MAUMEE VALLEY
PLANNING ORGANIZATION

[SAFETY REPORT 2016-2020]

A COMPREHENSIVE FIVE-YEAR REPORT PRESENTING REGIONAL CRASH TRENDS FROM 2016-2020, TOP CRASH LOCATIONS FROM 2018-2020, AND POTENTIAL FUNDING OPPORTUNITIES TO ENHANCE SAFETY THROUGHOUT THE MAUMEE VALLEY PLANNING ORGANIZATION (MVPO) REGION IN NORTHWEST OHIO.

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EXECUTIVE SUMMARY

Overview & Regional Trends

The Maumee Valley Planning Organization (MVPO) is a regional planning and development organization serving Defiance, Fulton, Henry, Paulding and Williams Counties in Northwest Ohio. MVPO is designated as a Regional Transportation Planning Organization (RTPO) and as such, developed a Long Range Transportation Plan (LRTP) to assess current conditions of the region's transportation system and plan for the future. The LRTP established a goal to "reduce the number and severity of crashes across all modes of transportation," with the objectives to make comprehensive crash data readily available, monitor crashes over time, and identify top safety locations in the region. The purpose of this Safety Report is to identify crash trends in order to address safety concerns and provide insight for funding opportunities, in order to achieve the safety goal of the LRTP. The overarching goal for this Safety Report is to reduce serious injuries and fatalities on the region's roadways.

This Safety Report outlines regional crash trends and statistics utilizing ten-year crash data, five-year crash data, and specific locations of safety concerns based on three-year data from 2018-2020. In order to remain consistent with State and Federal guidelines, MVPO addressed the five safety performance measures developed by the Federal Highway Administration based on five-year rolling averages. The regional trends over ten years show a decline in total crashes, according to yearly totals and rolling five-year averages, resulting in a 17% decrease in total crashes from 2010-2020.

Top Crashes

Animal, fixed object, rear end, and angle are the top four identified crash types from 2016-2020. Animal crashes account for the highest number of total crashes and the greatest number of property damage only crashes. Fixed object crashes consist of the highest number of fatal, serious injury, and injury crashes, and follow second in property damage only crashes. Two serious crash types exist in the MVPO region: roadway departure and intersection. These crash types account for high numbers of fatal and injury crashes. Density maps are used to show the distribution of crashes in the region and indicate higher crash density areas are located in the four major cities of Bryan, Defiance, Napoleon, and Wauseon. Density maps also illustrate the distribution of top crash types as well as other contributing factors relating to crashes, like crashes involving impaired drivers and high speeds.

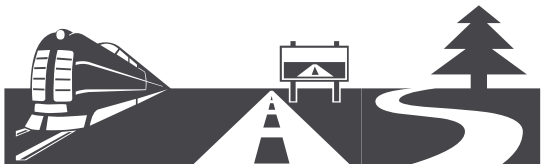
Top crash intersections and sections were identified using formulas outlined by other planning organizations in Ohio. Factors used to determine the top crash locations include crash frequency, the equivalent property damage only rate, and the crash rate. The top 100 urban and non-urban intersections and sections were identified, split evenly between intersections and sections. The number one high crash intersection was identified as the intersection Scott and the Westbound on/off ramps for US Route 6 in the City of Napoleon. The top location for a high crash section was identified as US Route 6 from State Route 191 to County Road 20 in Williams County.

Next Steps

The next step is to identify funding opportunities and implementation measures in order to make progress toward goals for safety in the MVPO region. MVPO will offer technical support in the form of grant writing, safety studies, and road safety audits to local governments that wish to implement countermeasures that will address specific high crash locations.

[SECTION 1] INTRODUCTION

A. OVERVIEW



As a regional planning and development organization, MVPO makes and implements joint regional decisions, provides management, planning, and technical services to local governments while identifying and solving problems best served at the regional level. MVPO is also designated as a Regional Transportation Planning Organization (RTPO)[1] and carries out transportation planning in the form of grant writing, technical services, and short and long range planning activities for the region.

One responsibility of the RTPO is to develop a Long Range Transportation Plan (LRTP) to assess current conditions of the region's transportation system, develop goals and objectives, and include specific projects to implement in order to achieve plan goals. One of the implementation items from MVPO's LRTP, known as Moving Together 2045[2], is to develop a Safety Report. The purpose of the Safety Report is to identify and monitor crash trends of the five-county area to address safety concerns and provide insight into opportunities for reducing serious injuries and fatalities on all roadways in the MVPO region.

This Safety Report outlines regional crash trends and statistics utilizing five-year averages from 2010-2020, five-year crash data from 2016-2020, and identifies specific locations of safety concern based on three-year crash data from 2018-2020. The purpose of this report is to help the region better understand overall crash trends and where specific high crash locations exist. The desired outcome of the Report is for MVPO to offer technical support in the form of grant writing, safety studies, and road safety audits to local governments wishing to implement countermeasures that will address specific high crash locations. The overarching goal is to reduce serious injuries and fatalities on the region's roadways.

This Report strives to be consistent with the Strategic Highway Safety Plan (SHSP)[3] developed by the Ohio Department of Transportation (ODOT). The SHSP identifies the greatest causes of serious injuries and deaths on Ohio's roads and establishes common goals, priorities, and strategies using data while helping Ohio prevent injuries and save lives. MVPO's Safety Report attempts to be consistent with the goals and strategies outlined in the SHSP in order to further State and National objectives for increasing safety for all roadway users.

> "The overarching goal is to reduce serious injuries and fatalities on the region's roadways."

[1] The RTPO was officially designated by Ohio's Governor in January 2016. There are five other RTPOs in Ohio.
[2] Access Moving Together 2045 at https://www.mvpo.org/mt2045
[3] Read the 2020 SHSP report here: https://www.transportation.ohio.gov/wps/portal/gov/odot/working/publications/strategic-highway-safety-plan

B. DATA UTILIZATION

The crash data represented in this report was received from standardized police reports (OH-1) that are produced every time law enforcement responds to a traffic crash. The Ohio Department of Public Safety (ODPS) compiles, analyzes, and publishes crash data for the State of Ohio. ODPS works with the Ohio Department of Transportation (ODOT) to distribute crash information, which is input to an online database known as the GIS Crash Analysis Tool (GCAT)[4]. All data utilized in this report was gathered from the GCAT.

C. SAFETY PERFORMANCE MEASURES & TARGETS

Performance measurement is the utilization of statistical evidence to determine what progress has been achieved toward specific defined objectives. Performance measures are benchmarks that are used to assess progress toward each objective. The Federal Highway Administration (FHWA)[5] published the Safety Performance Management Measures (Safety PM) Final Rules in the Federal Register on March 15, 2016 with an effective date of April 14, 2016. The Safety PM Final Rule establishes five performance measures that states and Metropolitan Planning Organizations (MPOs)[6] must establish in order to carry out their respective safety programs.

Five measures[7] developed by the Federal Highway Administration based on five-year rolling averages are as follows:

01 Number of fatalities;
02 Rate of fatalities per 100 million Vehicle Miles Traveled (VMT);
03 Number of serious injuries;
04 Rate of serious injuries per 100 million VMT; and
05 Number of Non-motorized Fatalities and Non-motorized Serious Injuries.

These safety performance measures are to be used by States and MPOs to assess progress toward the safety objectives as well as the national safety goal, which is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. To be consistent with States and MPOs and contribute to the achievement of national safety goals, MVPO will also use the five safety performance measures to assess regional progress in serious injury and fatality reduction.

After performance measures have been established, the next step for States and MPOs is to set performance targets. Performance targets are goals for reduction that have a specific timeframe associated with them. For example, a potential performance target could be to reduce the number of fatalities on all public roads by 3% by the year 2030. MVPO will utilize the five national performance measures to allow for the future setting of performance targets, which will be another outcome of this Report.

[4] Learn more about the GCAT Tool here: https://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/GCAT.aspx
[5] More information on FHWA's Safety PM can be found here: http://safety.fhwa.dot.gov/hsip/spm/
[6] MPOs serve urbanized areas with populations of 50,000 or greater: https://www.planning.dot.gov/mpo/
[7] Read about the five measures developed by FHWA: http://safety.fhwa.dot.gov/hsip/spm/safety_pm_fs.cfm

[SECTION 2] REGIONAL OVERVIEW

Overall crash summary statistics for the MVPO region will be explored in this section, including total crashes, select crash trends, and crash density. In order to establish a better representation of the region, five-year rolling averages[8] from 2010-2020 will be examined, along with specific crash data from 2016-2020.

A. TOTAL CRASHES 2016-2020

In the MVPO region, there were 22,369 crashes from 2016 to 2020, comprising 138 (<1%) fatal crashes, 4,454 (20%) injury crashes - 660 (3%) of which were serious injury crashes, and 17,777 (79%) property damage only (PDO) crashes (Figure 1).

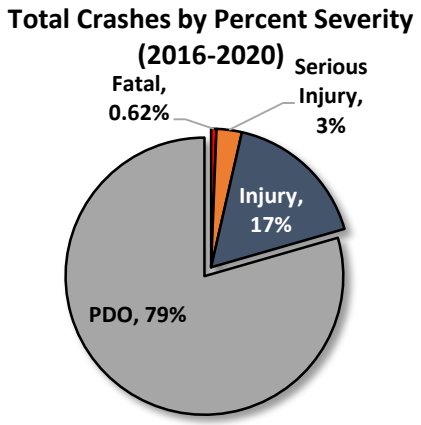


FIGURE 1. TOTAL CRASHES BY PERCENT SEVERITY 2016-2020

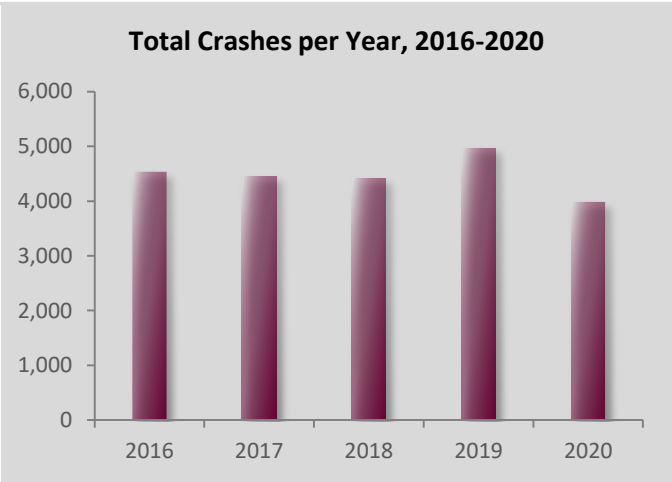


FIGURE 2. TOTAL CRASHES PER YEAR FROM 2016-2020

The highest number of crashes during the study period occurred in 2019 with a total of 4,968 crashes, followed by 2016 with 4,539 crashes (Figure 2, Table 1). Fatal crashes were highest in 2016 at 38 and lowest in 2019 at 20. Injury crashes decreased from 2016 to 2020 by 13.8% while property damage only crashes were highest in 2019 (Table 1). It is important to note the drastic reduction in traffic volumes, approximately 16% according to ODOT, in 2020 due to the COVID-19 pandemic contributing to a reduction of almost 1,000 crashes compared to 2019.

Table 1. TOTAL CRASHES, 2016-2020

Year	2016	2017	2018	2019	2020	TOTAL
Fatal Crash	38	32	26	20	22	138
Serious Injury Crash	152	139	137	130	102	660
Injury Crash	831	705	692	850	716	3,794
*PDO Crash	3,518	3,576	3,564	3,968	3,151	17,777
TOTAL	**4,539**	**4,452**	**4,419**	**4,968**	**3,991**	**22,369**

*PDO stands for 'Property Damage Only'

[8] The "rolling averages" were calculated by taking the average for total crashes and crash severities per each year of each five-year time period.

Table 2. CRASH TYPE BY SEVERITY AND FREQUENCY, 2016-2020

Crash Type	Total Crashes	Crash Severity			
		Fatal	Serious Injury	Minor Injury	No Injury
Animal	7642	0	10	164	7468
Fixed Object	4684	49	217	1120	3298
Rear End	2613	9	64	736	1804
Angle	2157	36	174	802	1145
Sideswipe - Passing	1289	3	30	186	1070
Backing	991	0	1	39	951
Left Turn	659	8	23	206	422
Parked Vehicle	489	1	6	59	423
Other Non-Collision	421	0	8	41	372
Overturning	413	5	57	205	146
Right Turn	326	0	2	59	265
Head On	287	12	28	93	154
Other Object	190	0	1	7	182
Pedestrian	83	8	25	44	6
Unknown	54	0	1	1	52
Pedalcycles	53	1	12	31	9
Train	12	2	1	1	8
Sideswipe - Meeting	7	4	0	0	3

Table 2 shows all crash types in the region with their total crashes and crash severity numbers for 2016-2020. The highest number of total crashes in the region (totaling 7,642) was animal crashes, which also made up the highest number of no injury crashes. Fixed object crashes accounted for the next highest amount of total crashes at 4,684. Fixed object crashes also comprised the greatest number of fatal (49), serious injury (217), and minor injury (1,120) crashes than all other crash types in the region (Table 2).

B. OVERALL CRASH TRENDS 2010-2020

Ten-year regional trends indicate a decline in total crashes, according to yearly totals (Figure 3) and rolling five-year averages (Table 2) encompassing years 2010 to 2020. Overall crash trends indicate that total crashes are down 17% from 2010-2020[9].

> “Overall crash trends indicate that crashes are down 17% from 2010-2020.”

[9] The percent change was calculated using the following formula: *((Vpresent – Vpast)/Vpast)*100*, where *Vpresent* = the total number of crashes for 2020 and *Vpast* = the total number of crashes for 2010.

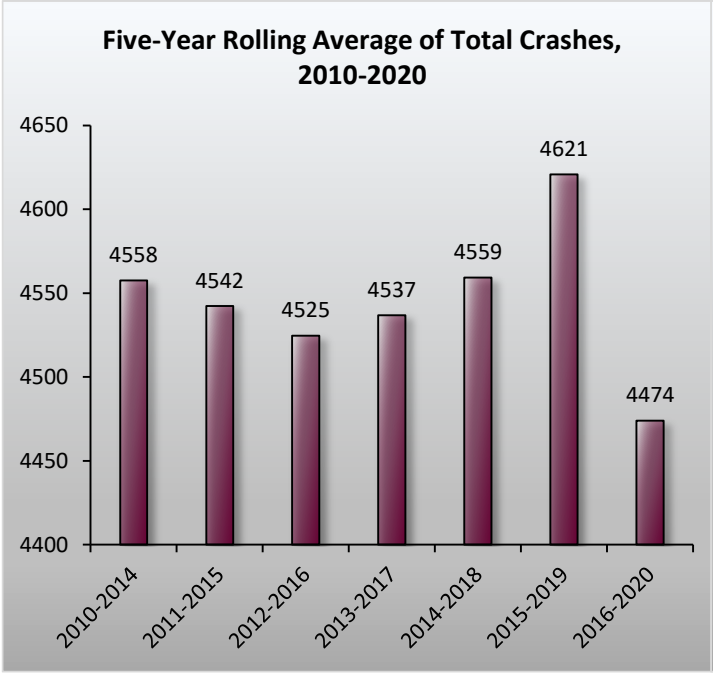


FIGURE 3. FIVE-YEAR ROLLING AVERAGE OF TOTAL CRASHES 2010-2020

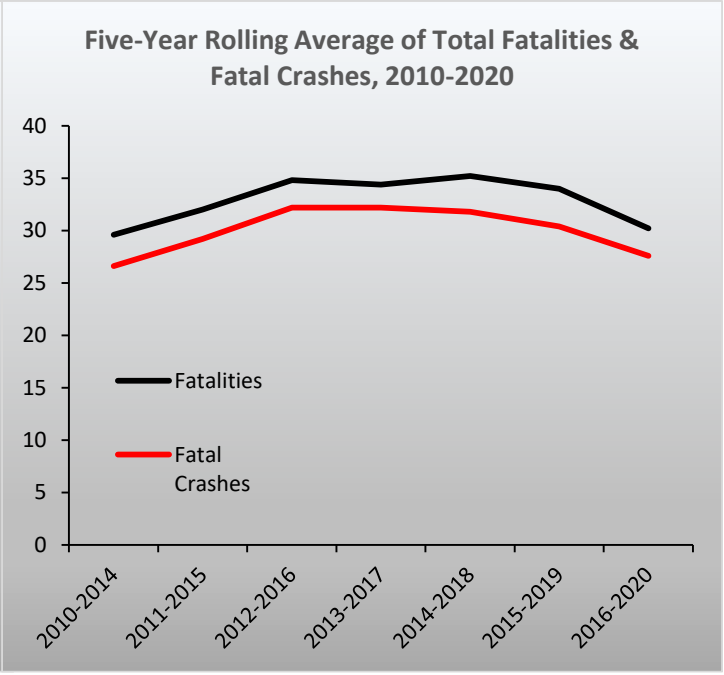


FIGURE 4. FIVE-YEAR ROLLING AVERAGE OF TOTAL FATALITIES & FATAL CRASHES 2010-2020

Despite the reduction in crashes as a whole, the numbers of fatalities and fatal crashes have actually increased from 2010 to 2020 according to the five-year rolling averages (Table 3, Figure 4). Injury crashes also increased but the number of serious injuries decreased from 2010 to 2020 (Table 3).

TABLE 3. FIVE-YEAR TOTAL AVERAGES OF CRASH SEVERITIES 2010-2020

Five-Year Period	2010 - 2014	2011 - 2015	2012 - 2016	2013 - 2017	2014 - 2018	2015 - 2019	2016 - 2020
Fatal Crashes	27	29	32	32	32	30	28
Injury Crashes	754	761	768	759	751	776	759
Serious Injury Crashes	157	151	149	145	139	139	132
# of Fatalities	30	32	35	34	35	34	30
# of Serious Injuries	213	203	207	198	191	188	174
*Total	**4,558**	**4,542**	**4,525**	**4,537**	**4,559**	**4,621**	**4,474**

*Total average per year per five-year rolling period

“ Fatal crashes increased by 11% from 2010-2020.”

C. TOP CRASH TYPES 2016-2020

The top four crash types from 2016 to 2020 by total crashes were: 1) Animal, 2) Fixed Object, 3) Rear End, and 4) Angle (Table 4, Figure 5).

TABLE 4. NUMBER OF CRASHES BY SEVERITY FOR THE TOP FOUR CRASH TYPES 2016-2020

Crash Type	Fatal	Serious Injury	Injury	PDO	TOTAL
Animal	0	10	164	7468	7642
Fixed Object	49	217	1120	3298	4684
Rear End	9	64	736	1804	2613
Angle	36	174	802	1145	2157

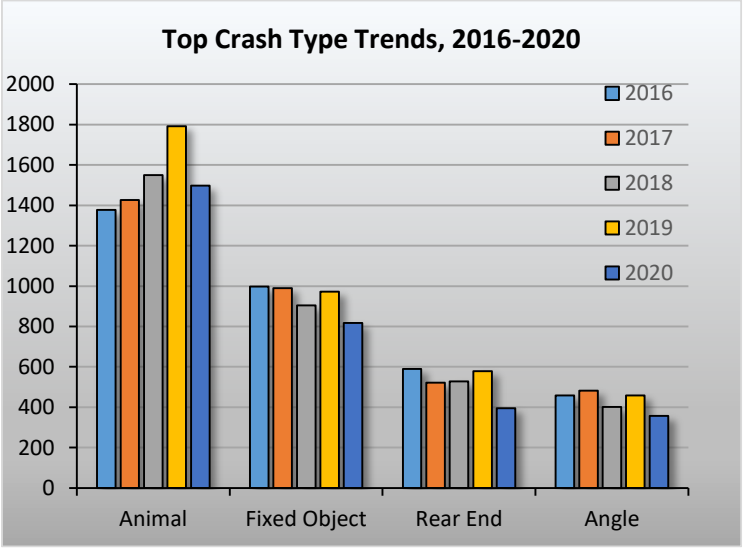


FIGURE 5. TOP CRASH TYPE TRENDS 2016-2020

Fixed object crashes resulted in the highest number of fatal and injury crashes out of all the identified top crash types, however, animal crashes resulted in the greatest amount of overall crashes and property damage only crashes (Table 4).

