table 13 shows the injury outcome for passenger vehicle occupants (both drivers and passengers) in all police-reported crashes in the UP from 2015-2019 according to restraint use. Passenger vehicles are defined as being one of the first four categories listed under Vehicle Type in Table 7—passenger car, SUV, van; motor home; pickup truck; or small truck under 10,000 pounds. Restraint use by passenger vehicle occupants overall was quite high—98.5% of cases, excluding those with unknown restraint use.

Table 13. Distribution of Injury Severity by Occupant Restraint Use
for All Passenger Vehicle Occupants, 2015-2019

Person Restraint	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	No Injury (O)	Unknown Injury	Total
No belts available	3	9	6	16	160	3	197
Shoulder belt only used	0	2	12	37	341	0	392
Lap belt only used	1	3	16	19	213	0	252
Lap & shoulder belts used	58	508	1,379	3,867	54,473	71	60,356
No belts used	42	119	131	123	312	0	727
Child restraint used	0	5	30	84	950	3	1,072
Child restraint not used	0	0	2	0	19	0	21
Restraint failure	0	0	0	1	27	0	28
Unknown/error	9	64	90	157	2,387	2,708	5,415
Total	113	710	1,666	4,304	58,882	2,785	68,460
Restraint Not Used	4.8%	13.5%	14.7%	14.7%	52.0%	0.3%	100.0%
Restraint Used	0.1%	0.8%	2.3%	6.5%	90.2%	0.1%	100.0%

The bottom two rows of Table 13 show injury distributions as a function of belt use. To calculate these percentages, the unknown cases of restraint use were excluded and all the other restraint use statuses were assigned to one of two categories. “Restraint not used” includes all cases of “no belts available,” “no belts used,” and “child restraint not used.” “Restraint used” includes all the other categories in Table 13 except “unknown/error.” When restraints were used, crash-involved passenger vehicle occupants were uninjured 90.2% of the time. Only 0.1% of restrained occupants received fatal injuries, and 0.8% sustained suspected serious injuries. In contrast, 4.8% of unrestrained occupants were killed, and 13.5% sustained suspected serious injuries.

Table 14 looks at restraint use for passenger vehicle occupants of known age in police-reported crashes in the UP from 2015-2019. Four age groups are considered, and occupants under the age of 14 are not included in the table. The unknown restraint category includes unknown restraint use, as well as all of the helmet use and child restraint use code levels. The table gives counts of passenger-vehicle occupants, as well as percentages out of all occupants in each age group. The overall proportion of restraint use is also provided, calculated with unknown/error excluded. While restraint use was high for all age groups, the lowest percent restrained was among occupants age 14-18 (97.7%), followed by occupants age 19-24 (98.0%).

Upper Peninsula: 2015-2019

Table 14. Restraint Use by Age Group for Passenger Vehicle Occupants, 2015-2019

Restraint Category	Age Group				
	14-18	**19-24**	**25-64**	**65+**	**Total**
No belts available	17 (0.3%)	30 (0.3%)	104 (0.3%)	37 (0.4%)	188 (0.3%)
Shoulder belt only	29 (0.6%)	69 (0.7%)	222 (0.6%)	60 (0.6%)	380 (0.6%)
Lap belt only	35 (0.7%)	36 (0.4%)	113 (0.3%)	14 (0.1%)	198 (0.3%)
Lap and shoulder belt	4,866 (92.6%)	9,092 (92.7%)	35,582 (93.6%)	9,677 (94.9%)	59,217 (93.6%)
No belts used	97 (1.8%)	161 (1.6%)	373 (1.0%)	73 (0.7%)	704 (1.1%)
Restraint failure	5 (0.1%)	7 (0.1%)	8 (0.0%)	3 (0.0%)	23 (0.0%)
Unknown/error	204 (3.9%)	416 (4.2%)	1,623 (4.3%)	336 (3.3%)	2,579 (4.1%)
Total	5,253	9,811	38,025	10,200	63,289
Percent Restrained (excluding unknown)	97.7%	98.0%	98.7%	98.9%	98.5%

