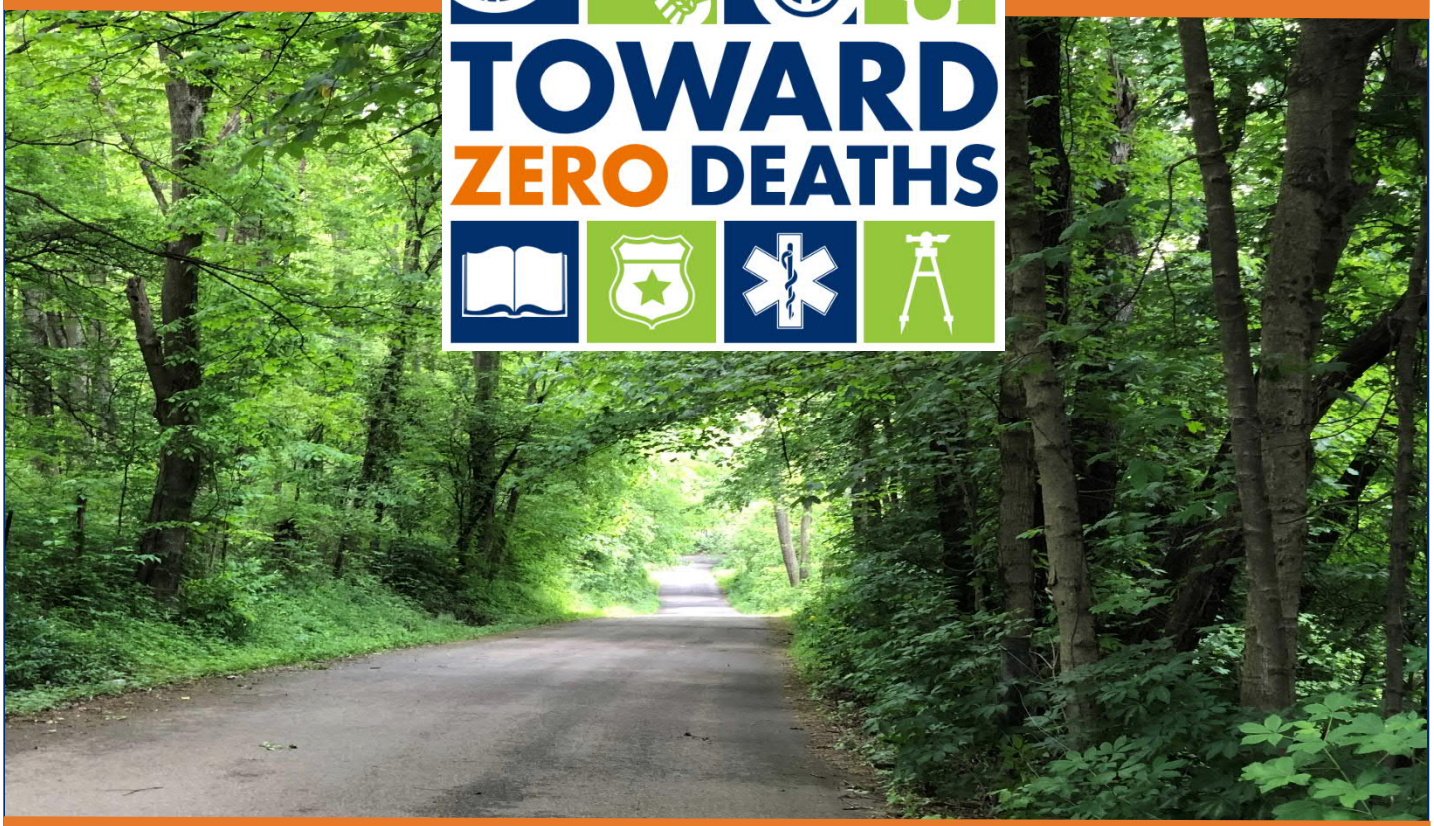
EVERY MOVE YOU MAKE

TOWARD ZERO DEATHS



OMEGA REGIONAL ROADWAY SAFETY PLAN

JUNE 2021

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1 EXECUTIVE SUMMARY

The Ohio Mid-Eastern Governments Association (OMEGA) is organized as a Council of Governments pursuant to Section 167 of the Ohio Revised Code and is designated by the Appalachian Regional Commission as a Local Development District and by the US Department of Commerce, Economic Development Administration, as an Economic Development District. On January 27, 2016, Governor John Kasich, pursuant to United States Code, Title 23, Section 135 (m), officially designated OMEGA as an Ohio Regional Transportation Planning Organization (RTPO). The OMEGA RTPO includes Carroll, Columbiana, Coshocton, Guernsey, Harrison, Holmes, Muskingum, and Tuscarawas Counties. While these counties are primarily rural, with a total population of 441,500[1] residents, there are diverse communities and transportation settings throughout the region. Most residents in these counties rely on personal vehicles as their main mode of transportation, though there are growing amenities for bicycles, pedestrians, and transit users. Likewise, there are growing Amish communities throughout the region using public roadways with horse and buggy, bicycles, and other alternate modes of transportation.

Between 2010 and 2019, there were a total of 104,426 crashes involving 221,824 people in the OMEGA region. Of those people, 577 lost their lives and 3,876 sustained serious injuries. The OMEGA Regional Roadway Safety Plan analyzes crash data from 2010-2019 to propose solutions to minimize crashes and reduce fatal and serious injuries. This data was reviewed with stakeholders and representatives to understand:

VISION
Well-funded and safer OMEGA roads for all transportation modes.

GOAL
Reduce OMEGA region traffic crashes and increase education and funding for improving drivers and roads.

OBJECTIVE
A 1% annual reduction in fatalities and serious injuries.

- **Crash Trends** – How fatal and serious injury crashes have trended over the past 10 years. This also included a review of crashes by jurisdiction and by roadway type.
- **Crash Types** – What types of crashes (e.g., roadway departure) are over-represented in the region.
- **Contributing Factors** – What types of crash contributors (e.g., young driver related) are over-represented in the region.
- **Locations** – The roadway segments in the OMEGA region that experience a higher frequency or severity on average than other locations and could be reviewed for further potential safety improvements. Additionally, the roadway segments within each county that are at a higher risk for a crash based on a systemic risk factor analysis.

Local transportation and safety stakeholders involved in the OMEGA region met for two webinars and individual county calls to provide the foundation of this plan. The multidisciplinary participation from each county and their respective member agencies also allowed for the development of county sub-plans included in the appendices of the plan. This document represents a unified approach to lowering fatalities and serious injuries in the OMEGA region, including:

- **Vision, Goal, and Objectives** providing a unified voice and targets for advancing the traffic safety culture of the region and a path to improving safety for all roadway users.
- Five main emphasis areas, **Roadway Departures, Intersections, Unrestrained Occupants, Speed-Related, and Active Transportation**, identifying the biggest safety challenges in the OMEGA region. Each county was also given the opportunity to choose a sixth emphasis area unique to the needs of their county (see Appendix A).
- An Action Plan, identifying locations, outlining programmatic and project solutions, and showing stakeholders where to focus their time and resources to make the most difference in reducing fatal and serious injury crashes.

[1] US Census Bureau population estimate, 2019.

2 TRANSPORTATION SAFETY PARTNERS

The Ohio Mid-Eastern Governments Association has a wide range of transportation and safety stakeholders working to reduce fatal and serious injury crashes. Due to COVID-19, stakeholder meetings were held virtually between webinars and county-specific calls. The following organizations had representation and participation in these meetings and the development of the OMEGA region safety road plan:

- Carroll County Economic Development
- Carroll County Regional Planning
- Carroll County Transit
- Columbiana County Board of Commissioners
- Columbiana County Engineer's Office
- Columbiana County Port Authority
- Coshocton County Engineer's Office
- Coshocton County Park District
- Coshocton County Port Authority
- Coshocton County Transit
- Guernsey County Engineer's Office
- Harrison County Transit Agencies
- Holmes County Engineer's Office
- Holmes County Planning Department
- Holmes County Safe Communities
- Village of Millersburg
- Millersburg Police Department
- Muskingum County Engineer's Office
- Muskingum County Planning
- City of New Philadelphia
- City of Salem
- Tuscarawas County Economic Development
- Tuscarawas County Engineer's Office
- Tuscarawas County Park District
- Tuscarawas County Planning Department
- Tuscarawas County Safe Communities
- Zanesville Police Department

INTRODUCTION – SETTING THE STAGE

SECTION CONTENT:

- Transportation Safety Planning
- OMEGA Region Transportation Safety
- Vision, Goal, and Objectives

3 INTRODUCTION – SETTING THE STAGE

TRANSPORTATION SAFETY PLANNING

The purpose of a road safety plan is to identify strategies to ultimately improve traffic safety across a specific roadway network. This aligns with the national campaign of *Toward Zero Deaths*, which is to reduce the number of acceptable annual traffic-related fatalities to zero. These strategies require the cooperation from stakeholders, health and safety professionals, emergency response personnel, local law enforcement, and educators. The Ohio Department of Transportation (ODOT) is working with local governments to meet these goals.

The *OMEGA Regional Roadway Safety Plan* (Plan) is a document that works to follow this national campaign to reduce the fatalities on the OMEGA road network. In order to prevent motor vehicle-related crashes, the plan developed action plans and strategies based on the causes of these crashes, which include implementing roadway countermeasures (such as road markings, clearing of vegetation/roadside obstacles, etc.) and/or behavioral countermeasures (such as public education, campaigns, etc.).

A SOLUTION – ROAD SAFETY PLAN

ODOT recognizes the need to address crash statistics and is encouraging the development of Regional Safety Plans to reduce them.

The *OMEGA Regional Roadway Safety Plan* addresses road safety improvements using strategies outlined by ODOT.

Data was used to identify current and potential risk areas that are more prone to crashes.

This plan can be used by local stakeholders and county representatives to identify projects that will be eligible for ODOT safety funding.

DEVELOPMENT OF THE OMEGA REGIONAL ROADWAY SAFETY PLAN

The OMEGA Rural Transportation Planning Organization (RTPO) was formally established in 2016. This Plan is a step towards establishing a cycle of safety improvement for the eight member counties of the RTPO. The Local Road Safety Plan (LRSP) development process has been identified by the Federal Highway Administration (FHWA) as a proven effective countermeasure for traffic safety. The process as adapted in Ohio is shown in Figure 1. Given the diverse nature of the various member agencies with the RTPO, this Plan was developed through a variety of engagement and problem identification efforts. The region jointly participated in the development and selection of the Vision, Goal, and Emphasis Areas of the plan through surveys and webinars. Representatives from member agencies within each county also participated in a series of county specific webinars. From these county specific meetings, county sub-plans were created to capture the unique aspects of each county.

Figure 1 Safety Plan Development Process

OMEGA REGION TRANSPORTATION SAFETY

THE STUDY AREA

The OMEGA Region includes member organizations from 10 counties, however, only eight counties are a part of the OMEGA RTPO, including Carroll, Columbiana, Coshocton, Guernsey, Harrison, Holmes, Muskingum, and Tuscarawas counties. The location of the RTPO counties is shown in Figure 2. Agencies from Belmont and Jefferson counties are members of the Belomar Regional Council (Belmont, Ohio, and Marshall Counties) and the Brook-Hancock-Jefferson Metropolitan Planning Commission, respectively.

In the study area, there are 10,520 center line miles of roads[2]. Local roads account for 71% of the total roads, 12% are major collectors, and 9% are minor collector roads. There are two major roadways that travel through the OMEGA region; Interstate 77 extends north-south through Guernsey County and Tuscarawas County running through Dover and New Philadelphia, while Interstate 70 crosses the OMEGA region east-west through Muskingum and Guernsey Counties passing through the cities of Zanesville and Cambridge. Other major cities and villages include Cadiz (Harrison County), Carrollton (Carroll County), Coshocton (Coshocton County), East Liverpool (Columbiana County), Millersburg (Holmes County), Salem (Columbiana County), and Uhrichsville (Tuscarawas County). Apart from these cities and other smaller cities and villages, the OMEGA region is primarily rural though it is situated between major urban centers with Columbus to the west, Pittsburgh to the East and Akron/Cleveland to the north. The region lies in the western foothills of the Appalachian Plateau.

The rolling hills in the northern counties gradually transition to steeper terrain in the south with river valleys that travel through multiple counties. By taking advantage of this rural forested landscape, nine state parks were established in the region. These parks provide visitors and tourists with fishing, camping, kayaking, hiking, and hunting. Although the landscape may provide scenic views, rough terrain poses challenges with roadway design, maintenance, and safety countermeasure implementation. Several counties in the OMEGA region are heavily impacted by the natural gas and fracking industry. The Utica and Marcellus shale formations present in this region make it a particularly active area for heavy truck traffic related to fracking. Several counties have reported a decline in gas and fracking operations in recent years, though the industry was a factor in traffic trends and roadway maintenance challenges.

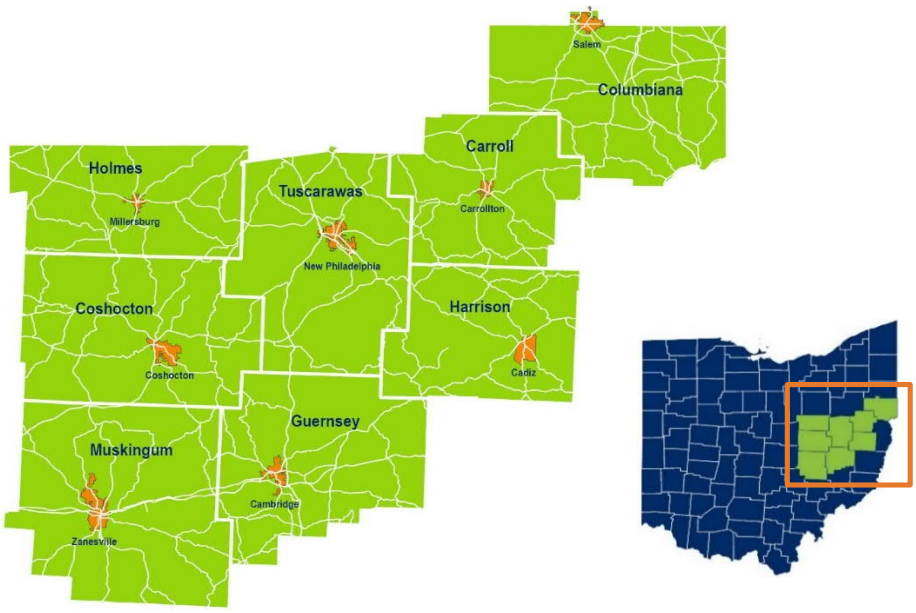

Figure 2: OMEGA RTPO counties

EXTERNAL FACTORS IMPACTING CRASHES

In this safety plan, crash trends were analyzed to identify common patterns of crashes and contributing factors to crashes. In addition to these details, some external factors were also taken into consideration. Population and Vehicle Miles Traveled (VMT) were reviewed in conjunction with the crash data better understand the recent trends in fatal and serious injury crashes in the region.

[2] OMEGA Regional Transportation & Development Plan, 2020-2045

POPULATION

Population and demographics are considered in this analysis since they can influence crash rates and statistics. According to the US Census Bureau's 2019 population estimates, there are approximately 441,474 residents living in the eight counties of the OMEGA RTPO[3]. Based on the population estimates in OMEGA's Regional Transportation and Development Plan 2020-2045, the OMEGA region had an overall population increase of 6.09% from 1990 to 2010. However, from 2010 through 2019 the region experienced a population decrease of 2.06%. Based on the data in Figures 3 and 4, the number of traffic fatalities and serious injuries both show slightly decreasing trends from 2010-2019 though these trends are not matching the decline in regional population over the same period. Despite the overall decline in population, there is a growing Amish population in the OMEGA region. Between all eight OMEGA counties, there is approximately 39,975 Amish people living in this area. Most of the Amish population lives in Holmes County (extending into Tuscarawas and Coshocton County) with 36,755 members. Carroll County has two Amish settlements with a total of 1,115 members and Guernsey County also has two settlements that have 565 total members[4].

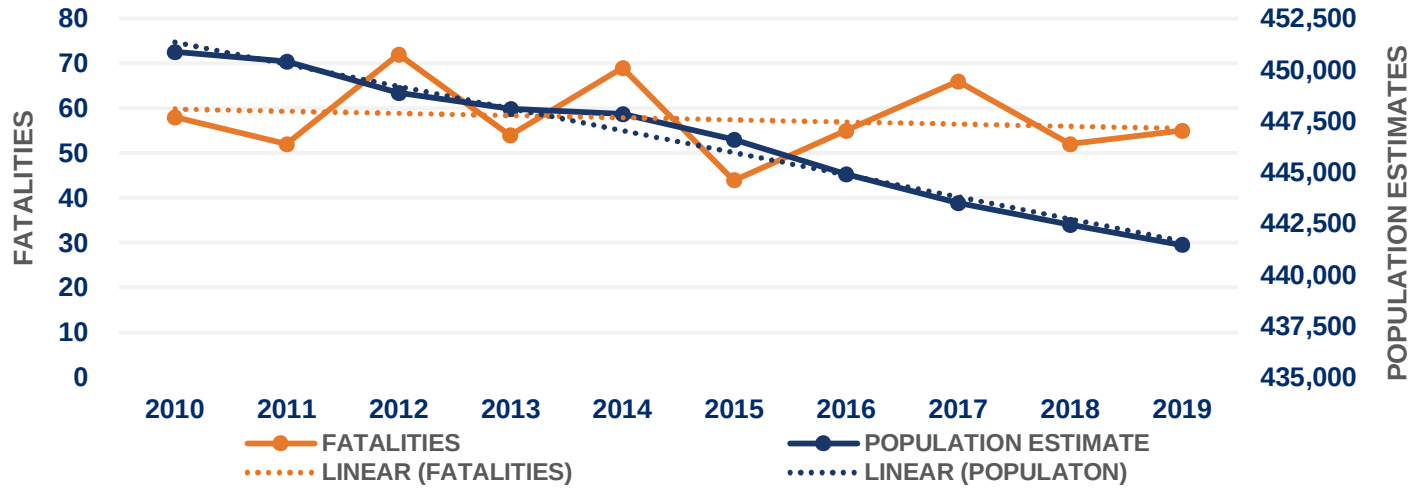

Figure 3: Fatalities and regional population by year, 2010-2019

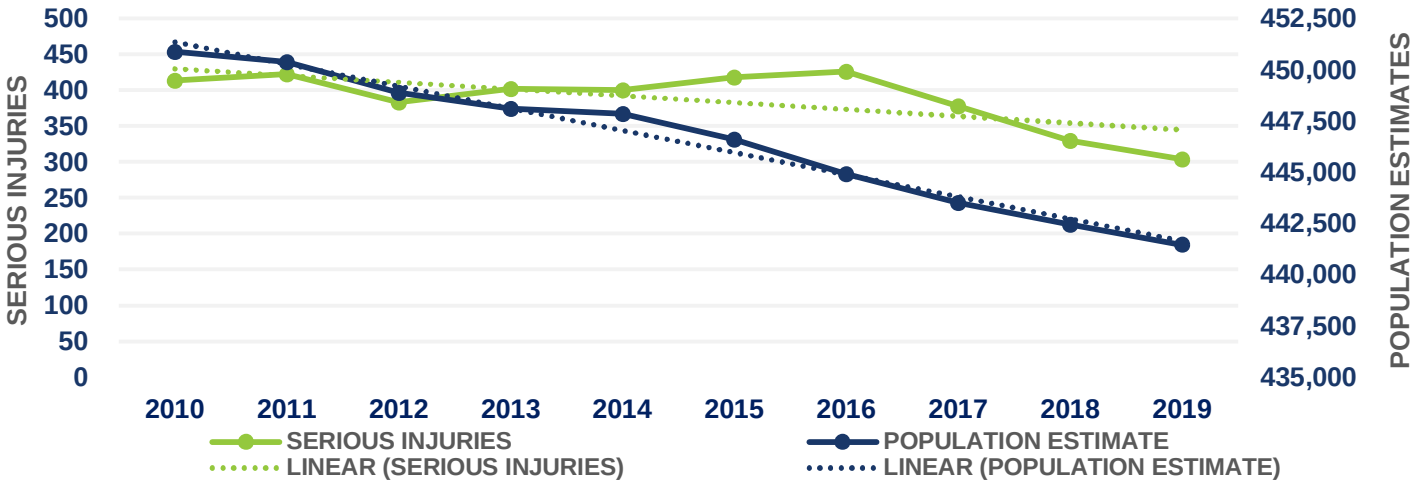

Figure 4 Serious injuries and regional population by year, 2010-2019

[3] US Census Bureau population estimate, 2019

[4] Ohio Department of Transportation – 2019 Statewide Amish Travel Study, March 2020

VEHICLE MILES TRAVELED

Population is a good estimation of the number of people living in the area, but it does not capture the full traffic picture which includes residents as well as visitors to and travelers through the region. Vehicle miles traveled (VMT) is a factor calculated by multiplying the number of centerline roadway miles by the Average Daily Traffic (ADT) volumes. This factor is independent of the total population and looks at the number of vehicles traveling on a specific roadway over a given year. Yearly VMT estimates for the eight RTPO counties were obtained from ODOT for 2010-2018[5], while a linear estimate of VMT was used for 2019. The comparison of fatalities and serious injuries to MVMT (million vehicle miles traveled) is shown in Figures 5 and 6. VMT has fluctuated over the last decade, with a high of approximately 13.9 MVMT in 2015 and a low of 12.5 MVMT in 2018. It is notable that the highest year for fatalities, 2012, coincided with a below average year for VMT, while the highest year of VMT, 2015 was the lowest year for traffic fatalities. Serious injuries, given the larger sample size, show less year to year fluctuations. After a high of 426 injuries in 2016, there has been a steady decline in serious injuries to a low of 304 in 2019. The decline in serious injuries from 2016-2019 may coincide with the decrease in VMT over that time.

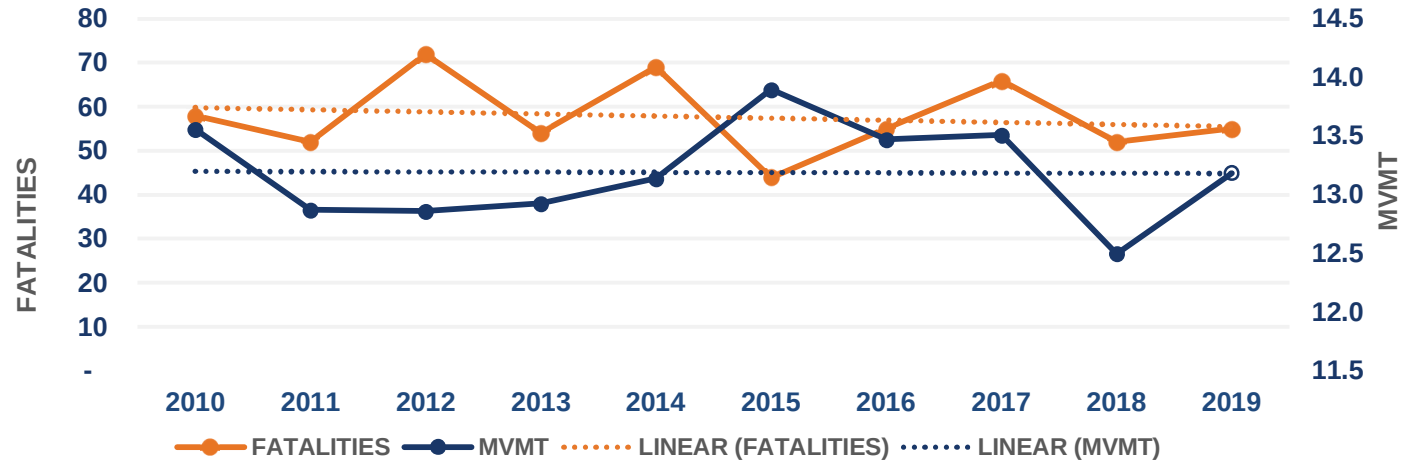

Figure 5: Fatalities and VMT by year, 2010-2019. NOTE: 2019 VMT is a linear projection of 2010-2018 data.

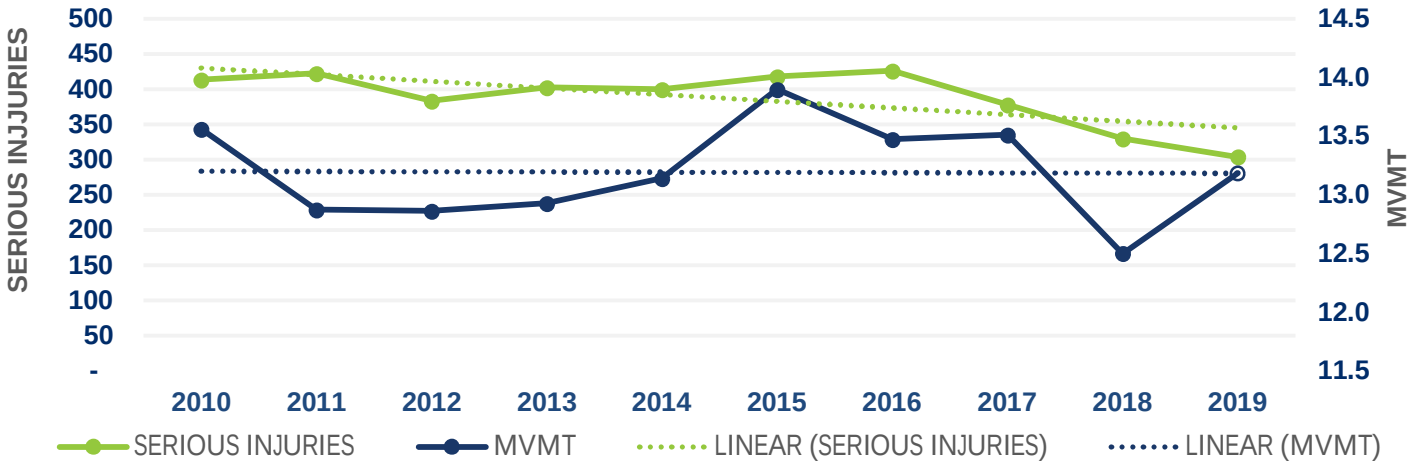

Figure 6: Serious injuries and VMT by year, 2010-2019 NOTE: 2019 VMT is a linear projection of 2010-2018 data.

[5] Vehicle miles traveled data was obtained from ODOT's Daily Vehicle Miles Traveled (DVMT) database accessed from http://www.dot.state.oh.us/Divisions/Planning/TechServ/traffic/Pages/DVMT.aspx

VISION, GOAL, AND OBJECTIVES

The vision, goal, and objectives of a local road safety plan help to align stakeholders, create a joint purpose in developing region-wide efforts, and set measurable targets for performance. Objectives, within the Ohio LRSP development process, refer to the reduction of fatalities and serious injuries that a region feels they can achieve through the implementation of infrastructure and behavioral strategies. In both figures, the target reduction is based on the five-year rolling average of fatalities/serious injuries. As a part of the statewide target setting process, a 1% annual reduction in the five-year rolling average for fatalities and serious injuries was chosen.

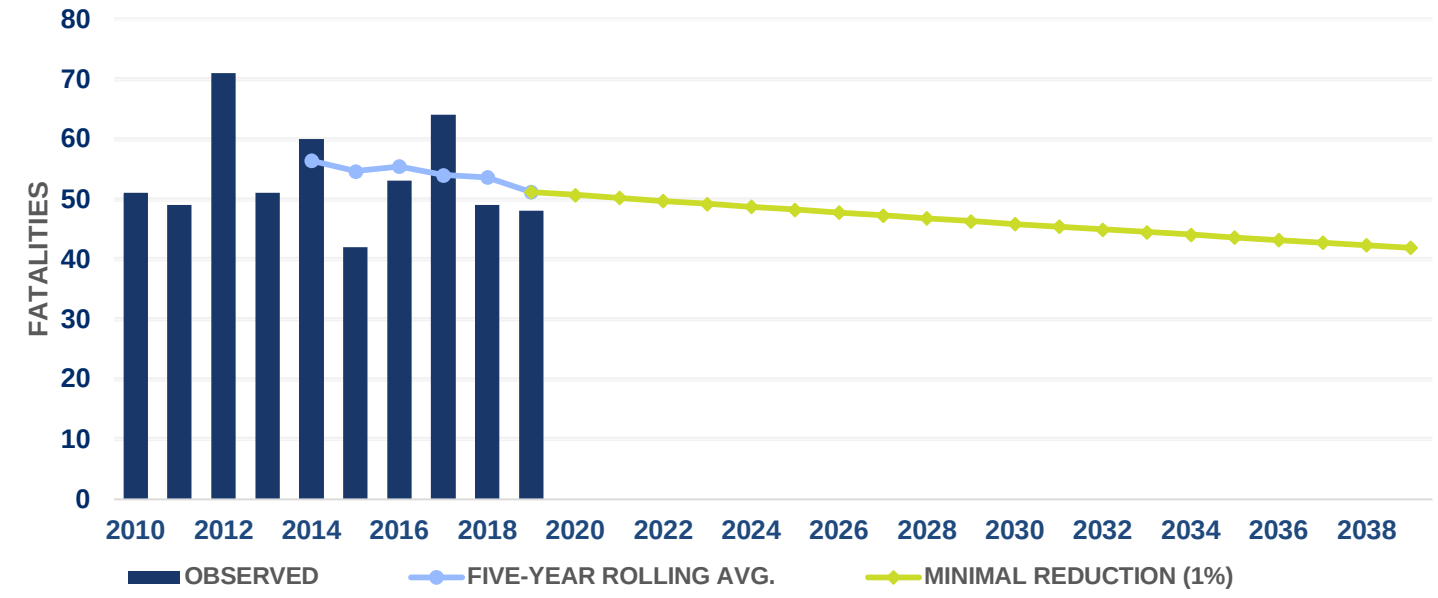

Figure 7: Five-year rolling average of fatalities forecast to 2039 based on potential annual reduction plans. "Forecast of Current Trend" refers to the average trend in fatalities projected over the next 20 years.