01 ANIMAL CRASHES

From 2016 to 2020, there were 7,642 crashes involving animals (Table 4). Animal crashes were the number one identified crash type in the region (Figure 5). The most identified animals struck during these crashes were deer (accounting for 7,181 of total animal crashes), followed by other animals (412 crashes), and 49 crashes involving farm animals (Figure 6). Table 2 shows that from 2016-2020 animals were involved in 34% of all crashes in the region. Property damage only was the main outcome of most animal crashes (Figure 7).

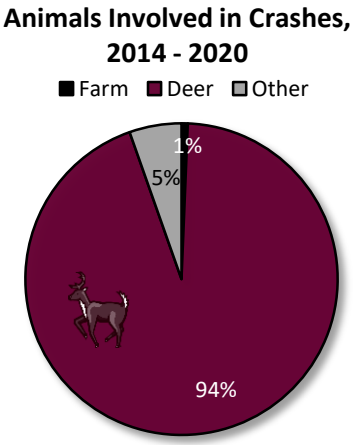


FIGURE 6. ANIMALS INVOLVED IN CRASHES 2016-2020

From 2016-2020, there was a small percentage of injury crashes resulting from a crash involving an animal (Figure 7), however, there were no fatal crashes reported as a result of this crash type. PDO crashes accounted for 98% of total animal crashes, while the other 2% consisted of injury crashes (Table 4).

> “ Animal crashes were the number one identified crash type in the region for the study period.”

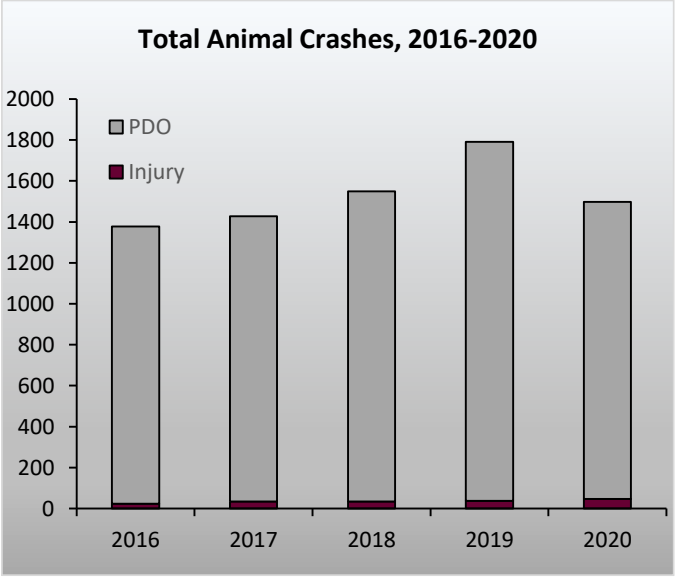


FIGURE 7. TOTAL ANIMAL CRASHES 2016-2020

02 FIXED OBJECT CRASHES

Crashes where a fixed object was struck consisted of the second highest number of crashes from 2016-2020, totaling 4,684 crashes (Table 4). Fixed object crashes resulted in the greatest amount (49) of fatal crashes among the top crash types followed by angle crashes (36), and head-on crashes (12). Fatal crashes involving a fixed object accounted for approximately 36% of all fatal crashes in the region from 2016-2020. Crashes involving a fixed object were 70% property damage only crashes, 29% injury crashes, and 1% fatal crashes (Figure 8).

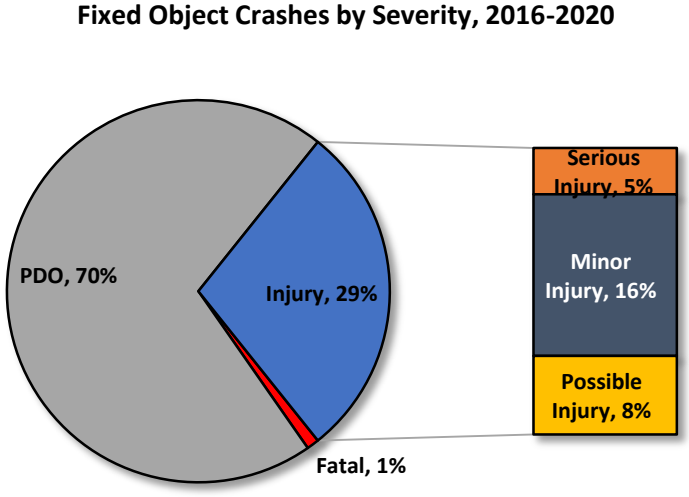


FIGURE 8. FIXED OBJECT CRASHES BY SEVERITY 2016-2020

In comparison with the other top crash types, fixed object crashes totaled 1,120 injury crashes from 2016-2020, angle crashes resulted in 802 injury crashes, rear-end totaled 736 injury crashes, and animal crashes made up 164 injury crashes.

> “ 32% of all fatal crashes in the region involved a fixed object.”

03 REAR END CRASHES

Rear end crashes accounted for approximately 12% of all regional crashes from 2016-2020. Rear end crashes only resulted in 1-2 fatal crashes per year during this time. Serious injury and injury crashes remained comparable from year to year, although the highest number of serious injury and injury crashes occurred in 2016 and 2019 (Figure 9). There was a precipitous drop in injury crashes in 2020, presumably due to reduced traffic volumes during the COVID-19 pandemic. Rear end crashes saw a similar drop in PDO cases with 399 crashes in 2016 and 272 in 2020.

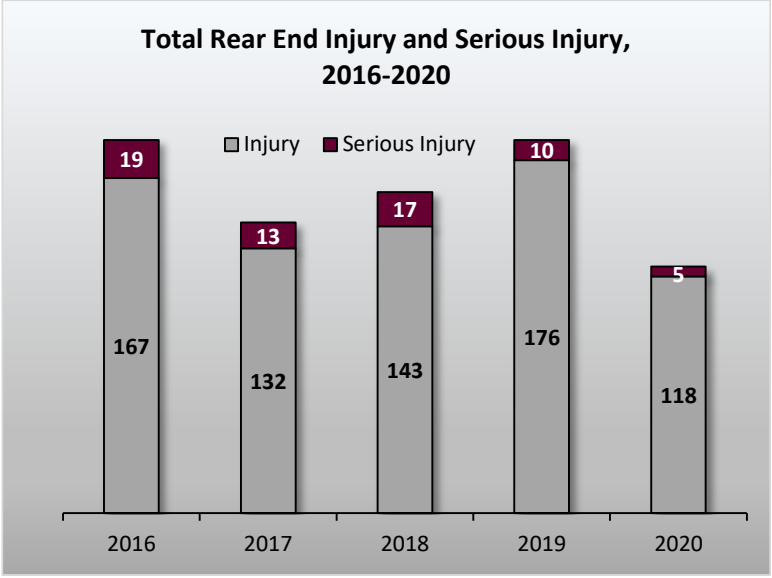


FIGURE 9. TOTAL REAR END INJURY AND SERIOUS INJURY CRASHES 2016-2020

4 ANGLE CRASHES

10% of all crashes in the MVPO region from 2016-2020 were angle crashes. While angle crashes had a lower number of overall crashes than rear end, they accounted for a higher number of serious injury and fatal crashes (Figure 10). As shown in Figure 11, injury crashes made up 45% of all angle crashes, 8% of those involving a serious injury.

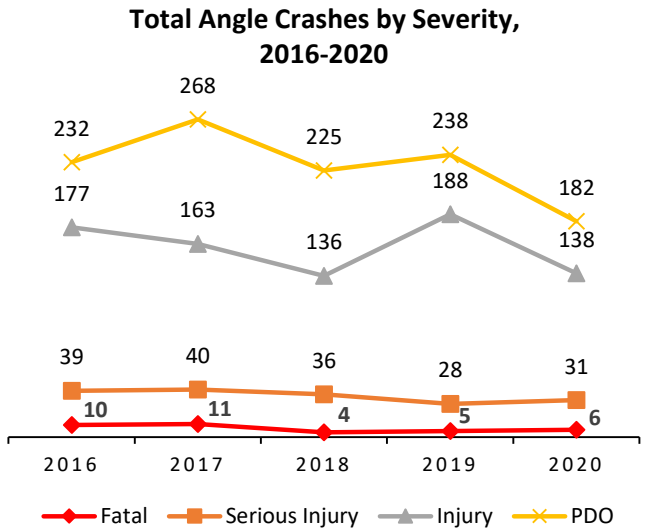


FIGURE 10. TOTAL ANGLE CRASHES BY SEVERITY 2016-2020

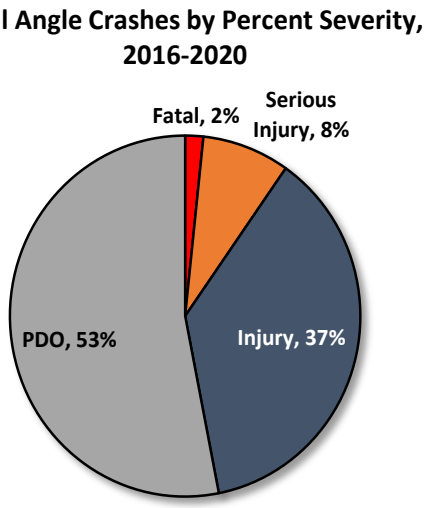


FIGURE 11. TOTAL ANGLE CRASHES BY PERCENT SEVERITY 2016-2020

Angle crashes most commonly occurred at four way intersections within the MVPO region, with the contributing circumstance typically being failure to yield.

D. TOP CRASH TYPE DENSITY MAPS 2016-2020

ANIMAL CRASH DENSITY [2016-2020]

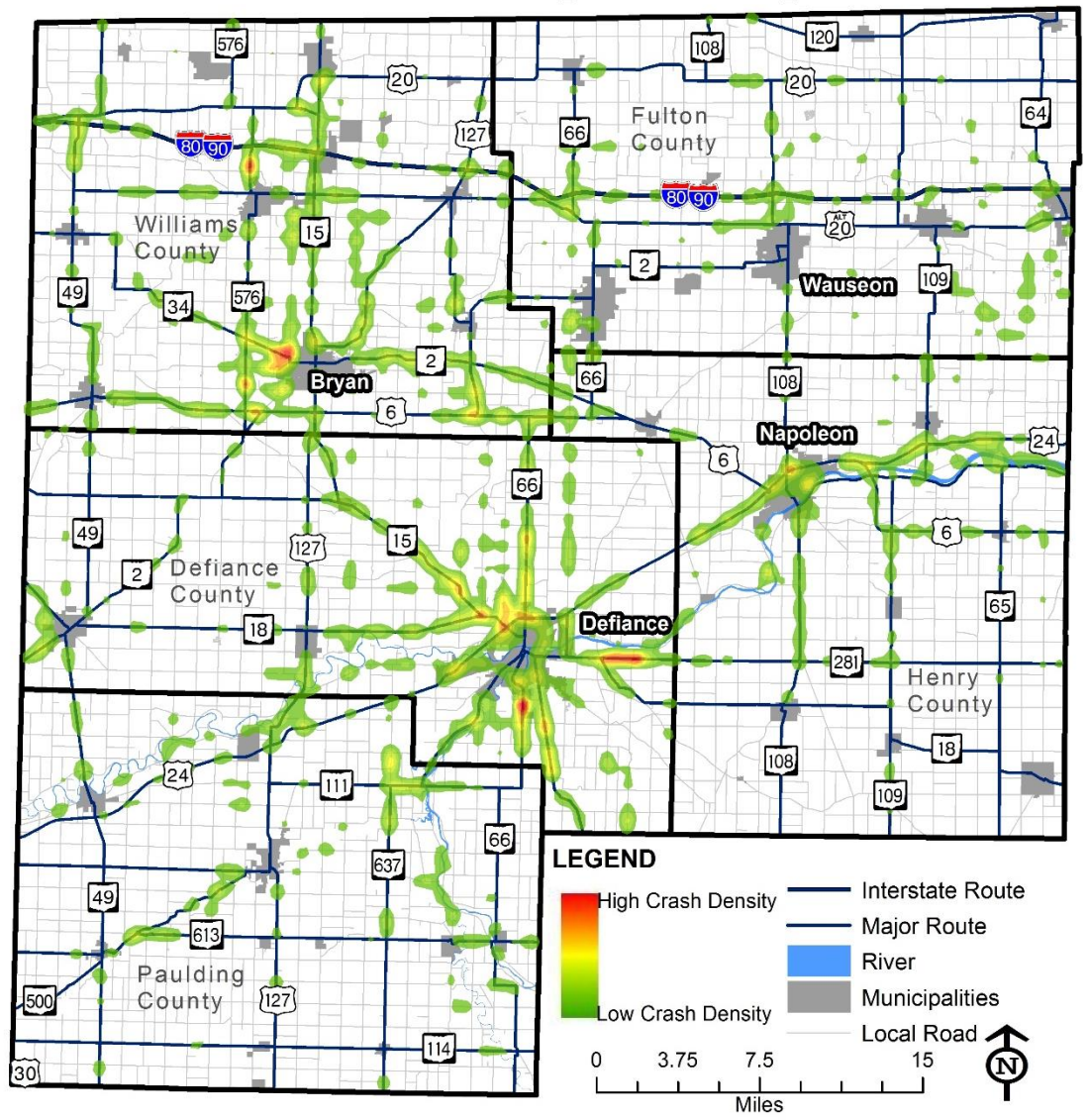


FIGURE 12. ANIMAL CRASH DENSITY MAP, 2016-2020
Map Sources: ODOT, ODPS, U.S. Census Bureau

Figure 12 displays the crash densities by location for animal crashes throughout the region. High density locations are apparent near the cities of Bryan and Defiance.

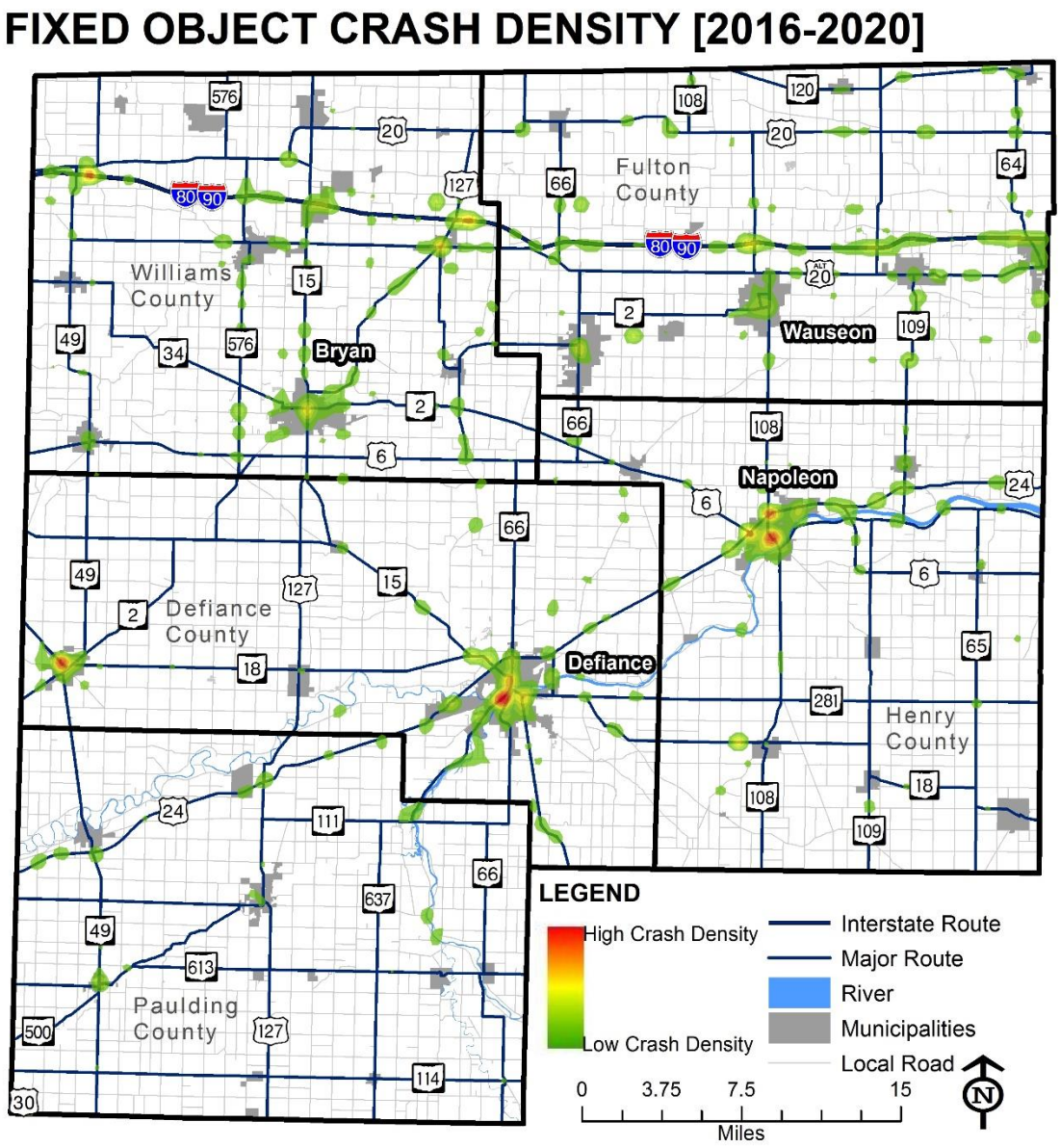


FIGURE 13. FIXED OBJECT CRASH DENSITY MAP, 2016-2020
Map Sources: ODOT, ODPS, U.S. Census Bureau

The greatest number of fixed object crashes occurred within Cities and Villages, most notably the City of Bryan and the Village of West Unity in Williams County, the City of Napoleon in Henry County, the City of Wauseon and the Village of Archbold in Fulton County, and the City of Defiance and the Village of Hicksville in Defiance County. There is also an area of high density along the Ohio Turnpike (Interstate Route 80/90) in Williams and Fulton Counties (Figure 13).