13.2 Motorcyclist Helmet Status

From 2015-2019, 569 motorcyclists (operators and passengers) were involved in 476 crashes in the UP. Of the 569 motorcyclists, 354 were reported to have been wearing a helmet at the time of the crash, 172 were reported to have been unhelmeted, and the remaining 43 had unknown helmet status. Of the 526 motorcyclists with known helmet status, about 67.3% were helmeted and 32.7% were not helmeted at the time of the crash, which is similar to the overall helmet use rate in Michigan (detailed in the motorcycle in-depth analysis report).

Figure 10 shows the injury outcome for the motorcyclists with known helmet status. Probability of injury given a crash was generally higher for the unhelmeted motorcyclists. About 25.4% of helmeted motorcyclists received fatal or A-level injuries, compared with 34.3% of motorcyclists who were not wearing a helmet at the time of the crash.

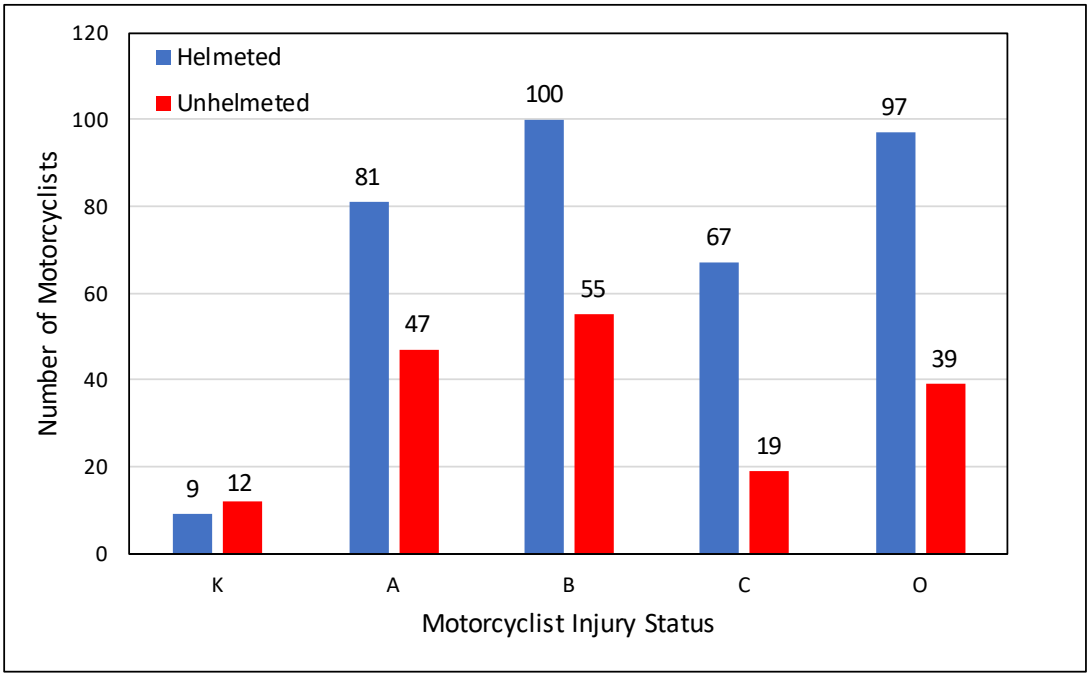

Figure 10 – Helmet Status and Injury Status of Crash-Involved Motorcyclists in the UP, 2015-2019

14.0 Mileage-Based Rates of KAB Injuries by County

Up to this point this report has focused on counts of traffic crashes, injuries, and fatalities in the UP. When the prevalence of crashes by county was evaluated in Section 3.0, it was not surprising that the most populous county in the UP, Marquette, had the greatest number of crashes, or that the least populous county, Keweenaw, had the lowest crash count. Another way to compare counties is to calculate their rates of crashes or injuries per a unit of exposure. This helps to equalize the inherent differences between counties in terms of size and amount of driving.