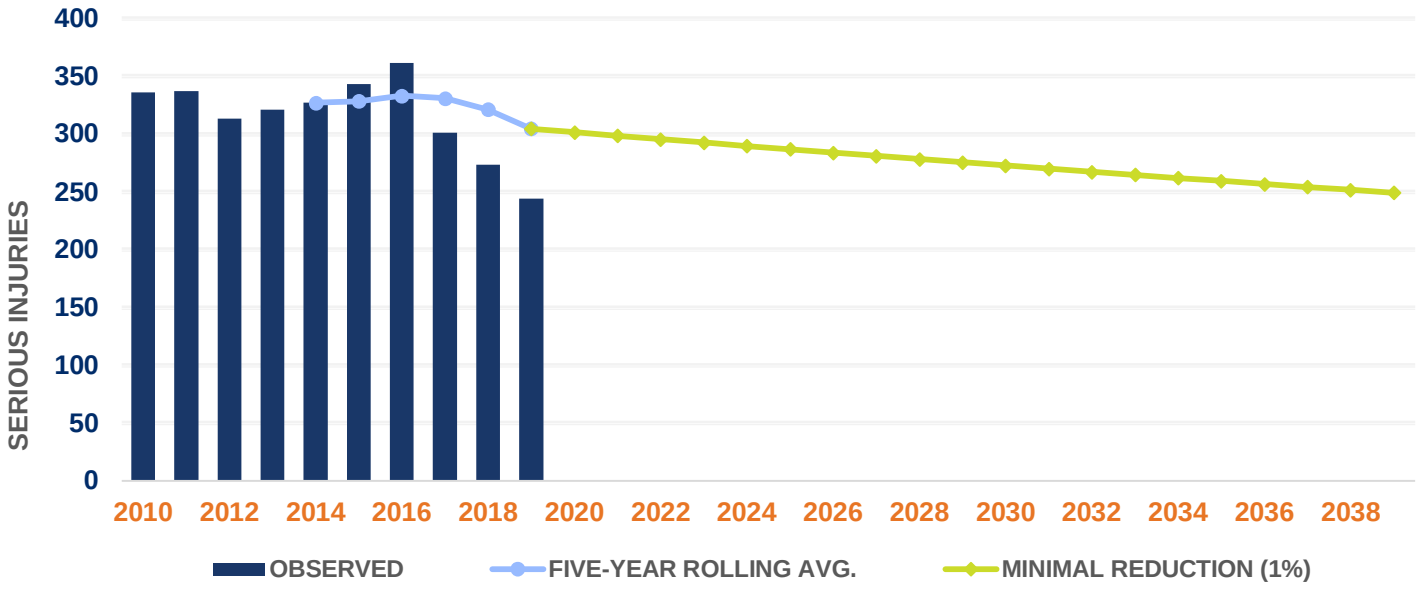

Figure 8: Five-year rolling average of serious injuries forecast to 2039 based on potential annual reduction plans. "Forecast of Current Trend" refers to the average trend in fatalities projected over the next 20 years.

The vision of the Plan was decided by asking stakeholders to think about "the ideal OMEGA roadway network of the future". The Plan's vision is meant to be broad and offer a long-term focus for traffic safety in the region. The goal of the plan is how the long-term vision will be achieved. The elements below present a plan framework that will help the region focus funding and resources to implement safety policies, programs, and projects that will best achieve the identified safety goal and objectives.

EXISTING CONDITIONS
UNDERSTANDING SAFETY NEEDS IN THE OMEGA REGION

SECTION CONTENT

The Big Picture

Crash Types

Vision, Goals & Objectives

EVERY MOVE YOU MAKE
TOWARD ZERO DEATHS

4 EXISTING CONDITIONS

THE BIG PICTURE

For the development of the Plan, crash data obtained from ODOT from 2010 through 2019 was analyzed for crashes that took place on all public roads. For this analysis, crash trends involving all crashes were investigated to understand existing safety conditions and what actions can be implemented to reduce these numbers. Information on individual county trends is contained within the county sub-plans found in Appendix A.

CRASH STATISTICS

Between 2010 and 2019, there were 104,426 total crashes in the eight counties included in the OMEGA region with 538 resulting in a fatality and 25,517 resulting in an injury. There are, on average, 10,443 crashes per year in the OMEGA region, which includes 54 fatal crashes and 2,552 injury crashes.

Table 1: Regional crashes by severity and year, 2010-2019

YEAR	FATAL CRASHES	INJURY CRASHES	PROPERTY DAMAGE CRASHES	TOTAL CRASHES
2010	51	2,820	8,597	11,468
2011	49	2,832	8,133	11,014
2012	71	2,622	8,034	10,727
2013	51	2,560	8,123	10,734
2014	60	2,538	7,871	10,469
2015	42	2,528	7,670	10,240
2016	53	2,591	7,628	10,272
2017	64	2,492	7,415	9,971
2018	49	2,247	7,450	9,746
2019	48	2,287	7,450	9,785
10-YEAR TOTAL	538	25,517	78,371	104,426
ANNUAL AVERAGE	**54**	**2,552**	**7,837**	**10,443**

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

OCCUPANT STATISTICS

Of the crashes that occurred in 2010 to 2019 in the OMEGA region, 221,824 people were involved, 577 individuals died, while another 3,876 were seriously injured. On average, 22,182 people are directly involved in crashes every year. There are approximately 58 deaths and 388 serious injuries that result from these crashes.

Table 2: Regional occupant statistics, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES	MINOR INJURIES	POSSIBLE INJURIES	NO INJURIES	TOTAL PEOPLE INVOLVED
2010	58	413	1,849	1,832	20,257	24,409
2011	52	422	1,954	1,731	19,028	23,187
2012	72	383	1,882	1,606	18,717	22,660
2013	54	402	1,675	1,615	18,749	22,495
2014	69	400	1,681	1,598	18,572	22,320
2015	44	418	1,607	1,560	18,311	21,940
2016	55	426	1,673	1,549	18,058	21,761
2017	66	378	1,614	1,619	17,948	21,625
2018	52	330	1,435	1,392	17,452	20,661
2019	55	304	1,734	1,186	17,487	20,766
10-YEAR TOTAL	577	3,876	17,104	15,688	184,579	221,824
ANNUAL AVERAGE	**58**	**388**	**1,710**	**1,569**	**18,458**	**22,182**

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

CRASH TYPES

REGIONWIDE CRASH TYPES

Crash types describe the manner in which the crash took place. Different crash types have different associated infrastructure and behavioral elements. Understanding prevalent crash types helps to understand which potential countermeasures and treatments may offer the most impact across the region. Figure 9 shows the crashes by type and severity for 2010 through 2019. The most common crashes are fixed object and rear end crashes followed by animal crashes. While animal crashes are frequent in OMEGA, this is not uncommon for rural areas. Animal-related crashes have limited treatments and countermeasures and are not recommended as a focus for the plan.

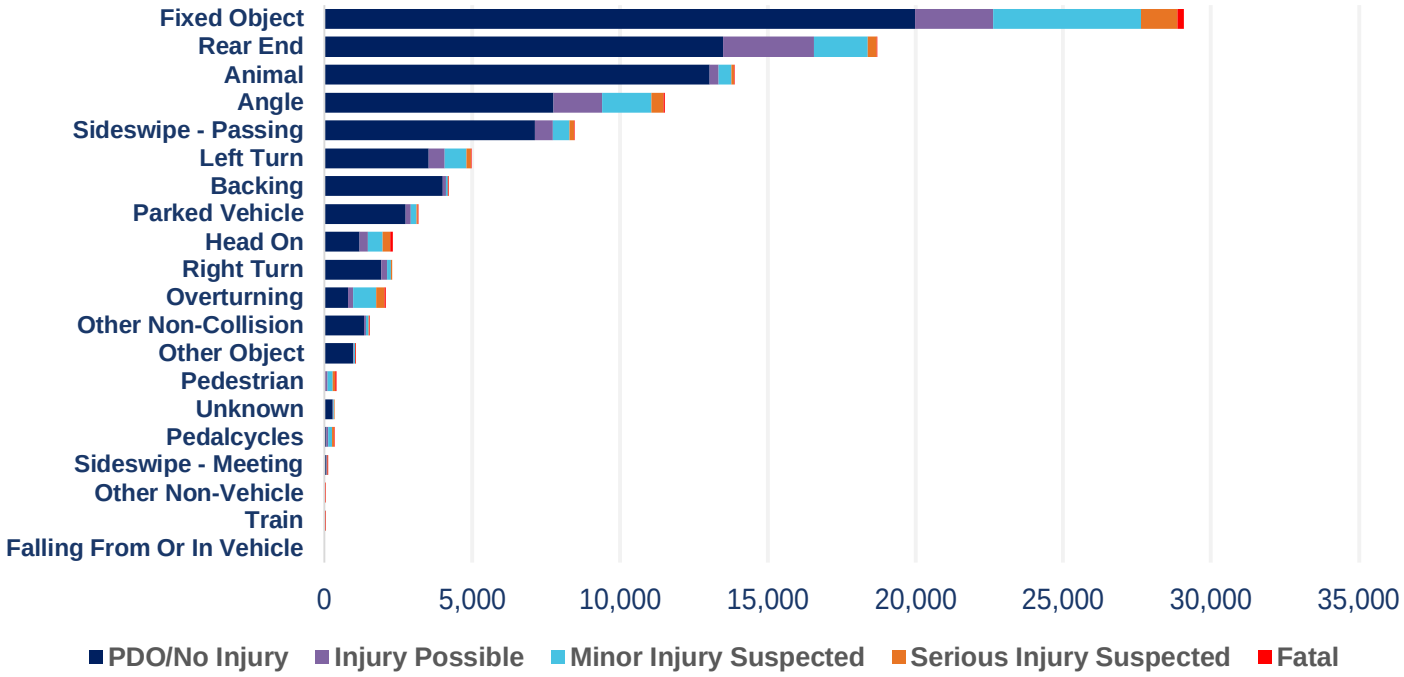

Figure 9 Crashes by crash type and severity, 2010-2019

While frequency of crashes is important, we need to dive deeper in the associated severity of crash types to address the goal of reducing fatal and serious injury crashes in the OMEGA RTPO region.

EQUIVALENT PROPERTY DAMAGE ONLY CRASH FREQUENCY

The equivalent property damage only (EPDO) crash frequency is a measure that considers the relative severity of crashes. EPDO crash frequency relates all crashes in terms of a property damage only (no injury) crash by assigning a weighted value to each crash severity type except for PDO crashes which have a weight of 1. To calculate the EPDO, the following equation was used with crash severity weights based on information provided in the ODOT Economic Crash Analysis Tool (ECAT).

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*EPDO Crash Frequency = (37.93 * Fatal and Serious Injury Crashes + 6.55 * Visible Injury Crashes + 4.44 * Possible Injury Crashes + Property Damage Only Crashes) / Total Number of Crashes*

EDPO crash frequencies allow for a better comparison of different groups of crashes based on both frequency and severity instead of either measure alone. When evaluating groups of crashes with EPDO frequencies, the groups with high frequency and high severity rise to the top. By evaluating different crash types with EPDO frequencies, as shown in Figure 10, we're better able to understand the balance between frequency and severity of various crash types in the OMEGA RTPO Region. Figure 10 shows that pedestrian and sideswipe – meeting crashes have the highest EPDO values. This indicates that while these crash types are rare (as shown in Figure 9) they generally are high severity crashes. By comparison, animal-related crashes are the third most common crash type in the region but have the second

lowest EPDO crash frequency. Focusing on crash types with high EPDO crash frequencies, even if overall occurrences are low, allows for greater opportunities to reduce fatal and serious injury crashes.

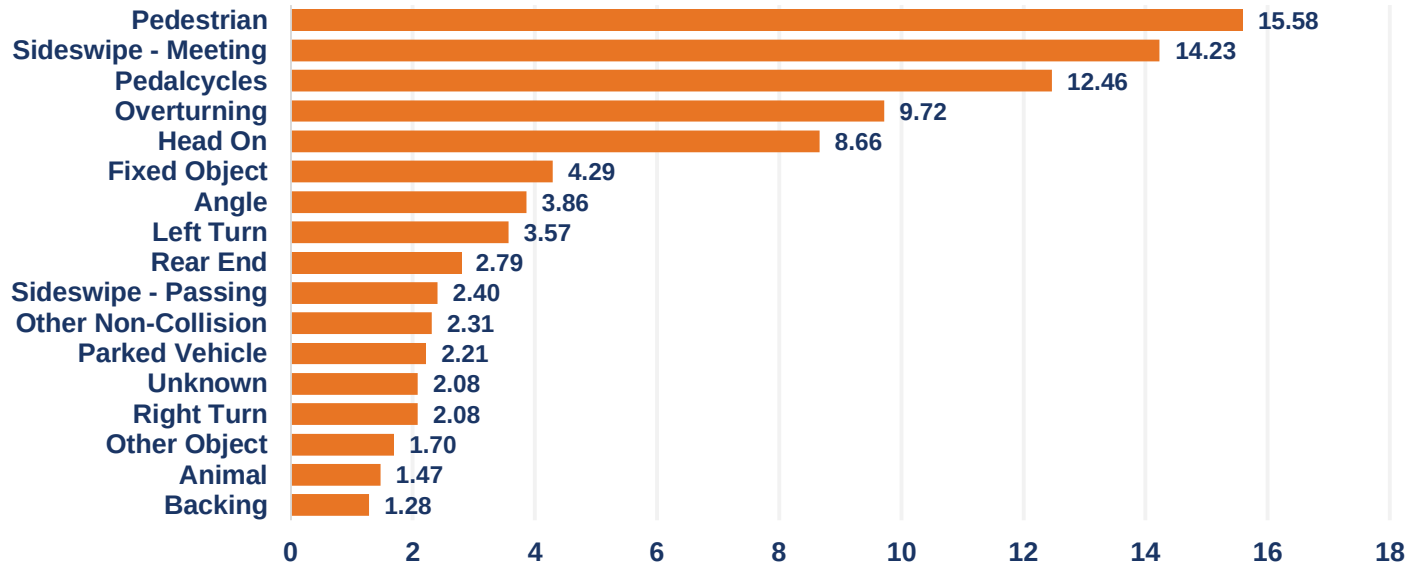


Figure 10: Equivalent Property Damage Only (EPDO) Crash Frequency by crash type, 2010-2019

Figure 10 shows the importance of focusing on pedestrian and bicycle (pedalcycle) crashes. While the frequency of these crashes is low, as shown in Figure 9, they tend to be some of the most severe crashes when they do occur.

CRASHES BY JURISDICTION AND MAINTAINING AUTHORITY

CRASH STATISTICS BY JURISDICTION

Figure 11 shows a breakdown of crashes by roadway jurisdiction and severity. The figure shows that road safety is a joint responsibility by the state, counties, municipalities, and townships. For “off-system” roads (not a part of the state system), local jurisdictions must make decisions on how to implement strategies to improve safety.

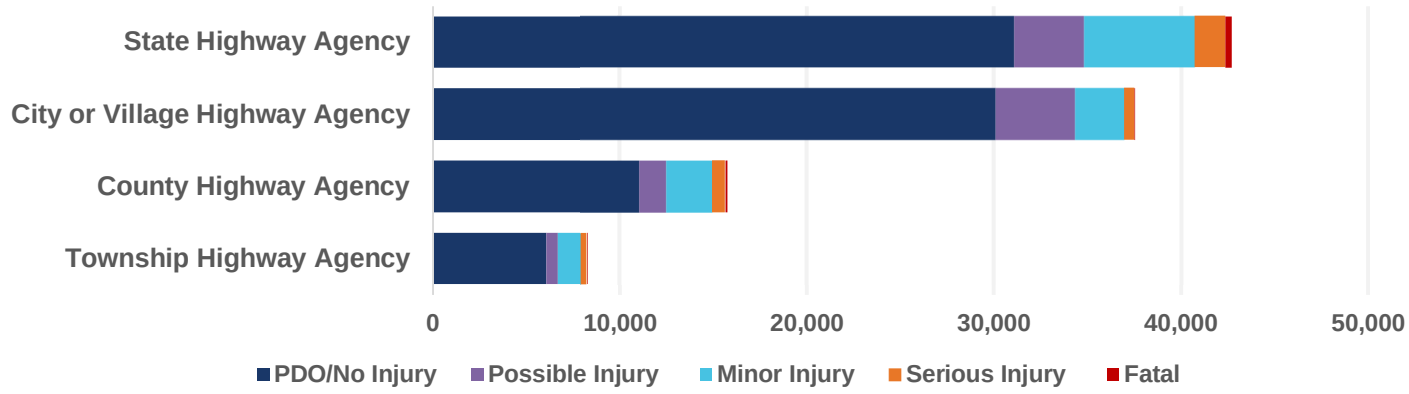


Figure 11: Crashes by severity and jurisdiction, 2010-2019

CRASH TYPES BY JURISDICTION

Further breaking down crashes, particularly fatal and serious injury crashes by crash type and jurisdiction allows for a better understanding of where the high frequency/high severity crashes are occurring. Understanding how the patterns shift across roadway types allows for more efficient use of resources. Table 4 shows a breakdown of fatal and serious injury crashes by type as a percentage of total jurisdiction crashes.

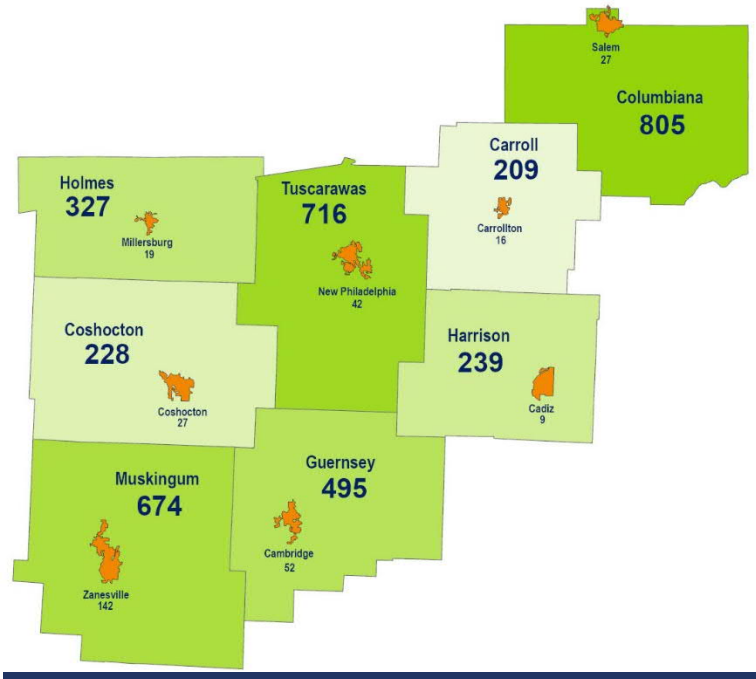
Table 3: Fatal and serious injury crashes by crash type and jurisdiction, 2010-2019

Crash type	State Highway Agency	County Highway Agency	City or Village Highway Agency	Township Highway Agency	Grand Total
Angle	12.6%	9.1%	19.0%	4.8%	12.1%
Animal	2.2%	3.2%	0.3%	2.0%	2.1%
Backing	0.2%	0.3%	0.9%	0.0%	0.3%
Fixed Object	36.5%	54.9%	20.9%	55.3%	39.7%
Head On	10.5%	8.3%	8.8%	6.8%	9.5%
Left Turn	6.1%	1.0%	6.0%	1.4%	4.6%
Other Non-Collision	0.6%	1.2%	0.9%	1.7%	0.9%
Other Object	0.3%	0.3%	0.5%	0.0%	0.3%
Overturning	8.7%	10.3%	4.1%	15.1%	8.9%
Parked Vehicle	0.4%	1.4%	5.5%	0.9%	1.5%
Pedalcycles	1.3%	1.3%	3.8%	3.1%	1.9%
Pedestrian	1.7%	1.3%	11.2%	2.0%	3.1%
Rear End	10.9%	3.4%	10.7%	2.8%	8.6%
Right Turn	0.7%	0.4%	1.0%	0.3%	0.6%
Sideswipe - Meeting	1.0%	1.8%	1.0%	0.6%	1.1%
Sideswipe - Passing	6.2%	1.8%	4.1%	1.4%	4.5%
Unknown	0.0%	0.0%	0.5%	0.3%	0.1%
Train	0.0%	0.0%	0.7%	0.0%	0.1%
Other Non-Vehicle	0.0%	0.0%	0.0%	1.1%	0.1%
Falling from Or in Vehicle	0.0%	0.0%	0.0%	0.3%	0.0%
Grand Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

While each jurisdiction still shows fixed object crashes as the top severity, we can see significantly different proportions of total crashes accounted for by fixed object crashes accounting for nearly 55% of county and township road crashes to 36.5% of state route crashes and 20.9% of city/village road crashes.

CRASHES BY COUNTY



The other piece of the location puzzle is the dispersion of crashes across the region. Figure 12 highlights fatal and serious injury crashes by county along with the fatal and serious injury crashes for the largest city in each county. While the crash numbers fluctuate throughout the region, each county is still facing unique safety challenges. One of the benefits of the safety planning process for the OMEGA Region is the development of county-sub plans. These plans, available in Appendix A, not only contain detailed crash information for the county, but reflect the locally driven planning approach taken in the development of this plan. While each county is unique, it takes multidisciplinary and cross jurisdictional efforts to drive down fatalities and serious injuries across the OMEGA RTPO region.

Figure 12: Fatal and serious injury crashes by county and largest city from 2010-2019

EMPHASIS AREA - PRIORITIZED FOCUS AREAS

SECTION CONTENT:

- **Roadway Departure**
- **Intersections**
- **Speed**
- **Unrestrained Occupants**
- **Active Transportation**

EVERY MOVE YOU MAKE
TOWARD ZERO DEATHS

5 EMPHASIS AREAS – PRIORITIZED FOCUS AREAS

Traffic crashes do not happen in a bubble, and often have several different contributing factors such as impairment, speed, distraction, etc. At the statewide level, the Ohio Strategic Highway Safety Plan (SHSP) reviews a wide range of potential factors, identifies the top issues leading to fatalities and serious injuries, and develops strategies and actions to address them. Agencies often refer to these primary contributing factors as emphasis areas, which means they receive additional "emphasis", in the form of time and resources.

For the counties included in the OMEGA RTPO region, crash data for a ten-year timeframe (2010-2019) were evaluated to determine the top contributors to crashes, or the local emphasis areas. The top five emphasis areas were chosen based on data and crash trends from the ten years, surveys distributed to local community representatives (including law enforcement, safe communities, county engineers, port authority, etc.), and input during stakeholder webinars. The five emphasis areas are roadway departure, intersection, speed, unrestrained occupants, and active transportation (including pedestrians and bicycles). Each county was also given the opportunity to choose an additional sixth emphasis area based on the individual needs and challenges. Three counties chose to add distracted driving as an additional emphasis area.

Table 4: Crashes by emphasis area, 2010-2019

	STATEWIDE	REGIONWIDE - ALL ROADS	REGIONWIDE - LOCAL ROADS
ROADWAY DEPARTURE	37.6%	38.0%	37.2%
YOUNG DRIVER INVOLVEMENT (15-25)	36.9%	35.9%	38.5%
INTERSECTION	36.7%	30.4%	37.8%
SPEED RELATED INVOLVEMENT	24.0%	17.3%	15.3%
RESTRAINTS NOT USED DRIVER/ OCCUPANTS	18.9%	6.1%	6.0%
OLDER DRIVER INVOLVEMENT (65+)	18.4%	16.8%	18.2%
ALCOHOL RELATED INVOLVEMENT	16.5%	5.5%	6.1%
REAR END	12.4%	17.9%	19.4%
MOTORCYCLE DRIVER/PASSENGER	10.9%	2.0%	1.7%
DRUG RELATED INVOLVEMENT	8.1%	0.0%	0.0%
PEDESTRIAN INVOLVEMENT	6.6%	0.4%	0.5%
DISTRACTED DRIVERS	6.4%	5.7%	5.9%
RAILROAD CROSSING	0.3%	0.1%	0.1%
BICYCLE INVOLVEMENT	2.0%	0.2%	0.3%
WORK ZONE INVOLVEMENT	3.0%	0.9%	0.4%
MARIJUANA INVOLVEMENT	3.0%	0.1%	0.1%

ABOVE STATEWIDE AVERAGE BELOW STATEWIDE AVERAGE

ROADWAY DEPARTURE

Roadway departures accounted for 37.6% of all crashes that occurred in the eight counties of the OMEGA RTPO region from 2010-2019. The Ohio Strategic Highway Safety Plan defines a roadway departure as a crash resulting from a vehicle leaving its lane or the designated roadway. These crashes may result in a collision with another vehicle or object or result in a vehicle overturn. Common fixed objects include trees, utility poles, and roadside ditches. Figure 13 shows the trend in five-year rolling averages for roadway departure-related fatalities and serious injuries.

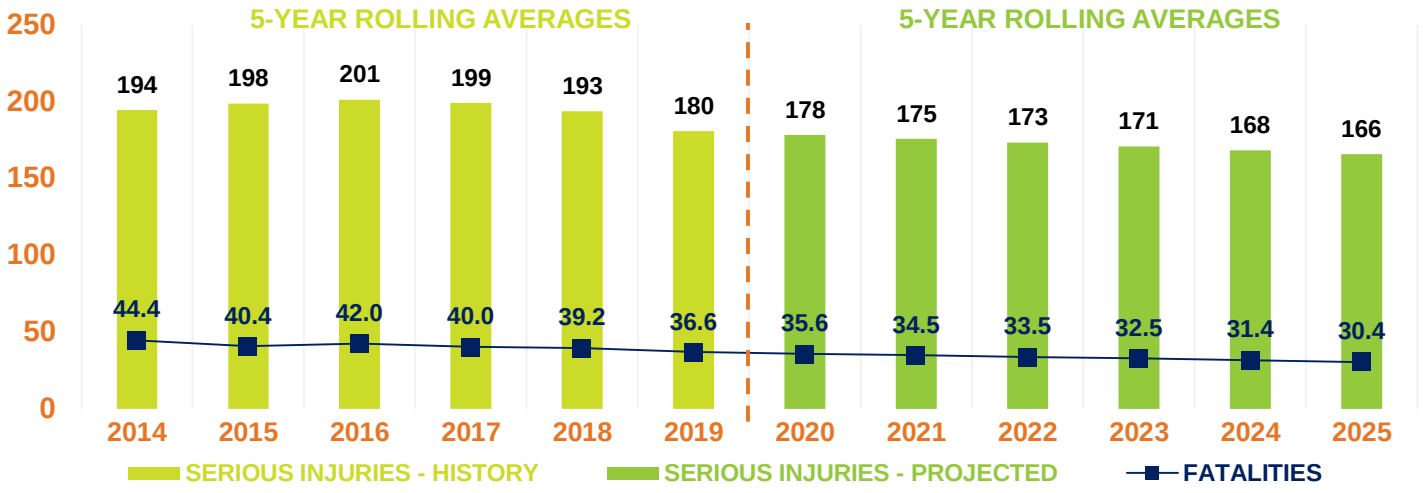


Figure 13: Five-year observed and projected rolling averages of roadway departure-related fatalities and serious injuries

The emphasis on multidisciplinary approaches to traffic safety is paramount to driving down fatalities and serious injuries across all emphasis areas. To that end, Figure 14 shows the overlaps in fatalities and serious injuries across the other ODOT SHSP emphasis areas. Any improvements in roadside safety reducing the severity of crashes will have positive benefits on the overlapping emphasis areas, most notably restraint use and speed.