REAR END CRASH DENSITY [2016-2020]

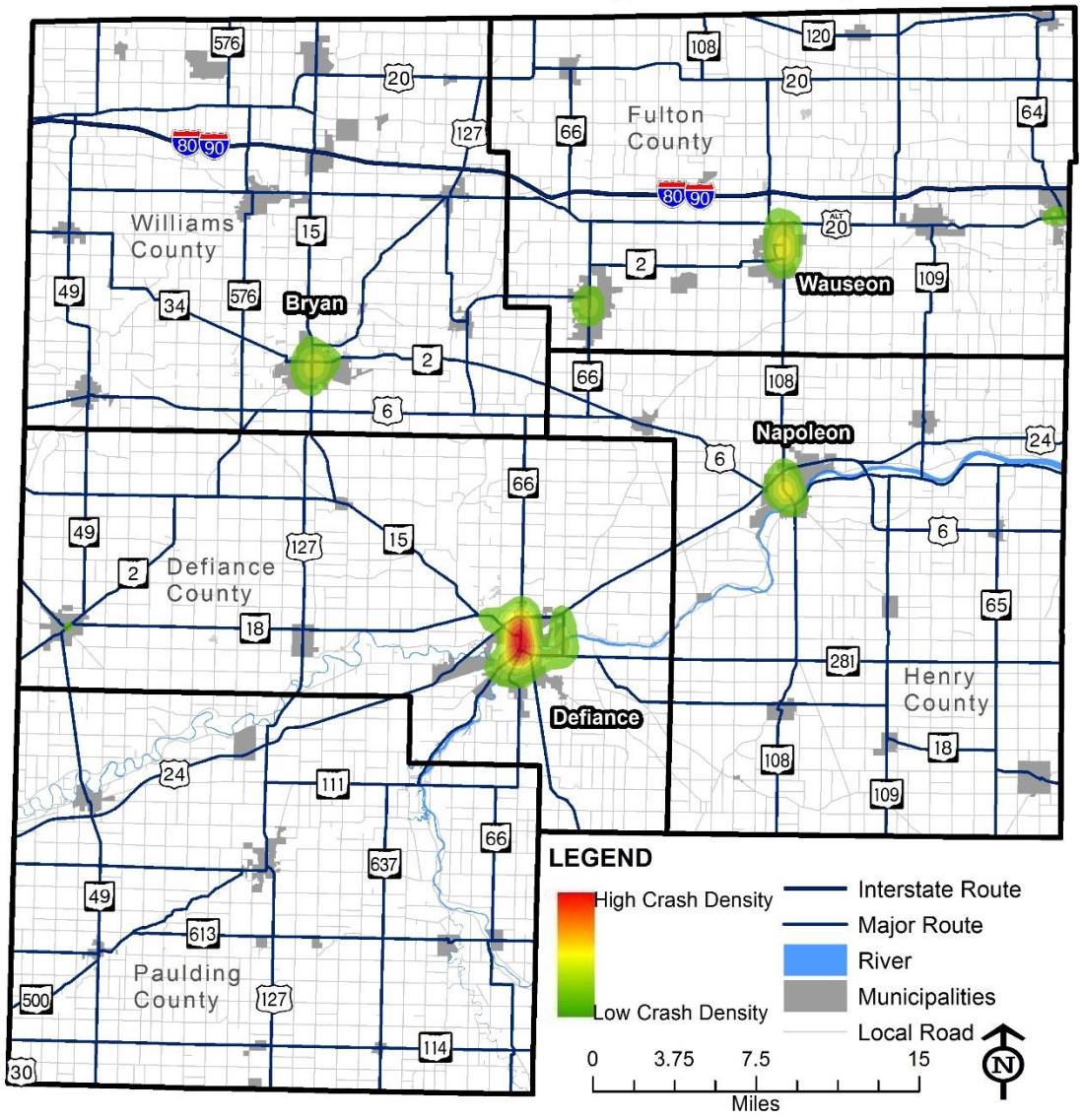


FIGURE 14. REAR END CRASH DENSITY MAP, 2016-2020
Map Sources: ODOT, ODPS, U.S. Census Bureau

The greatest densities of rear end crashes can be found in Cities within Defiance, Fulton, Henry, and Williams Counties, and in two Villages within Fulton County. Rear end crash density was highest in the City of Defiance (Figure 14).

ANGLE CRASH DENSITY [2016-2020]

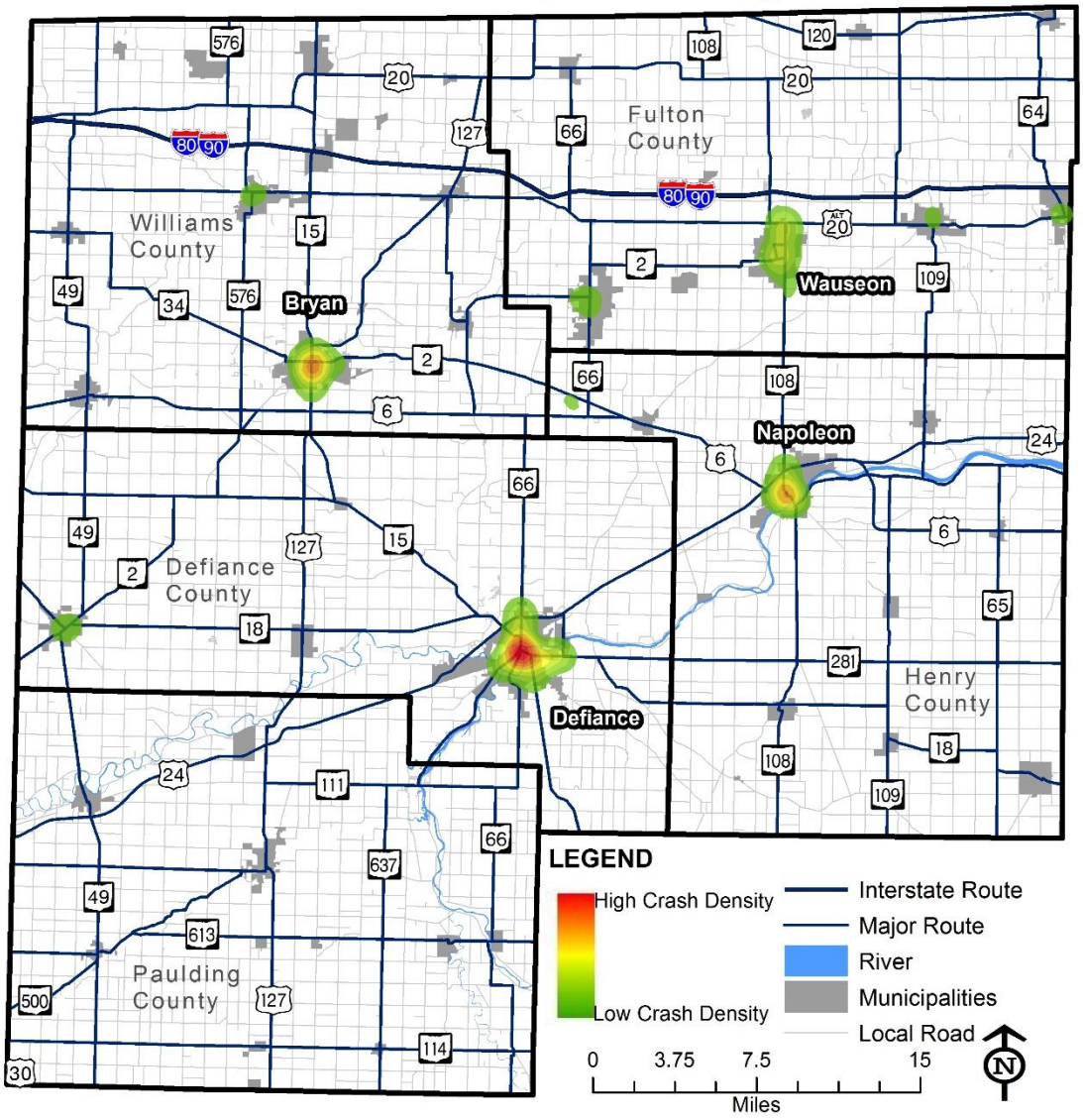


FIGURE 15. ANGLE CRASH DENSITY MAP, 2016-2020
Map Sources: ODOT, ODPS, U.S. Census Bureau

Angle crash densities were marginally more widespread than rear end crashes, spanning more Villages throughout the region and the Cities of Bryan, Defiance, Napoleon, and Wauseon. The City of Defiance had the greatest angle crash density, followed by Bryan and Napoleon (Figure 15).

[SECTION 3] SERIOUS CRASH TYPES

Ohio's Strategic Highway Safety Plan (SHSP) identifies four main emphasis areas in order to focus implementation efforts, help direct resources, and organize stakeholder teams. According to the Federal Highway Administration, these emphasis areas should reflect the greatest potential for reducing fatalities and injuries. The emphasis areas in the SHSP include serious crash types, high risk drivers and behaviors, special vehicle and roadway users, and data. To be as consistent as possible with the SHSP, this report investigates three of the four emphasis areas identified by the state, focusing on specific elements within those areas that are most pertinent to the MVPO region. The following three sections will discuss serious crash types, high risk drivers and behaviors, and special vehicles and roadway user trends for the MVPO region from 2016-2020.

Serious crash types for the MVPO region were chosen due to the high number of injury and fatal crashes associated with each crash type. These crash types also have high numbers of property damage only crashes. In the MVPO region, two serious crash types were identified: 1) roadway departure and 2) intersection.

A. ROADWAY DEPARTURE

According to Ohio's SHSP, roadway departure crashes occur when a vehicle leaves the designated lane of travel and hits another vehicle head-on or a fixed object of some type. For purposes of this report, roadway departures are defined the same way, combining both head-on and fixed object crashes into this category. Figure 16 shows the number of fatal roadway departure crashes per year from 2016-2020.

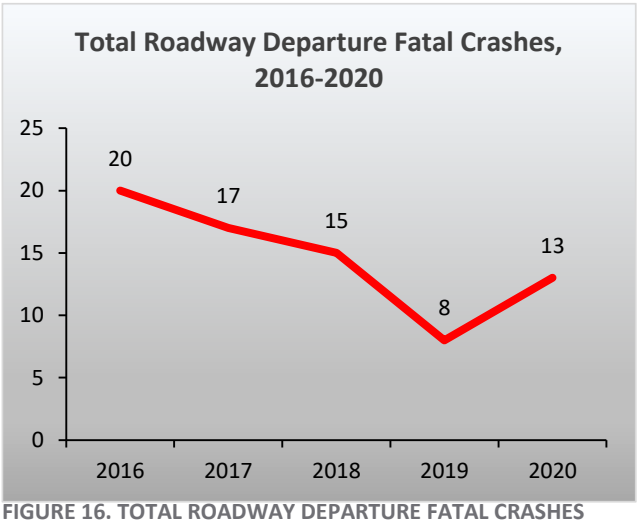


FIGURE 16. TOTAL ROADWAY DEPARTURE FATAL CRASHES 2016-2020

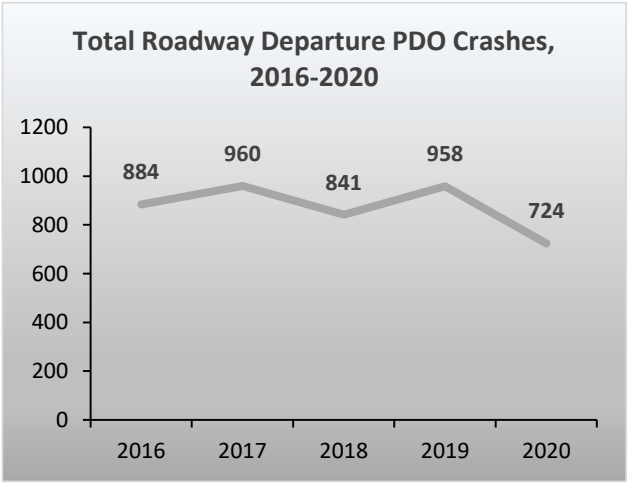


FIGURE 17. TOTAL ROADWAY DEPARTURE INJURY AND SERIOUS INJURY CRASHES 2016-2020

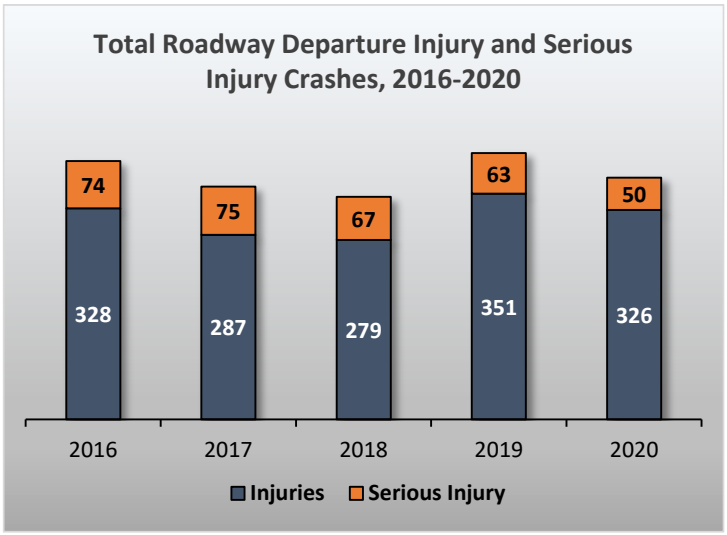


FIGURE 18. TOTAL ROADWAY DEPARTURE PDO CRASHES 2016-2020

During the study period, roadway departure crashes made up 53% of all fatal crashes in the MVPO region and 50% of all serious injury crashes. The most common contributing factor in departure crashes was failure to control, followed by unsafe speed and improper lane change/passing/off-road. Roadway departure crashes accounted for approximately 28% of all crashes from 2016-2020, totaling 6,340 crashes. Additionally, property damage only as a result of roadway departure crashes remained steady from 2016 to 2019 but saw a drastic reduction in 2020 (Figure 17). Injuries and incapacitating injuries decreased marginally from 2016 to 2020 (Figure 18). Roadway departure crashes were concentrated primarily within Cities and Villages, and along major routes such as the Ohio Turnpike (Route 80/90) and U.S. Route 127 (Figure 19).

ROADWAY DEPARTURE CRASH DENSITY [2016-2020]

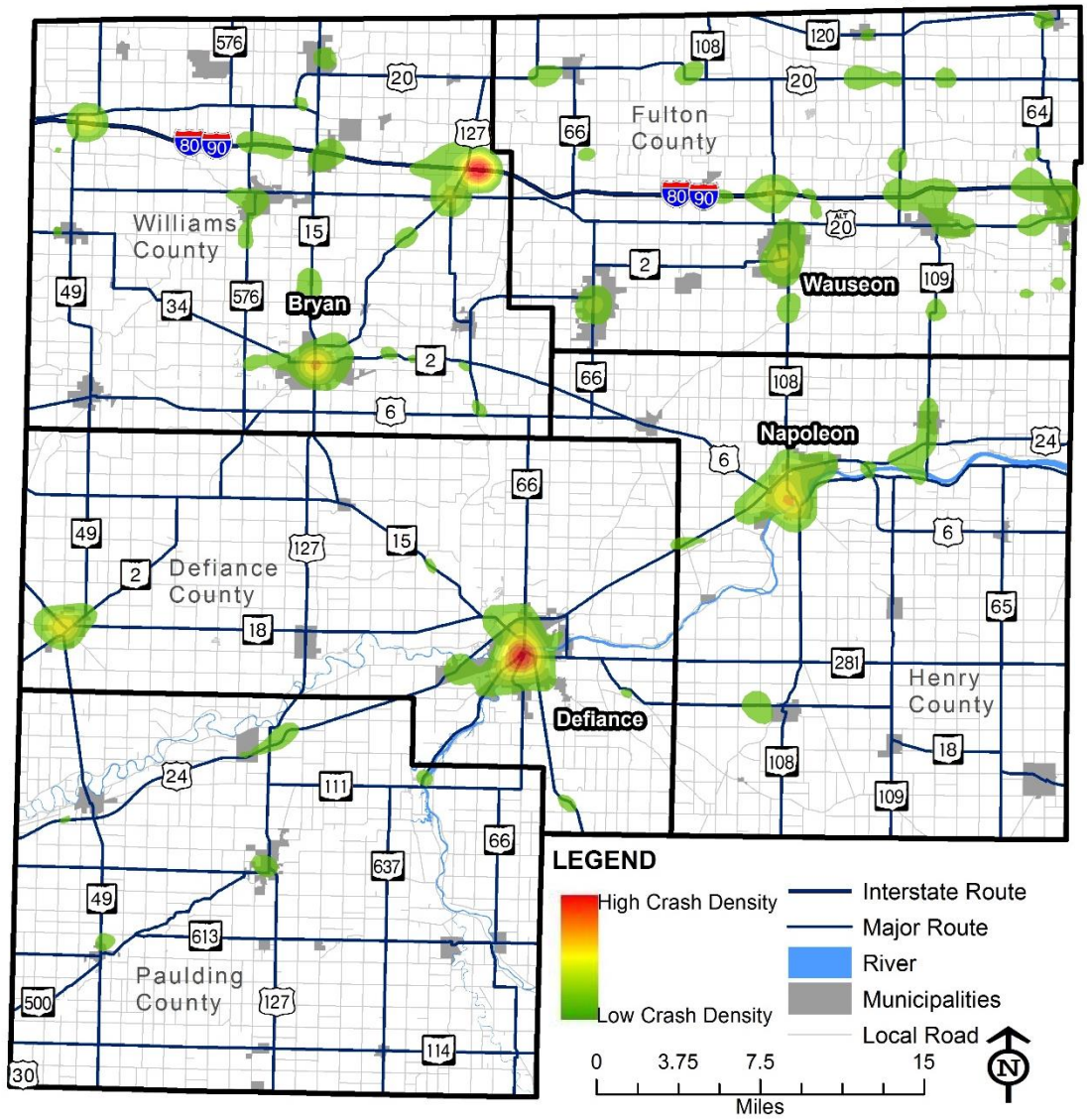


FIGURE 19. ROADWAY DEPARTURE CRASH DENSITY MAP 2016-2020
Map Sources: ODOT, ODPS, U.S. CENSUS BUREAU

> “Roadway departure crashes made up 53% of all fatal crashes and 50% of all serious injury crashes in the MVPO region.”

B. INTERSECTION

Crashes that occurred at a five-point or more, 4-way, Y, or T intersection were combined to represent the entirety of intersection crashes in the MVPO region from 2016-2020. Intersection crashes accounted for approximately 26% of the total number of crashes in the region.

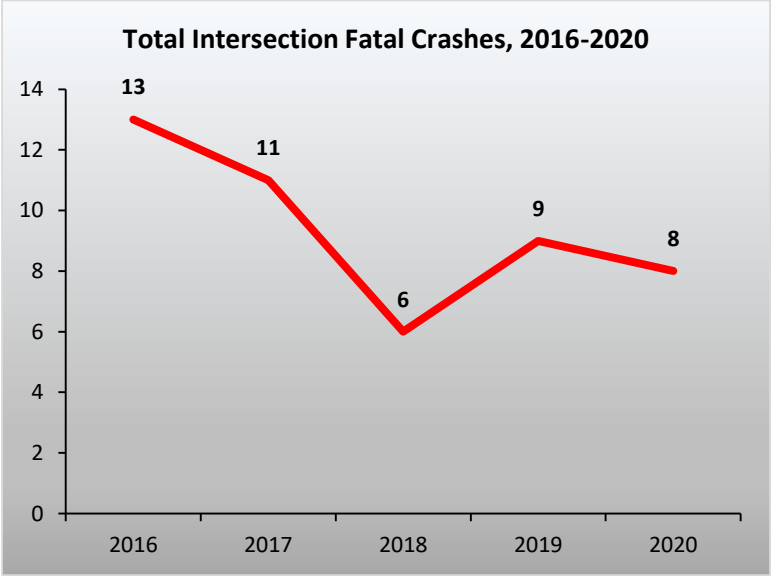


FIGURE 20. TOTAL INTERSECTION FATAL CRASHES 2016-2020

The number of fatal intersection crashes remained relatively steady from year to year, except for a decline in 2018 (Figure 20). Injury crashes mostly decreased during the study period, with 2016 having the highest amount of injury crashes at intersections during the five-year time period (Figure 21). Property damage only crashes also decreased from 2016 to 2020 (Figure 22). The most common crash type that occurred at an intersection was angle followed by rear end.