This section compares the counties in the UP according to mileage-based rates of KAB injuries in all crashes and five different subsets of crashes. Rates are presented in terms of number of KAB injuries per 100 million vehicle miles traveled (VMT). The rate tables provide a different perspective on the crash experience of the counties in the UP beyond the actual counts of KAB injuries in each. However, even though five years of data are used, the counts are still relatively small, so the resulting rates may sometimes be misleading. For example, Keweenaw County has the lowest VMT of all the UP counties, so one crash there with several KABs will boost Keweenaw's KAB rate considerably.

The overall mileage-based rates of KABs in crashes for each county in the UP from 2015-2019 are presented in Table 15. The table shows the total number of KABs in crashes, the five-year mileage total (source: Michigan Department of Transportation), and the rate of KABs per 100 million VMT. The counties are ranked 1 through 15 on the basis of this rate. Houghton County had the highest rate of KABs per 100 million VMT (25.96), and Schoolcraft had the lowest rate (12.26) over the five-year period. In fact, Schoolcraft's rate was less than half that of Houghton's. The rate of KABs per 100 million VMT for

the UP as a whole was 20.05. The heavy horizontal line in the middle of the table divides the counties with rates higher than the overall UP rate from the counties whose rate was lower than the overall UP rate.

Table 15. KABs per 100 Million VMT by County, 2015-2019

County	KABs	VMT (thousands)	KABs per 100 Million VMT	Rank
Houghton	321	1,236,592	25.96	1
Dickinson	280	1,159,473	24.15	2
Luce	93	400,548	23.22	3
Marquette	654	2,916,785	22.42	4
Keweenaw	49	223,699	21.90	5
Alger	164	797,471	20.57	6
Delta	402	2,045,122	19.66	7
Chippewa	371	1,903,827	19.49	8
Baraga	113	586,060	19.28	9
Menominee	258	1,345,819	19.17	10
Iron	123	703,674	17.48	11
Gogebic	127	734,951	17.28	12
Mackinac	222	1,310,621	16.94	13
Ontonagon	87	560,344	15.53	14
Schoolcraft	111	905,643	12.26	15
UP Total	3,375	16,830,626	20.05	---

Table 16 has similar rate comparisons for KABs resulting from alcohol-involved crashes. All of the rates are lower than the overall rates since KABs in alcohol-involved crashes are a subset of all KABs. Luce County had the highest rate of KABs in alcohol crashes, and Schoolcraft County again had the lowest, with Luce's rate over twice that of Schoolcraft's. Again, the heavy horizontal line in the middle of the table separates the counties with rates higher than the UP average for KABs in alcohol-involved crashes from counties with rates below the UP average.

Table 16. KABs in Alcohol-Involved Crashes per 100 Million VMT by County, 2015-2019

County	KABs	VMT (thousands)	KABs per 100 Million VMT	Rank
Luce	20	400,548	4.99	1
Houghton	58	1,236,592	4.69	2
Dickinson	53	1,159,473	4.57	3
Iron	31	703,674	4.41	4
Keweenaw	9	223,699	4.02	5
Chippewa	74	1,903,827	3.89	6
Mackinac	47	1,310,621	3.59	7
Baraga	21	586,060	3.58	8
Ontonagon	19	560,344	3.39	9
Menominee	45	1,345,819	3.34	10
Marquette	95	2,916,785	3.26	11
Gogebic	22	734,951	2.99	12
Alger	20	797,471	2.51	13
Delta	46	2,045,122	2.25	14
Schoolcraft	20	905,643	2.21	15
UP Total	580	16,830,626	3.45	---

In general, whether a county's ranking changed between Table 15 and Table 16 reflects the county's percent of alcohol-involved KABs out of all KABs compared with the UP as a whole. For example, Delta County was ranked seventh in the overall KAB rate but moved down to fourteenth in the rate of alcohol-involved KABs. Only 11.4% of the KABs in Delta County came from alcohol-involved crashes, compared with 17.2% for all of the UP.