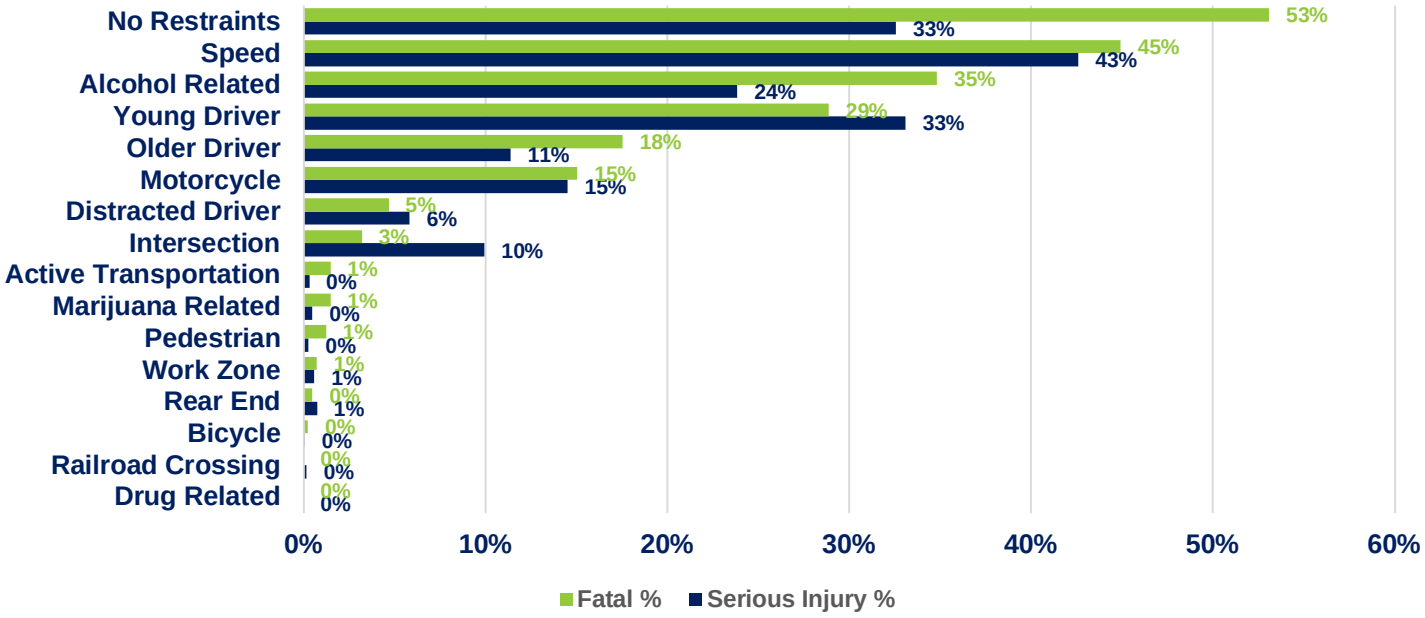


Figure 14: Roadway departure-related fatal and serious injury crashes with overlapping emphasis areas, 2010-2019

ROADWAY DEPARTURE

WHO? Figure 16 shows the breakdown of ages for drivers involved in fatal and serious injury roadway departure crashes. The highest at-risk age group is 15 to 34 years old with a peak at 20 to 24 years old. There is a slight increase in drivers 45 to 54 years old.

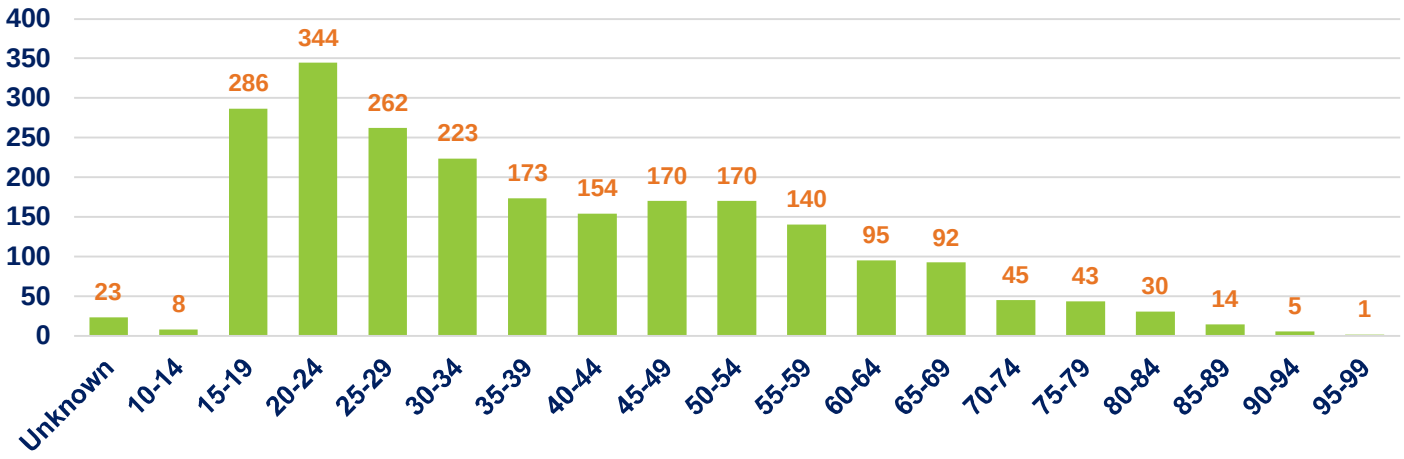


Figure 15: Roadway departure-related fatal and serious injury crashes by age, 2010-2019

WHERE? Roadway departure crashes by functional classification are shown in Figure 16. Roadway departure crashes most commonly occur on major collector roads, followed by local roads and minor arterials.

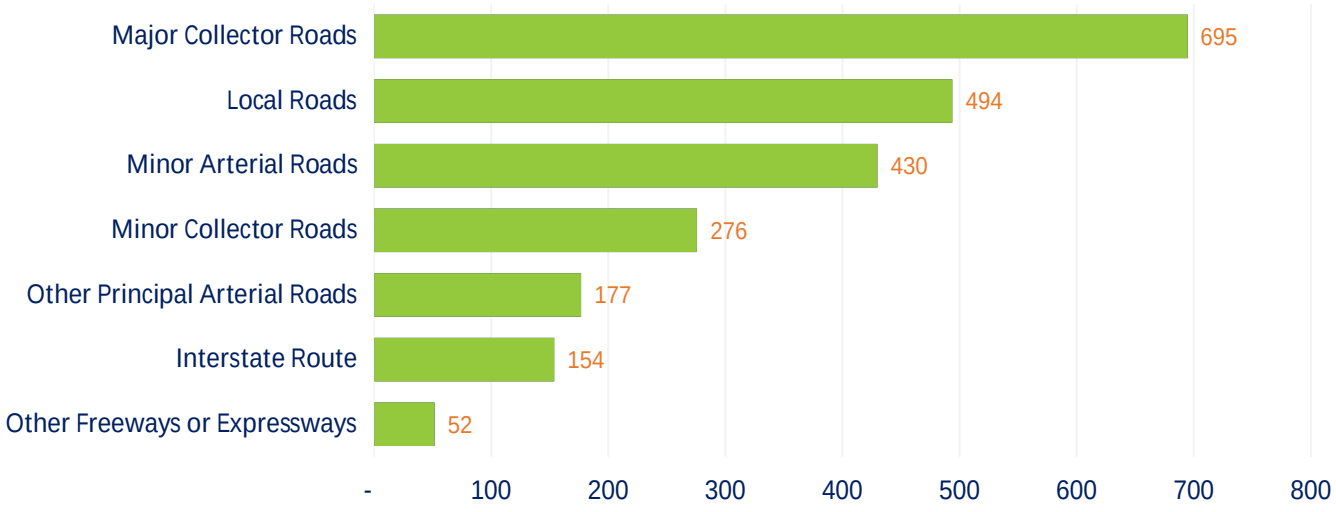


Figure 16: Roadway departure-related fatal and serious injury crashes by roadway functional class, 2010-2019

ROADWAY DEPARTURE

WHEN? Figures 17, 18, and 19 show the distribution of fatal and serious injury crashes by time, day of week, and month of year, respectively. Fatal and serious injury roadway departure crashes most frequently occur during afternoon peak hours, 2:00 PM to 7:00 PM. The highest peak occurred at 3:00 PM. Crashes are also more frequent during the weekend (Friday, Saturday, and Sunday), with Saturday having the highest volume of roadway departure crashes. The months of May through September saw the most fatal and serious injury roadway departure crashes while February and December saw the least.

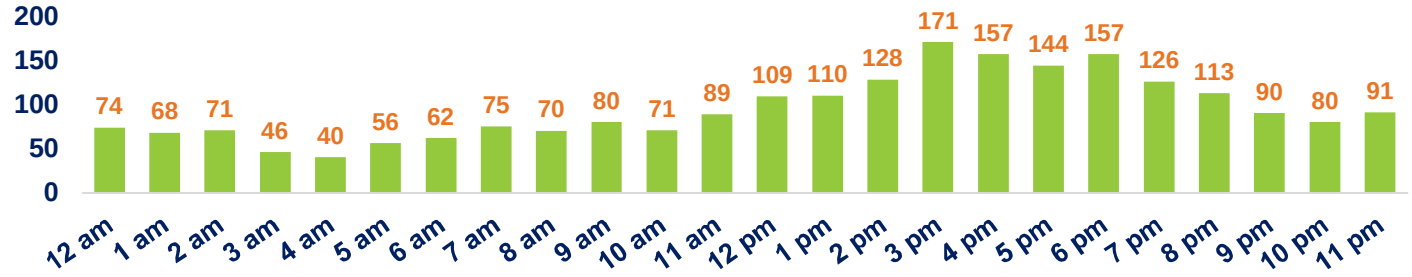


Figure 17: Roadway departure-related fatal and serious injury crashes by time of day, 2010-2019

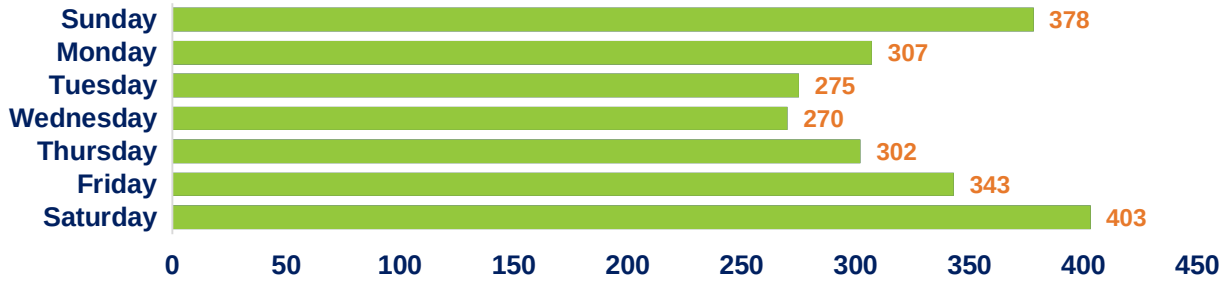


Figure 18: Roadway departure-related fatal and serious injury crashes by day of week, 2010-2019

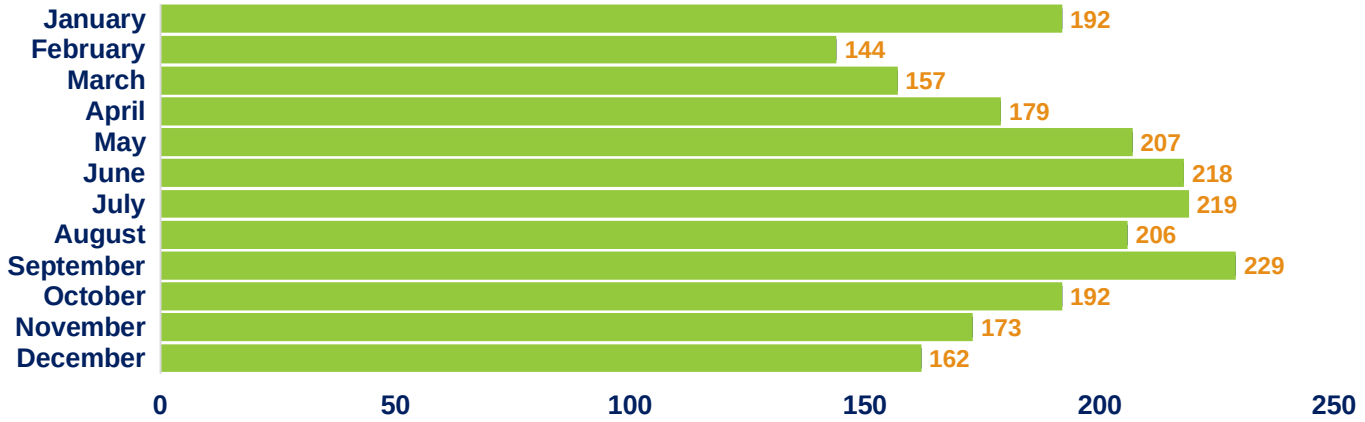


Figure 19: Roadway departure-related fatal and serious injury crashes by month, 2010-2019

ROADWAY DEPARTURE

HOW? Most roadway departure crashes result in a collision with roadside objects. Figure 20 shows the breakdown of fatal and serious injury crashes by object struck. The top three objects; trees, embankments, and ditches, are expected for the largely rural OMEGA region. Guardrail, however, is a bit different as it's a fixed roadside object generally installed to prevent serious crashes. While guardrail is an effective means to reduce the likelihood of serious and fatal crashes in certain situations, it is important to remember that installing a fixed object near a roadway should be done in accordance with engineering guidance and that guardrail does not serve as a catch all for fixing other roadside hazards.

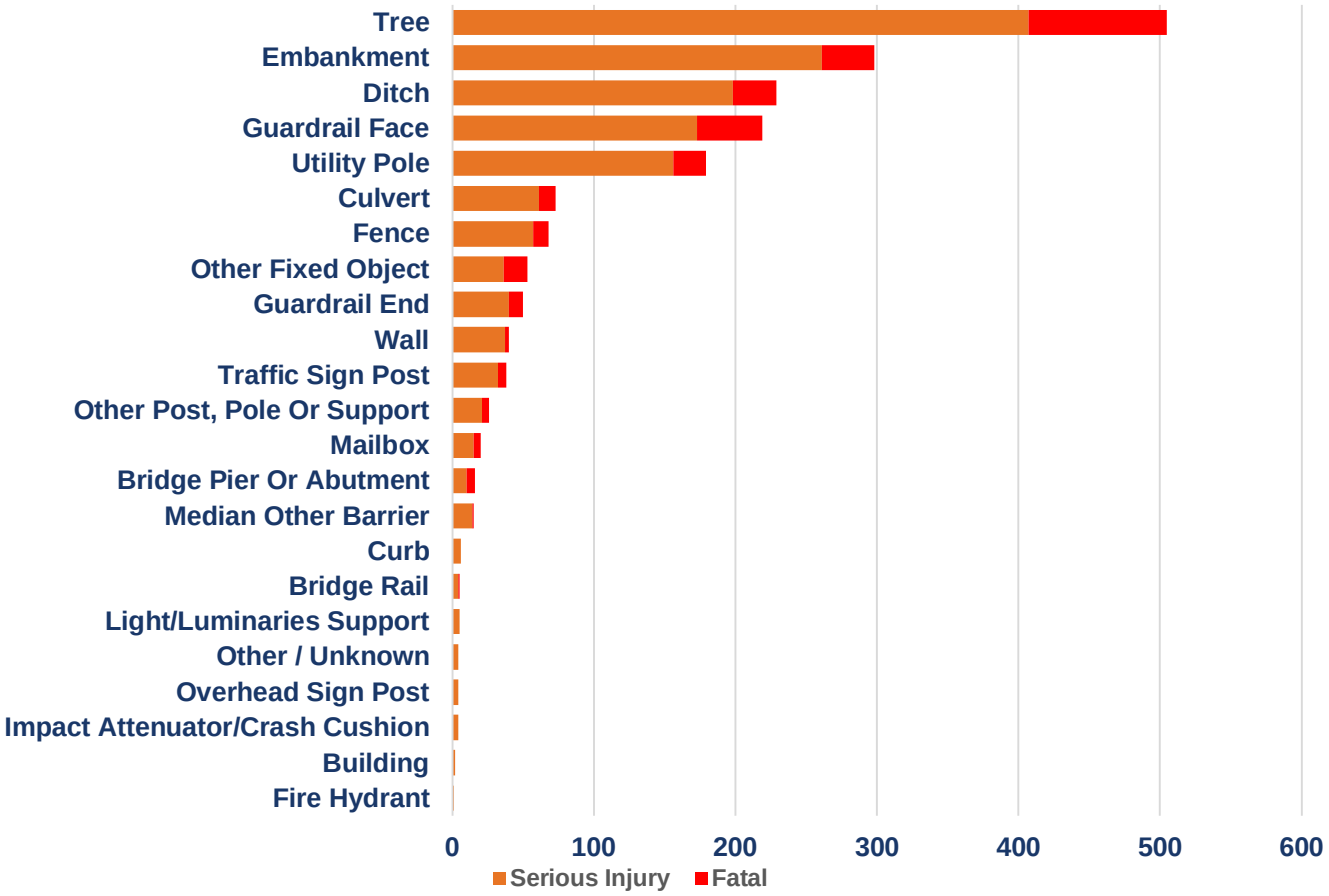


Figure 20: Fatal and serious injury crashes by object struct, 2010-2019

INTERSECTION

Between 2010-2019, 36.7% of fatal and serious injury crashes occurred at intersections. On average, 75 to 87 people are seriously injured each year while five to eight people are fatally injured at an intersection. Figure 21 shows the five-year rolling average for intersection-related fatalities and serious injuries along with the projected trend for the five-year rolling averages. While the projected trend in fatalities is showing a decline, the trend in serious injuries is projected to grow by 2 injuries annually.

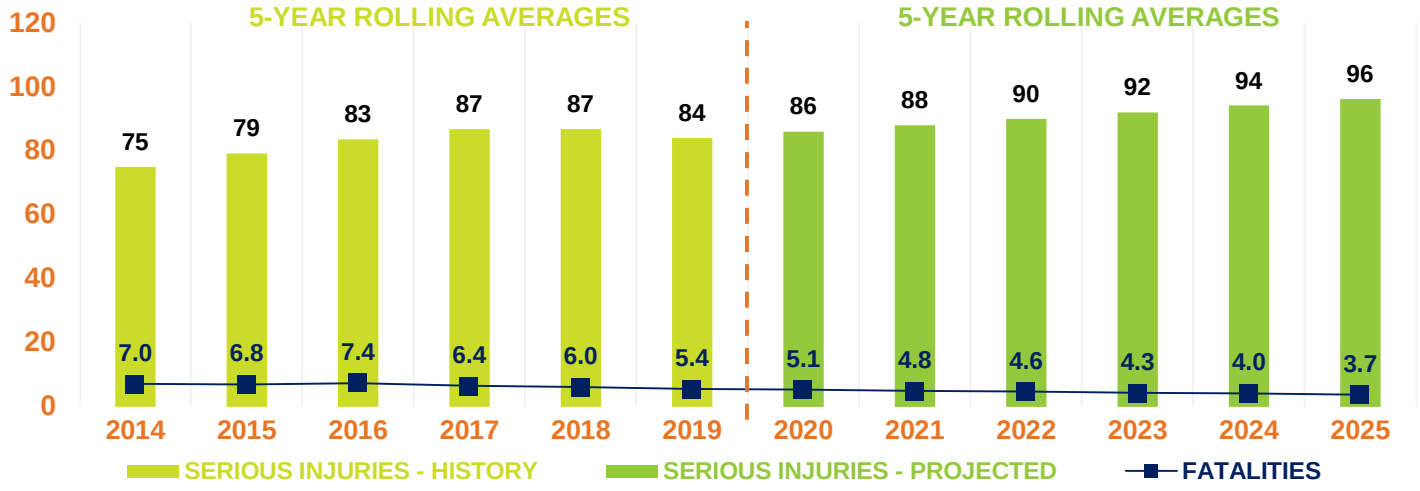


Figure 21 Five-year observed and projected rolling averages of intersection-related fatalities and serious injuries

Intersection-related fatalities and serious injuries typically have other contributing factors involved in the crash. Figure 22 shows the emphasis area overlaps for intersection-related crashes. From Figure 22, 44% of people fatally injured in intersection-related crashes were not properly restrained. Additionally, 84% of fatal injuries, and 64% of serious injuries at intersections involved at-risk age groups (older and younger drivers).

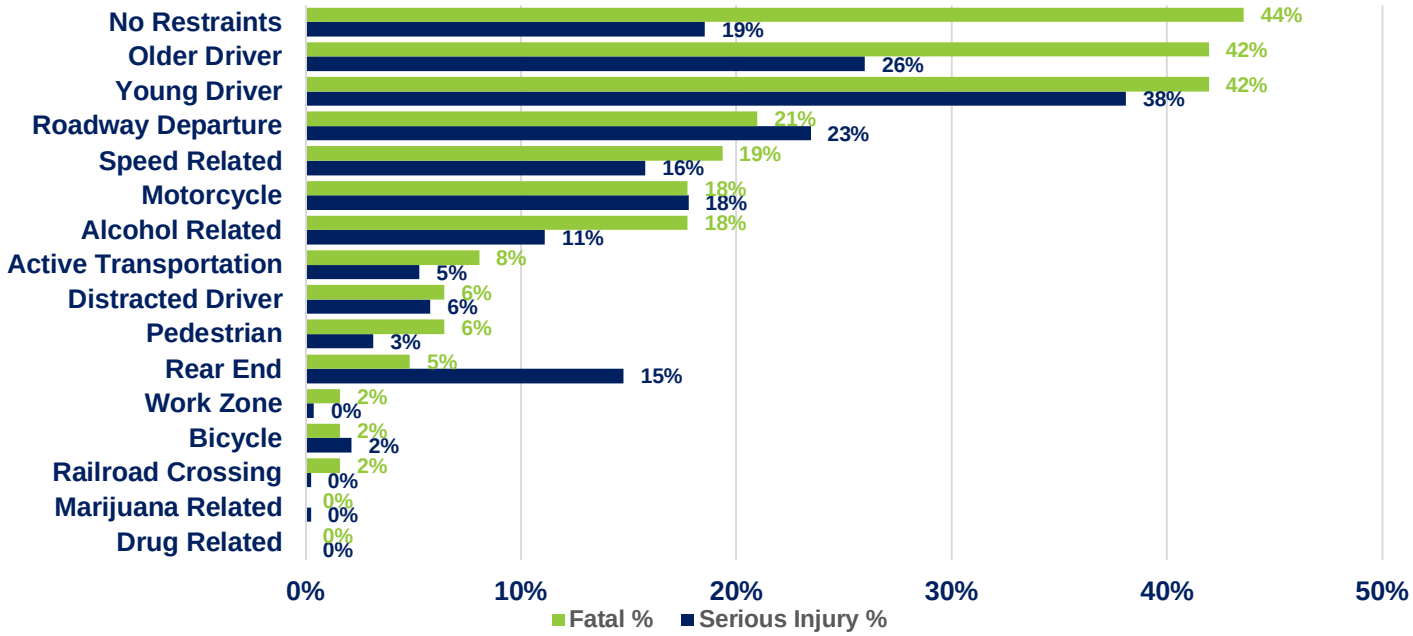


Figure 22: Intersection-related fatal and serious injury crashes with overlapping emphasis areas, 2010-2019

INTERSECTION

WHO? Figure 23 shows the breakdown of ages for drivers involved in fatal and serious injury intersection-related crashes. The highest at-risk age group is 15 to 24 years old. There is also a slight increase in crashes from adults 50 to 59 years old but then stays consistent to 70 years old.

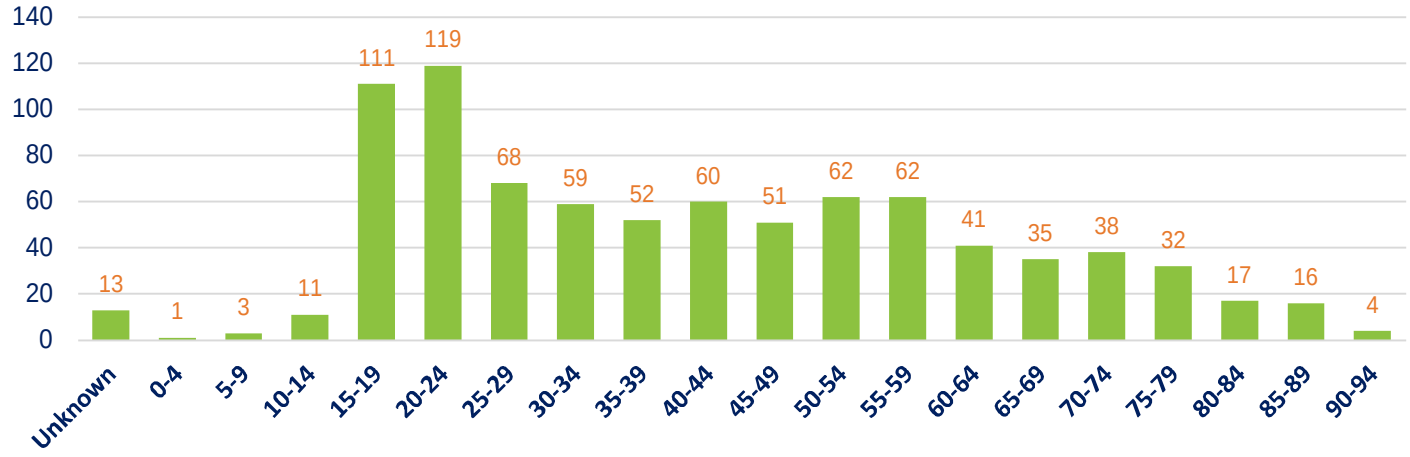


Figure 23: Intersection-related fatal and serious injury crashes by age, 2010-2019

WHERE? Intersection-related crashes by highest functional classification at the intersection where the crash occurred are shown in Figure 24. The most common intersection crashes occurred at minor arterial intersections followed by major collector intersections.

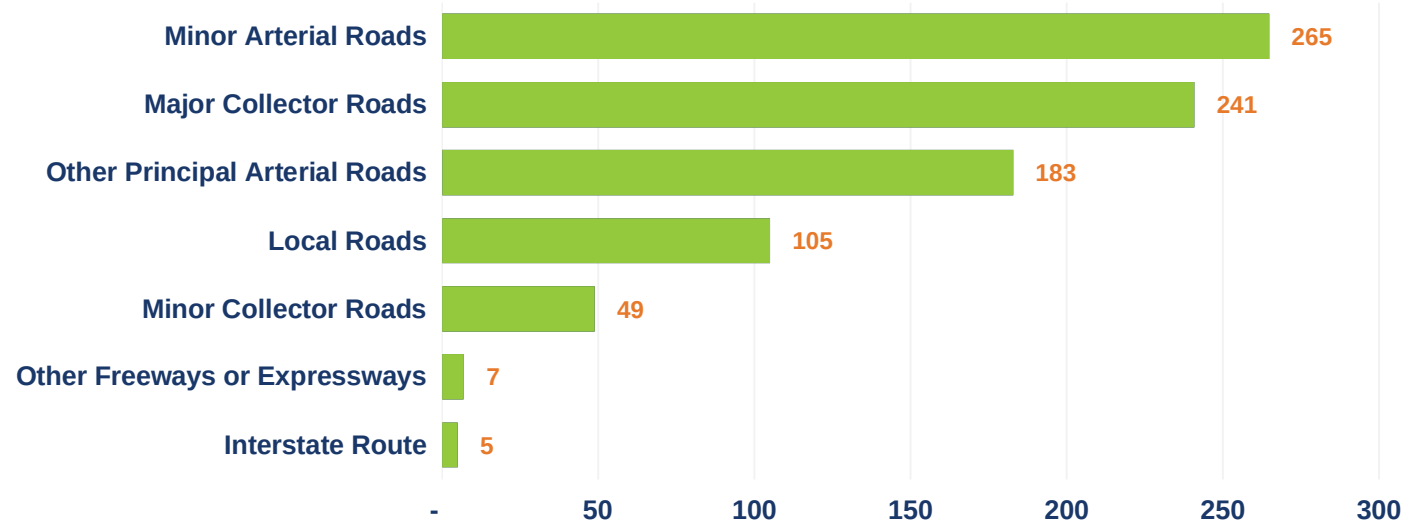


Figure 24: Intersection-related fatal and serious injury crashes by roadway functional class, 2010-2019

INTERSECTION

WHEN? Figures 25, 26, and 27 show the distribution of fatal and serious injury crashes by time, day of week, and month of year, respectively. Intersection-related fatal and serious injury crashes steadily increase throughout the day and peak at 4:00 pm. Intersection-related crashes are relatively steady throughout the week, peaking on Friday. The frequency of fatal and serious injury crashes at intersections is higher between the months of May and October.