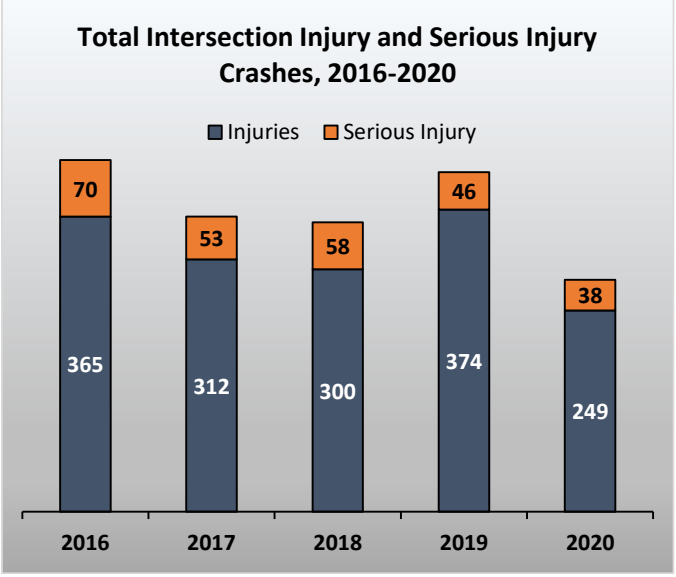


FIGURE 21. TOTAL INTERSECTION INJURY AND SERIOUS INJURY CRASHES 2016-2020

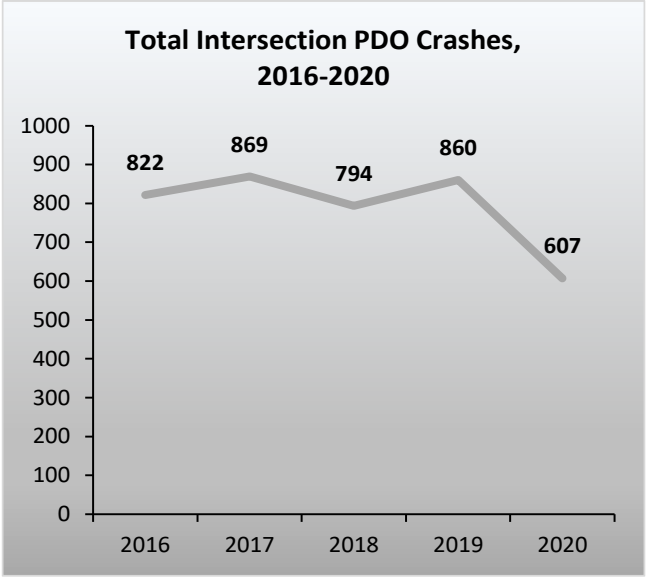


FIGURE 22. TOTAL INTERSECTION PDO CRASHES 2016-2020

> “ Intersection crashes account for approximately 26% of total crashes from 2016-2020.”

[SECTION 4] HIGH RISK DRIVERS & BEHAVIORS

A. IMPAIRED DRIVERS

For the purpose of this report, impaired drivers are defined as those drivers in which alcohol and/or drugs were suspected during the time of the crash, excluding those who had been drinking but were determined not to be impaired by law enforcement. This information was noted for both units involved in the crash.

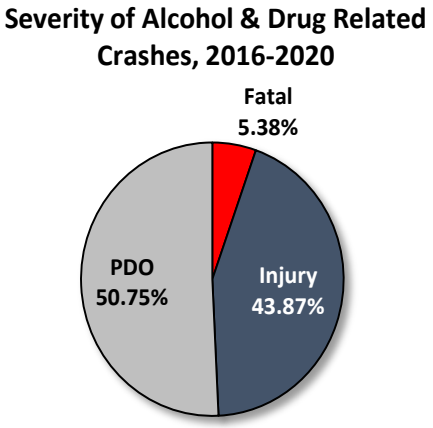


FIGURE 23. SEVERITY OF ALCOHOL & DRUG RELATED CRASHES 2016-2020

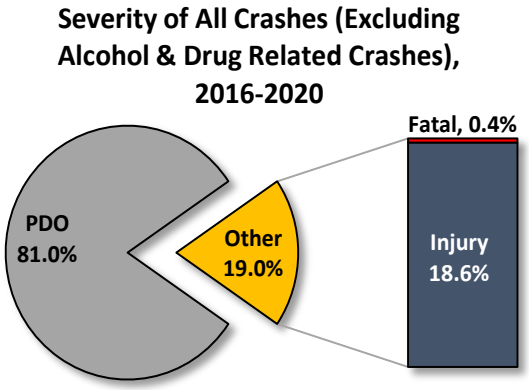


FIGURE 24. SEVERITY OF ALL CRASHES (EXCLUDING ALCOHOL & DRUG RELATED CRASHES) 2016-2020

Figure 23 demonstrates the almost even distribution of injury/fatal crashes and property damage only crashes involving an impaired driver. Though there was a smaller overall number of alcohol and drug related crashes (only 5% of total crashes in the region), these crashes accounted for 44% of the total fatal crashes from 2016-2020 (Table 5). Figure 24 shows the severity of all other crashes, excluding alcohol and drug related crashes. All other crashes which exclude those relating to alcohol and drugs account for less than 1% of fatal crashes, 19% of injury crashes, and 81% of property damage only crashes (Figure 24). Though there was a greater overall amount of crashes unrelated to alcohol and drugs, accounting for 95% of total crashes from 2016-2020, the crashes excluding those related to alcohol and drugs made up only a slightly higher percentage of total fatal crashes in the region (Table 5).

Table 5. Alcohol & Drug Related Crashes in Comparison to All Other Crashes, 2016-2020

	Fatal	Injury	PDO	TOTAL
Number of Alcohol & Drug Related Crashes	61	497	575	1133
% of Alcohol & Drug Related Crashes Compared to Total Crashes	44.20%	11.16%	3.23%	5.07%
Number of All Other Crashes*	77	3957	17202	21236
% of All Other Crashes* Compared to Total Crashes	55.80%	88.84%	96.77%	94.93%
*Excludes Alcohol & Drug Related Crashes				

IMPAIRED DRIVER CRASH DENSITY [2016-2020]

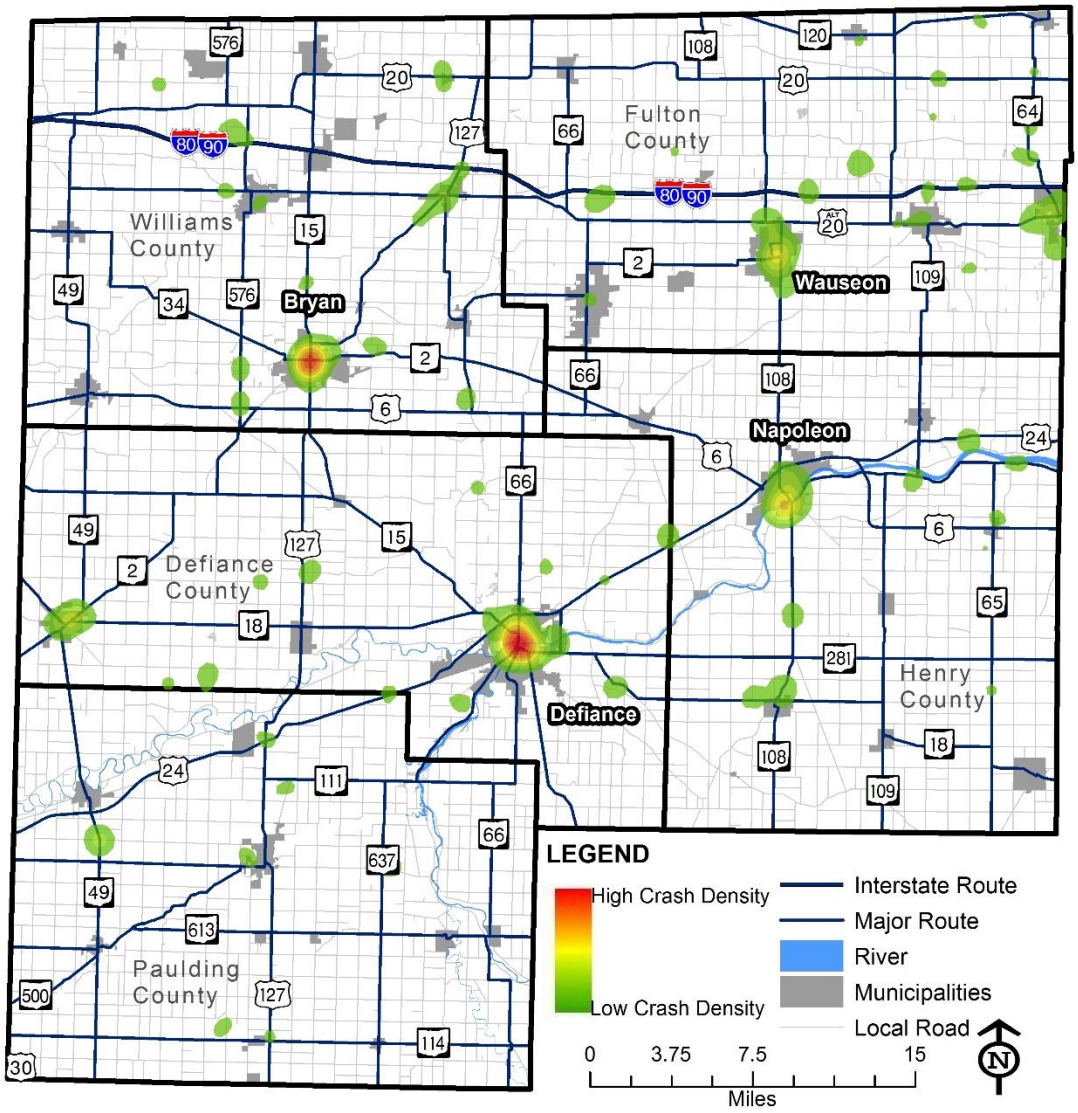


FIGURE 25. IMPAIRED DRIVER CRASH DENSITY MAP 2016-2020
Map Sources: ODOT, ODPS, U.S. CENSUS BUREAU

The highest density of crashes involving impaired drivers occurred in the City of Defiance in Defiance County, followed by the City of Bryan in Williams County, the City of Napoleon in Henry County, and the City of Wauseon in Fulton County. (Figure 25).

B. SPEED

Crashes where the unit speed exceeded the posted speed limit and crashes that had a contributing factor of 'unsafe speed' or 'exceeded speed limit' for either Unit 1 or Unit 2, excluding animal crashes, were studied to assess speed as a contributing factor of crashes. There was a total of 2,489 crashes where speeding was involved in the MVPO region from 2016-2020. Of these crashes, 15 were fatal (1%), and 659 (38%) involved an injury, with 143 total incapacitating injury crashes (Figure 26). Speed related crashes accounted for 11% of all fatal crashes in the MVPO region during the study period. Fatal crashes occurred most often when the unit speed was recorded at a travelling speed of 56 miles per hour or greater (Figure 27).

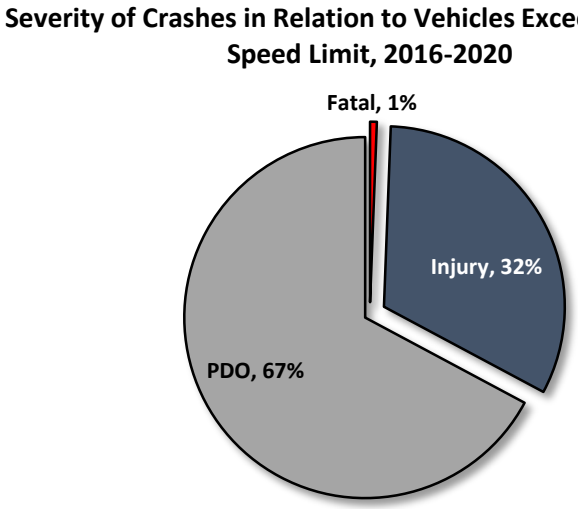


FIGURE 26. SEVERITY OF CRASHES IN RELATION TO EXCEEDING POSTED SPEED LIMIT 2016-2020

"Speed related crashes accounted for 15% of all fatal crashes in the MVPO region during the study period."

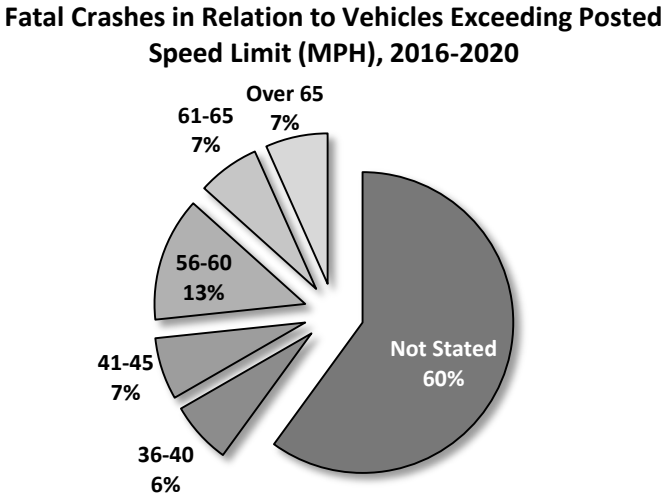


FIGURE 27. FATAL CRASHES IN RELATION TO VEHICLES EXCEEDING POSTED SPEED LIMIT (MPH) 2016-2020

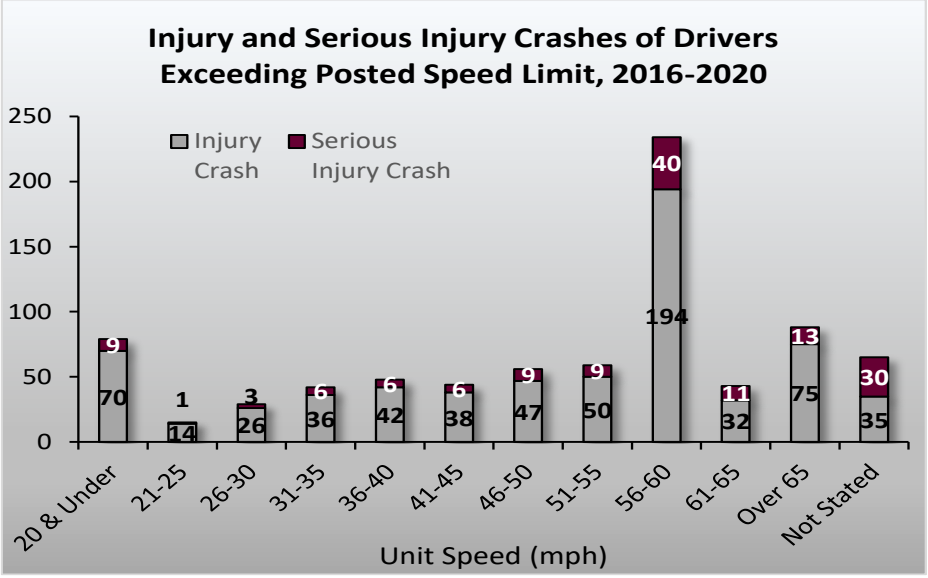


FIGURE 28. INJURY AND SERIOUS INJURY CRASHES IN RELATION TO VEHICLES EXCEEDING POSTED SPEED LIMIT 2016-2020

Figure 28 shows injury and serious injury crashes in which drivers exceeded the posted speed limit during the study period. The greatest number of serious injury crashes occurred when unit 1 was travelling at 56-60 mph, accounting for 40 of the serious injury crashes and 194 of the injury crashes (Figure 28).

Speed as a factor in crashes accounted for 15 of the 133 fatal crashes (or 11% of all fatal crashes) from 2016-2020. A unit speed of 56-60 mph resulted in the greatest numbers of serious injury, injury, and PDO crashes. However, fatal crashes were highest when the unit speed was not stated (Table 6).

TABLE 6. NUMBERS OF CRASHES BY SEVERITY OF DRIVERS EXCEEDING POSTED SPEED LIMIT 2016-2020

Unit Speed (mph)	Fatal Crash	Serious Injury Crash	Injury Crash	PDO Crash	TOTAL
20 & Under	0	9	70	126	205
21-25	0	1	14	31	46
26-30	0	3	26	98	127
31-35	0	6	36	93	135
36-40	1	6	42	126	175
41-45	1	6	38	100	145
46-50	0	9	47	85	141
51-55	0	9	50	115	174
56-60	**2**	**40**	**194**	**566**	**802**
61-65	1	11	32	53	97
Over 65	1	13	75	217	306
Not Stated	9	30	35	62	136
TOTAL	**15**	**143**	**659**	**1,672**	**2,489**

Speed related crashes were concentrated most within the City of Defiance, followed by the Cities of Bryan, Napoleon, and Wauseon. The Ohio Turnpike (Interstate Route 80/90) also had high densities of speed related crashes (Figure 29).

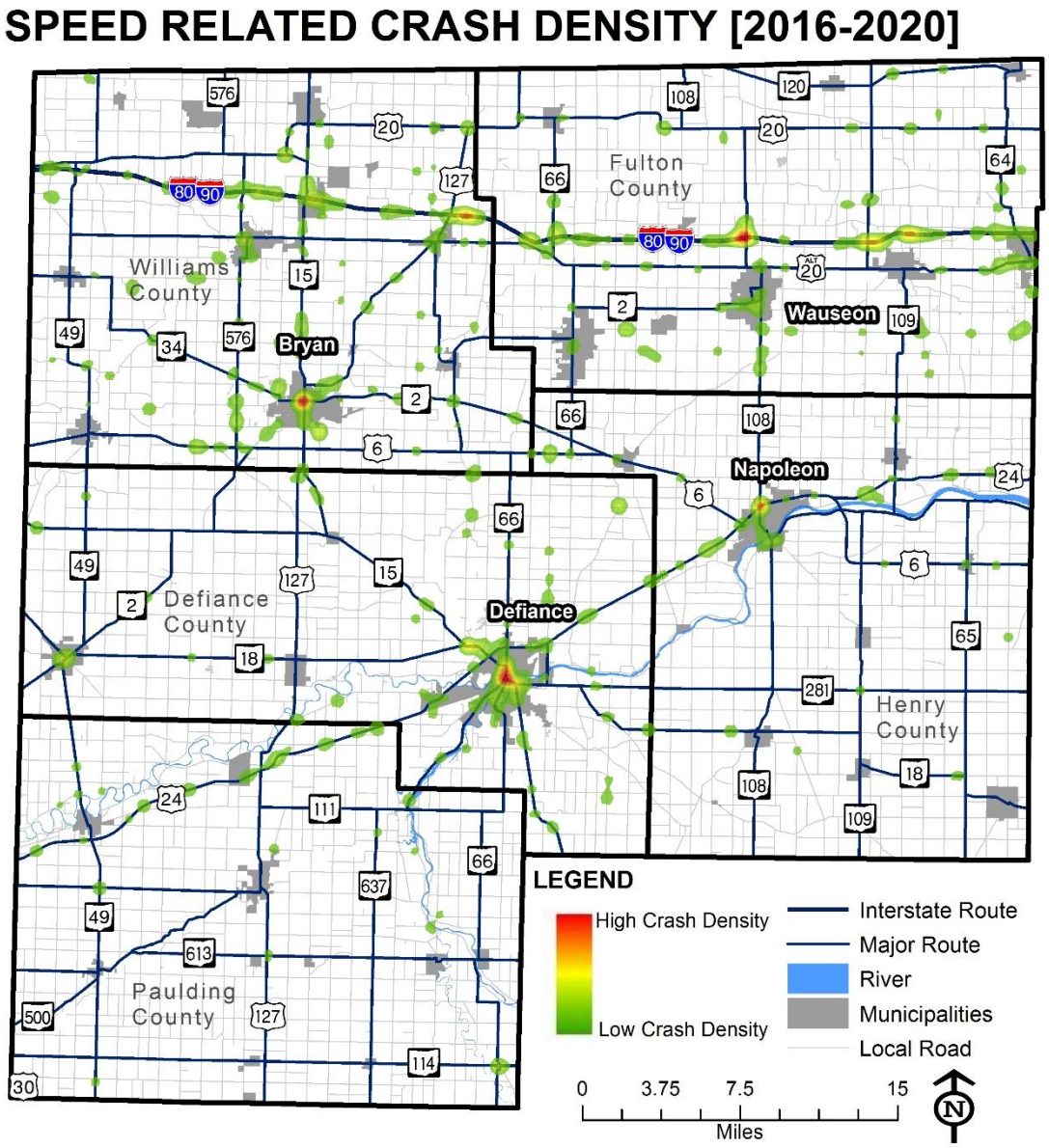


FIGURE 29. SPEED RELATED CRASH DENSITY MAP 2016-2020
Map Sources: ODOT, ODPS, U.S. CENSUS BUREAU

C. DRIVER CHARACTERISTICS

01 GENDER

Unit 1 was identified as the "at fault" driver in most cases and this assumption was made for the following analyses. Figure 30 shows the gender distribution of drivers at fault in crashes from 2016-2020. Males were 22% more likely than females to be at fault in crashes during the study period. Furthermore, males were involved in more fatal, injury, and property damage crashes than at-fault female drivers (Figure 31).