Table 17 shows rates of KABs in crashes involving speeding drivers. Luce County had the highest rate with 7.49, followed closely by Alger with 7.40, and Schoolcraft the lowest with 2.10. Dickinson had the second highest rate of KABs overall but was ranked twelfth in KABs in speeding crashes. While 21.5% of all KABs in the UP came in speeding crashes, only 15.4% of the KABs in Dickinson were a result of speeding crashes.

Table 17. KABs in Speeding Crashes per 100 Million VMT by County, 2015-2019

County	KABs	VMT (thousands)	KABs per 100 Million VMT	Rank
Luce	30	400,548	7.49	1
Alger	59	797,471	7.40	2
Keweenaw	12	223,699	5.36	3
Baraga	29	586,060	4.95	4
Chippewa	91	1,903,827	4.78	5
Marquette	139	2,916,785	4.77	6
Mackinac	61	1,310,621	4.65	7
Iron	32	703,674	4.55	8
Houghton	55	1,236,592	4.45	9
Gogebic	31	734,951	4.22	10
Menominee	52	1,345,819	3.86	11
Dickinson	43	1,159,473	3.71	12
Ontonagon	19	560,344	3.39	13
Delta	55	2,045,122	2.69	14
Schoolcraft	19	905,643	2.10	15
UP Total	727	16,830,626	4.32	---

The rank order of counties by rates of KABs in failure to yield crashes (Table 18) differs from the previous comparisons. Dickinson and Marquette Counties had the highest rates of failure to yield crashes and Keweenaw one of the lowest. Counties with higher VMTs and the presence of larger towns tended to have higher rates of KABs in failure to yield crashes. One would expect the rate of failure to yield crashes to increase with traffic density.

Table 18. KABs in Failure to Yield Crashes per 100 Million VMT by County, 2015-2019

County	KABs	VMT (thousands)	KABs per 100 Million VMT	Rank
Dickinson	72	1,159,473	6.21	1
Marquette	162	2,916,785	5.55	2
Houghton	62	1,236,592	5.01	3
Delta	90	2,045,122	4.40	4
Gogebic	32	734,951	4.35	5
Luce	16	400,548	3.99	6
Alger	23	797,471	2.88	7
Menominee	36	1,345,819	2.67	8
Iron	18	703,674	2.56	9
Baraga	14	586,060	2.39	10
Mackinac	31	1,310,621	2.37	11
Chippewa	37	1,903,827	1.94	12
Keweenaw	4	223,699	1.79	13
Ontonagon	9	560,344	1.61	14
Schoolcraft	8	905,643	0.88	15
UP Total	614	16,830,626	3.65	---

The mileage-based rates of KABs on icy/snowy/slushy roads are shown in Table 19. The rates vary only moderately between counties, but the northern tier of counties along the Lake Superior shore tended to have higher rates than the other counties of the UP. All seven counties with winter weather KAB rates higher than the Upper Peninsula average border Lake Superior. Luce County had the highest rate (7.99) of KABs on icy/snowy/slushy roads among all UP counties, and Dickinson had the lowest (2.93).

Table 19. KABs in Crashes on Icy/Snowy/Slushy Roads
per 100 Million VMT by County, 2015-2019

County	KABs	VMT (thousands)	KABs per 100 Million VMT	Rank
Luce	32	400,548	7.99	1
Alger	59	797,471	7.40	2
Houghton	75	1,236,592	6.07	3
Marquette	175	2,916,785	6.00	4
Chippewa	107	1,903,827	5.62	5
Baraga	31	586,060	5.29	6
Gogebic	38	734,951	5.17	7
Mackinac	57	1,310,621	4.35	8
Ontonagon	24	560,344	4.28	9
Keweenaw	9	223,699	4.02	10
Iron	25	703,674	3.55	11
Delta	64	2,045,122	3.13	12
Schoolcraft	27	905,643	2.98	13
Menominee	40	1,345,819	2.97	14
Dickinson	34	1,159,473	2.93	15
UP Total	797	16,830,626	4.74	---