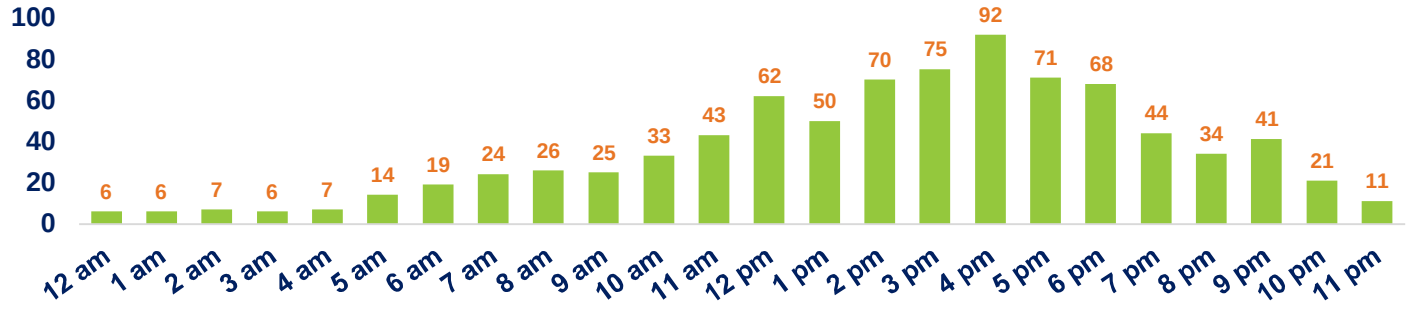


Figure 25: Intersection-related fatal and serious injury crashes by time of day, 2010-2019

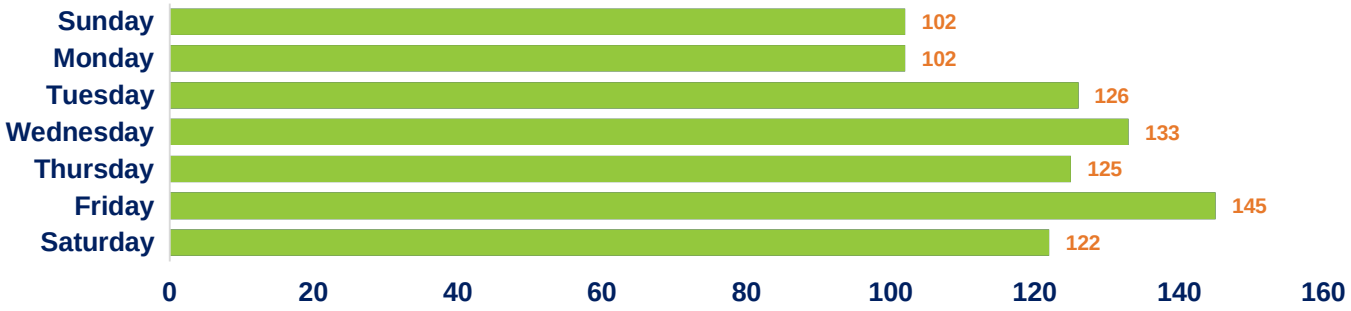


Figure 26: Intersection-related fatal and serious injury crashes by day of week, 2010-2019

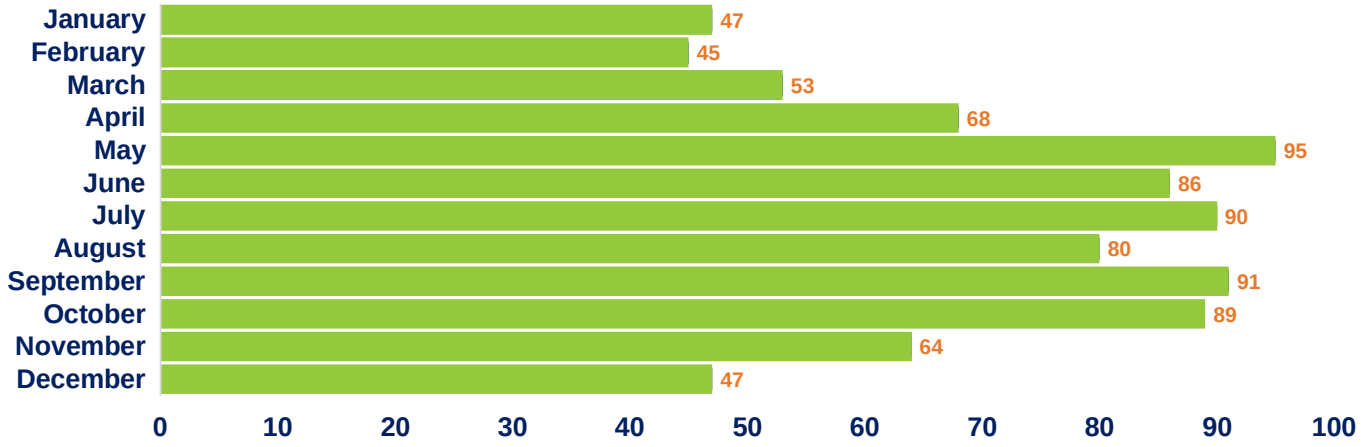


Figure 27: Intersection-related fatal and serious injury crashes by month, 2010-2019

INTERSECTION

HOW? Figure 28 shows the breakdown of fatal and serious injury crashes by crash type. Over 38% of intersection-related fatal and serious injury crashes from 2010 to 2019 were the result of angle-collisions. Rear-end crashes accounted for 14% of crashes at intersections. While rear-end crashes are typically associated with lower severity crashes, higher speeds in more rural setting may contribute to these crashes trending towards more severe in the OMEGA Region.

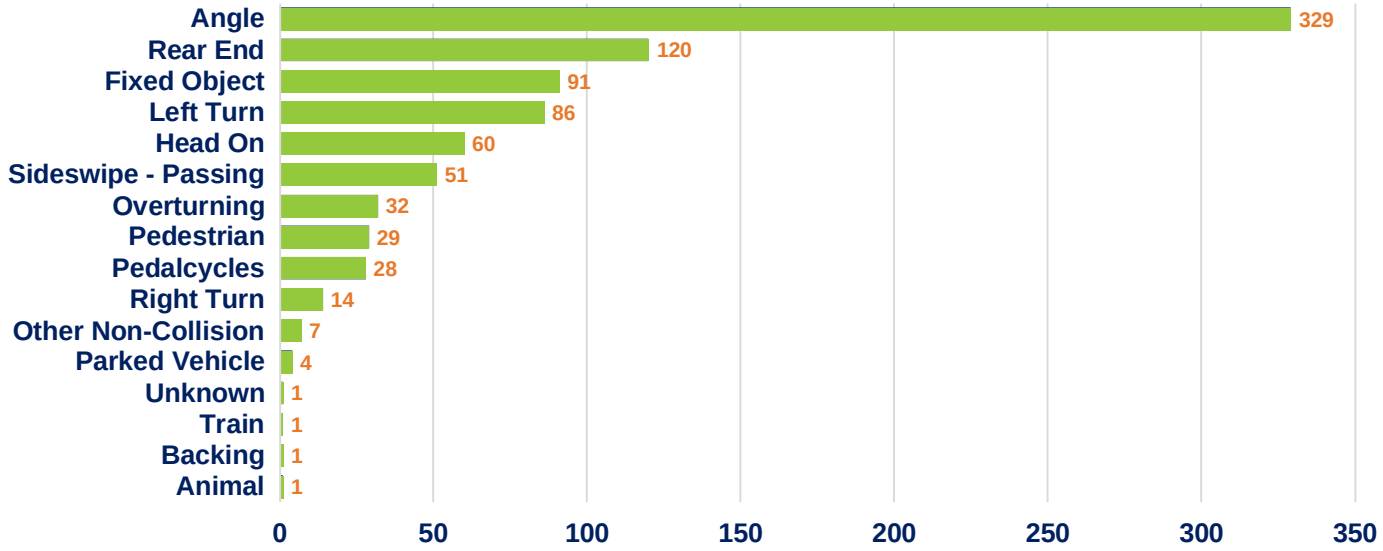


Figure 28: Intersection-related fatal and serious injury crashes by crash type, 2010-2019

SPEED

Speed-related crashes accounted for 24% of all fatal and serious injuries from 2010-2019 in the OMEGA region. On average, 90 to 105 people will sustain serious injuries and 18 to 22 people will have fatal injuries per year. Figure 29 shows the five-year rolling average for speed-related fatalities and serious injuries along with the projected trend for the five-years rolling averages. While the projected trend in fatalities is showing a mild increase, the trend in serious injuries is projected to decrease by roughly three injuries per year.

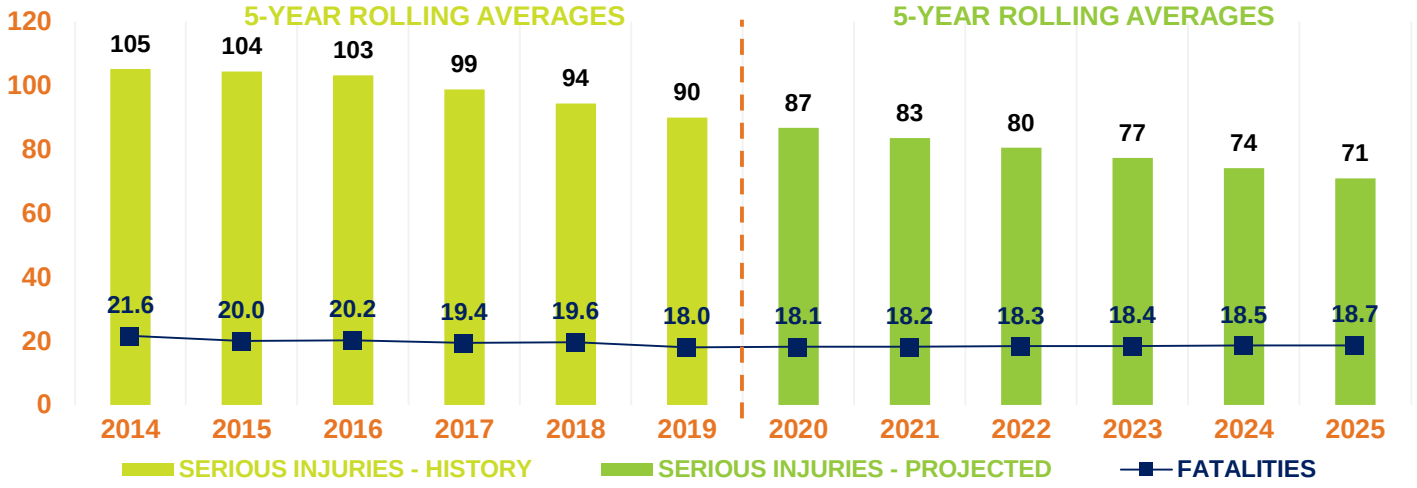


Figure 29 Five-year observed and projected rolling averages of speed-related fatalities and serious injuries

Figure 30 shows the overlapping emphasis area related to speeding crashes. The leading related cause for fatal and serious injuries sustained by speed-related crashes is roadway departure, where 92% of these crashes are fatal and 82% result in serious injuries. While speeding may primarily be a behavioral emphasis area, improvements to roadsides and reducing roadway departure crash severity will have spillover effects in terms of reducing speed-related fatalities and serious injuries.

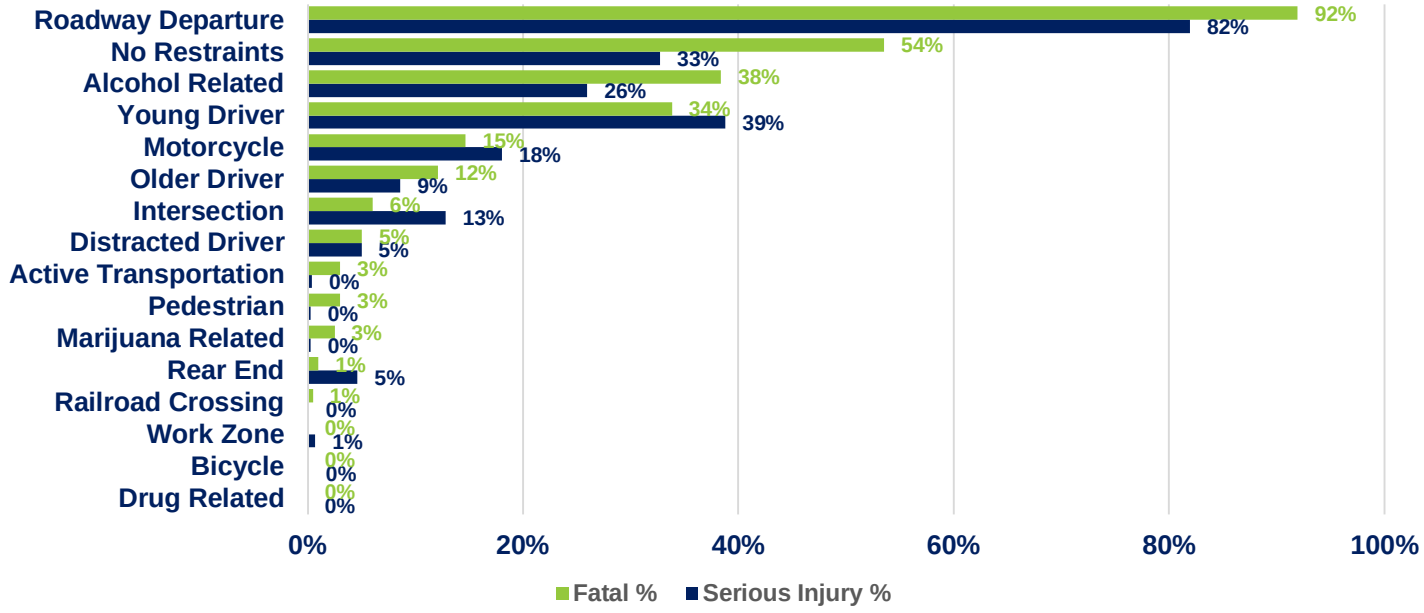


Figure 30: Speed-related fatal and serious injury crashes with overlapping emphasis areas, 2010-2019

SPEED

WHO? Figure 31 shows the breakdown of the age of drivers involved in fatal and serious speed-related crashes. In younger adults, there is a peak around 15 to 24 year old drivers. The trend declines steadily in older ages except for another peak in drivers 45 to 54 years old.

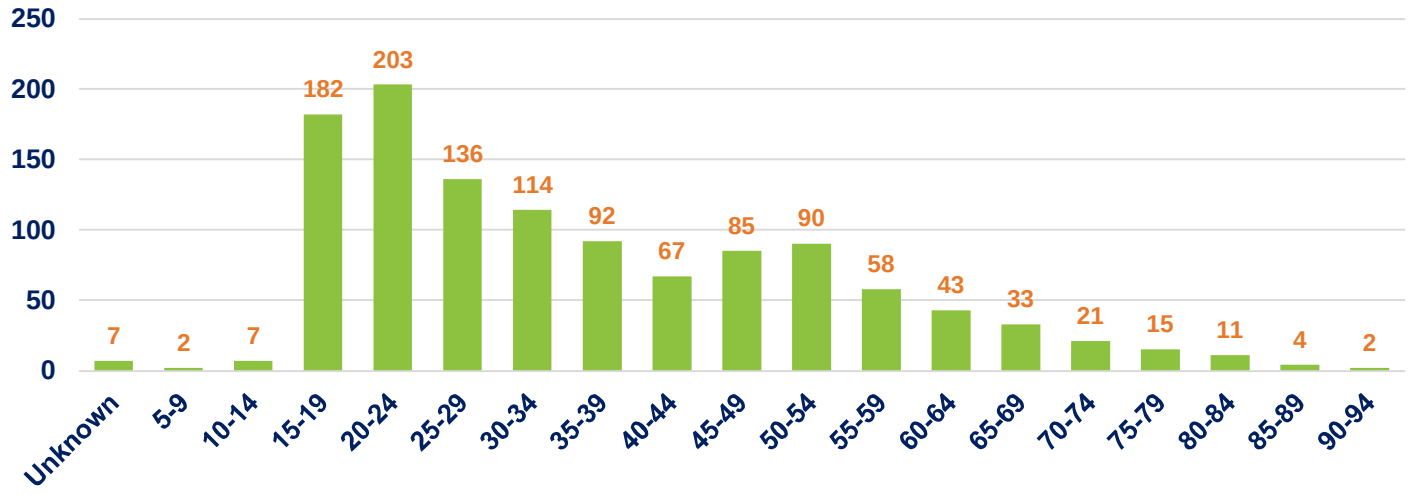


Figure 31: Speed-related fatal and serious injury crashes by age, 2010-2019

WHERE? Figure 32 shows a breakdown of speeding-related crashes by functional classification. The most frequent functional classification where speeding-related crashes occur are major collector roadways, followed by local roads and minor arterial roads.

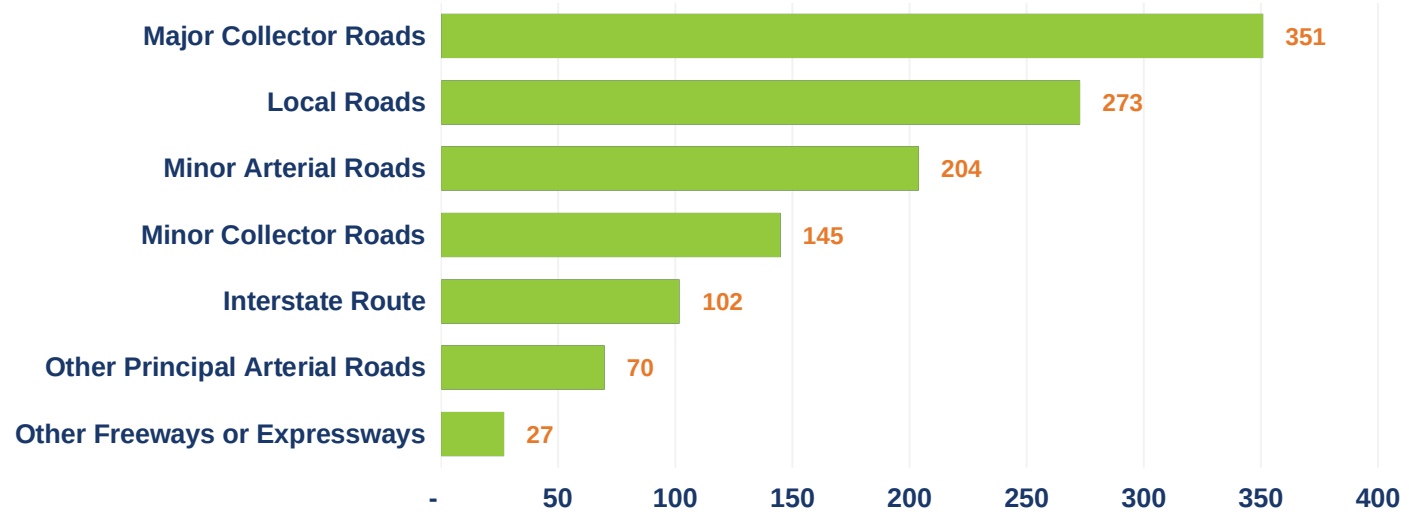


Figure 32: Speed-related fatal and serious injury crashes by roadway functional class, 2010-2019

SPEED

WHEN? Figures 33, 34, and 35 show the distribution of fatal and serious injury crashes by time, day of week, and month of year, respectively. The highest frequencies of speed-related crashes occurred between 3:00 PM and 6:00 PM. Higher frequencies of speed-related fatal and serious injury crashes occur on the weekends (Saturday and Sunday). The highest number of crashes happen during the months of May, June, August, and September.

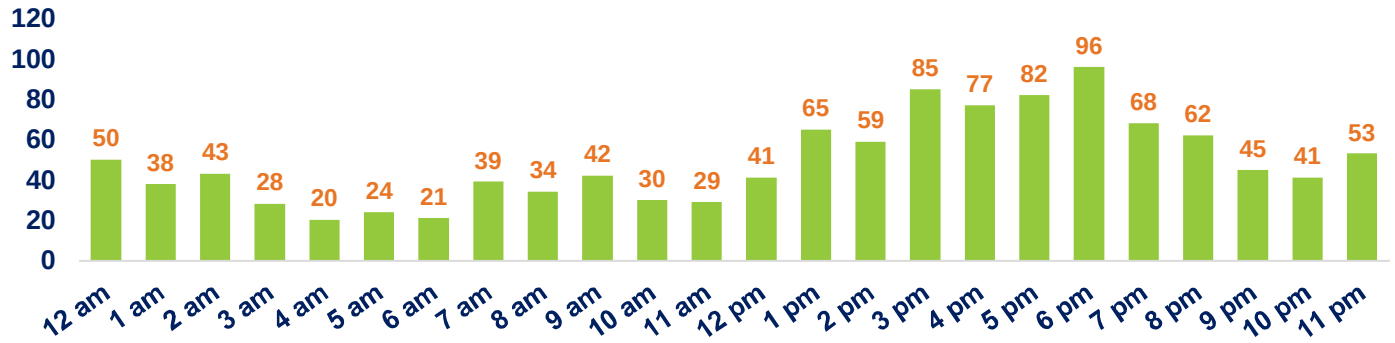


Figure 33: Speed-related fatal and serious injury crashes by time of day, 2010-2019

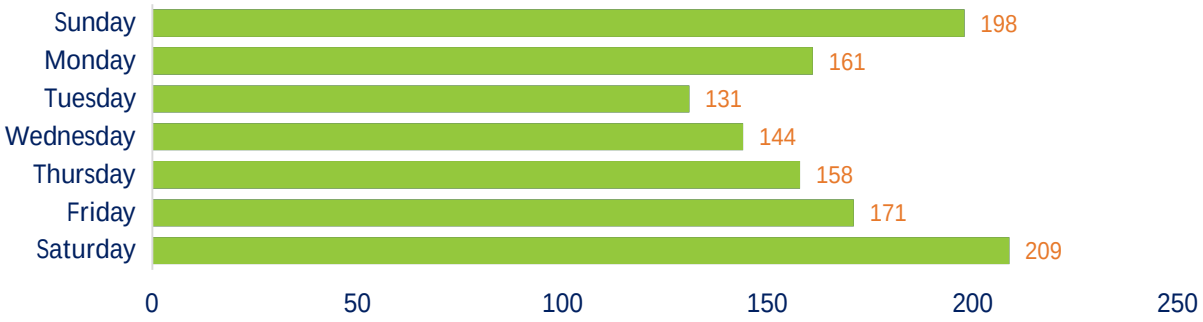


Figure 34: Speed-related fatal and serious injury crashes by day of week, 2010-2019

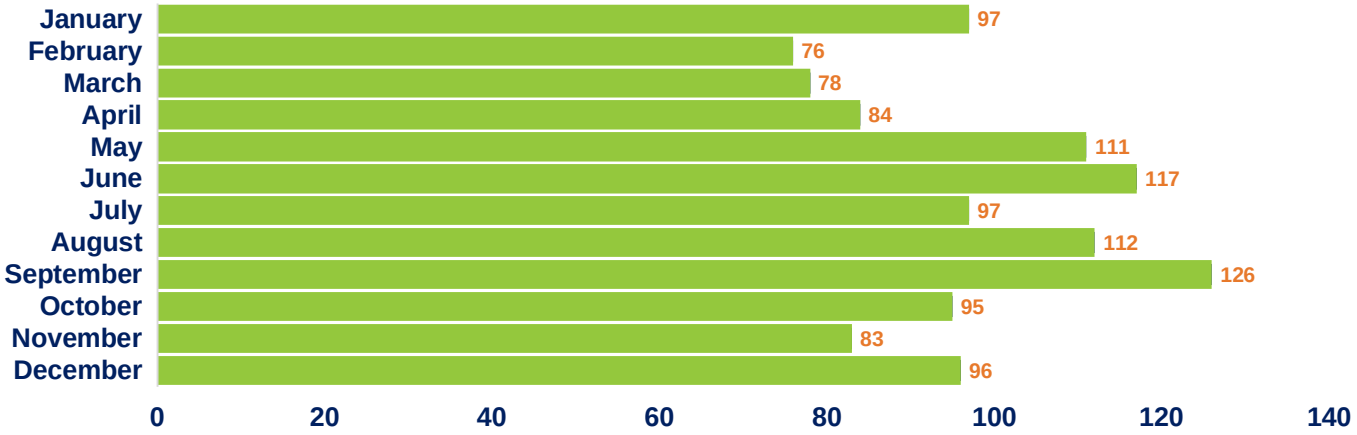


Figure 35: Speed-related fatal and serious injury crashes by month, 2010-2019

SPEED

HOW? Figure 28 shows the breakdown of fatal and serious injury crashes by crash type. The highest occurrence of speed-related fatal and serious injury crashes is when a car hit a fixed object. This further exemplifies the relationship between the speeding and roadway departure emphasis areas.

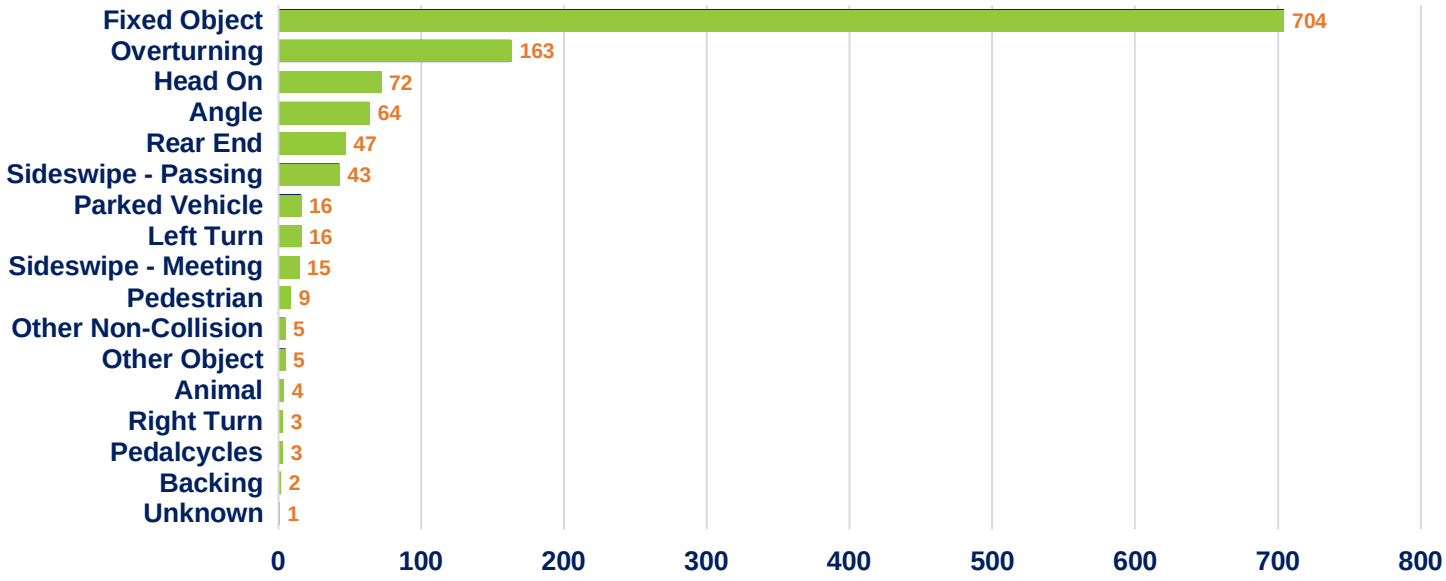


Figure 36: Speed-related fatal and serious injury crashes by crash type, 2010-2019

UNRESTRAINED OCCUPANTS

Between 2010 to 2019 in the OMEGA counties, almost 19% of all serious and fatal injuries sustained from crashes were due to no restraints used in the vehicles. On average, there are 75 to 88 serious injuries and 21 to 28 fatal injuries per year. Based on historical trends, the number of injuries from crashes that has unrestrained occupants is slightly decreasing. Figure 37 shows the five-year rolling average for unrestrained occupant fatalities and serious injuries along with the projected trend for the five-year rolling averages. The projected trends in both fatalities and serious injuries show consistent year-over-year decreases.