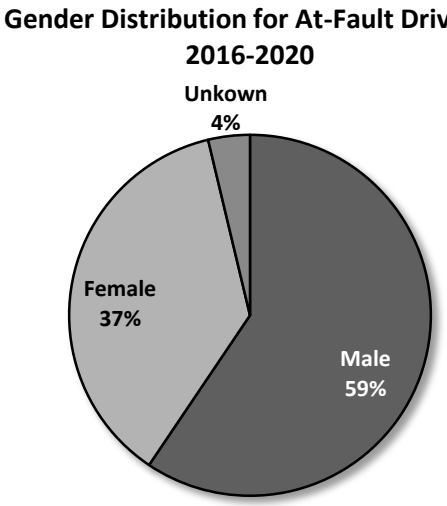
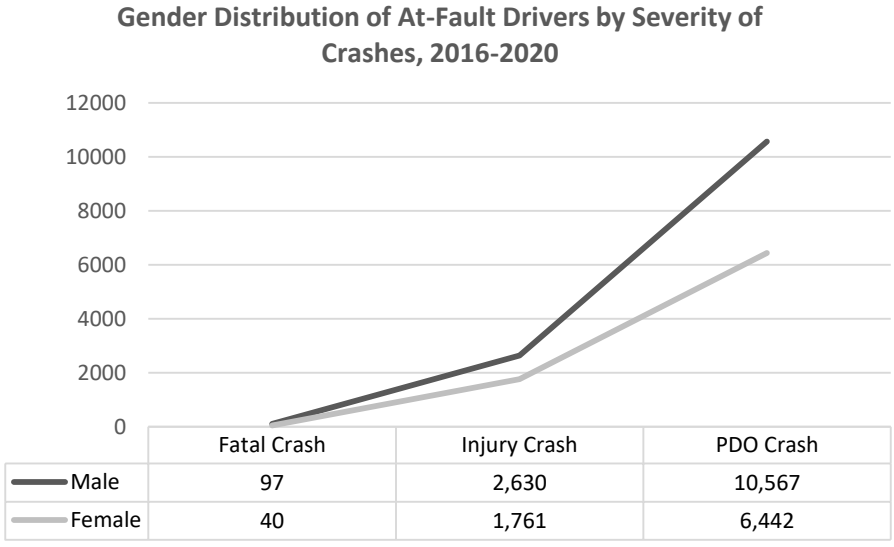


FIGURE 30. GENDER DISTRIBUTION FOR AT-FAULT DRIVERS, 2016-2020

> "Males were 22% more likely than females to be at fault in crashes from 2016-2020."



	Fatal Crash	Injury Crash	PDO Crash
Male	97	2,630	10,567
Female	40	1,761	6,442

FIGURE 31. GENDER DISTRIBUTION OF AT-FAULT DRIVERS BY SEVERITY OF CRASHES,

02 AGE

Crash data from 2016-2020 demonstrates that older drivers had a higher amount of at fault responsibility for fatal crashes than other age groups. As shown in Figure 32, the 65+ age group accounted for the highest number of fatal crashes (22) from 2016-2020. For injury crashes, the 16-19 year age group and the 20-24 age group had the highest numbers, while the 65+ age group had the third highest number (Figure 33). For PDO crashes, the 20-24 and 65+ age groups showed the two highest frequencies of at-fault drivers with the 25-29 age group having the third highest. This demonstrates that younger drivers and older drivers were more likely to be involved in all types of crashes than the other age groups during the study period.

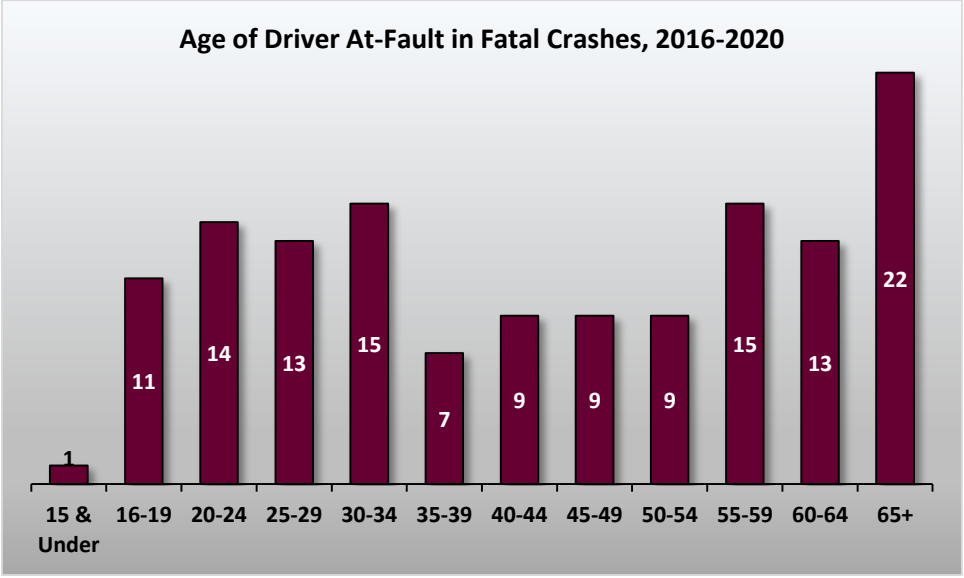


FIGURE 32. AGE OF DRIVERS AT-FAULT IN FATAL CRASHES, 2016-2020

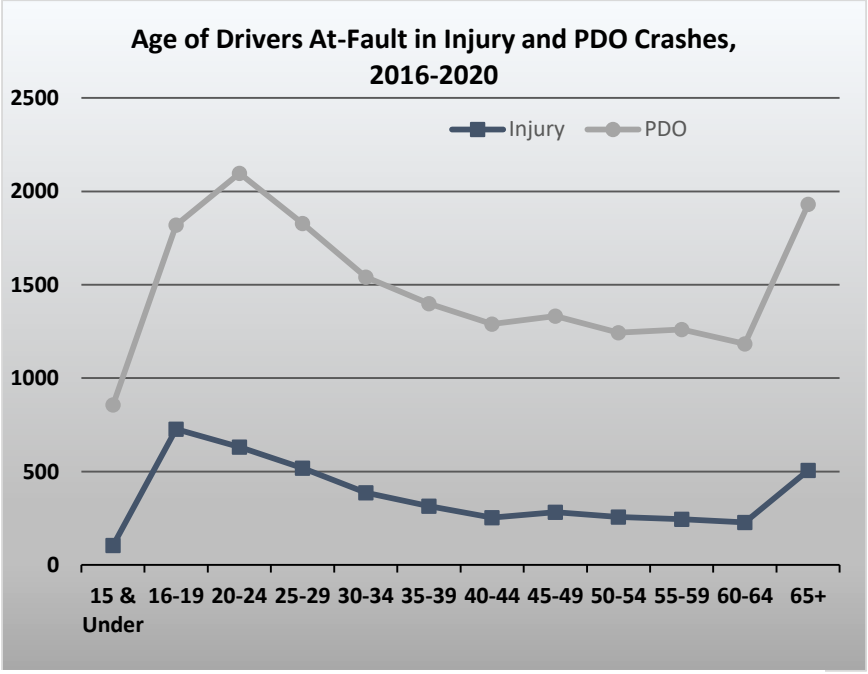


FIGURE 33. AGE OF DRIVERS AT-FAULT IN INJURY AND PDO CRASHES, 2016-2020

"The 65+ age group accounted for the highest number of fatal crashes from 2016-2020."

[SECTION 5] ROADWAY USERS & CONDITIONS

A. PEDESTRIANS & CYCLISTS

There were a total of 83 crashes involving a pedestrian/skater and 53 crashes involving a bicyclist/pedalcyclist from 2016-2020. Of those crashes, 9 were fatal, 112 involved injuries, and the remaining 15 crashes were property damage only (Table 8). Of the 8 fatal pedestrian crashes, 1 occurred in 2016 and 2017, respectively, and 2 in each year from 2018 to 2020, which accounts for 10% of the total pedestrian/skater crashes (Figure 34). Bicyclist/pedalcyclist crashes had one fatal crash in 2017 but a greater percentage (29%) of injury crashes than pedestrian/skater crashes (Figure 35). 83% of total pedestrian/skater crashes and 81% of total bicyclist/pedalcyclist crashes resulted in an injury (Figures 34 & 35). During the study period, pedestrians/skaters were 10% more likely to sustain a serious injury than a bicyclist/pedalcyclist (Figures 36 & 37). Figure 38 shows the distribution of pedestrian and bicyclist crashes throughout the MVPO region.

TABLE 7. NUMBER OF CRASHES BY SEVERITY INVOLVING PEDESTRIANS OR BICYCLISTS, 2016-2020

Years	Pedestrain/Skater					Bicyclist/Pedalcyclist				
	Fatal Crash	Serious Injury Crash	Injury Crash	PDO Crash	TOTAL	Fatal Crash	Serious Injury Crash	Injury Crash	PDO Crash	TOTAL
2016	1	5	14	1	21	0	4	8	1	13
2017	1	5	5	2	13	1	0	7	4	12
2018	2	4	9	2	17	0	2	4	2	8
2019	2	8	11	0	21	0	2	3	1	6
2020	2	3	5	1	11	0	4	9	1	14
TOTAL	**8**	**25**	**44**	**6**	**83**	**1**	**12**	**31**	**9**	**53**

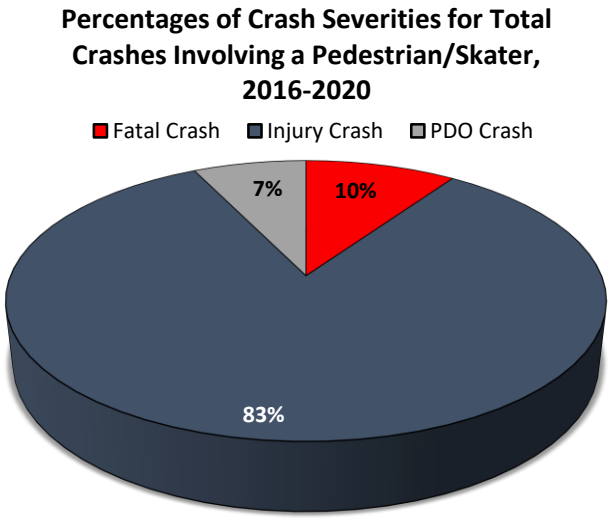


FIGURE 34. PERCENTAGES OF CRASH SERVERITIES FOR TOTAL CRASHES INVOLVING A PEDESTRIAN/SKATER 2016-2020

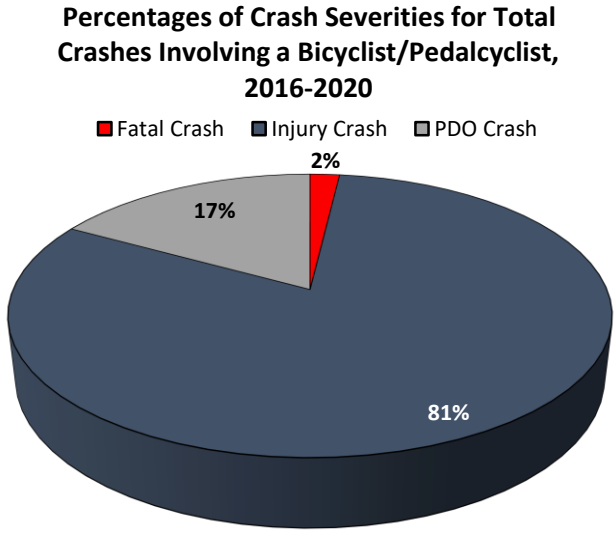


FIGURE 35. PERCENTAGES OF CRASH SERVERITIES FOR TOTAL CRASHES INVOLVING A BICYCLIST/PEDALCYCLIST 2016-2020

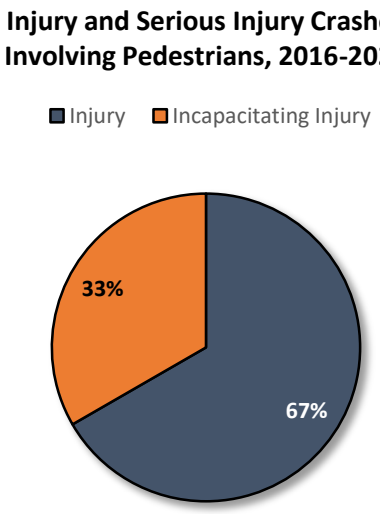


FIGURE 36. INJURY AND SERIOUS INJURY CRASHES INVOLVING CYCLISTS 2016-2020

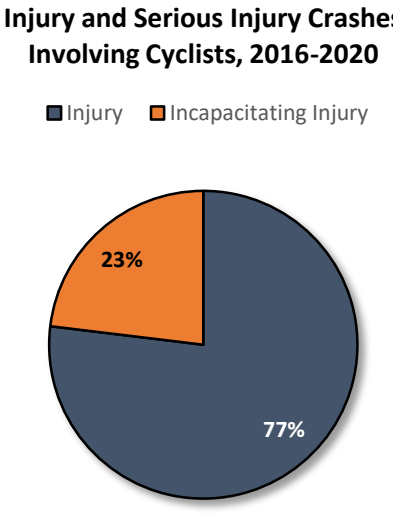


FIGURE 37. INJURY AND SERIOUS INJURY CRASHES INVOLVING CYCLISTS 2016-2020

01

CONTRIBUTING CIRCUMSTANCES

Improper crossing was identified as the number one contributing circumstance that led to half of the fatal crashes involving a pedestrian/skater. Other contributing circumstances in fatal crashes were determined as follows:

- Inattentive
- Lying and/or illegally in the roadway
- Not visible (dark clothing)

Improper crossing and failure to yield to the right of way were the main contributing circumstances in injury crashes involving a bicyclist/pedalcyclist. The contributing circumstances accounted for approximately 40% of all injury crashes involving cyclists. Other contributing circumstances in injury crashes were determined as follows:

- Unknown
- Failure to obey signs/signals/officer
- Darting

“ Fatal crashes involving pedestrians and bicyclists occurred nine times between 2016 and 2020.”

PEDESTRIAN & BICYCLE CRASH DENSITY [2016-2020]

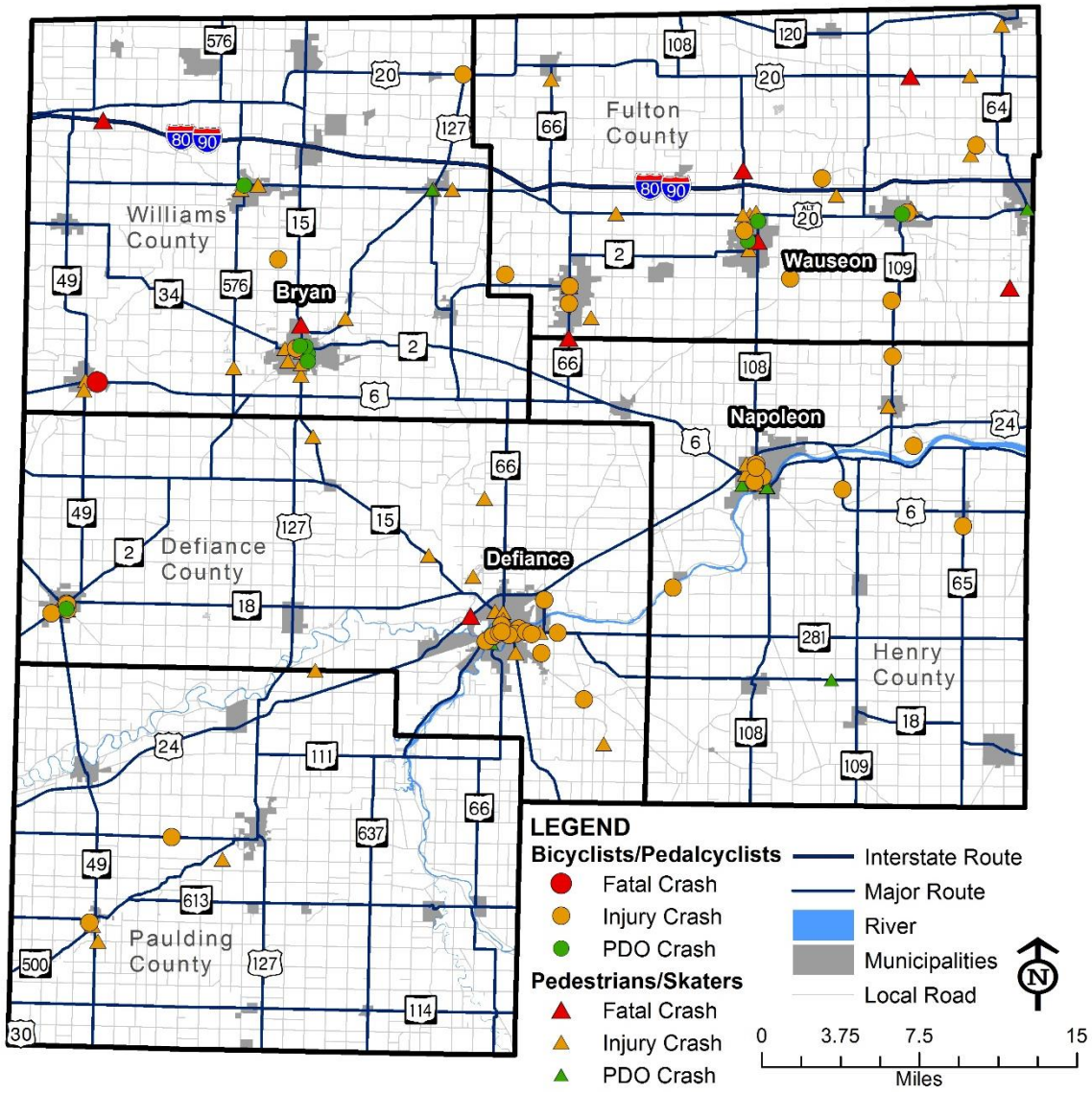


FIGURE 38. PEDESTRIAN & BICYCLE CRASHES MAP 2016-2020
Map Sources: ODOT, ODPS, U.S. CENSUS BUREAU

B. COMMERCIAL VEHICLES

Commercial vehicles included the following types of vehicles:

- Single unit truck or trailer
- Single unit truck with 3 or more axles
- Single unit truck or van with 2 axles and 6 tires
- Tractor/double
- Tractor/semi-trailer
- Tractor/triples
- Truck/tractor

Most crashes (78%) involving a "commercial vehicle" were property damage only (Table 9). Crashes involving commercial vehicles only accounted for 12% of total crashes in the MVPO region from 2016-2020.