Rates of KABs in crashes involving at least one driver age 14 to 24 are shown in Table 20. Generally, the counties with a relatively higher share of younger drivers and/or presence of college campuses tended to have higher rates. Houghton County had the highest rate of KABs in crashes with drivers 14-24 at 11.24, and Ontonagon had the lowest at 1.78. The rates of KABs in crashes with drivers 14-24 are also fairly well correlated with the overall VMT for the counties.

Table 20. KABs in Crashes with Driver Age 14-24 per 100 Million VMT by County, 2015-2019

County	KABs	VMT (thousands)	KABs per 100 Million VMT	Rank
Houghton	139	1,236,592	11.24	1
Marquette	250	2,916,785	8.57	2
Dickinson	94	1,159,473	8.11	3
Keweenaw	17	223,699	7.60	4
Menominee	99	1,345,819	7.36	5
Delta	140	2,045,122	6.85	6
Chippewa	127	1,903,827	6.67	7
Mackinac	82	1,310,621	6.26	8
Luce	24	400,548	5.99	9
Baraga	35	586,060	5.97	10
Alger	44	797,471	5.52	11
Iron	32	703,674	4.55	12
Gogebic	33	734,951	4.49	13
Schoolcraft	35	905,643	3.86	14
Ontonagon	10	560,344	1.78	15
UP Total	1,161	16,830,626	6.90	---

15.0 Comparisons with the Lower Peninsula

In this section, KABs resulting from a variety of crash types are compared between the Upper Peninsula and the Lower Peninsula in two ways. The first comparison is based on percentages. From 2015-2019, there were 3,375 KAB injuries in the UP and 125,831 in the Lower Peninsula. Table 21 shows the percentages of KABs resulting from particular crash types out of all KABs in the UP from 2015-2019, as well as the comparable percentages for the Lower Peninsula. The crash type categories are not mutually exclusive—one crash could be both a single-vehicle crash as well as a crash involving a pick-up truck. The crash type categories are displayed in descending order based on the number of KABs in the UP.

Table 21. Comparison of KABs in Different Crash Types between the Upper Peninsula and the Lower Peninsula, 2015-2019

Type of Crash	Upper Peninsula		Lower Peninsula	
	Number of KABs	Percent of All UP KABs	Number of KABs	Percent of All LP KABs
Single Vehicle	1,691	50.1%	41,525	33.0%
Driver 14-24 Involved	1,161	34.4%	45,663	36.3%
Pickup Truck Involved	995	29.5%	22,775	18.1%
Icy/Snowy/Slushy Roads	797	23.6%	11,568	9.2%
Driver 65+ Involved	739	21.9%	24,113	19.2%
Speed Related	727	21.5%	17,281	13.7%
Failure to Yield	614	18.2%	27,722	22.0%
Alcohol Involved	580	17.2%	15,457	12.3%
Motorcycle Involved	327	9.7%	9,007	7.2%
Drugs Involved	225	6.7%	5,982	4.8%
ORV/ATV Involved	201	6.0%	915	0.7%
Truck/Bus Involved	170	5.0%	6,217	4.9%
Deer Involved	163	4.8%	2,374	1.9%
Snowmobile Involved	116	3.4%	178	0.1%
Pedestrian Involved	109	3.2%	6,516	5.2%
Bicyclist Involved	71	2.1%	3,854	3.1%

Comparing the percentage of all KABs resulting from a particular type of crash in the UP with the percentage that crash type comprises out of all KABs in the Lower Peninsula (LP) points to some differences between these two geographical regions of Michigan. For example, about half (50.1%) of all KABs in the UP result from single-vehicle crashes, compared with about a third (33.0%) in the LP. A greater share of KABs in the UP come from crashes involving pickup trucks (29.5% compared with 18.1%), in wintry road conditions (23.6% compared with 9.2%), and involving alcohol (17.2% compared with 12.3%). Large differences in the relative percentages are also seen in the percent of KABs resulting from ORV/ATV crashes (6.0% in the UP and 0.7% in the LP), deer crashes (4.8% to 1.9%) and snowmobile crashes (3.4% to 0.1%), although all of these occur less frequently than the previous examples.