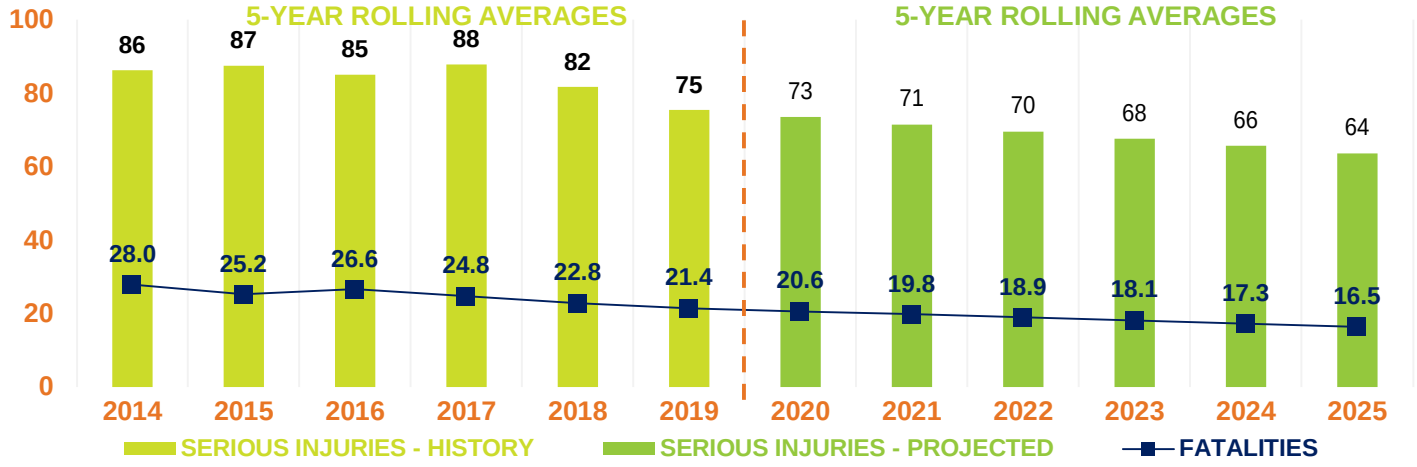


Figure 37 Five-year observed and projected rolling averages of unrestrained occupant fatalities and serious injuries

Proper restraint use is a unique emphasis area given it's one factor that is proven to reduce injury severity regardless of crash type or other related emphasis areas. Improvements in restraint use and reducing unrestrained occupants will help to reduce fatalities and serious injuries for all other emphasis areas, making this a powerful and important part of the plan. Figure 38 shows how unrestrained occupants impact other key emphasis areas like roadway departure and speed-related crashes.

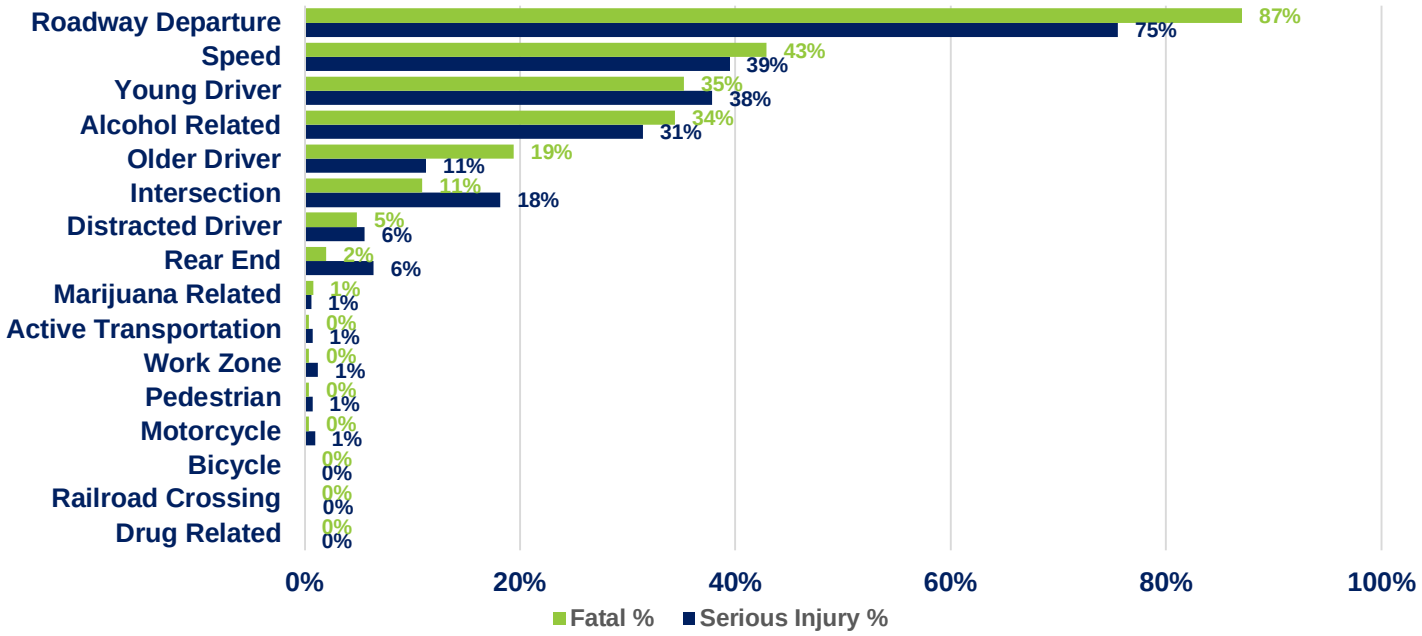


Figure 38: Unrestrained occupant-related fatal and serious injury crashes with overlapping emphasis areas, 2010-2019

UNRESTRAINED OCCUPANTS

WHO? Figure 39 shows the breakdown of the age of unrestrained occupants involved in fatal and serious crashes. Restraint use has been referred to as a generational issue, with drivers who did not grow up wearing seatbelts having harder times adapting to proper restraint use. It's notable that in OMEGA, 317 younger drivers (age 15 to 24 years old) were involved in crashes with at least one unrestrained occupant compared to 103 older drivers (65 years old and older) involved. While the number of younger versus older drivers within the region is likely in play, the importance of restraint use education at all ages should not be overlooked.

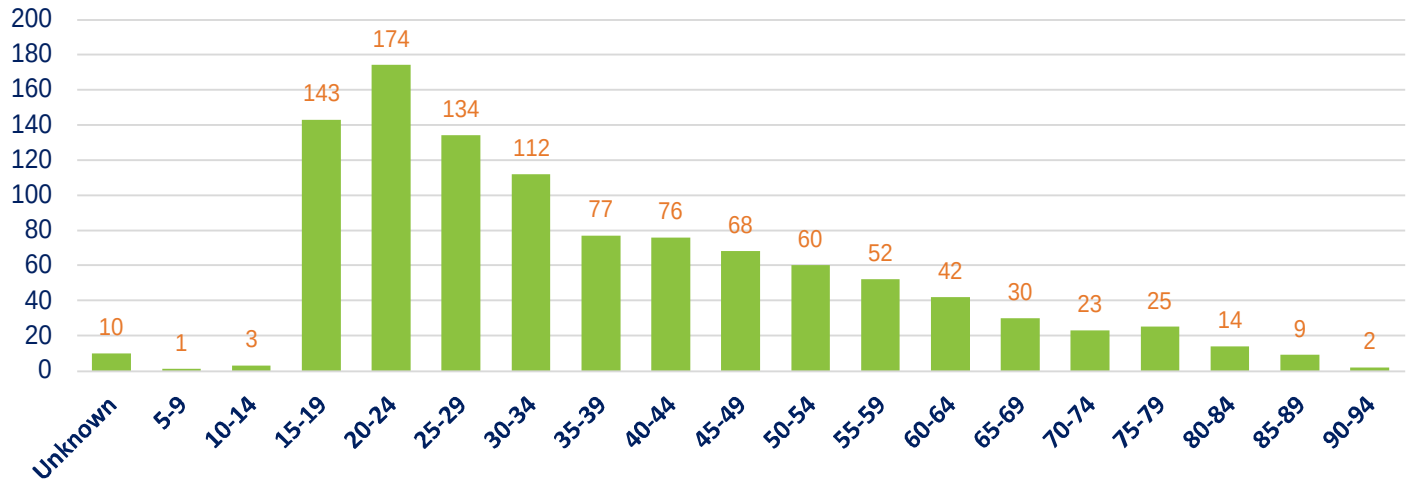


Figure 39: Unrestrained occupant-related fatal and serious injury crashes by age, 2010-2019

WHERE? Figure 40 shows a breakdown of unrestrained occupant-related crashes by functional classification. The most frequent functional classification where unrestrained occupant-involved crashes occur is major collector roadways, followed by local roads and minor arterial roads.

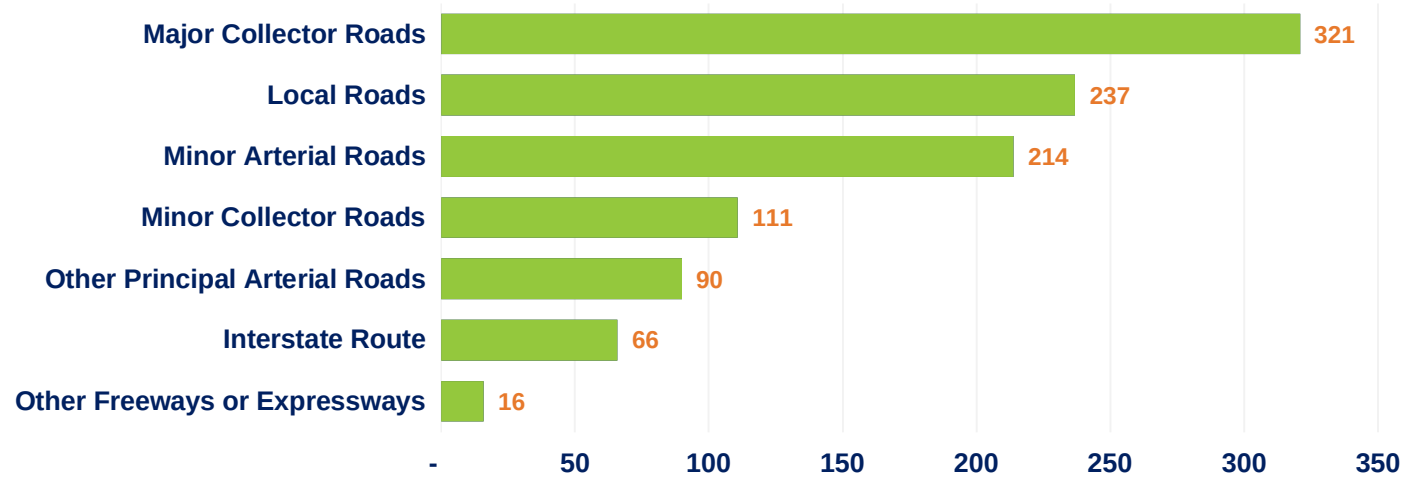


Figure 40: Unrestrained occupant-related fatal and serious injury crashes by roadway functional class, 2010-2019

UNRESTRAINED OCCUPANTS

WHEN? Figures 41, 42, and 43 show the distribution of fatal and serious injury crashes by time, day of week, and month of year, respectively. Serious and fatal crashes involving unrestrained occupants show consistently higher frequencies starting in the early afternoon through the late evening. The highest frequency of crashes occurs on Friday and Saturday throughout the week. Unrestrained occupant crashes are relatively consistent on a month-to-month basis.

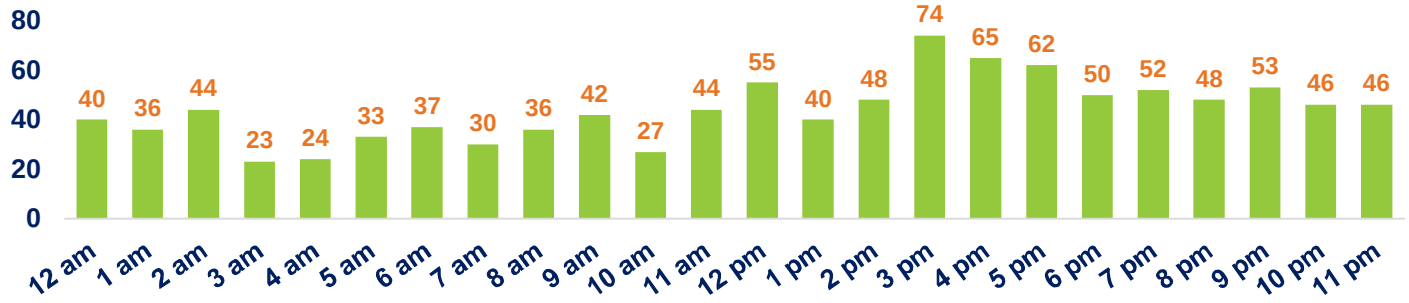


Figure 41: Unrestrained occupant-related fatal and serious injury crashes by time of day, 2010-2019

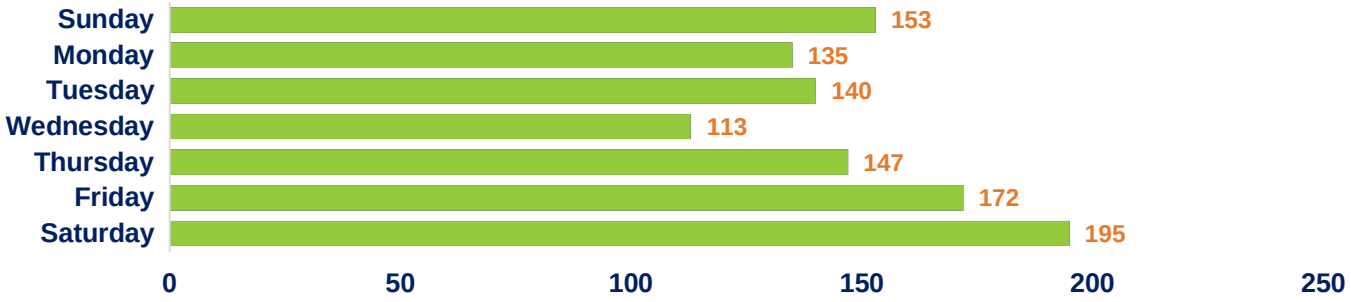


Figure 42: Unrestrained occupant-related fatal and serious injury crashes by day of week, 2010-2019

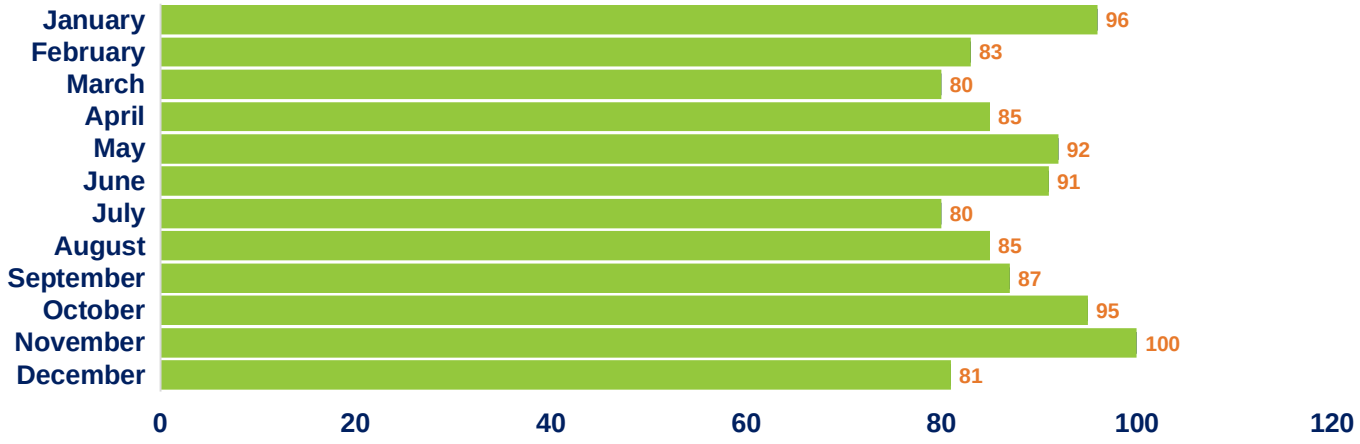


Figure 43: Unrestrained occupant-related fatal and serious injury crashes by month, 2010-2019

UNRESTRAINED OCCUPANTS

HOW? Figure 44 shows the breakdown of fatal and serious injury crashes involving unrestrained occupants by crash type. Many crashes that involved unrestrained occupants were due to a collision involving a fixed object, which accounted for 55% of all fatal and serious injury crashes of this type.

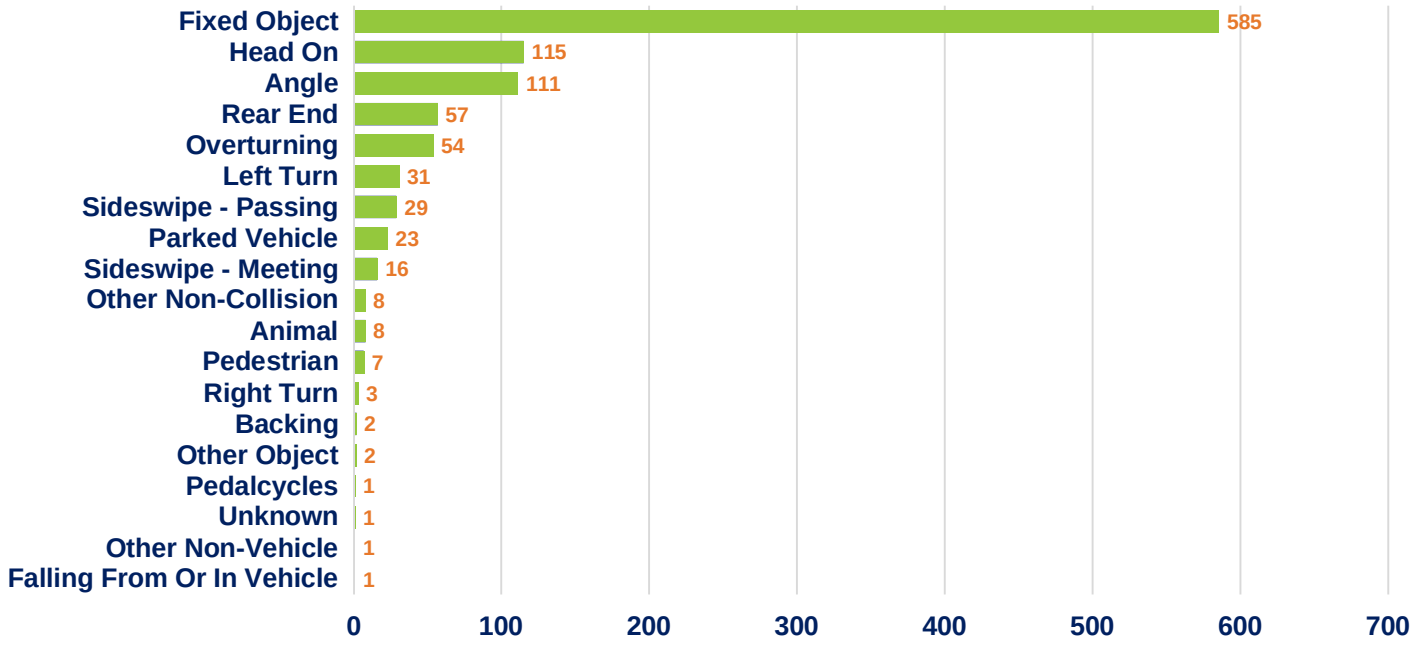


Figure 44: Unrestrained occupant-related fatal and serious injury crashes by crash type, 2010-2019

NON-MOTORIZED USERS

Non-Motorized users includes vehicular crashes that involve a non-motorist, including pedestrians, bicyclists, riders on animals, or animal-drawn buggies. Active transportation crashes accounted for 8.6% of fatal and serious injury crashes in the region. On average, 10 to 14 serious injuries occur per year while 3 to 5 injuries are fatal. According to the rolling average trend, fatal injuries are increasing. While the occurrence of bicycle and pedestrian crashes is rare, the result is generally a high severity injury to the non-motorist. Figure 45 shows the five-year rolling average for active transportation fatalities and serious injuries along with the projected trend for the five-year rolling averages. The projected trend in fatalities is showing an increase, while the trend in serious injuries is projected to decrease slightly each year.

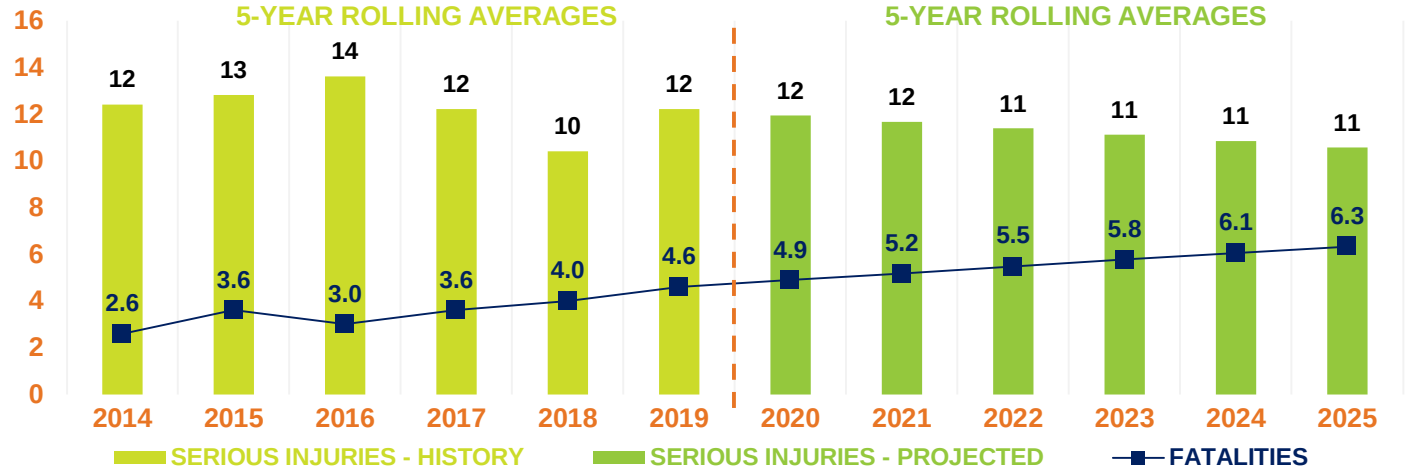


Figure 45 Five-year observed and projected rolling averages of active transportation-related fatalities and serious injuries

Figure 46 shows the overlapping emphasis areas for active transportation. The highest contributing factor to active transportation is the involvement of pedestrians, where 94% of these crashes result in a fatality and 67% result in a serious injury. While bicycle crashes are rarer than pedestrian crashes, they are still overrepresented in terms of injury severity.

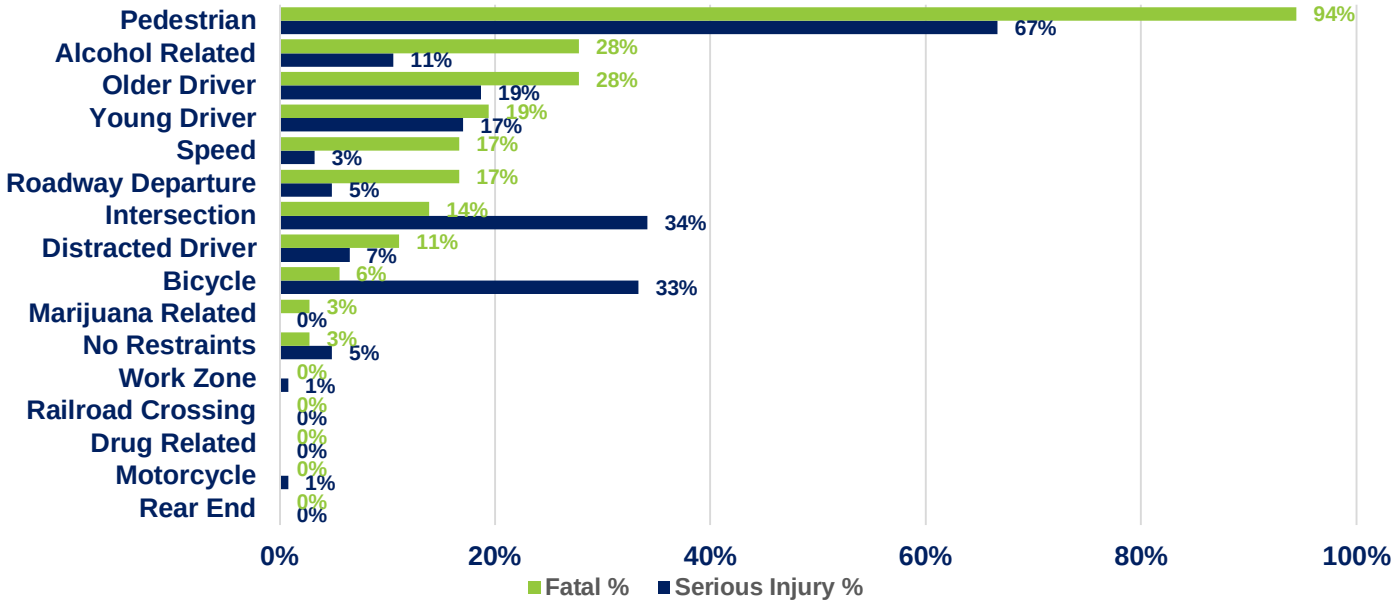


Figure 46: Active transportation-related fatal and serious injury crashes with overlapping emphasis areas, 2010-2019

NON-MOTORIZED USERS

WHO? Unlike other emphasis areas, there are no age restrictions on being a pedestrian, bicyclist, or other non-motorist. Figure 47 shows the age of the at-fault individual for each fatal and serious injury active transportation crash. Pedestrians may be considered at fault if they enter the roadway without having the right-of-way. Figure 47 shows that younger citizens (less than 20 years old) are critically at risk for involvement in active transportation crashes.

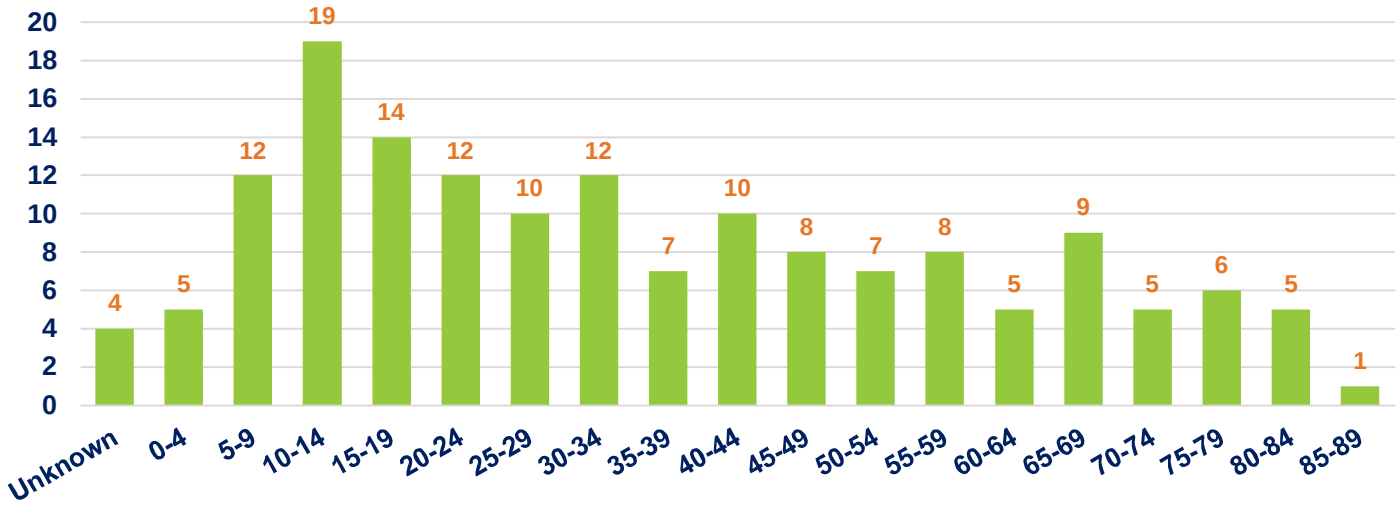


Figure 47: Non-motorized user-related fatal and serious injury crashes by age of at-fault individual, 2010-2019

WHERE? Figure 48, showing the breakdown of active transportation crashes by roadway jurisdiction shows that pedestrian crashes most frequently occur on city or village roads. This underscores the necessity for partnerships across the region to comprehensively reduce fatalities and serious injuries.