TABLE 8. COMMERCIAL VEHICLE CRASHES BY SEVERITY 2016-2020

Commercial Vehicle 2016 - 2020	Fatal Crashes	Injury Crashes	PDO Crashes	TOTAL
Number of Crashes	32	557	2074	2663
% of Total	1.20%	20.92%	77.88%	100%
Total Compared with All Crashes	23%	13%	12%	12%

C. DAILY CONDITIONS

01 ROAD CONDITIONS

The majority of crashes (approximately 75%) were reported as occurring while the roadway conditions were dry, followed by wet roadway conditions (approximately 16% of crashes), and snow, which accounted for about 6% of crashes in the region from 2016-2020 (Table 10).

TABLE 9. ROADWAY CONDITIONS 2016-2020

Road Condition	Fatal Crash	Injury Crash	PDO Crash	TOTAL	% of TOTAL
Dry	119	3299	13291	16709	**74.69%**
Ice	1	120	519	640	2.86%
Snow	2	224	1071	1297	**5.80%**
Wet	15	779	2726	3520	**15.74%**
Sand, Mud, Dirt, Oil, Gravel	0	9	9	18	0.08%
Water (Standing, Moving)	0	2	17	19	0.08%
Slush	0	17	63	80	0.36%
Other	1	4	82	87	0.39%

02 TIME OF DAY

a) Light Conditions

Daylight was the most prevalent time of day at which crashes occurred in the MVPO region, comprising 50% of crashes, followed by dark (no lights) at 34% of total crashes (Figure 39).

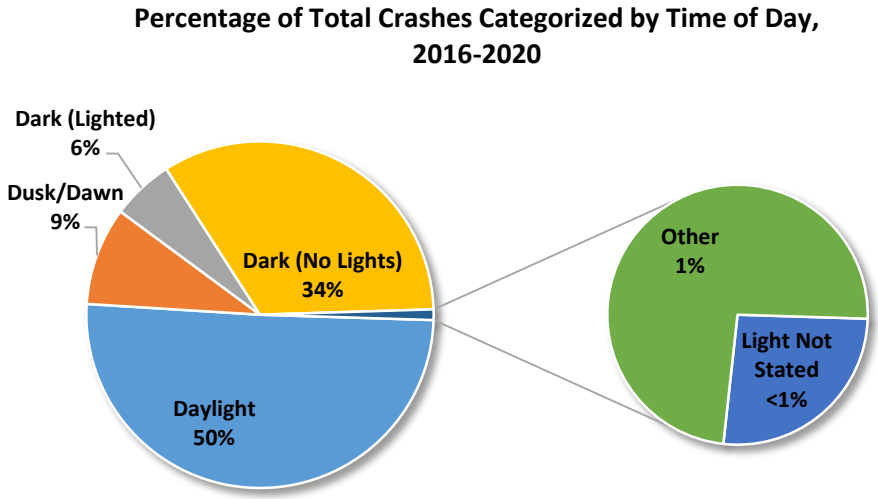


FIGURE 39. PERCENTAGE OF TOTAL CRASHES CATEGORIZED BY TIME OF DAY 2016-2020

b) Crash Hour

Fatal crashes occurred most frequently at 10am and 6pm hours, closely followed by the 3pm hour (Figure 40). Injury and PDO crashes had similar trends to each other, with 3pm having the greatest amount of injury crashes and 6pm showing the greatest number of PDO crashes (Figure 41).

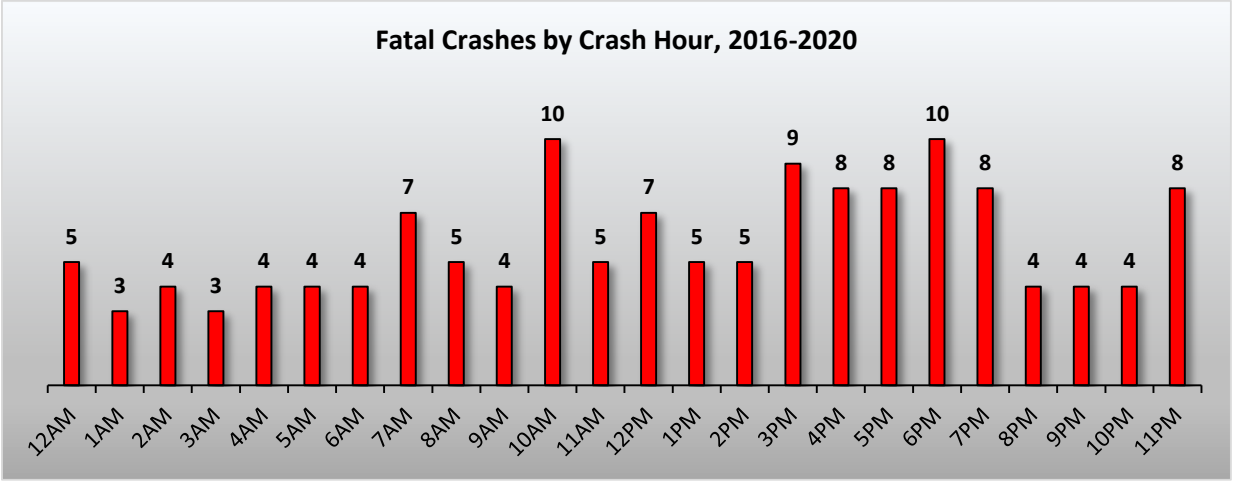


FIGURE 40. FATAL CRASHES BY CRASH HOUR 2016-2020

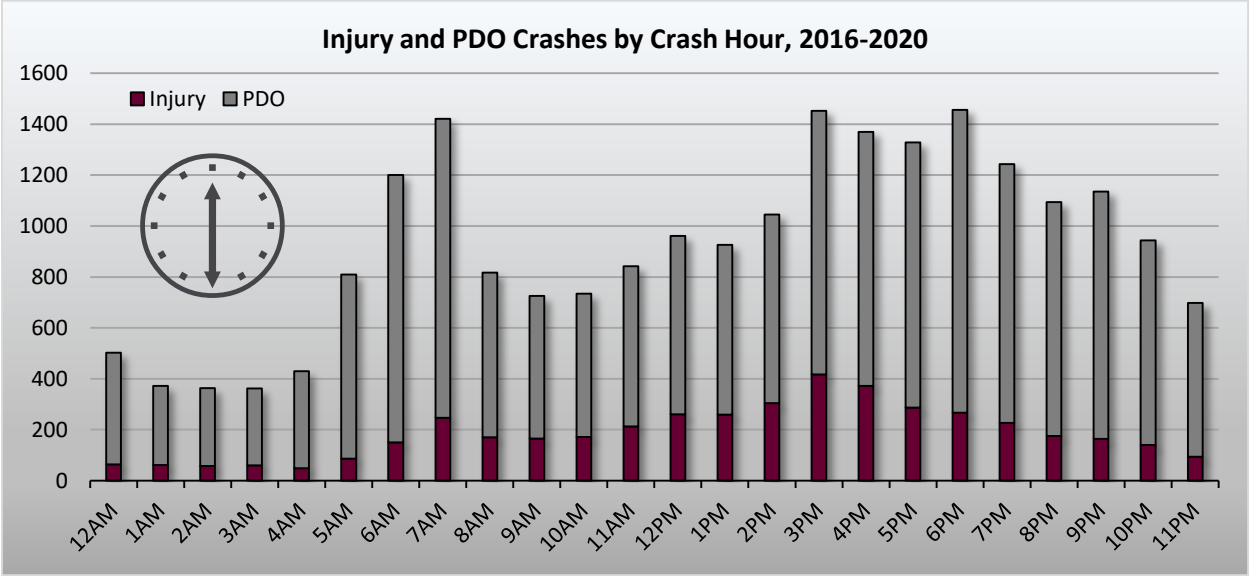


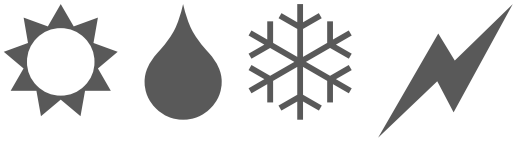
FIGURE 41. INJURY AND PDO CRASHES BY CRASH HOUR 2016-2020

03 WEATHER

Weather conditions are important to consider when determining the cause of a crash. Table 11 shows the breakdown of total crashes by weather condition in the MVPO region from 2016-2020. Crashes during clear weather conditions were the most common at 60%, followed by Cloudy (23%), Rain (8%), Snow (6%), and Other (3%) (Figure 42).

TABLE 10. WEATHER CONDITION TOTALS BY CRASH SEVERITY 2016-2020

Weather Conditions	Fatal Crash	Injury Crash	PDO Crash	TOTAL
Clear	**96**	**2631**	**10720**	**13447**
Cloudy	29	1089	4136	5254
Rain	7	406	1362	1775
Snow	3	218	1039	1260
Other	4	217	924	634



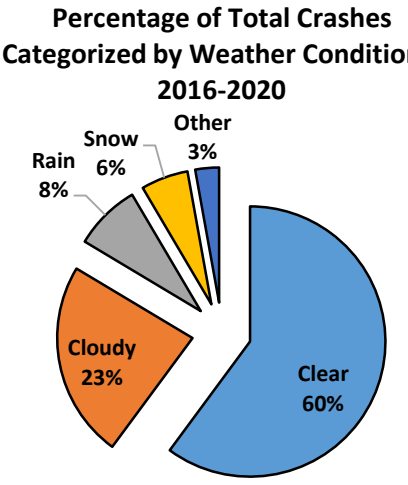


FIGURE 42. PERCENTAGE OF TOTAL CRASHES CATEGORIZED BY WEATHER CONDITIONS 2016-2020

04 DAY OF THE WEEK

From 2016-2020, fatal crashes occurred most often on Thursday and Saturday, followed by Friday (Figure 43). For injury, property damage only, and total crashes, the greatest amount occurred on Thursday, followed by Saturday (Figure 44).

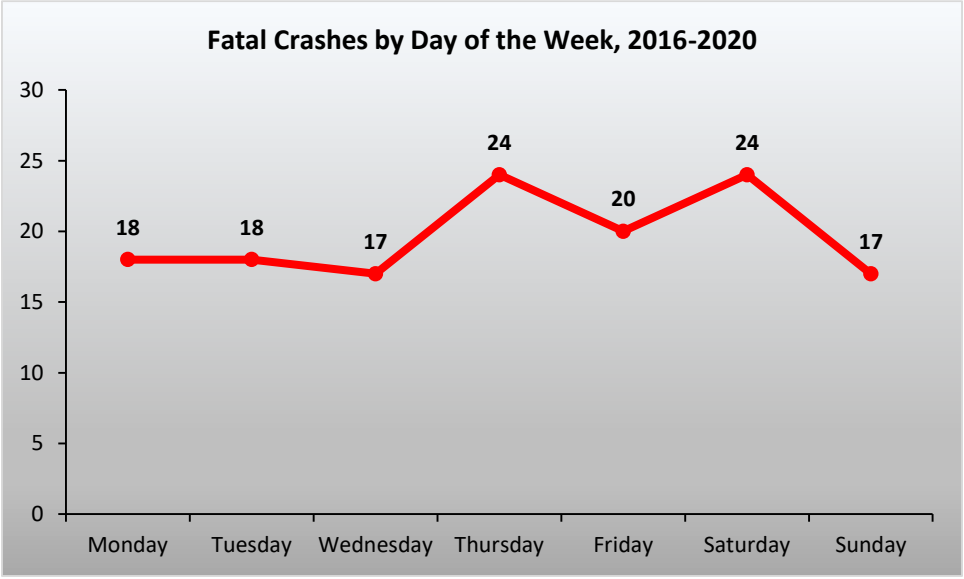


FIGURE 43. FATAL CRASHES BY DAY OF THE WEEK 2016-2020

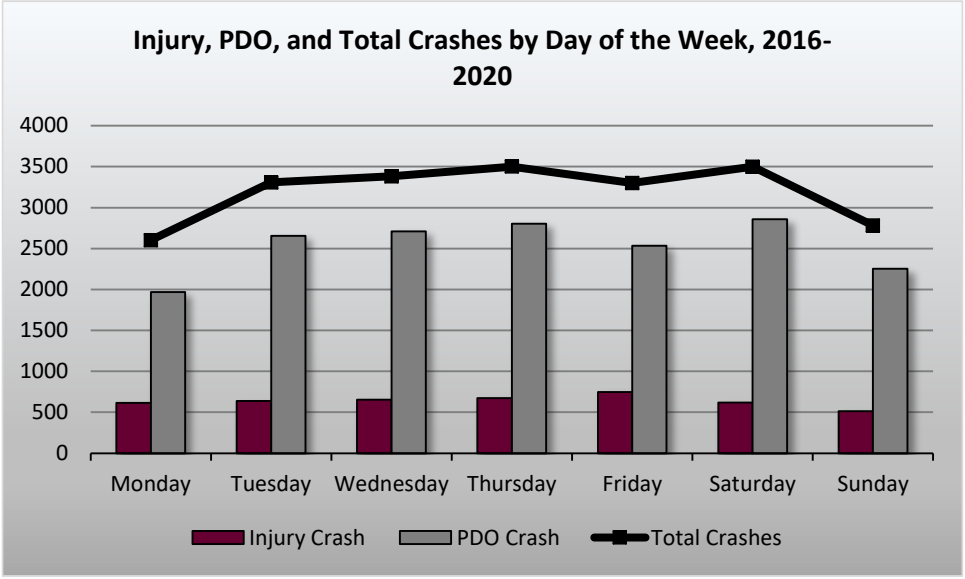


FIGURE 44. INJURY, PDO, AND TOTAL CRASHES BY DAY OF THE WEEK 2016-2020

"Most crashes in the region occurred during daylight hours, in clear weather, and on dry roads."

"Factors other than daily conditions must have contributed to the majority of crashes from 2016-2020."

[SECTION 6] CRASH LOCATIONS 2018-2020

A. METHODS

In order to identify the top crash locations from 2018-2020, MVPO used a network screening method utilized by other planning organizations in Ohio[10]. Since the MVPO region is primarily rural, intersections and sections of roadways were separated into "urban" and "non-urban" categories. "Urban" was defined as being within municipal boundaries (i.e. within a City or Village) and "non-urban" was defined as being outside of municipal boundaries. These designations required separate values, for which the calculations also differed slightly. Three categories with associated formulas were used to determine top crash locations since there are different ways to measure traffic safety and not one single element can sufficiently determine the level of safety factors at a specific location. The crash frequency, equivalent property damage only (EPDO), and crash rate of each location were determined to produce the final "rank sum," which established the top crash locations. More details on each category and the arrival of the rank sum score are as follows.

01 CRASH FREQUENCY

Crash frequency is the number of crashes that occurred at an intersection or section from 2018-2020. To determine the frequency for intersections, crashes that occurred within the intersection and on all approaches within a specified distance from the center of the intersection were studied. In urban areas, the distance used from the center of the intersection was 250 feet and in non-urban areas a distance of 100 feet was used. The difference in distances is due to the lower traffic volume typically associated with non-urban area intersections. Lower traffic volumes lessen the likelihood that crashes occurring further than 100 feet from the intersection are intersection-related. The minimum crash threshold needed for a location to be studied as a potentially high crash area for this report was 7 crashes during the 3-year period in non-urban areas and 10 crashes in urban areas.

A section was defined as a length of roadway between two logical termini, such as an intersection, for purposes of this report. Section lengths studied as part of this report vary from 0.5 miles in urban areas to up to 2 miles in rural areas. The minimum crash threshold needed for considering a section as a high crash location was 7 crashes on a 1-mile section of roadway, excluding intersection crashes.

02 EQUIVALENT PROPERTY DAMAGE ONLY (EPDO)

The EPDO rate[11] quantifies the severity of crashes that occur at a given location. For each intersection and section, the values were determined as follows:

- Fatal & Serious Injuries: Number of fatal & incapacitating injury crashes
- Visible Injuries: Number of visible injury crashes
- Possible Injuries: Number of possibly injury crashes
- PDO: Number of property damage only crashes
- N: Total number of all fatal, injury, and PDO crashes

[10] MVPO modeled its analysis from Safety Reports completed by the Toledo Metropolitan Area Council of Governments (TMACOG) and the Mid-Ohio Regional Planning Commission (MORPC).

[11] The values used to calculate the EPDO rate were obtained from the Toledo Metropolitan Area Council of Governments (TMACOG) Transportation Safety Plan for 2019.

Formula:

EPDO Rate = ((41.18 * Fatal & Serious Injuries) + (6.55 * Visible Injuries) + (4.44 * Possible Injuries) + (1.00 * PDO))/N

03 CRASH RATE

The crash rate for intersections and sections was calculated using the following:

- N: Total number of crashes at each location over 3 years (2012-2014)
- ADT[12]: Number of Average Daily Traffic
  - The entering ADT was used for intersection calculations
  - The ADT of the segment was used for section calculations

Formula:

Crash Rate = (N/3) / ((365 * ADT) / 1,000,000)

04 RANK SUM

The rank sum was calculated using the results from the crash frequency, EPDO rate, and the crash rate. Once the frequency, EPDO rate, and crash rate were calculated, each location was given a rank number for all three categories depending on how each location ranked in comparison to the other locations. In cases where duplicate numbers affected the ranking in a specific category, priority was given to those locations with a higher EPDO rate to emphasize severity in determining high crash locations. For example, if two intersections both had 22 crashes over the 3-year study period, the higher ranking was given to the location with the higher EPDO rate. Once all locations had ranking numbers for each category, the rankings were summed to give each location an overall rank sum. In cases where there were duplicate rank sums, priority again was given to locations with a higher EPDO rate. The overall rank sum was then sorted by the lowest sum and given a rank of 1 to 50 for both intersections and sections.

[12] Average daily traffic information was gathered from various sources including: traffic counts provided by ODOT, traffic counts provided by local communities/counties, and traffic counts collected by MVPO. Because of the COVID-19 pandemic in 2020 and the drop in traffic across the state, traffic counts for 2019 were used to have a more accurate representation of normal driving conditions.

B. TOP CRASH LOCATIONS 2018-2020

The following lists are meant to be a starting point for identifying high crash locations in the MVPO region. For any location listed, more detailed analysis would need to be done in order to fully understand and address the safety problems that may or may not exist. Although a location appears on the list, it may not be necessarily dangerous. The number of crashes at an identified intersection or section may be a result of the number of vehicles traveling at that location rather than a correctable problem. These locations were identified to the best ability of the MVPO staff with the best data available. Other high crash locations may exist within the region and this list will be updated annually in an attempt to remain as current as possible. This list is meant to be used as a tool to identify problem areas that may need further study and does not attempt to determine whether or not the crash was a result of engineering aspects.