KABs resulting from the same categories of crash types were also compared using VMT rates (Table 22). One thing to note is that the overall mileage-based rate of KABs was slightly higher in the Lower Peninsula than in the UP. From 2015-2019, KAB injuries in the UP occurred at the rate of 20.05 per 100 million VMT, while KAB injuries in the LP occurred at the rate of 25.86 per 100 million VMT. All things being equal, we would expect the KAB injury rate in each crash category to be slightly higher for the LP than the UP. If the KAB injury rate for a type of crash in the UP is greater than or equal to the rate in the LP, it may reflect relatively greater exposure to that type of crash in the UP compared to the LP.

Upper Peninsula: 2015-2019

Table 22. Comparison of Mileage-Based Rates of KABs in Different Crash Types between the Upper Peninsula and the Lower Peninsula, 2015-2019

Type of Crash	Upper Peninsula		Lower Peninsula	
	Number of KABs	KAB Rate per 100 Million VMT	Number of KABs	KAB Rate per 100 Million VMT
Single Vehicle	1,691	10.05	41,525	8.53
Driver 14-24 Involved	1,161	6.90	45,663	9.39
Pickup Truck Involved	995	5.91	22,775	4.68
Icy/Snowy/Slushy Roads	797	4.74	11,568	2.38
Driver 65+ Involved	739	4.39	24,113	4.96
Speed Related	727	4.32	17,281	3.55
Failure to Yield	614	3.65	27,722	5.70
Alcohol Involved	580	3.45	15,457	3.18
Motorcycle Involved	327	1.94	9,007	1.85
Drugs Involved	225	1.34	5,982	1.23
ORV/ATV Involved	201	1.19	915	0.19
Truck/Bus Involved	170	1.01	6,217	1.28
Deer Involved	163	0.97	2,374	0.49
Snowmobile Involved	116	0.69	178	0.04
Pedestrian Involved	109	0.65	6,516	1.34
Bicyclist Involved	71	0.42	3,854	0.79
All Crashes	3,375	20.05	125,831	25.86

For the most complete picture, data in Tables 21 and 22 should be compared together. For example, while KABs from crashes involving ORV/ATV vehicles and crashes involving snowmobiles both have low counts compared with other crash types, they make up a higher percentage of all KABs in the UP compared with the LP (Table 21), and their rates per total VMT are also higher in the UP compared with the LP (Table 22). Mileage-based KAB rates in snowmobile crashes are 18.8 times higher in the UP than the LP, and ORV/ATV rates are 6.4 times higher in the UP than the LP. These differences suggest that snowmobiles and ORV/ATVs have relatively more exposure to traffic crashes in the UP compared to the LP and that there is a greater opportunity for countermeasures to address these kinds of crashes in the UP compared to the LP.

In contrast, KABs resulting from crashes involving pedestrians and crashes involving bicyclists make up smaller percentages of KABs in the UP compared with the LP and occur at lower rates per mile in the UP than the LP. This suggests that KABs resulting from non-motorist crashes are relatively less of a problem in the UP than the LP. The same can be said for KABs resulting from crashes involving drivers age 14-24,

although a much higher number of KABs result from young driver crashes than from non-motorist crashes.

16.0 Summary

The numbers of crashes, fatalities, and injuries in the Upper Peninsula were charted from 1982 through 2019, and all three have all shown a downward trend since the mid-1990s. There were 9,140 police-reported crashes in the UP in 2019, resulting in 40 fatalities and 1,548 injuries. From their respective peak years to 2019, crashes decreased 51.0%, fatalities declined 52.4%, and injuries were down 62.5%.