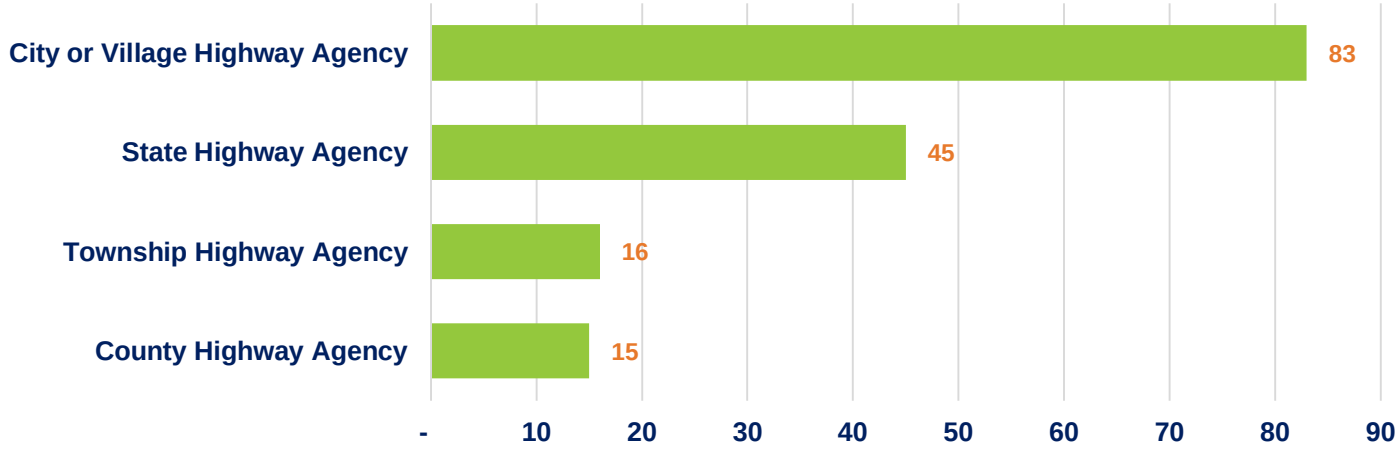


Figure 48: Active transportation-related fatal and serious injury crashes by roadway functional class, 2010-2019

NON-MOTORIZED USERS

WHEN? Figures 49, 50, and 51 show the distribution of fatal and serious injury crashes by time, day of week, and month of year, respectively. Active transportation crashes most frequently occur in the mid-afternoon and late evening hours between 2:00 PM and 9:00 PM. Given the low total number of fatal and serious injury active transportation crashes, there are no definitive trends for day of week, or month. However, it appears that Fridays may show an increased likelihood for active transportation crashes. Similarly, summer months appear to show higher frequencies of pedestrian and bicycle crashes.

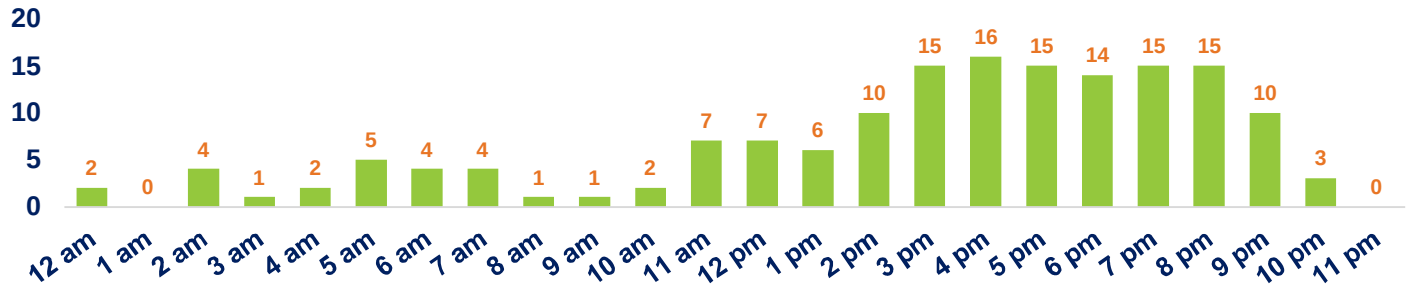


Figure 49: Active transportation-related fatal and serious injury crashes by time of day, 2010-2019

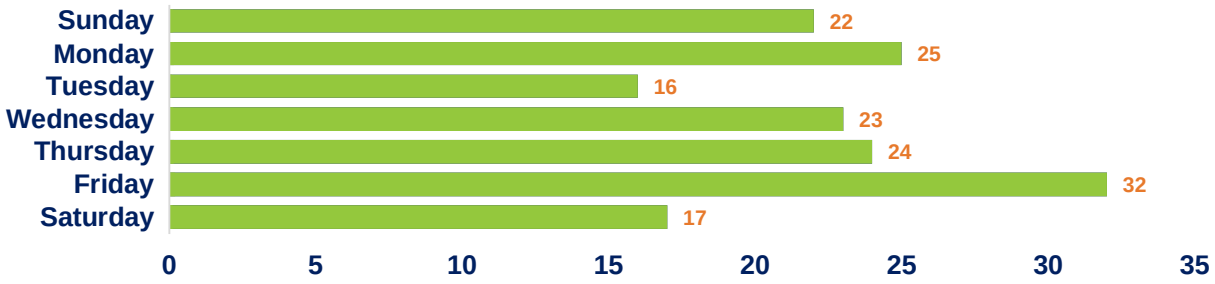


Figure 50: Active transportation-related fatal and serious injury crashes by day of week, 2010-2019

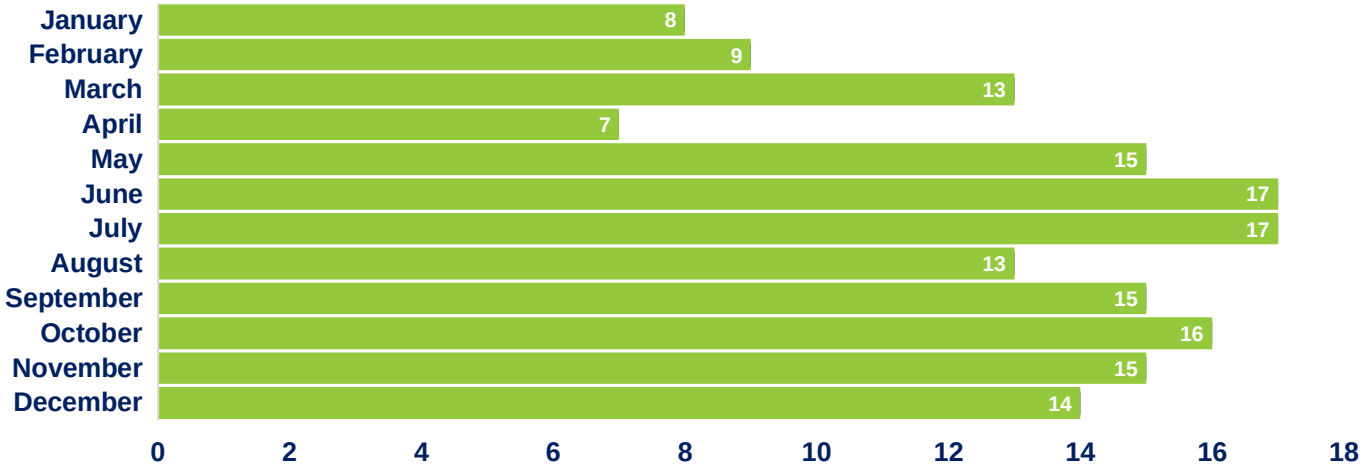


Figure 51: Active transportation-related fatal and serious injury crashes by month, 2010-2019

NETWORK SCREENING – CRASH AND SYSTEMIC PRIORITY SEGMENT IDENTIFICATION

SECTION CONTENT:

Network Screening Background

Crash History Method

Systemic Method

EVERY MOVE YOU MAKE
TOWARD ZERO DEATHS

6 NETWORK SCREENING

BACKGROUND

Network screening is the first component of the roadway safety management process, and is a method of applying a data driven analysis to review a specific roadway network, or subset of a roadway network, and to determine and rank locations of need, priority or potential for safety improvement after implementation of appropriate countermeasures. There are two basic approaches to data driven safety analysis: hot spot and systemic. Both hot spot and systemic analyses are methods that can be used to perform network screening. However, regardless of the specific method, network screening results are still only a snapshot. Changes in traffic patterns, treatment implementation, and other factors can all impact network screening results. The process of network screening is cyclical, based on problem identification, project development, treatment implementation, and evaluation. This cycle allows for a consistent approach to project location identification with ability to adjust and make process or procedural improvements as needed as conditions change and the benefits of implemented treatments are appreciated.

CRASH HISTORY SCREENING METHOD

BACKGROUND

Crash history-based analyses use historic crash data to identify individual locations and then develop/implement treatments to address crashes at specific locations. Crash history-based screening methods result in high crash locations lists (or often maps).

PURPOSE

Identifying and prioritizing high crash locations allows roadway agencies to implement infrastructure treatments at locations with the most pressing current need. Crash history-based methods are reactive, meaning they can only be determined after a large proportion of target crashes occur.

PROCESS

1) **Establish focus** – For this plan, the focus crash type was all crashes in the OMEGA Region.
2) **Identify network and establish reference populations** – The network for the crash history screening included all roadways with a functional classification greater than local road (collectors and above). Note, functional classification does not have to do with jurisdiction or "locally owned" roads. For example, Vocational Road (CR-35) southeast of Cambridge is a "local road" in the sense that it is off the state maintained system. However, the functional classification of this section of roadway is a minor collector. This section of roadway is included in the network screening. While fatal and serious injury crashes occur on roads with local functional classifications, these roads count for a very large percentage of lane miles in the region but a much smaller percentage of traffic volume. Excluding these roadways in this first regional safety screening allows stakeholders to focus on roadway improvements on a more critical sub section of the region. In time, expanding the analysis to local functional classification roadways will allow for additional improvements.
3) **Select performance measures** – EPDO crash rates for 2015-2019 were used as the performance measure for the network screening. EPDO crash rates are ideally suited for screening a diverse network as encountered in the OMEGA Region. EPDO crash rates allow for rates to be calculated for all roadways experiencing crashes of any severity, but weight more severe crashes. The result is a range of crash rate values instead of simply identifying the rare circumstances where fatal crashes occur.
4) **Select screening method** – The network screening started with the base roadway segmentation from ODOT's Transportation Information Mapping System (TIMS). Segments less than 500 feet in length were joined with adjacent segments to avoid prioritizing extremely short segments. For each resulting segment, EPDO crash rates were calculated using the EPDO calculation defined in Section 3. Traffic volumes for state system roadways were obtained from TIMS while off system traffic volume estimates were obtained from Streetlight.
5) **Screen and evaluate results** – Top 50 high-crash locations for each county, and ODOT jurisdiction roadways within OMEGA, are determined by ranking each segment within the county by EPDO crash rate.

RESULTS

Results and high-crash locations for each county are contained within each county sub-plan in Appendix A.

SYSTEMIC SCREENING METHOD

BACKGROUND

Systemic analysis focuses on identifying conditions associated with higher occurrences of crashes and then treating locations where the conditions are present across a network regardless of crash history. Risk factors for a study network are identified and then the study network is screened for locations where the risk factors are present. Systemic safety analyses are considered a complimentary tool to crash history-based analyses.

PURPOSE

Prioritizing on potential or future risk for a crash allows locations to be investigated and projects to be developed before fatal and serious injuries occur. The proactive deployment of countermeasures allows a fundamental shift in traffic safety improvement and problem identification.

PROCESS

1) **Data collection** – For the OMEGA Regional Safety Plan, data collection involved compiling crash, roadway, and operational data from existing sources. ODOT TIMS data was the primary source for roadway attribute information and crash information. Crashes from 2015 through 2019 were used in the screening process and assigned to routes based on the NLFID and county mile points in the crash data. Traffic volumes for state system roadways were obtained from TIMS while off system traffic volume estimates were obtained from Streetlight.
2) **Risk factor analysis** – Risk factors can be determined in several ways but should follow a data driven process. Overrepresentation was determined by comparing the proportion of fatal and severe injury (KA) crashes accounted for by a roadway feature to the proportion of traffic traveling on the segments containing the feature. Roadway features are recommended as risk factors when they account for a greater proportion of KA crashes than traffic volume. Overrepresentation analysis is easily conducted using bar charts as shown in Figure 52.

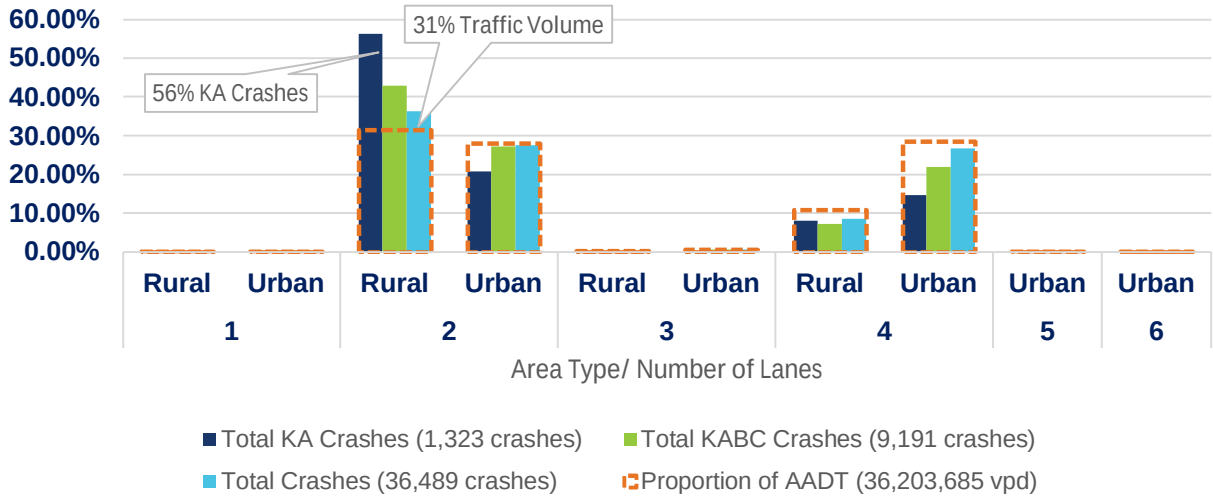


Figure 52: Example overrepresentation analysis chart

As shown in Figure 53, 2-lane segments in rural areas account for approximately 56% of KA crashes, but only 31% of regional traffic volume. Based on this overrepresentation, we consider two-lane roads in rural area types to be a risk factor.

3) **Network screening** – The OMEGA public roadway network was then screened for the presence of risk factors. Each segment was assigned a point towards a risk score for each risk factor present at that segment.
4) **Priority locations** – Segments were then ranked within each county based on risk factor score. Segments with the highest risk factor scores are considered the highest priority locations in terms of at-risk locations, though these sites may not have any fatal or serious injury crashes in the last five years.

RISK FACTOR ANALYSIS RESULTS

More than 30 attributes were tested for overrepresentation in determining the OMEGA RSP risk factors. Of the attributes tested, 5 showed unique overrepresentation and were chosen as risk factors including:

- Area Type and Lane Count – Rural area AND two-lanes
- Jurisdiction – County
- Lane Width – Less than 12 feet
- Speed Limit – 45 or 55 miles per hour

- Traffic Volume – 2,000 to 3,999 vehicles per day

Systemic screening results and high-risk locations for each county are contained within each county sub-plan in Appendix A. For full results of the risk factor analysis, see Appendix B. The region-wide results of the risk factor analysis are presented in Figure 53. The roadways with scores of 4 or 5 (orange or red in Figure 53) make up the “at risk” network. While these roadways may not have significant crash trend histories, they show the roadways where the ingredients for a crash are present. Addressing at risk locations with low cost or systemic improvements is a way to address known risk across the network and potentially address crashes before they occur.

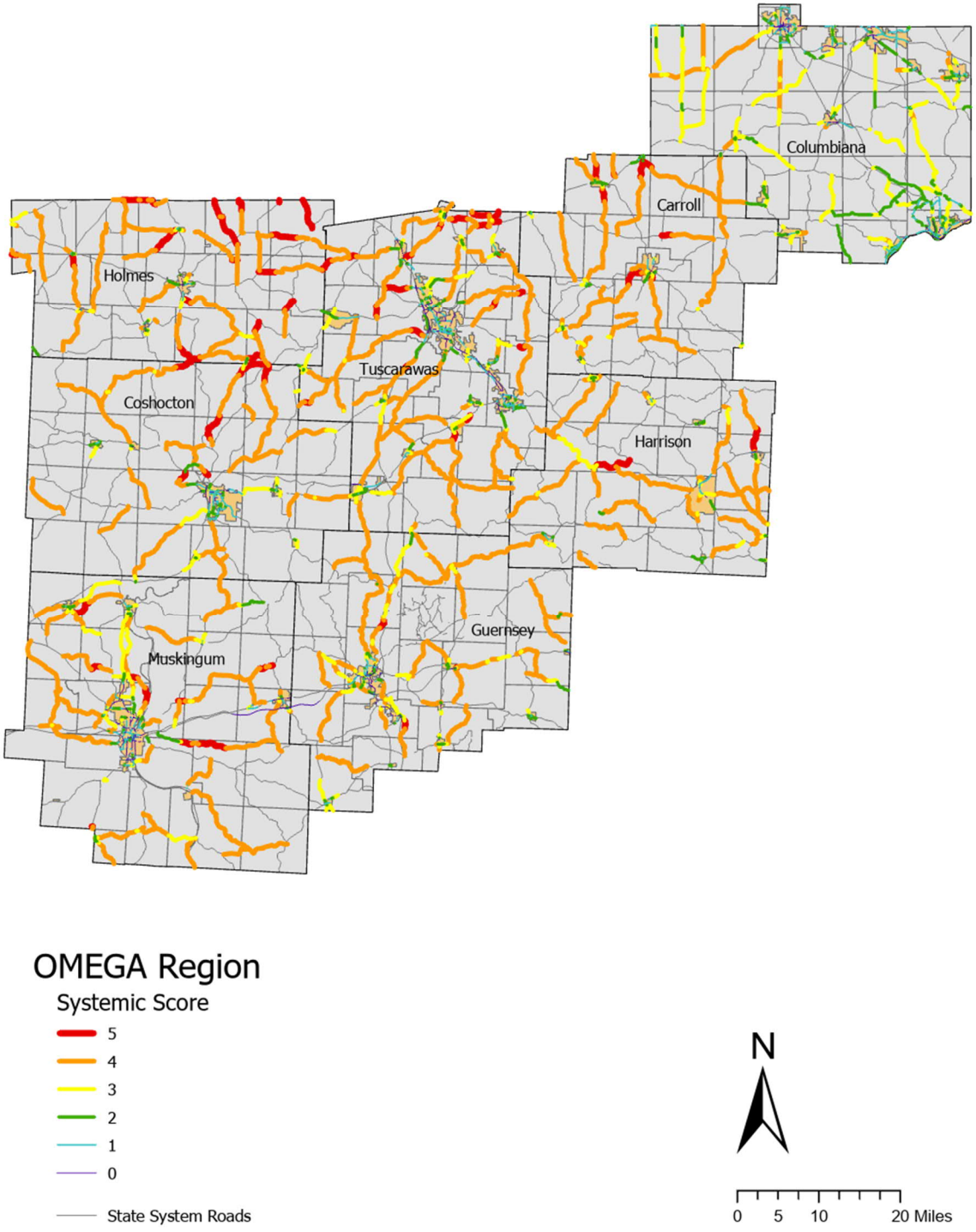


Figure 53 OMEGA region systemic analysis scores for collector roads and above.

IMPLEMENTATION & ACTION PLAN

Creating a Safer System

SECTION CONTENT:

- **Roadway Departure**
- **Intersections**
- **Speed**
- **Unrestrained Occupants**
- **Non-Motorized Users**

7 IMPLEMENTATION & ACTION PLAN – CREATING A SAFER SYSTEM

The strategies and actions identified in this section are suggested based on the frequency and severity of crashes in relation to the five chosen emphasis areas: roadway departure, intersections, speed, unrestrained occupants, and active transportation. The projects eligible for implementation were recommended with input from the Project Team, OMEGA representatives, and key stakeholders. The Action Plan recognizes the most effective approaches to corridors, road segments, and intersections to address critical safety concerns to make progress toward the objective of lower fatal and severe crashes.

ROADWAY DEPARTURE	Implementation of safety projects along high crash and at risk roadway corridors and specific segments will help guide drivers, allow for more recovery, and reduce the severity of crashes when vehicles depart the roadway.
INTERSECTIONS	Implementation of these strategies and actions will ensure safety projects are implemented to lower fatalities and serious injuries at intersections.
SPEED	Implementation of these strategies and actions will ensure safety projects are implemented to lower the severity speed-related crashes resulting in fatalities and serious injuries and that the public and others are educated about speed safety.
UNRESTRAINED OCCUPANTS	Implementation of these strategies and actions will ensure the public and stakeholders are educated about seat belt use, employers are promoting safety in the workplace, and education and enforcement campaigns are effectively utilized.
NON-MOTORIZED USERS	Implementation of these strategies and actions will ensure the public and stakeholders are educated about sharing the road with bicyclists, pedestrians, Amish buggies, and other non-motorists; safety projects along corridors, specific road segments, and at intersections will minimize the chances of crashes resulting in fatalities or serious injuries.

ROADWAY DEPARTURE

STRATEGIES AND ACTIONS

Strategy 1: Implement systemic delineation improvements including raised pavement markers, LED curve warning signs, chevron signs within curves, and/or upgraded pavement markings.

Leaders	Description	Performance Measure
Carroll County Engineer, Harrison County Engineer, Muskingum County Engineer, Tuscarawas County Engineer	Determine which low cost delineation improvements (including wider edge lines, raised pavement markers, LED curve warning signs, or supplemental chevrons) could be incorporated into annual resurfacing as high risk or high crash segments are repaved.	Number of systemic improvements adopted.
Carroll County	Upgrade signing and marking at crash hotspots.	Number of locations addresses.
Guernsey County Engineer	Continue to evaluate existing supplemental delineation and install upgrades with annual resurfacing projects.	Number of enhanced delineation projects installed.
Columbiana County Engineering Department	Install wider edgeline along corridors with documented roadway departure crash problems/or along with resurfacing efforts.	Annual projects with enhanced edgeline installed.
Coshocton County Engineer	Continue to install raised pavement markers along high crash corridors.	Annual projects with raised pavement markers installed.

Strategy 2: Widen clear zone.

Leaders	Description	Performance Measure
Carroll County Engineer, Coshocton County Engineer, Guernsey County Engineer,	Widen clear zone through vegetation control as a part of annual maintenance (as a part of resurfacing projects or through general maintenance).	Miles of clear zone widened.

Strategy 3: Install rumble strips (centerline or edgeline)

Leaders	Description	Performance Measure
Coshocton County Engineer, Muskingum County Engineer	Install centerline rumble strips on main county roads with resurfacing program.	Miles of rumble strip installed with resurfacing.
Columbiana County Engineer	Identify locations for future edgeline rumble strip installation as a part of resurfacing program. Rumble strips to be considered where context is appropriate and where wider edge lines have not reduced instances of lane departure crashes. (excludes centerline rumble strips)	Number of projects identified for edgeline rumble strip improvement.

Strategy 4: Install Safety Edge.

Leaders	Description	Performance Measure
Harrison County Engineer	Continue to install Safety Edge with all county resurfacing projects.	Miles of Safety Edge installed

Strategy 5: Utilize ODOT funding resources.

Leaders	Description	Performance Measure
Harrison County Engineer/OMEGA/Greene Township	Contact Greene Township to gauge interest and assist with a Township Sign Grant application through ODOT.	N/A
Tuscarawas County Engineer/OMEGA	Work with Tuscarawas County townships on county sign grant applications.	N/A
ODOT Central Office, ODOT Districts 5 and 11, OMEGA	Hold townhall with ODOT and regional engineering leadership to discuss barriers to utilizing funding and brainstorm alternatives to improve safety funding utilization by smaller local agencies.	One townhall style meeting
ODOT District 5, OMEGA, Coshocton County Engineer, Guernsey County Engineer, Muskingum County Engineer	Identify corridors for vegetation control as a countermeasure for improving roadside clear zone and work with OMEGA to submit a joint systemic safety application through District 5 in FY 2022.	List of prioritized locations, systemic funding application
ODOT District 11, OMEGA, Carroll County Engineer, Columbiana County Engineer, Harrison County Engineer, Holmes County Engineer, Tuscarawas County Engineer	Identify corridors for vegetation control as a countermeasure for improving roadside clear zone and work with OMEGA to submit a joint systemic safety application through District 11 in FY 2022.	List of prioritized locations, systemic funding application

Strategy 6: Widen Travel Way

Leaders	Description	Performance Measure
Muskingum County, Tuscarawas County Engineer	Identify and prioritize locations for future roadway widening.	List of locations

INTERSECTION

STRATEGIES AND ACTIONS

Strategy 1: Install transverse rumble strips to alert drivers of approaching intersection.

Leaders	Description	Performance Measure
Carroll County Engineer, Columbiana County Engineer	Install transverse rumble strips at intersections with a high crash number or severity.	Number of transverse rumble strips installed

Strategy 2: Install enhanced LED advanced warning signs

Leaders	Description	Performance Measure
Columbiana County Engineer, Guernsey County Engineer, Harrison County Engineer, Tuscarawas County Engineer	Evaluate necessity for enhanced stops signs at high crash intersection.	Number of LED warning signs installed

Strategy 3: Install enhanced stop signs

Leaders	Description	Performance Measure
City of Coshocton, Muskingum County Engineer, City of Zanesville, Tuscarawas County Engineer	Install enhanced stop signs (LED, double signs, or adding reflective strips) at minor stop controlled intersections.	Number of signals updates

Strategy 4: Address outdated traffic signals

Leaders	Description	Performance Measure
City of Cambridge	Evaluate and remove unwarranted traffic signals.	Number of signals reviewed
City of Coshocton, City of Zanesville	Upgrade outdated signal equipment and retime signal corridors.	Number of signals updates

Strategy 5: Widen clear zone to improve intersection sight distance

Leaders	Description	Performance Measure
Guernsey County Engineer, Tuscarawas County Engineer	Provide clear zones to remove obstructions at all intersection improvement projects.	Number of clear zone projects

Strategy 6: Improve stop-controlled intersection geometry.

Leaders	Description	Performance Measure
Harrison County Engineer	Develop proactive strategy to eliminate “triangle intersection” either through repaving projects or grant funded projects.	N/A

SPEED

STRATEGIES AND ACTIONS

Strategy 1: Educate public on anti-speeding awareness.

Leaders	Description	Performance Measure
All OMEGA TAC members, OMEGA	Develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials.	OMEGA Regional Safety Partner educational material distribution list
OMEGA	Join NHTSA's national campaign marketing group at trafficsafetymarketing.org. Materials for national campaigns will be delivered in advance of national traffic safety campaigns.	N/A
OMEGA	Distribute speeding material as made available from trafficsafetymarketing.org	Number of traffic safety messages distributed
Harrison County Engineer, Guernsey County Engineer	Contact Ohio State Highway Patrol Post about availability of safety banners/signs	N/A
Harrison County Engineer, Guernsey County Engineer	Determine locations suitable for signage.	Number of signs or billboards installed.
Harrison County Engineer, Guernsey County Engineer	Install signs/banners as made available from ODPS (via Ohio State Highway Patrol, County Sheriff's Office, local law enforcement or Safe Communities).	Number of signs or billboards installed.
Tuscarawas County Safe Communities	Continue working through schools to educate younger drivers on speeding safety issues	N/A
Tuscarawas County Safe Communities, Tuscarawas County Engineer, OMEGA	Identify partnership with local business for use of variable message boards for national traffic safety campaign messaging.	N/A

Strategy 2: Implement dynamic speed feedback signs

Leaders	Description	Performance Measure
Guernsey County Engineer, City of Zanesville	Obtain and deploy one speed warning feedback sign to alert drivers of their operating speed	Installation of speed warning feedback sign
City of Coshocton	Continue speed feedback sign program.	Number sign deployments.

Strategy 3: Engage Law Enforcement

Leaders	Description	Performance Measure
City of Coshocton, City of Zanesville	Share County sub plans/OMEGA RSP with local law enforcement	Number of agencies contacted

UNRESTRAINED OCCUPANTS

STRATEGIES AND ACTIONS

Strategy 1: Educate public on proper restraint use.