Due to the high volume of crashes that occurred on a portion of Clinton Street in the City of Defiance during the study period, intersections and sections on Clinton Street from Fifth Street to Stadium Drive were not included in the Top 50 high crash locations lists. Instead, this section of roadway and the intersections associated with it is being highlighted as a high crash corridor (Figure 45). From 2018-2020 there were a total of 253 crashes on the identified Clinton Street Corridor, 38 of which involved an injury (15%). No fatalities were reported as a result of a crash in this location and only two crashes resulted in incapacitating injuries. The majority of crashes were rear-ends (99), followed by sideswipe-passing (51), angle (22), and left turn (21). Most crashes occurred when road conditions were dry, when the weather was clear, and during daylight hours, with the highest number occurring during the 4 p.m. hour and the 12 p.m. hour. It should be noted that this corridor experiences a high volume of daily traffic, ranging from 11,700 average vehicles per day in certain areas and up to 27,048 vehicles per day in others. The high number of crashes seen on this corridor may be attributed in part to the high number of vehicles that travel this corridor every day.

Tables 11 and 12 will show the top 50 intersections and top 50 sections, respectively, for both urban and non-urban areas. The top 10 intersections and sections per urban and non-urban areas will also be highlighted in the following tables. (Please see the key on the bottom of each table for the distinction between the top 10 urban and non-urban intersections and sections.) See figure 46 for a map of top crash locations throughout the region.

CLINTON STREET CORRIDOR [2018-2020]

FIGURE 45. CLINTON STREET CORRIDOR MAP, 2018-2020

Map Sources: ODOT, ODPS, Defiance County Engineer

TABLE 11. TOP 50 CRASH LOCATIONS FOR URBAN AND NON-URBAN INTERSECTIONS, 2018-2020

URBAN AND NON-URBAN INTERSECTIONS				CRASH SEVERITY				RATES			RANKS			
Overall Rank & Location		Place	Crash Freq.	Fatal	Inc. Inj.	Inj.	PDO	ADT	EPDO	Crash Rate	Crash Freq.	EPDO Rate	Crash Rate	Sum
1	Scott @ US 6 On/Off Ramp	Napoleon	22	0	0	7	20	3,960	2.71	5.07	2	38	3	43
2	Ottawa @ Cleveland	Defiance	18	0	0	7	13	4,579	3.04	3.59	7	34	9	50
3	SR 108 @ CR R	Napoleon	15	0	0	9	7	3,875	3.83	3.54	19	27	11	57
4	High @ Bryan	Bryan	10	0	2	1	7	3,070	9.38	2.98	37	12	18	67
5	US 20 @ State/SR 15	Pioneer	12	0	3	3	6	6,167	12.26	1.78	27	5	41	73
6	US 20A @ Shoop/CR 13	Wauseon	36	0	0	7	29	13,725	1.90	2.40	1	48	24	73
7	US 127 @ CR F	Williams County	6	0	1	2	4	1,785	9.01	3.07	49	13	16	78
8	2nd @ Wayne	Defiance	18	0	0	4	14	7,259	2.00	2.26	8	44	26	78
9	US 20A @ Selwyn	Holiday City	10	0	1	3	6	3,447	6.68	2.65	39	18	22	79
10	CR D @ CR 15	Fulton County	5	0	1	2	2	1,483	11.26	3.08	64	7	15	86
11	CR D @ CR 13	Fulton County	6	0	0	6	0	1,693	6.20	3.24	52	20	14	86
12	SR 18 @ Harrison	Sherwood	11	0	0	5	7	4,322	3.61	2.32	34	28	25	87
13	SR 108 @ Orth/CR D	Wauseon	14	0	1	8	5	7,886	6.29	1.62	22	19	47	88
14	SR 109 @ Old US 424	Henry County	6	0	0	3	4	1,165	3.59	4.70	55	29	4	88
15	Perry @ Maumee	Napoleon	18	0	1	3	14	13,237	3.92	1.24	6	25	59	90
16	US 20A @ Munson	Swanton	12	0	0	6	6	5,207	3.25	2.10	28	32	30	90
17	Woodlawn @ Carey/Haley	Napoleon	10	0	0	2	8	2,304	2.11	3.96	41	42	7	90
18	Clinton @ Deatrick/Downs	Defiance	22	0	0	5	17	10,656	1.88	1.89	3	50	37	90
19	Scott @ La Grange	Napoleon	18	0	0	1	21	4,595	1.41	3.58	11	69	10	90
20	SR 249 @ Ridenour	Defiance County	6	0	1	3	3	2,739	10.29	2.00	48	9	34	91
21	Washington @ Scott	Napoleon	14	0	0	2	12	1,607	1.49	7.96	24	65	2	91
22	SR 49 @ SR 249	Defiance County	5	0	1	2	2	1,669	11.26	2.74	65	8	20	93
23	SR 576 @ CR C	Williams County	5	0	0	3	2	564	4.33	8.10	69	23	1	93
24	High @ Main	Hicksville	17	0	0	4	13	8,719	2.18	1.78	12	41	40	93
25	Domersville @ River	Defiance	10	0	1	5	4	5,079	6.74	1.80	38	17	39	94
TOP 10 URBAN INTERSECTIONS								TOP 10 NON-URBAN INTERSECTIONS						

Note: "Inc. Inj." In Crash Severity stands for "Incapacitating Injury" and is established as a serious injury crash.

TABLE 11. TOP 50 CRASH LOCATIONS FOR URBAN AND NON-URBAN INTERSECTIONS 2018-2020 (cont.)

URBAN AND NON-URBAN INTERSECTIONS				CRASH SEVERITY				RATES			RANKS			
Overall Rank & Location		Place	Crash Freq.	Fatal	Inc. Inj.	Inj.	PDO	ADT	EPDO	Crash Rate	Crash Freq.	EPDO Rate	Crash Rate	Sum
26	SR 637 @ SR 613	Paulding County	5	0	2	1	2	2,273	18.18	2.01	60	2	33	95
27	Clinton @ Stadium	Defiance	22	0	0	2	23	9,296	1.55	2.16	4	63	29	96
28	US 127 @ SR 613	Paulding County	5	0	1	7	5	2,324	17.14	1.96	62	4	35	101
29	Jackson @ Main	West Unity	13	0	0	1	12	3,078	1.43	3.86	26	68	8	102
30	US 6 @ CR P	Henry County	5	0	2	2	1	2,743	18.87	1.66	59	1	43	103
31	Domersville @ CR 424	Defiance	18	0	0	4	14	10,157	1.88	1.62	9	49	48	106
32	2nd @ Main	Defiance	19	0	0	2	24	12,840	1.95	1.35	5	45	56	106
33	North @ East	McClure	11	0	0	1	13	3,487	1.78	2.88	35	53	19	107
34	SR 34 @ CR 2425	Williams County	5	0	0	3	2	1,294	3.91	3.53	70	26	12	108
35	Defiance @ Lugbill	Archbold	12	0	0	2	11	5,057	1.83	2.17	30	51	28	109
36	US 20 @ SR 576	Williams County	5	0	1	0	8	2,187	9.84	2.09	67	11	32	110
37	SR 281 @ SR 108	Henry County	6	1	0	0	5	3,303	7.70	1.66	50	15	45	110
38	SR 15 @ Bowman	Defiance County	6	0	0	3	3	2,086	3.42	2.63	56	31	23	110
39	SR 64 @ CR J	Fulton County	5	0	0	2	3	1,017	3.22	4.49	72	33	5	110
40	Shoop @ Oak	Wauseon	16	0	0	2	14	6,677	1.43	2.19	16	67	27	110
41	Stryker @ Defiance	Archbold	15	0	0	3	12	7,061	1.69	1.94	20	58	36	114
42	High @ Union	Bryan	14	0	0	6	8	10,214	2.93	1.25	23	35	58	116
43	US 20A @ CR 13	Fulton County	6	0	0	7	1	3,473	7.46	1.58	51	16	50	117
44	Main @ High	Bryan	18	0	0	3	15	11,975	1.81	1.37	10	52	55	117
45	US 6 @ TR P3	Henry County	5	0	1	1	3	2,743	10.15	1.66	66	10	44	120
46	Clinton @ George Isaac	Defiance	16	0	0	3	13	9,296	1.78	1.57	15	54	51	120
47	Domersville @ Banner School	Defiance County	5	0	0	2	3	1,323	2.80	3.45	73	36	13	122
48	US 127 @ CR 1575	Williams County	6	0	0	1	5	1,785	1.93	3.07	58	47	17	122
49	US 6 @ US 127	Williams County	7	0	1	2	5	6,000	8.17	1.07	47	14	64	125
50	US 127/CR E @ Main/SR 15	Bryan	17	0	0	2	15	11,208	1.65	1.39	13	59	54	126
TOP 10 URBAN INTERSECTIONS								TOP 10 NON-URBAN INTERSECTIONS						

TABLE 12. TOP 50 CRASH LOCATIONS FOR URBAN AND NON-URBAN SECTIONS, 2018-2020

URBAN AND NON-URBAN SECTIONS				CRASH SEVERITY				RATES			RANKS			
Overall Rank	Location	Place	Crash Freq.	Fatal	Inc. Inj.	Inj.	PDO	ADT	EPDO	Crash Rate	Crash Freq.	EPDO Rate	Crash Rate	Sum
1	**US 6:** CR 20 to SR 191	Williams County	30	1	3	5	25	4,899	7.275	5.592	3	3	10	16
2	**Old US 424:** TR M to Florida	Henry County	18	0	2	4	14	947	6.692	17.36	14	5	3	22
3	**SR 576:** CR C to CR C-60	Williams County	19	0	1	1	17	1,127	3.407	15.4	12	21	4	37
4	**SR 576:** CR J to Montpelier	Williams County	12	0	2	0	11	1,759	7.78	6.23	44	2	7	53
5	**SR 15:** Carter to Brandt	Defiance County	15	0	1	6	12	4,172	6.165	3.283	23	6	27	56
6	**SR 15:** Schick to Trinity	Defiance County	18	0	1	4	13	5,039	4.466	3.262	15	14	28	57
7	**SR 2:** Casebeer Miller to OH-IN State Line	Defiance County	13	0	1	4	8	2,886	5.474	4.114	35	7	19	61
8	**SR 15:** SR 18 to Stever	Defiance County	24	0	2	1	21	11,038	4.492	1.986	7	13	47	67
9	**US 20:** CR 3 to CR 4	Williams County	17	1	0	3	13	5,205	4.343	2.983	18	17	33	68
10	**US 127:** CR 17 to CR I-50	Williams County	15	0	0	5	12	3,569	2.702	3.838	24	25	20	69
11	**SR 576:** CR D to CR E	Williams County	15	0	0	4	11	2,960	2.339	4.628	25	31	13	69
12	**SR 281:** Snyder to Stevens	Defiance County	24	0	0	2	22	1,952	1.463	11.23	8	56	5	69
13	**SR 281:** Harris to SR 18	Defiance County	30	0	0	5	25	6,540	1.714	4.189	5	48	17	70
14	**SR 15:** SR 18 to Deerfoot	Defiance County	19	0	1	6	16	10,100	4.856	1.718	11	11	49	71
15	**US 20A:** CR 3 to CR 2-2	Fulton County	17	0	1	6	10	11,033	5.074	1.407	17	8	53	78
16	**Scott Street:** Lagrange to US 6 EB Ramps	Napoleon	34	0	0	11	23	18,378	2.485	1.69	1	28	50	79
17	**SR 576:** CR M to CR 11	Williams County	23	0	0	0	23	1,050	1	20	9	68	2	79
18	**US 6:** CR 2-50 to OH-IN State Line	Williams County	12	0	1	0	11	2,908	4.348	3.769	45	15	22	82
19	**US 6:** CR 8 to CR 9	Williams County	14	0	1	1	12	4,411	4.116	2.899	30	18	34	82
20	**SR 15:** SR 107 to CR M	Williams County	22	0	1	4	17	14,657	3.74	1.371	10	20	54	84
21	**Domersville Road:** River to SR 18/2nd	Defiance	27	0	2	3	22	32,199	4.593	0.766	6	12	67	85
22	**SR 49:** I-80 EB Ramps to CR N-30	Williams County	15	0	0	2	13	2,455	1.599	5.58	27	52	11	90
23	**SR 66:** CR L to CR M	Fulton County	13	0	0	3	10	2,850	2.118	4.166	38	35	18	91
24	**SR 15:** Bowman to Blanchard	Defiance County	16	0	0	3	14	4,172	1.839	3.502	21	45	26	92
25	**SR 66:** Banner School to Flory	Defiance County	12	1	0	0	11	3,625	4.348	3.023	46	16	32	94
TOP 10 URBAN SECTIONS								TOP 10 NON-URBAN SECTIONS						

TABLE 12. TOP 50 CRASH LOCATIONS FOR URBAN AND NON-URBAN SECTIONS, 2018-2020 (cont.)

URBAN AND NON-URBAN SECTIONS				CRASH SEVERITY				RATES			RANKS			
Overall Rank & Location		Place	Crash Freq.	Fatal	Inc. Inj.	Inj.	PDO	ADT	EPDO	Crash Rate	Crash Freq.	EPDO Rate	Crash Rate	Sum
26	**Christy Road:** Elliott to Breckler	Defiance County	15	0	0	3	14	4,350	1.962	3.149	26	40	30	96
27	**SR 15:** US 20 to CR P	Williams County	14	0	1	3	10	12,333	5.059	1.037	29	9	61	99
28	**Shoop Street:** US 20A to Bannister	Wauseon	30	0	0	8	22	27,450	2.128	0.998	4	34	62	100
29	**SR 66:** Watson to Bowman	Defiance County	13	0	0	2	12	2,255	1.606	5.265	40	51	12	103
30	**Clinton Street:** Elliott to Defiance City Limit	Defiance	17	0	1	3	13	22,974	3.971	0.676	19	19	69	107
31	**US 6:** CR 9 to CR 10	Williams County	18	0	0	0	18	4,411	1	3.727	16	70	23	109
32	**SR 18:** SR 15 to Ashpacher	Defiance County	14	0	0	1	13	2,894	1.396	4.418	32	63	15	110
33	**SR 111:** Hammersmith to Defiance City Limit	Defiance County	10	1	1	0	9	6,183	9.136	1.477	62	1	51	114
34	**SR 191:** CR C to SR 2	Williams County	13	0	0	2	11	3,825	1.854	3.104	39	44	31	114
35	**CR 6-1:** CR E to CR D	Fulton County	11	0	0	1	10	260	1.505	38.64	59	54	1	114
36	**US 127:** CR J to CR K	Williams County	11	0	0	5	7	3,569	3.23	2.815	55	23	37	115
37	**SR 2:** CR 18 to CR 19	Williams County	15	0	0	0	15	3,206	1	4.273	28	71	16	115
38	**SR 34:** Ford to CR D-50	Williams County	14	0	0	0	14	2,084	1	6.135	34	73	8	115
39	**CR 424:** Ashwood to Tittle	Defiance County	10	0	0	2	8	1,605	2.11	5.69	70	37	9	116
40	**US 20:** Williams to SR 49	Williams County	12	0	0	4	8	5,205	2.674	2.105	47	26	44	117
41	**Clinton Street:** Stadium to US 24 EB Ramps	Defiance	31	0	0	2	29	16,267	1.29	1.74	2	67	48	117
42	**Shoop Street:** Linfoot to Parkview	Wauseon	13	1	0	3	9	29,428	5.047	0.403	36	10	74	120
43	**SR 15:** Stever to Ashpacher	Defiance County	17	0	0	3	15	16,077	1.914	0.966	20	42	63	125
44	**SR 2:** CR 1950 to CR 19	Williams County	10	0	0	3	7	3,206	2.665	2.849	66	27	36	129
45	**CR 171:** TR 146 to TR 120	Paulding County	10	0	0	2	8	2,008	1.899	4.548	72	43	14	129
46	**SR 66:** Banner School to Kammeyer	Defiance County	14	0	0	0	14	3,625	1	3.527	33	72	25	130
47	**SR 15:** Airport to Trinity	Defiance County	11	0	0	3	8	5,039	2.322	1.994	56	32	45	133
48	**SR 34:** SR 66 to TR 22	Henry County	13	0	0	4	10	15,777	2.46	0.752	37	29	68	134
49	**Elliott Road:** Hotel to Defiance City Limit	Defiance	12	0	0	2	10	4,350	1.749	2.519	49	47	41	137
50	**SR 18:** Ashpacher to Trinity	Defiance County	10	0	0	2	10	2,894	2.099	3.156	71	38	29	138
TOP 10 URBAN SECTIONS								TOP 10 NON-URBAN SECTIONS						

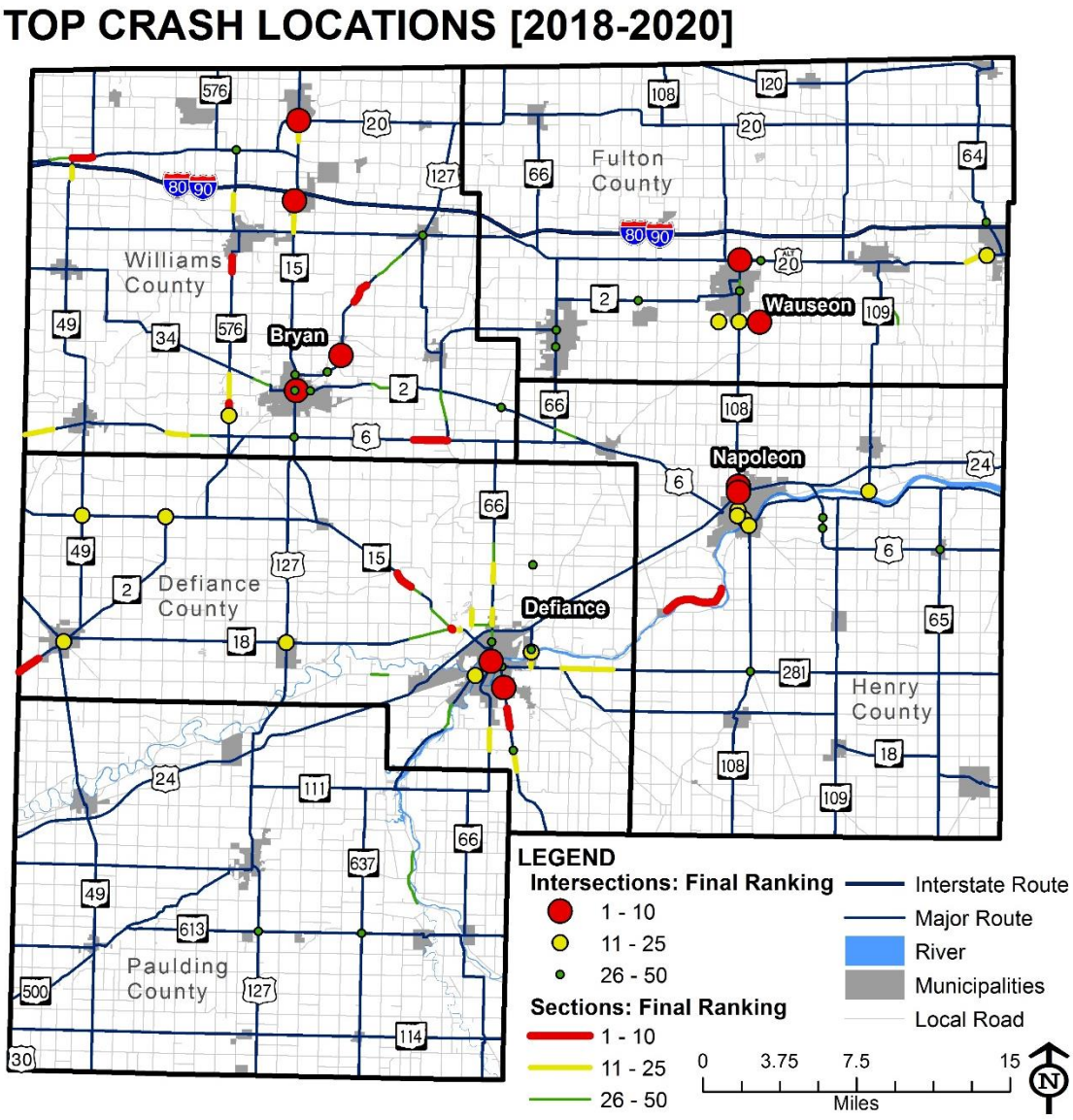


FIGURE 46. TOP CRASH LOCATIONS MAP 2018-2020
MAP SOURCES: ODOT, ODPS, U.S. CENSUS BUREAU
Note: This map features the top 50 crash locations for urban and non-urban intersections and the top 50 urban and non-urban sections of roadways within the MVPO region.