Overall crashes in the UP peak in late fall/early winter, while KAB crashes peak in the summer months. The majority of crashes in the UP occur during daylight, even more so for KAB crashes than all crashes. Each year, an average of 2,521 crashes occur on icy/snowy/slushy roads in the UP. More than one-third of police-reported crashes in the UP involve deer, but 98.0% of these deer crashes are property damage only.

County comparisons using the last five years of data showed Marquette County to have the highest number of KAB injuries in the UP but also the greatest number of vehicle miles travelled. Calculating rates of KABs per 100 million VMT showed Houghton County to have the highest rate of KABs in the UP. When mileage-based rates for KABs in different crash types were compared, Dickinson had the highest rate for KABs in failure to yield crashes, Luce was highest for KABs on icy/snowy/slushy roads, and Houghton had the highest rate for KABs in driver age 14 to 24 crashes.

17.0 Appendix

Two tables are included as an appendix. The first table lists the number of KAB crashes each year across a range of categories, which are not mutually exclusive. All counts in this table are number of crashes, such as the number of KAB crashes involving a bicyclist or alcohol or wet roads. Percent change in counts from year to year and from 2015 to 2019 are also included in the table. Cells shaded red indicate an increase, and cells shaded green reflect a decrease.

The second table is structured similarly, but instead of crash counts it has counts of people with KAB injuries in different types of crashes. Most of the categories have counts of all people in the crash type who suffered KAB injuries. These categories are the ones that appear without “KABs” in their name, such as deer crashes, drugs-involved, and driver 14-18-involved. All of these categories list counts of anyone involved in the crash with KAB injuries. In contrast, the categories that include “KABs” in their name, such as bicyclist KABs, snowmobiler KABs, and unrestrained occupant KABs, show KAB counts for the specified people indicated, not KAB counts for the entire crash. So in these examples, the table has counts of bicyclists with KAB injuries, snowmobilers with KAB injuries, and unrestrained occupants with KAB injuries.

Number of KAB Crashes in the UP, 2015-2019

Number of KAB Crashes by Category	2015	2016	2017	2018	2018	2015-2016 Percent	2016-2017 Percent	2017-2018 Percent	2018-2019 Percent	2015-2019 Percent
All KAB crashes	477	544	563	553	555	14.0%	3.5%	-1.8%	0.4%	16.4%
Bicyclist-involved	14	8	13	17	17	-42.9%	62.5%	30.8%	0.0%	21.4%
Pedestrian-involved	19	23	19	20	18	21.1%	-17.4%	5.3%	-10.0%	-5.3%
Motorcycle-involved	53	67	57	48	55	26.4%	-14.9%	-15.8%	14.6%	3.8%
Snowmobile-involved	11	18	21	18	43	63.6%	16.7%	-14.3%	138.9%	290.9%
ORV/ATV-involved	28	34	47	35	33	21.4%	38.2%	-25.5%	-5.7%	17.9%
Deer-involved	15	35	37	26	27	133.3%	5.7%	-29.7%	3.8%	80.0%
Single-vehicle	267	317	328	291	291	18.7%	3.5%	-11.3%	0.0%	9.0%
Alcohol-involved	87	85	111	94	109	-2.3%	30.6%	-15.3%	16.0%	25.3%
Drugs-involved	20	38	26	33	50	90.0%	-31.6%	26.9%	51.5%	150.0%
Distraction-involved	---	50	56	68	53	---	12.0%	21.4%	-22.1%	---
Lane departure	244	262	269	257	248	7.4%	2.7%	-4.5%	-3.5%	1.6%
Hit-and-run	12	18	14	10	7	50.0%	-22.2%	-28.6%	-30.0%	-41.7%
Truck- or bus-involved	26	20	29	36	27	-23.1%	45.0%	24.1%	-25.0%	3.8%
Wet road	63	67	74	67	70	6.3%	10.4%	-9.5%	4.5%	11.1%
Icy road	46	37	50	53	41	-19.6%	35.1%	6.0%	-22.6%	-10.9%
Snowy road	42	57	70	58	102	35.7%	22.8%	-17.1%	75.9%	142.9%
Driver 14-18-involved	64	65	79	59	59	1.6%	21.5%	-25.3%	0.0%	-7.8%
Driver 65+-involved	88	102	109	123	135	15.9%	6.9%	12.8%	9.8%	53.4%
Speeding-involved	99	108	125	122	118	9.1%	15.7%	-2.4%	-3.3%	19.2%
Failure to yield-involved	81	89	88	100	109	9.9%	-1.1%	13.6%	9.0%	34.6%
Unable to stop-involved	32	32	44	48	45	0.0%	37.5%	9.1%	-6.3%	40.6%
Unrestrained occupant	74	59	94	70	57	-20.3%	59.3%	-25.5%	-18.6%	-23.0%