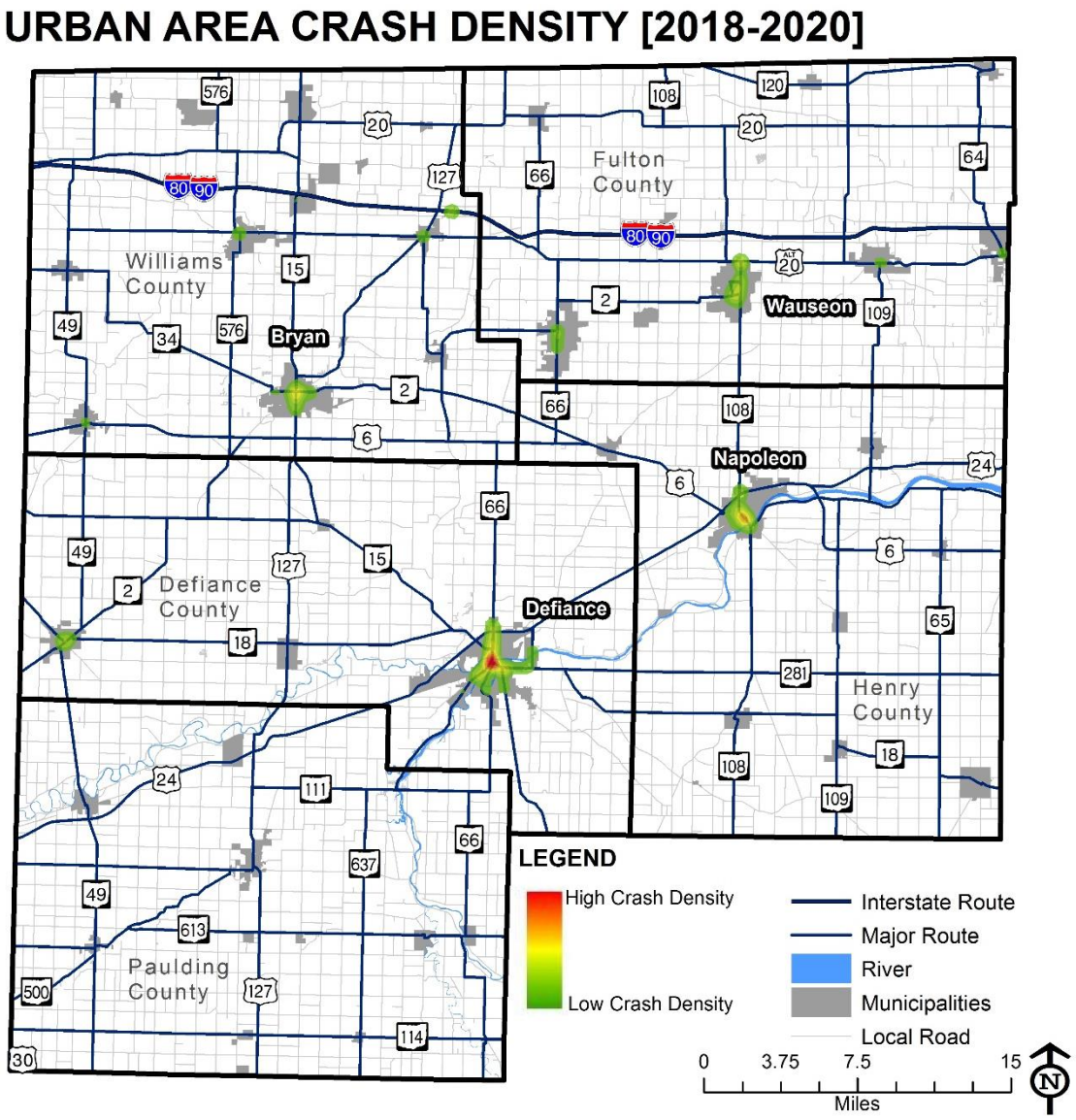


FIGURE 47. URBAN AREA CRASH DENSITY MAP 2018-2020
MAP SOURCES: ODOT, ODPS, U.S. CENSUS BUREAU
Note: Urban area refers to areas inside City and Village boundaries.

To develop this map, only crashes occurring within City and Village boundaries were analyzed. The Cities of Bryan, Defiance, Napoleon, and Wauseon and the Villages of Hicksville, Archbold, Swanton, Delta and Montpelier had the highest overall crash densities within urban areas (Figure 47).

“ From 2018-2020, 71% of crashes occurred in rural areas, while only 29% occurred in urban areas.”

NON-URBAN AREA CRASH DENSITY [2018-2020]

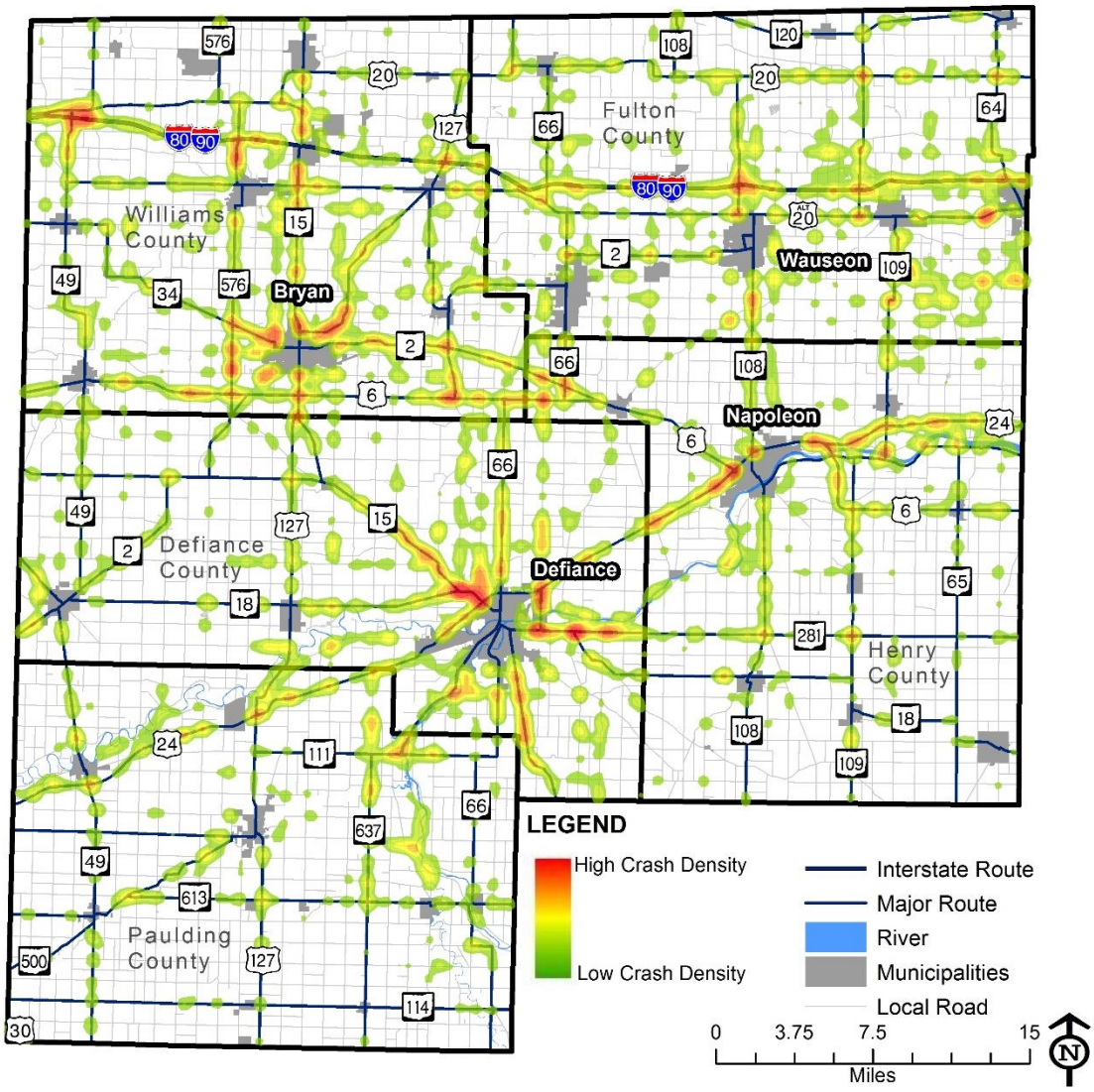
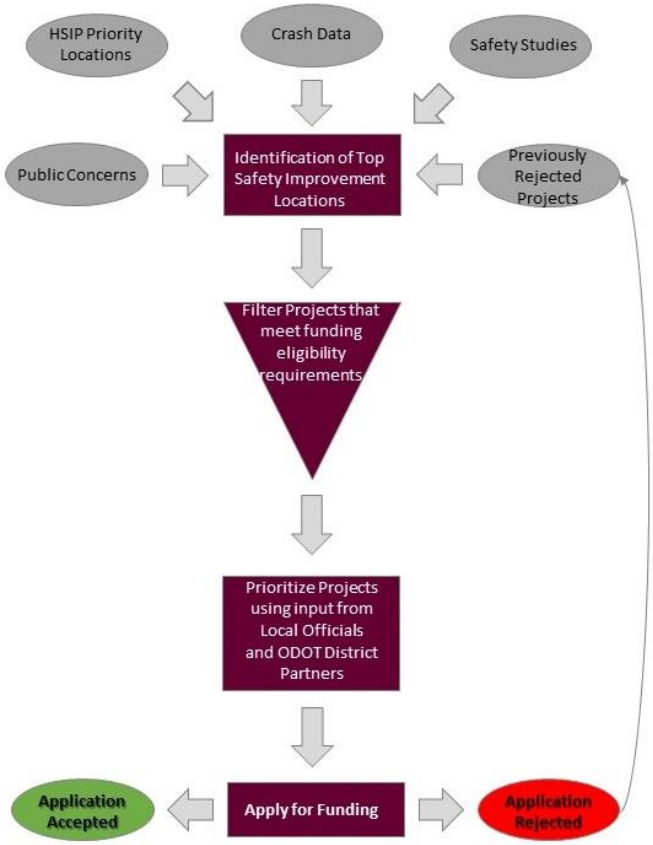


FIGURE 48. NON-URBAN AREA CRASH DENSITY 2018-2020
MAP SOURCES: ODOT, ODPS, U.S. CENSUS BUREAU
Note: Non-urban area refers to areas outside of City and Village boundaries. This map excludes crashes on the Ohio Turnpike.

To develop this map, only crashes occurring outside City and Village boundaries were analyzed. The areas surrounding the City of Bryan in Williams County and the surrounding areas of the City of Defiance in Defiance County featured the greatest overall crash densities within non-urban areas (Figure 48). There are also two portions of I80/I90 that experienced high crash densities at the toll plazas at SR 108 in Fulton County and SR 49 in Williams County

[SECTION 7] NEXT STEPS

One of the goals of this Safety Report is for local governments in the MVPO region to utilize this document to pursue funding for high crash priority locations. Our process for determining which projects to pursue funding can be seen in Figure 49. MVPO staff can assist the community with preparing applications for funding and other technical items needed for further safety analysis such as safety studies and road safety audits.



A. FUNDING OPPORTUNITIES

Several funding opportunities exist for projects that enhance safety for motorized and non-motorized users. The following lists the major funding sources available along with a brief explanation of each. More information can be found in the ODOT Program Resource Guide (2020).

01 ODOT SAFETY PROGRAM[13]

a) Overview

The Safety Program provides funds to ODOT and local governments for highway safety treatments or corrective activity designed to alleviate a safety problem or a potentially hazardous situation. The program is funded with an annual budget of $158 million and ODOT will provide up to 90% of the eligible costs for preliminary engineering, detailed design, right-of-way or construction. Local projects may be on a City, County, or Township road and priority is given to projects that have recommended countermeasures to improve safety at locations with a high frequency and/or severity of crashes.

b) Eligible Applicants

Local governments

c) Application Process

Each year there are two application cycles for the Safety Program. Applications are due on April 30 and September 30, but must be submitted in advance through the ODOT districts and signed off by the respective District Safety Review Team. A safety study must typically accompany the application.

[13] http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/HSIP/Pages/default.aspx

02 SAFE ROUTES TO SCHOOL[14]

a) Overview

The Safe Routes to School (SRTS) program provides federal funds for infrastructure and non-infrastructure projects to enable and encourage children in grades K-8, including those with disabilities, to walk or bicycle to school. The program is funded at approximately $4 million annually and ODOT will provide up to 100% of the eligible costs for projects in 5 categories: Engineering, Encouragement, Education, Enforcement, or Evaluation. Priority is given to projects that provide a safety benefit.

b) Eligible Applicants

Community governments, individual schools or school systems. Infrastructure projects must be sponsored by a local governmental agency.

c) Application Process

ODOT will provide funds on a competitive basis to applications who have developed their School Travel Plan (STP) and demonstrate the need for funding to implement the STP. Applications are typically accepted from early January to early March each year.

03 COUNTY HIGHWAY SAFETY PROGRAM[15]

a) Overview

This program provides funds to Counties for highway safety treatments or corrective activity designed to alleviate a safety problem or potentially hazardous situation. The County Engineers Association of Ohio (CEAO) is the program manager and is responsible for project selection, funding criteria, and program priorities. The program is funded at approximately $14 million annually, of which a portion is set aside for safety studies, sign upgrades, and curve sign upgrades. Safety projects may be on any public road of any functional classifications.

b) Eligible Applicants

County Governments

c) Application Process

Applications for safety studies and sign upgrade projects are accepted once per year, typically in July. Applications for all other safety improvements are accepted once per year, typically in the month of August.

[14] http://www.dot.state.oh.us/Divisions/Planning/ProgramManagement/HighwaySafety/ActiveTransportation/Pages/SRTS.aspx

[15] See ODOT Safety Program link and the ODOT Program Resource Guide.

04 SMALL CITY[16]

a) Overview

The Small City program provides federal funds to cities with populations of 5,000 to 24,999 that are not located within Metropolitan Planning Organizations. The program is funded at approximately $10 million annually and ODOT will provide up to 80% ($2 million max) of the eligible costs for construction only. Funds may generally be used for any road, safety, or signal project on the Federal Aid System.

b) Eligible Applicants

Cities with populations of 5,000 to 24,999 not located within Metropolitan Planning Organizations.

c) Application Process

Project solicitation begins January 1 of each year and each year's process is for the last year of a rolling four-year program. Applications are due to the respective district office by March 1 of each calendar year.

04 Township Safety Signage Grant Program[17]

a) Overview

The Township Safety Signage Grant provides funds to townships for upgrading existing and installing new safety signage on Ohio's township roads. The program is funded at approximately $1 million annually and ODOT will provide up to $50,000 for signs, posts and hardware.

b) Eligible Applicants

Eligible Applicant Townships are invited to apply on annually and the application will be based on two criteria: 1) the township has higher than average crash rates based on the previous five years' crash history, and; 2) the township has NOT been funded previously by the Township Safety Signage Grant Program.

c) Application Process

In order to apply, townships MUST complete the three eLearning modules listed on the program's webpage through ODOT's Local Technical Assistance Program (LTAP).

[16] http://www.dot.state.oh.us/Divisions/Planning/LocalPrograms/Pages/LocalFundingOpportunities.aspx
[17] https://www.transportation.ohio.gov/wps/portal/gov/odot/programs/local-funding-opportunities/resources/township-safety-sign-grant-program

B. CONCLUSION

This Safety Report identifies many high crash locations spanning urban and non-urban sections of roadways as well as high crash intersections within and outside of municipal boundaries. This Report furthers the goals and objectives established in MVPO's LRTP "Moving Together 2045." Comprehensive crash data has now been thoroughly analyzed, collected, and archived in order to determine the number and severity of crashes over time throughout the MVPO region. This will lead to better identification of areas where safety studies can be performed and provide evidence of crash locations for municipalities in the region to apply for safety funds.

Moving forward, MVPO plans to update the Safety Report annually. MVPO will continue to monitor crash trends in the five-county area in addition to reviewing fatal crashes in cooperation with the ODOT District offices. MVPO will also continue to gather traffic counts at the request of local communities and at locations determined by MVPO Staff that require further investigation of safety considerations. All traffic data gathered will be available on MVPO's website where safety trends will also be posted and updated regularly. The completion of this Report, the continued gathering of safety data, and the cooperation and coordination of local communities in the region will facilitate significant progress toward reducing fatalities and serious injuries on all of the region's roadways.

ACKNOWLEDGEMENTS

Maumee Valley Planning Organization Executive Board

Jeff Leonard, Chairman ..... City of Defiance Administrator
Terry Rummel, Vice Chairman ..... Williams County Commissioner
Clint Vance, Secretary/Treasurer ..... Paulding County Commissioner
Mick Pocratsky ..... Defiance County Commissioner
Jon Rupp ..... Fulton County Commissioner
Glenn Miller ..... Henry County Commissioner
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Carrie Schlade ..... City of Bryan Mayor
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Keith Torbert ..... City of Wauseon, Director of Public Services
Brian Zeedyk ..... Defiance County, Milford Township Trustee
Ivan Hite ..... Fulton County, Clinton Township Trustee
Charles Sheller ..... Henry County, Monroe Township Trustee
Joe Sukup ..... Paulding County, Crane Township Trustee
Tod Schlachter ..... Williams County, Pulaski Township Trustee

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Frank Onweller ..... Fulton County Engineer
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Todd Roth ..... Williams County Engineer
Nick Rettig ..... Henry County Planning Commission
Matt Davis ..... Williams County Economic Development Corporation
April Welch ..... Henry County Community Improvement Corporation
Jerry Zielke ..... Paulding County Economic Development Office
Erika Willitzer ..... Defiance County Economic Development Office
Will Burns ..... BGSU, Center for Regional Studies
Charles Schreck ..... ODOT District 1, MPO Rep. and Traffic Studies
Ben Cordes ..... ODOT District 2, ODOT District Planning Engineer
Melinda Sprow ..... City of Defiance Engineer
Chad Lulfs ..... City of Napoleon, Director of Public Works
Brian Wieland ..... City of Bryan Engineer
Dexter Krueger ..... Village of Archbold Engineer
Matt Gilroy ..... Fulton County Economic Development Corporation
Dennis Miller ..... Maumee Valley Planning Organization
Laney Nofer ..... Maumee Valley Planning Organization
Travis Jones ..... Maumee Valley Planning Organization