Upper Peninsula: 2015-2019

Number of KAB Injuries in the UP, 2015-2019

Number of KAB Injuries by Category	2015	2016	2017	2018	2019	2015-2016 Percent	2016-2017 Percent	2017-2018 Percent	2018-2019 Percent	2015-2019 Percent
All KABs	590	667	727	693	698	13.1%	9.0%	-4.7%	0.7%	18.3%
Bicyclist KABs	14	8	14	17	18	-42.9%	75.0%	21.4%	5.9%	28.6%
Pedestrian KABs	21	23	21	20	19	9.5%	-8.7%	-4.8%	-5.0%	-9.5%
Motorcyclist KABs	59	78	61	59	61	32.2%	-21.8%	-3.3%	3.4%	3.4%
Snowmobiler KABs	12	18	21	19	44	50.0%	16.7%	-9.5%	131.6%	266.7%
ORV/ATV rider KABs	32	35	50	42	39	9.4%	42.9%	-16.0%	-7.1%	21.9%
Deer crashes	18	41	39	33	32	127.8%	-4.9%	-15.4%	-3.0%	77.8%
Single-vehicle	300	349	372	335	335	16.3%	6.6%	-9.9%	0.0%	11.7%
Alcohol-involved	101	99	138	112	130	-2.0%	39.4%	-18.8%	16.1%	28.7%
Drugs-involved	23	55	38	42	67	139.1%	-30.9%	10.5%	59.5%	191.3%
Distraction-involved	---	67	82	89	69	---	22.4%	8.5%	-22.5%	---
Lane departure	285	303	349	318	308	6.3%	15.2%	-8.9%	-3.1%	8.1%
Hit-and-run	14	22	15	10	7	57.1%	-31.8%	-33.3%	-30.0%	-50.0%
Truck- or bus-involved	38	22	36	46	28	-42.1%	63.6%	27.8%	-39.1%	-26.3%
Wet road	74	79	104	82	88	6.8%	31.6%	-21.2%	7.3%	18.9%
Icy road	56	44	63	61	63	-21.4%	43.2%	-3.2%	3.3%	12.5%
Snowy road	53	65	99	67	129	22.6%	52.3%	-32.3%	92.5%	143.4%
Driver 14-18-involved	91	74	122	81	82	-18.7%	64.9%	-33.6%	1.2%	-9.9%
Driver 65+-involved	118	130	150	166	175	10.2%	15.4%	10.7%	5.4%	48.3%
Speeding-involved	122	123	169	154	159	0.8%	37.4%	-8.9%	3.2%	30.3%
Failure to yield-involved	105	122	119	126	142	16.2%	-2.5%	5.9%	12.7%	35.2%
Unable to stop- involved	42	38	56	56	53	-9.5%	47.4%	0.0%	-5.4%	26.2%
Unrestrained occ. KABs	69	60	102	66	60	-13.0%	70.0%	-35.3%	-9.1%	-13.0%

Upper Peninsula: 2015-2019