Leaders	Description	Performance Measure
All OMEGA TAC members, OMEGA	Develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials.	OMEGA Regional Safety Partner educational material distribution list
OMEGA	Join NHTSA's national campaign marketing group at trafficsafetymarketing.org. Materials for national campaigns will be delivered in advance of national traffic safety campaigns including extensive messaging for the national "Click-it or Ticket" campaign.	N/A
OMEGA	Distribute restraint use material as made available from trafficsafetymarketing.org	Number of traffic safety messages distributed
Harrison County Engineer, Guernsey County Engineer	Contact Ohio State Highway Patrol Post about availability of safety banners/signs	N/A
Harrison County Engineer, Guernsey County Engineer	Determine locations suitable for signage.	Number of signs or billboards installed.
Harrison County Engineer, Guernsey County Engineer	Install signs/banners as made available from ODPS (via Ohio State Highway Patrol, County Sheriff's Office, local law enforcement or Safe Communities).	Number of signs or billboards installed.
Tuscarawas County Safe Communities	Continue working through schools to educate younger drivers on seatbelt use.	N/A
Tuscarawas County Safe Communities, Tuscarawas County Engineer, OMEGA	Identify partnership with local business for use of variable message boards for national traffic safety campaign messaging.	N/A

Strategy 2: Engage Law Enforcement

Leaders	Description	Performance Measure
City of Coshocton, City of Zanesville, Guernsey County	Share County sub plans/OMEGA RSP with local law enforcement	Number of agencies contacted

NON-MOTORIZED USERS

STRATEGIES AND ACTIONS

Strategy 1: Construct sidewalks

Leaders	Description	Performance Measure
Carroll County Engineers	Work with village officials to evaluate and install sidewalks on SR-43 within in the village of Carrollton	Installation of Sidewalks

Strategy 2: Develop and implement non-motorized users plans

Leaders	Description	Performance Measure
OMEGA, Carrollton City Schools, Columbiana Schools, Harrison Hills Schools	Implement, update, and maintain safe routes to school (SRTS) plans	Status of existing plans
OMEGA, Zanesville City Schools	Develop new SRTS plan	Final SRTS plan
Village of Byesville, OMEGA, Guernsey County Engineer	Implement the new Mobility and Connectivity Plan currently being developed for the Village of Byesville	Strategies implemented from plan

Strategy 3: Install buggy lanes

Leaders	Description	Performance Measure
Muskingum County Engineer	Identify locations with high frequencies of buggies and where funding is available, widen county roads to accommodate buggy travel.	Feet of buggy lanes installed

Strategy 4: Improve warning signs at pedestrian crossings

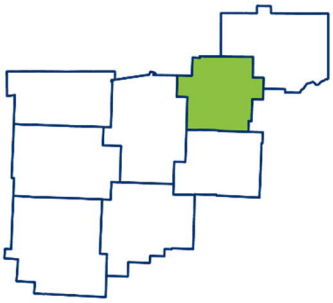
Leaders	Description	Performance Measure
Harrison County Engineer	Erect LED bicycle/pedestrian crossing warning signs at existing trail crossings on County roads.	Number of LED crossing warning signs installed

Strategy 5: Improve pedestrian signals

Leaders	Description	Performance Measure
City of Coshocton	Improve/provide pedestrian signals as a part of signal equipment upgrades in the City of Coshocton.	Feet of buggy lanes installed

APPENDIX A
COUNTY SUB-PLANS

CARROLL COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Carroll County is one of the eight member governments that will benefit from being included in this safety plan.

The United States Census Bureau estimates the 2019 population of Carroll County at 26,914 residents. The county spans 400 square miles with more than 919 miles of public roadways[1]. Most residents in the county rely on cars and other vehicles as their main mode of transportation. Ohio State Bicycle Routes 62 and 85 provide active transportation connections to neighboring counties and Atwood Lake is a popular bicyclist and pedestrian destination. However, active transportation is not otherwise prevalent in Carrol County.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 below shows that within Carroll County, there were a total of 36 fatalities and 205 serious injuries resulting from traffic collisions from 2010-2019. Fatalities range from 2 to 5 per year. Serious injuries peaked at 30 in 2017 while hitting a ten year low of 13 in 2015. Table 1 also shows that the frequency of fatalities and serious injuries that occur each year typically hovers around the ten-year annual average.

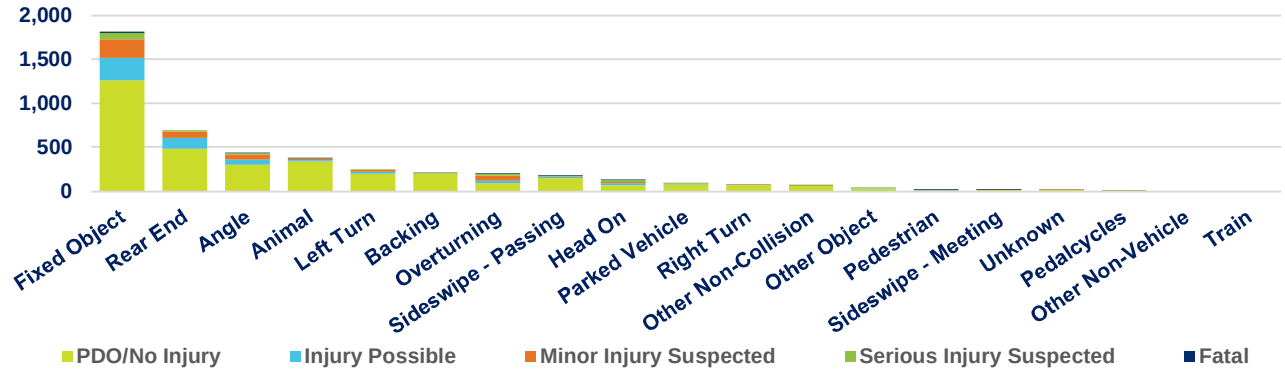
Table 1: Carroll County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	5	23
2011	3	29
2012	3	20
2013	3	21
2014	5	15
2015	3	13
2016	4	15
2017	5	30
2018	3	14
2019	2	25
10-YEAR TOTAL	36	205
ANNUAL AVERAGE	4	21

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash type for all crash severities in Carroll County is fixed object crashes (39%) followed by rear end crashes (15%), angle crashes (9%), and animal-related crashes (8%). The Carroll County crash type distribution follows the same general trends as the OMEGA regional crash breakdown.

Figure 1: Carroll County Crashes by Type and Severity, 2010-2019



[1] Ohio County Profiles 2020 Edition, Ohio Development Services Agency Office of Research, https://www.development.ohio.gov/files/research/C1011.pdf

COUNTY SAFETY STRATEGIES

Carroll County is currently working to improve safety on their roadways and to reduce crashes through a variety of efforts including:

- Improving the visibility of centerline pavement markings as part of their annual pavement marking replacement program.
- Improving pavement condition as part of their annual resurfacing program.
- Installing/ repairing guardrail through federally funded programs.
- Erecting double intersection warning signs (both sides of the roadway) on each approach.
- Vegetation management to improve sight distance and visibility.
- Lowering posted speed limits after the Shale Oil and Gas industry entered Carroll County.
- Improving curve warning signs through a CEAO grant.
- Community outreach to high-risk drivers and the general motoring public through Safe Communities and the Health Department.
- Participation in national education and enforcement campaigns.
- Manage Brown Local and Carrollton EVSD Safe Routes to School plans.

Talking Points

Representatives from Carroll County identified several areas of concern for the county including:

- The terrain/ natural environment limits the width of the clear zones and the ability to achieve ideal roadside conditions.
- Funding to widen clear zones and resurface roads is needed.
- Lack of centerline and edge line rumble strips.
- Narrow lane widths impact bicycle and pedestrian safety as well as the ability to install edge line rumble strips.
- A growing Amish community may cause issues with Amish buggies and active transport-tation conflicting with vehicles.
- Restraint education use and enforcement. Particularly hard to change the culture and mindset of motorists.
- Challenges surrounding an aging population.

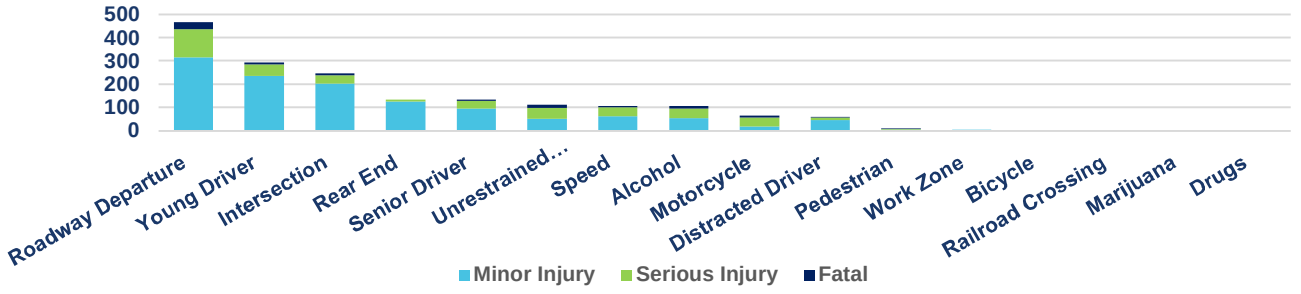
EMPHASIS AREAS

Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crash would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). The Strategic Highway Safety Plan developed by ODOT identifies ten emphasis areas to improve safety across the state. The OMEGA RSP evaluated ten years of crash data (2010-2019) to determine which emphasis areas from the SHSP best captured the traffic safety challenges within the region. Five emphasis areas were chosen to represent the OMEGA region including:

- Roadway departures
- Intersections
- Speed
- Unrestrained occupants
- Non-motorized user (bicycle/pedestrian/buggies/other non-motorists)

These emphasis areas help to define the regional safety challenges and focus the RSP towards the most critical crash trends in Carroll County.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Carroll County, 2010-2019

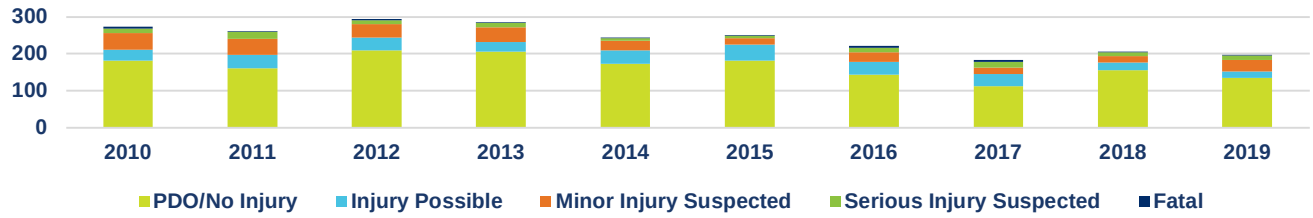


Carroll County Emphasis Areas

Roadway Departure

Roadway departure crashes accounted for 51% of all crashes that occurred on all roads in the county and 54% of all crashes that occurred on roads off the state system in Carroll County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis areas including alcohol-related crashes (36% of fatal roadway departure crashes), unrestrained drivers (36%), younger drivers involved (29%), and speeding (21%). These crashes typically resulted in collisions with fixed objects, but also include collisions with oncoming vehicles. Figure 3 shows slight fluctuations overs the years. The number of total crashes peaked in 2012 and has shown a consistent downward trend from 2014 through 2019.

Figure 3: Roadway Departure Total Annual Crashes by Severity in Carroll County, 2010-2019



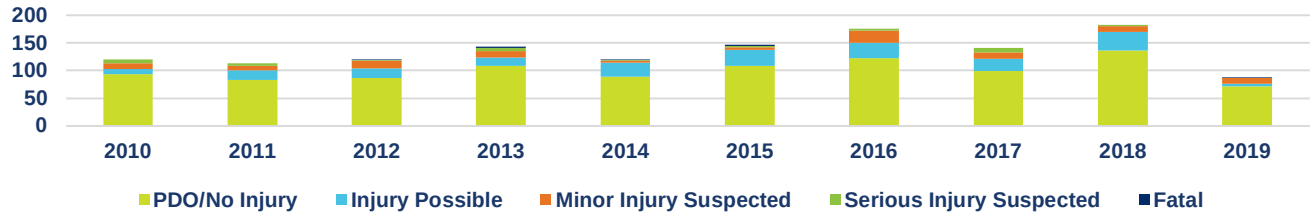
Carroll County Roadway Departure Action Steps:

- As part of the county's annual resurfacing program each segment of road being resurfaced will be evaluated to determine whether to include raised pavement markings, LED curve warning signs, chevron signs within curves, and/or upgraded pavement markings as part of the resurfacing project.
- The county will continue their ongoing efforts to widen the clear zone through vegetation maintenance.
- Upgrade signing and marking at crash hot-spots (beyond curve signing MUTCD requirements).
- Implement geometric improvements at crash hotspots after signing and marking updates are implemented.

Intersections

Intersection-related crashes accounted for 29% of all crashes that occurred on all roads in the county and 33% of all crashes that occurred on roads off the state system in Carroll County. In terms of overlapping emphasis area crashes for intersections, crashes involving older drivers (43% of fatal intersection crashes) and unrestrained occupants (43%) were the two most common. From 2010-2019, there was an increasing trend in total intersection-related crashes, with the highest two years being 2016 and 2018, as shown in Figure 4. There was a 50 percent drop from 2018 to 2019. Within Carroll County, 30% of fatal intersection-related crashes were angle crash types followed by fixed object crashes at 25%.

Figure 4: Intersection-Related Total Annual Crashes by Severity in Carroll County, 2010-2019



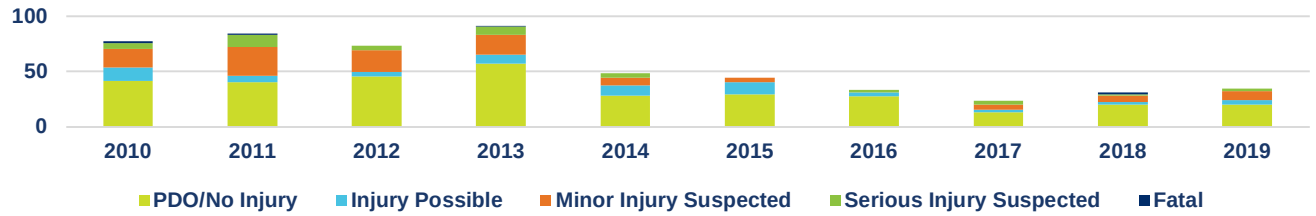
Carroll County Intersections Action Steps:

- Intersection improvement projects within the County will be evaluated to determine if installing transverse rumble strips on each approach is an appropriate safety countermeasure that could be included in the proposed improvements.

Speed

Speed-related crashes accounted for 10% of the crashes that occurred on all roads in the county and 10% of the crashes that occurred on roads off the state system countywide. As shown in Figure 5, after a high of 91 crashes in 2013, speed-related crashes saw a downward trend for four years but began increasing again in 2018. The most significant contributing factor within speed-related crashes were roadway departure crashes (100% of fatal speeding crashes) followed by alcohol-related crashes (50%). Unrestrained occupants, distracted drivers, and crashes involving younger drivers, were contributing factors in 33% of the crashes. Approximately 42% of fatal speed-related crashes occurred off of the state system. Of these crashes 24% occurred on county roads, 7% occurred on township roads and 11% occurred on city/ village roads.

Figure 5: Speed-Related Total Annual Crashes by Severity in Carroll County, 2010-2019



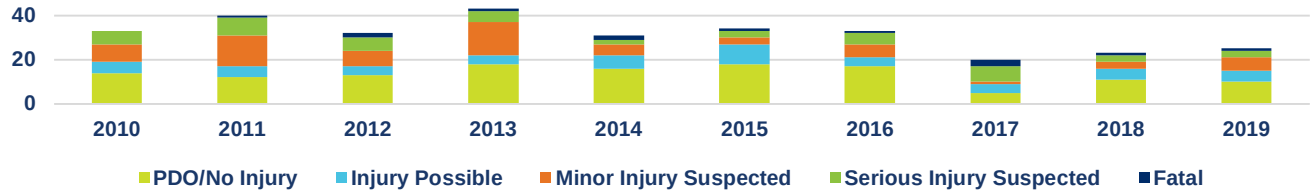
Carroll County Speeding Action Steps:

- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.

Unrestrained Occupants

Crashes that involved unrestrained occupants were the second highest contributor to fatalities, following roadway departure crashes, from 2010-2019. As shown in Figure 6, unrestrained occupants have been involved in at least one fatal crash each year since 2011. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occurred throughout the day and night with no discernable tie to traffic trends.

Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Carroll County, 2010-2019



Carroll County Unrestrained Occupants Action Steps:

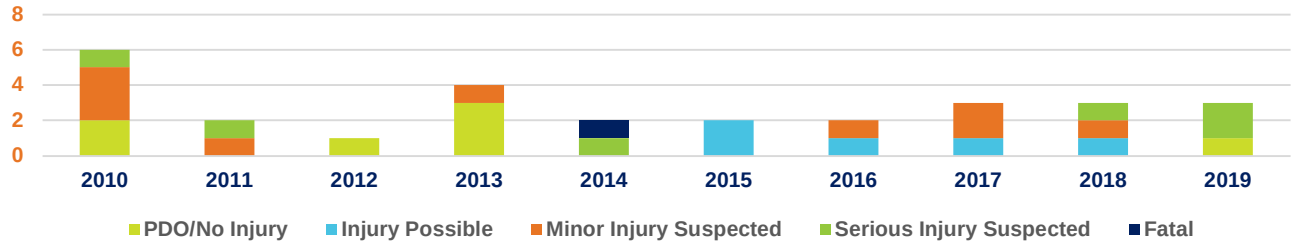
- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- The County, Cities, Villages and other public agencies will maintain and expand their ongoing seatbelt usage rules in County, City and Village vehicles.

Non-Motorized Users (Bicycle/Pedestrian/ Buggies/ Other Non-Motorists)

Non-motorized users was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active transportation, as shown in Figure 7. Throughout both the region and Carroll County, bicycle, pedestrian, and buggy crashes pose a wide array of challenges. From developing bike and pedestrian facilities in urban/suburban areas like

Carrollton or Malvern, this emphasis area includes many scenarios that can be classified as rare but high risk. Unlike other emphasis areas, active transportation crashes are more likely to result in an injury than a property damage only crash.

Figure 7: Non-Motorized Users Total Annual Crashes by Severity in Carroll County, 2010-2019



Carroll County Non-Motorized Users Action Steps:

- OMEGA is working with one of the former Carrol County Commissioners to construct sidewalks on SR 43 within the Village of Carrolton.
- OMEGA will partner with the Carrolton City School District to implement, maintain, and update the recently completed Carrolton City Schools Safe Routes to School plan

Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table below use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Carroll County with the highest EPDO crash frequency are as follows:

CR-18 from MP 4.43 to MP 4.99:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	2	37.93	75.86
Minor Injury (B)	0	6.55	0.00
Possible Injury (C)	3	4.44	13.32
Property Damage Only (O)	3	1	3
Total	8	-	92.18

To calculate the EPDO crash rate the following formula is used:

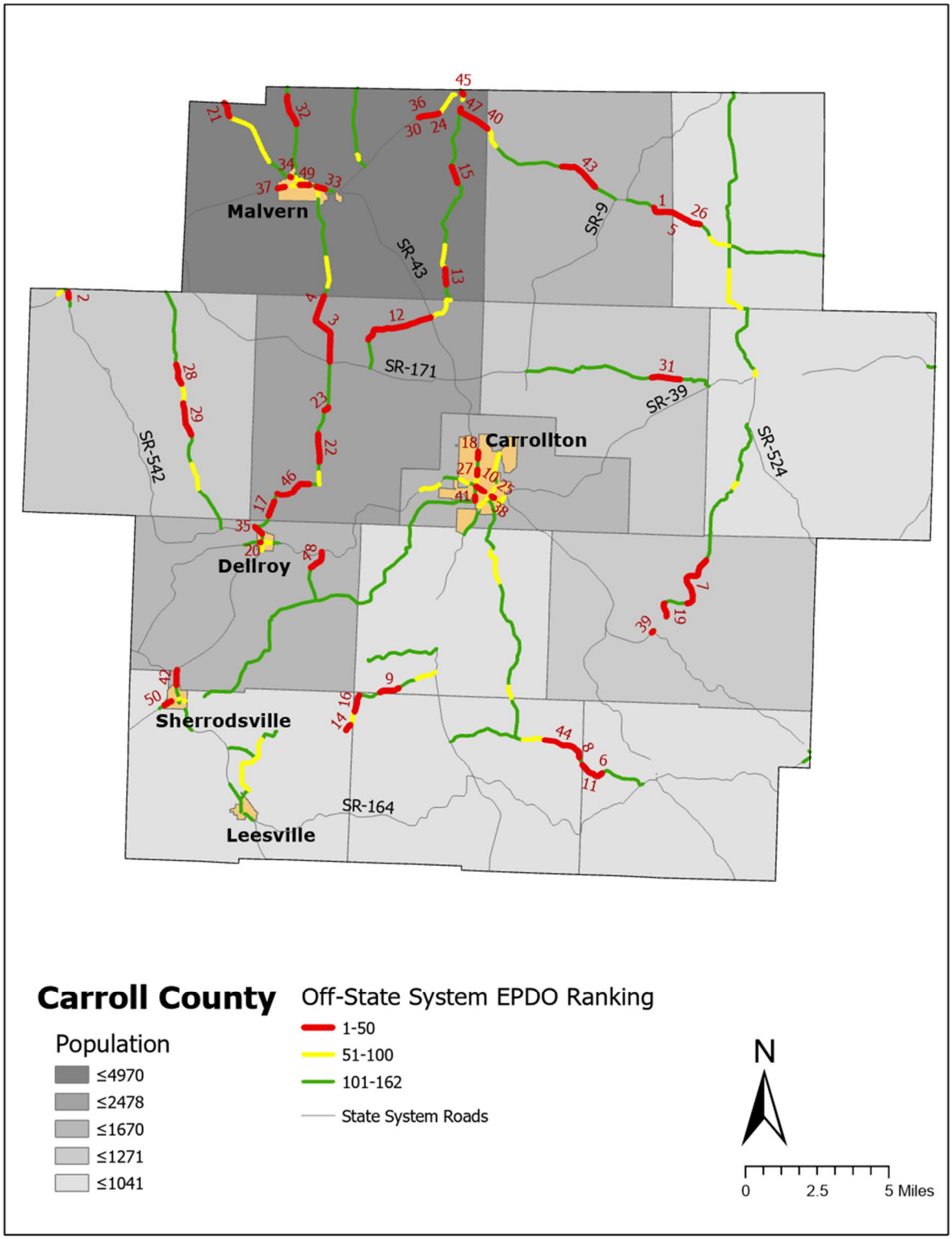
$$EPDO\ Crash\ Rate = \frac{C\ x\ 1{,}000{,}000}{N\ x\ V\ x\ 365\ x\ L} = \frac{92.18\ x\ 1{,}000{,}000}{5\ x\ 556\ x\ 365\ x\ 0.56} = 162.22$$

Where:

- *C* = EPDO Total Value from the table above (92.18)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (556 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.56)

HIGH CRASH SEGMENTS

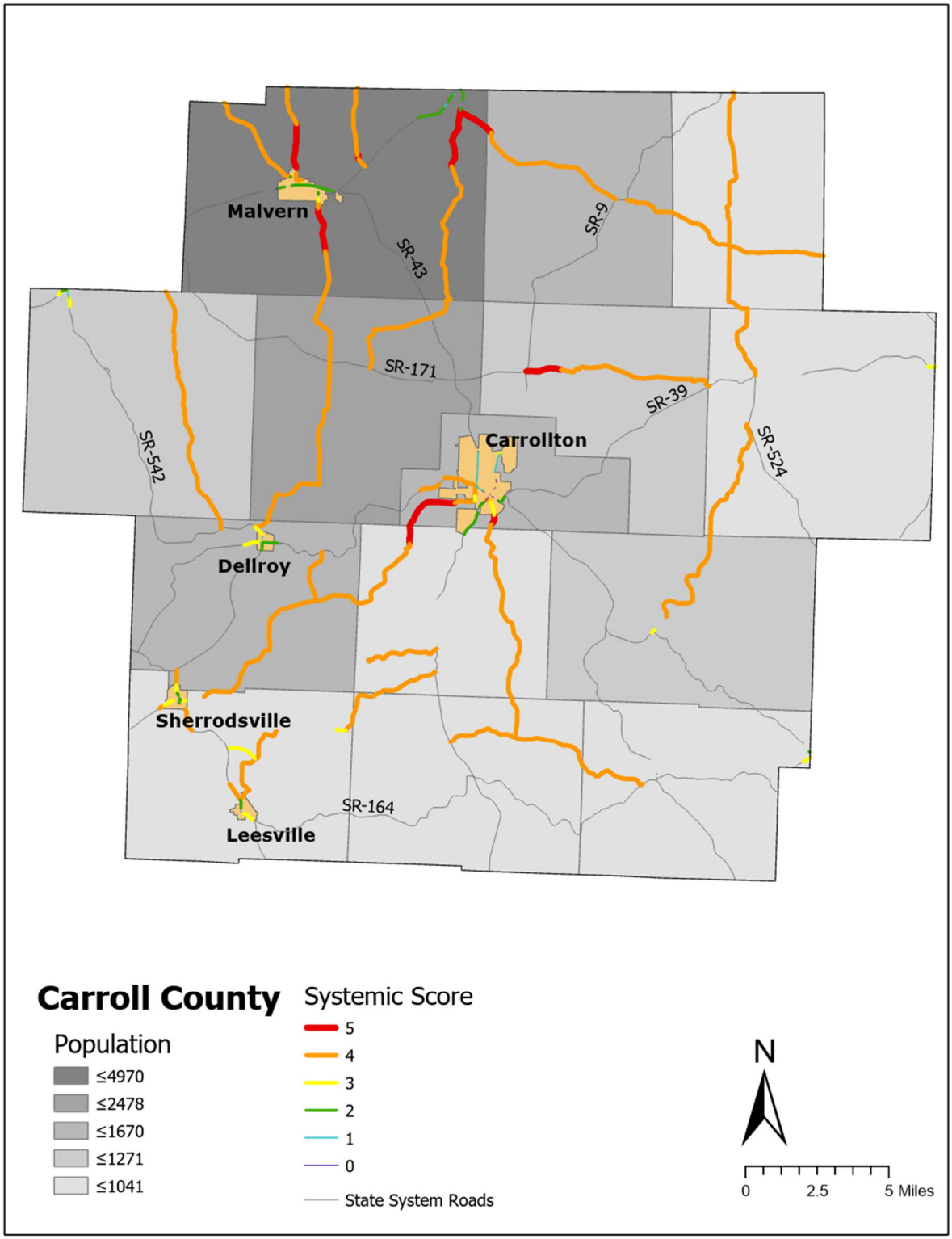
The following segments represent the top crash rate segments by crash severity in Carroll County. The road segment with the highest frequency and severity of crashes in Carroll County is Aurora Road (CR-18) between the mile points 4.43 and 4.99. Safety improvements and infrastructure projects at these locations will address the areas in the county with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	CR	18	4.43	4.99	AURORA RD	County	162.2
2	SR	542	15.60	15.81	MAIN ST	Municipal	94.3
3	CR	20	5.75	7.39	AVALON RD	County	93.3
4	CR	20	7.39	7.72	AVALON RD	County	73.9
5	CR	18	3.84	4.43	AURORA RD	County	65.9
6	CR	17	4.43	4.73	ASTER RD	County	58.3
7	CR	12	5.64	7.25	APOLLO RD	County	52.5
8	CR	17	3.63	3.85	ASTER RD	County	51.7
9	CR	19	5.45	5.97	AUTUMN RD	County	46.7
10	SR	39	14.25	14.45	MAIN ST	Municipal	46.2
11	CR	17	4.06	4.43	ASTER RD	County	45.5
12	CR	15	4.96	6.85	ARROW RD	County	43.6
13	CR	15	8.08	8.51	ARROW RD	County	39.7
14	CR	19	3.83	4.02	AUTUMN RD	County	39.2
15	CR	15	11.04	11.51	ARROW RD	County	39.2
16	CR	19	4.41	4.87	AUTUMN RD	County	38.4
17	CR	20	0.53	0.94	AVALON RD	County	37.9
18	SR	43	13.85	14.04	CANTON RD	Municipal	37.6
19	CR	12	4.64	5.01	APOLLO RD	County	35.3
20	SR	542	5.13	5.30	MAIN ST	Municipal	31.5
21	CR	68	0.00	0.41	CITRUS RD	County	31.4
22	CR	20	3.03	3.76	AVALON RD	County	27.7
23	CR	20	4.41	4.56	AVALON RD	County	27.2
24	SR	183	8.68	8.85	ALLIANCE RD	Municipal	22.3
25	SR	39	14.45	14.67	MAIN ST	Municipal	22.1
26	CR	18	3.61	3.84	AURORA RD	County	19.0
27	SR	43	13.41	13.56	CANTON RD	Municipal	18.8
28	CR	26	2.00	2.56	BARK RD	County	18.1
29	CR	26	3.08	3.95	BARK RD	County	17.7
30	SR	183	8.30	8.48	ALLIANCE RD	Municipal	17.3
31	CR	71	3.49	4.25	COBBLER RD	County	17.1
32	CR	20	12.58	13.37	AVALON RD	County	16.6
33	SR	43	22.76	23.00	CANTON RD	Municipal	16.5
34	CR	34	3.55	3.71	BLUEBIRD RD	Municipal	16.2
35	SR	542	5.42	5.69	MAGNOLIA RD	Municipal	15.7
36	SR	183	8.48	8.68	ALLIANCE RD	Municipal	15.6
37	SR	43	23.85	24.05	CANTON RD	Municipal	15.2
38	SR	9	13.98	14.12	MAIN ST	Municipal	15.1
39	CR	12	4.04	4.14	APOLLO RD	County	14.0
40	CR	14	0.00	0.86	ARBOR RD	County	13.7
41	CR	11	11.46	11.59	MOODY AVE	Municipal	13.0
42	SR	39	1.87	2.28	ROSWELL RD	Municipal	12.8
43	CR	18	6.69	7.80	AURORA RD	County	12.4
44	CR	17	2.72	3.63	ASTER RD	County	12.3
45	CR	15	13.52	13.68	MURRAY ST	Municipal	11.9
46	CR	20	1.17	2.16	AVALON RD	County	11.8
47	CR	15	13.10	13.39	MURRAY ST	Municipal	11.7
48	CR	51	0.00	0.55	CACTUS RD	County	11.4
49	SR	43	23.20	23.46	CANTON RD	Municipal	11.3
50	SR	39	1.17	1.39	CHURCH ST	Municipal	11.2

HIGH RISK SEGMENTS

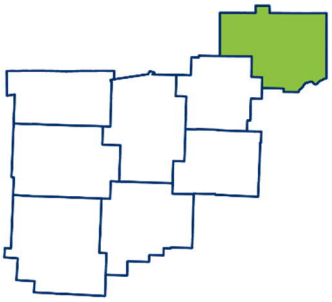
The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Safety improvements and infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.



Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	8	0.00	6.22	ALAMO RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	8	6.22	6.49	ALAMO RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	8	6.87	6.98	3RD ST	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	11	0.69	8.90	ANTIGUA RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	11	8.90	10.91	ANTIGUA RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	11	10.91	11.46	ANTIGUA RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	11	11.59	11.87	MOODY AVE	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	12	4.64	12.15	APOLLO RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	14	0.00	1.00	ARBOR RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	14	1.00	2.19	ARBOR RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	14	10.94	12.41	ARBOR RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	15	4.19	11.51	ARROW RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	15	11.51	13.10	ARROW RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	17	0.00	5.98	ASTER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	18	0.00	5.75	AURORA RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	18	6.06	8.96	AURORA RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	3.83	7.05	AUTUMN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	20	0.00	8.93	AVALON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	20	8.93	10.14	AVALON RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	20	10.14	10.32	AVALON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	20	10.95	11.16	WOOD ST	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	20	11.16	11.40	AVALON RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	20	11.40	12.58	AVALON RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	20	12.58	13.61	AVALON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	22	3.52	7.93	AZALEA RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	25	0.00	6.13	BANE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	26	0.00	1.12	BARK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	26	1.13	6.73	BARK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	32	0.00	0.25	BLADE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	32	0.25	0.39	BLADE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	32	0.39	2.20	BLADE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	34	2.85	3.55	BLUEBIRD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	51	0.00	1.45	CACTUS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	54	4.88	5.22	CANYON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	68	0.00	2.09	CITRUS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	71	0.00	0.94	COBBLER RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	71	0.94	5.18	COBBLER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
SR	39	1.01	1.17	CHURCH ST	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	39	1.87	2.28	ROSWELL RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	39	12.59	13.13	ROSWELL RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	39	13.35	14.01	ROSWELL RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	39	14.01	14.25	MAIN ST	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	212	2.60	3.22	CUMBERLAND RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	212	5.37	5.88	CUMBERLAND RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	8	0.00	6.22	ALAMO RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	8	6.22	6.49	ALAMO RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	8	6.87	6.98	3RD ST	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	11	0.69	8.90	ANTIGUA RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	11	8.90	10.91	ANTIGUA RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph

COLUMBIANA COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Columbiana County is one of the eight member governments that will benefit from being included in this safety plan.

The United States Census Bureau estimates the 2019 population of Columbiana County at 101,883 residents. The County spans an area of 534 square miles with more than 1,634 miles of public roadways[1]. Although bicycle, pedestrian, and other active transportation amenities are available, including access to Ohio State Bicycle Route 95, most residents in this county rely on cars and other vehicles as their main mode of transportation.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 below shows that within Columbiana County, there were a total of 103 fatalities and 870 serious injuries resulting from traffic collisions from 2010-2019. There was a significant rise in fatalities in 2014 (20) and the ten year low occurred in 2017 (5). Serious injuries peaked at 124 in 2011 and hit a ten year low of 54 in 2019. Table 1 also shows that the frequency of fatalities and serious injuries that occur each year varies year to year and indicates no obvious trend.

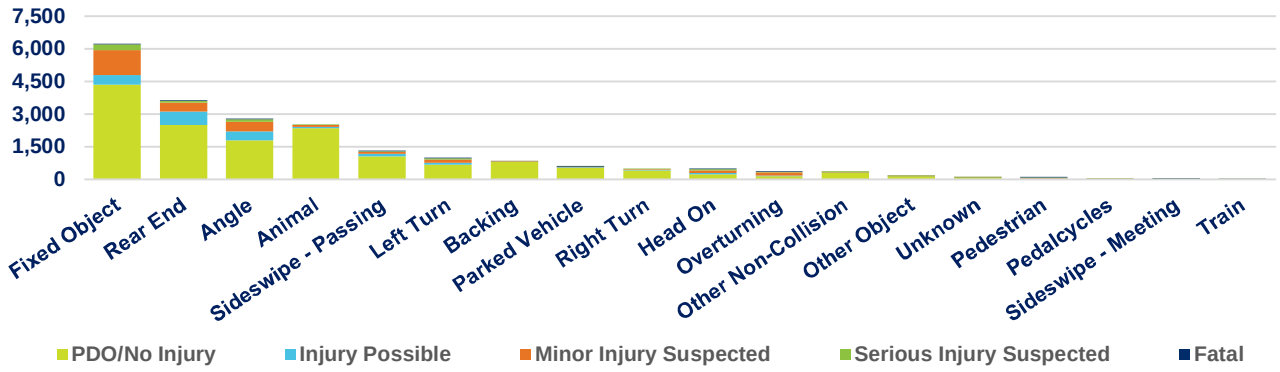
Table 1: Columbiana County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	6	109
2011	14	124
2012	14	109
2013	12	94
2014	20	90
2015	8	84
2016	10	80
2017	5	55
2018	7	71
2019	7	54
10-YEAR TOTAL	103	870
ANNUAL AVERAGE	10	87

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash type for all crash severities in Columbiana County is fixed object crashes (30%) followed by rear end crashes (17%), angle crashes (13%), and animal-related crashes (12%).

Figure 1: Columbiana County Crashes by Type and Severity, 2010-2019



[1] Ohio County Profiles 2020 Edition, Ohio Development Services Agency Office of Research, https://www.development.ohio.gov/files/research/C1016.pdf

COUNTY SAFETY STRATEGIES

Columbiana County is currently working to improving safety on their roadways and to reduce crashes through a variety of efforts including:

- Improving the visibility of signage and pavement markings as part of their annual resurfacing program.
- Installing centerline raised pavement markers and guardrails as part of their annual resurfacing program.
- Installing rumble strips on intersection approaches.
- Installing advance warning signs and LED stop signs at intersections.
- Vegetation control to improve sight distance and visibility.
- Previously there had been an aggressive community outreach campaign to high-risk drivers and the general motoring public through Safe Communities, though the program recently lost funding ending the campaign.
- Participation in national education and enforcement campaigns.
- An aggressive public community action plan for transit routing.

Talking Points

Representatives from Columbiana County identified several areas of concern for the county including:

- The terrain/ natural environment limits the width of the clear zones and the ability to achieve ideal roadside conditions.
- The Safe Communities group disbanded when funding expired.
- Narrow lane widths impact bicycle and pedestrian safety as well as the ability to install edge line rumble strips.
- Seatbelt usage and enforcement is difficult because it is challenging to change the culture and mindset of local motorists.
- Challenges surrounding an aging population.

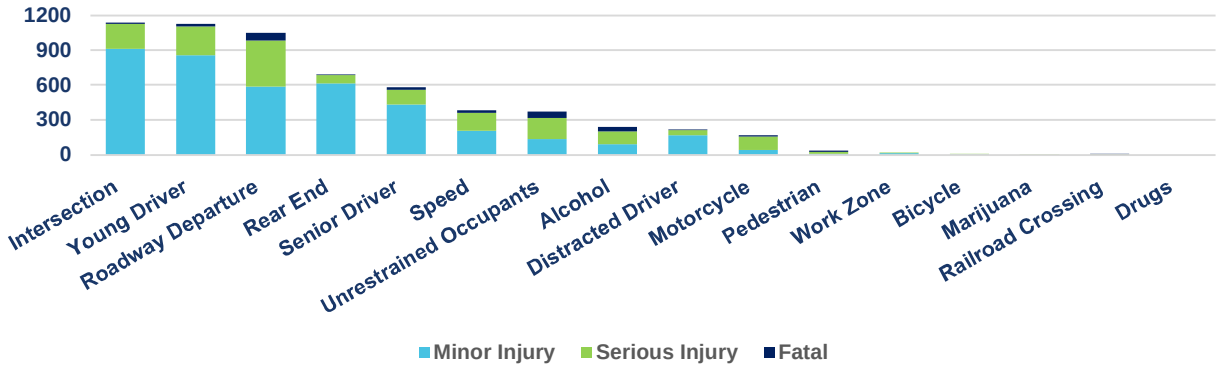
EMPHASIS AREAS

Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crash would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). The Strategic Highway Safety Plan developed by ODOT identifies ten emphasis areas to improve safety across the state. The OMEGA RSP evaluated ten years of crash data (2010-2019) to determine which emphasis areas from the SHSP best captured the traffic safety challenges within the region. Five emphasis areas were chosen to represent the OMEGA region including:

- Roadway departures
- Intersections
- Speed
- Unrestrained occupants
- Non-motorized users (bicycle/pedestrian/buggies/other non-motorists)

These emphasis areas help to define the regional safety challenges and focus the RSP towards the most critical crash trends.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Columbiana County, 2010-2019

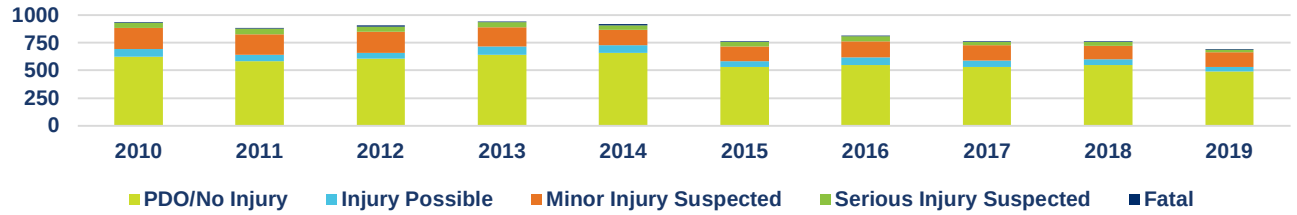


Columbiana County Emphasis Areas

Roadway Departure

Roadway departure crashes accounted for 39% of all crashes that occurred on all roads in the county and 40% of all crashes that occurred on roads that are off the state system in Columbiana County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis areas including unrestrained drivers (70% of fatal roadway departure crashes), alcohol-related crashes (45%), speed related (36%), and younger drivers involved (30%). These crashes typically resulted in collisions with fixed objects, but also included collisions with oncoming vehicles. Figure 3 shows slight fluctuations over the years, but the overall trend has remained constant since 2015.

Figure 3: Roadway Departure Total Annual Crashes by Severity in Columbiana County, 2010-2019



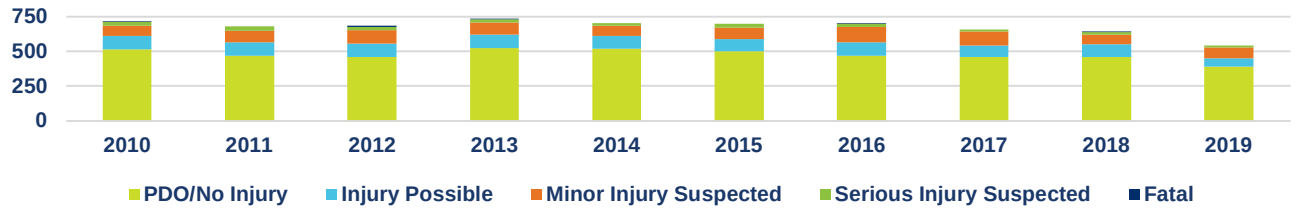
Columbiana County Roadway Departure Action Steps:

- Implement enhanced edge lines within the County's resurfacing program.
- Identify locations for future edgeline rumble strip installation as a part of resurfacing program. Rumble strips to be considered where context is appropriate and where wider edge lines have not reduced instances of lane departure crashes. (Note: centerline rumble strips will not be considered due to pavement degradation concerns.)

Intersections

Intersection-related crashes accounted for 31% of all crashes that occurred on all roads in the county and 37% of all crashes that occurred on roads that are off the state system in Columbiana County. Intersection-related crashes overlapped with several other emphasis area crashes including unrestrained occupants (58%), young drivers (50%), and older drivers (42%). As shown in Figure 4, from 2013-2019, there was a decreasing trend in total intersection-related crashes, with the largest annual decrease of 100 crashes between 2018 and 2019. Within Columbiana County, 48% of fatal intersection-related crashes were angle crash types followed by rear-end left turn and fixed object crashes at 10% each.

Figure 4: Intersection-Related Total Annual Crashes by Severity in Columbiana County, 2010-2019



Columbiana County Intersections Action Steps:

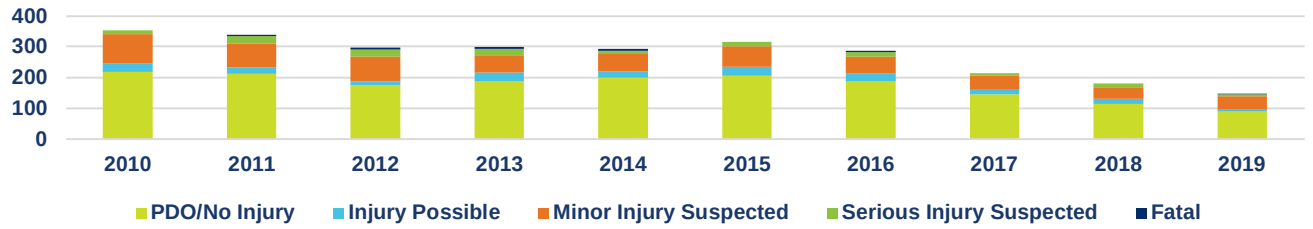
- Implement LED enhanced warning signs in advance of and LED stop signs as low cost countermeasures for crash hotspot intersections.
- Identify locations for future transverse rumble strip installations as audible warning for intersection approaches.

Speed

Speed-related crashes accounted for 12% of the crashes that occurred on all roads in the county and 10% of the crashes that occurred on roads that are off the state system countywide. After a high of 354 crashes in 2010, speeding-related crashes saw a slight downward trend until 2015, as shown in Figure 5.

After 2015, the downward trend reaches a low of 145 speed-related crashes in 2019. The most significant contributing factor within these crashes were roadway departure crashes (100% of fatal speeding crashes) followed by unrestrained occupants (76%) and alcohol-related crashes (44%). Approximately 39% of fatal speeding-related crashes occurred off of the state system of roads. Of these crashes, 15% occurred on county roads, 15% occurred on township roads and 9% occurred on city/village roads.

Figure 5: Speed-Related Total Annual Crashes by Severity in Columbiana County, 2010-2019



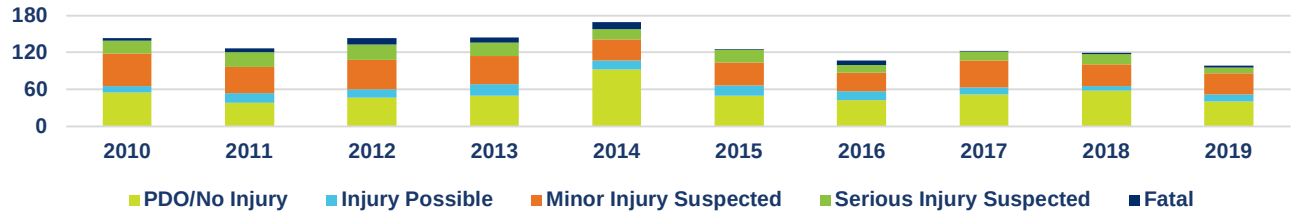
Columbiana County Speeding Action Steps:

- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.

Unrestrained Occupants

Crashes that involved unrestrained occupants were the second highest contributor to fatalities, following roadway departure crashes, from 2010-2019. As shown in Figure 6, unrestrained occupant crashes accounted for 54 fatalities in Columbiana County during this time. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occurred throughout the day and night with no discernable tie to traffic trends.

Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Columbiana County, 2010-2019



Columbiana County Unrestrained Occupants Action Steps:

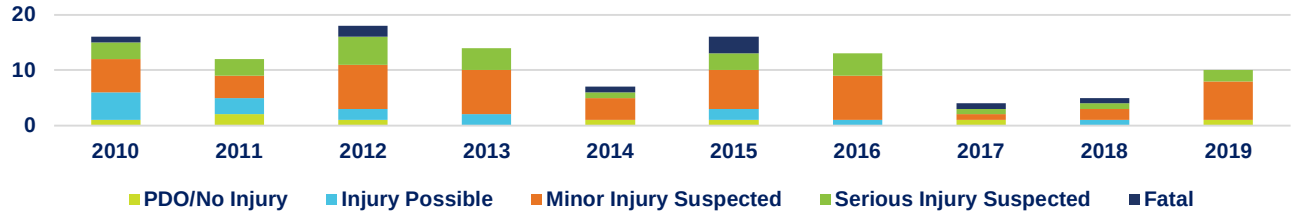
- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- The County, Cities, Villages and other public agencies will maintain and expand their ongoing seatbelt usage rules in County, City and Village vehicles

Non-Motorized Users (Bicycle/Pedestrian/ Buggies/ Other Non-Motorists)

Non-Motorized Users was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active transportation, as shown in Figure 7. Throughout both the region and Columbiana County, bicycle and pedestrian crashes represent a wide array of challenges. From developing bike and pedestrian facilities in suburban areas like Salem, Lisbon, or Calcutta to alerting motorists to potential bicyclists/ pedestrians on narrow rural/remote roadways, this emphasis area includes many scenarios that are rare but high risk. Unlike other

emphasis areas, active transportation crashes are more likely to result in an injury than a property damage only crash.

Figure 7: Non-Motorized Users Total Annual Crashes by Severity in Columbiana County, 2010-2019



Columbiana County Non-Motorized Users Action Steps:

- OMEGA will partner with the Columbiana County School District to implement, maintain, and update the recently completed Columbiana County Schools Safe Routes to School plan.

Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table below use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Columbiana County with the highest EPDO crash frequency are as follows:

CR-522 from MP 0.39 to MP 0.53:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	1	37.93	37.93
Minor Injury (B)	0	6.55	0.00
Possible Injury (C)	0	4.44	0.00
Property Damage Only (O)	4	1	4.00
Total	5	-	41.93

To calculate the EPDO crash rate the following formula is used:

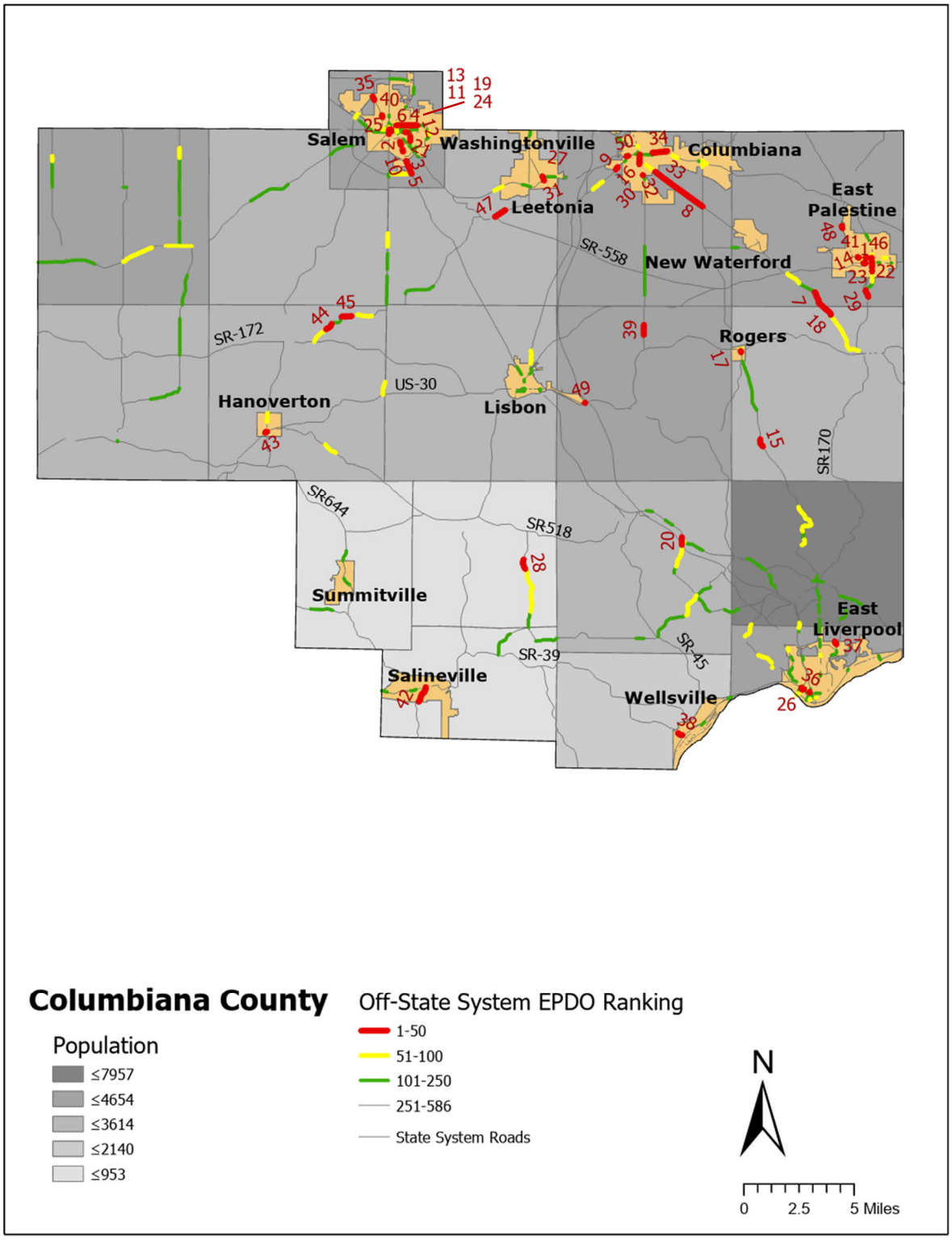
$$\boldsymbol{EPDO\ Crash\ Rate} = \frac{\boldsymbol{C\ x\ 1{,}000{,}000}}{\boldsymbol{N\ x\ V\ x\ 365\ x\ L}} = \frac{\boldsymbol{41.93\ x\ 1{,}000{,}000}}{\boldsymbol{5\ x\ 227\ x\ 365\ x\ 0.14}} = \boldsymbol{722.95}$$

Where:

- *C* = EPDO Total Value from the table above (41.93)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (227 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.14)

HIGH CRASH SEGMENTS

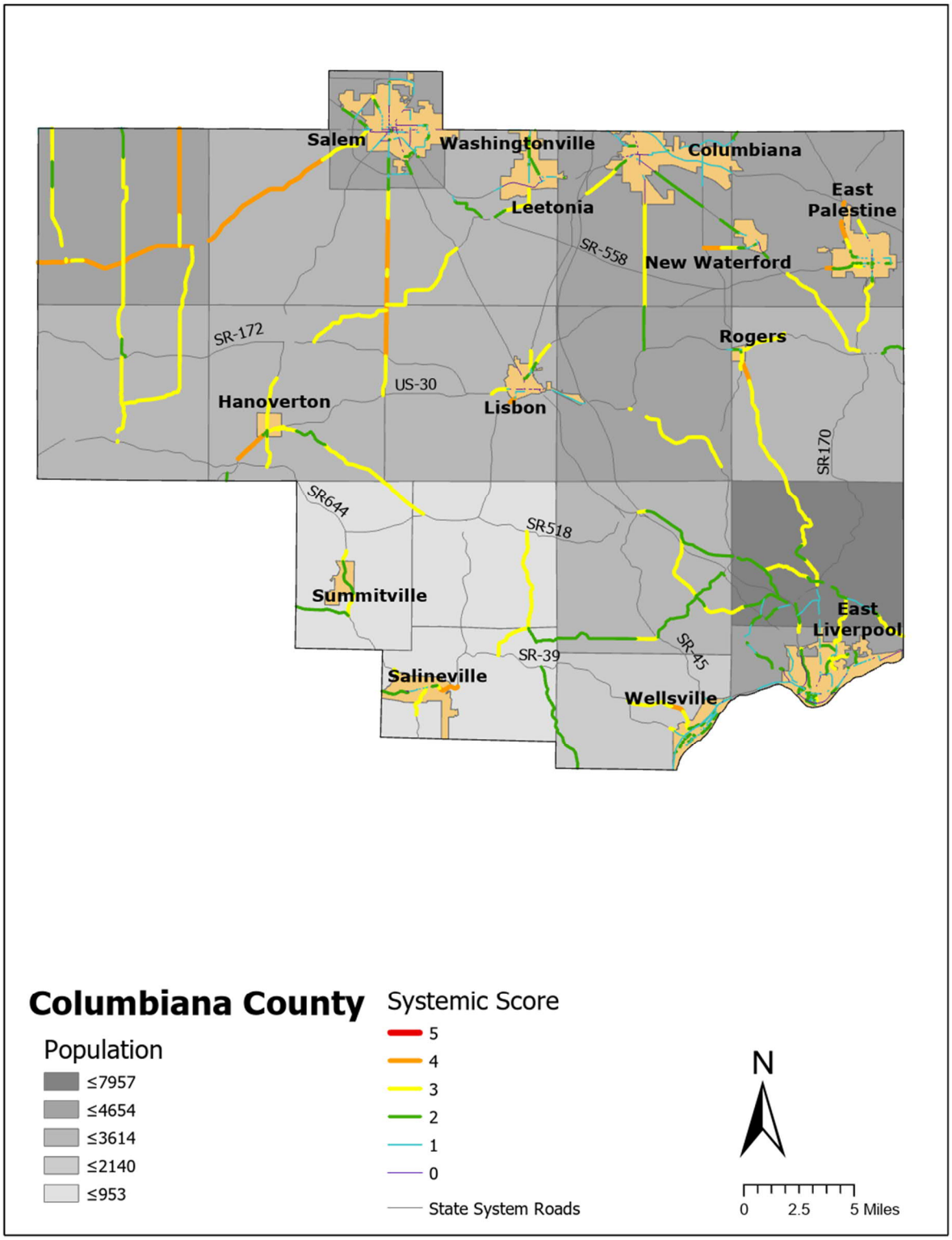
The following segments represent the top crash rate segments by crash severity in Columbiana County. The road segment with the highest frequency and severity of crashes in Columbiana County is Park Avenue (CR-522) between the mile points 0.39 and 0.53. Safety improvements and infrastructure projects at these locations will address the areas in the county with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	CR	522	0.39	0.53	PARK AVE	Municipal	722.9
2	CR	444	1.05	1.19	LINCOLN AVE	Municipal	714.8
3	CR	444	0.27	0.46	LINCOLN AVE	County	305.9
4	CR	503	0.81	0.98	3RD ST	Municipal	247.6
5	CR	444	0.00	0.27	LINCOLN AVE	County	216.3
6	CR	503	0.26	0.44	3RD ST	Municipal	211.9
7	CR	432	2.09	2.67	BYE RD	County	174.2
8	CR	422	0.00	0.98	COLUMBIANA-WATERFORD RD	County	167.1
9	CR	440	1.31	1.42	COL-LISBON RD	County	157.4
10	CR	444	0.46	0.83	LINCOLN AVE	County	148.3
11	CR	507	0.00	0.16	BROADWAY RD	Municipal	144.6
12	CR	444	0.83	1.05	LINCOLN AVE	Municipal	142.5
13	CR	503	0.44	0.81	3RD ST	Municipal	127.6
14	CR	521	0.18	0.32	MARTIN ST	Municipal	122.1
15	CR	428	10.08	10.38	SPRUCEVALE RD	County	101.5
16	CR	420	4.90	5.03	ELM ST	Municipal	101.5
17	SR	7	19.92	20.02	DEPOT ST	Municipal	94.4
18	CR	432	1.71	2.09	BYE RD	County	91.6
19	CR	500	1.29	1.69	PERSHING ST	Municipal	88.9
20	CR	424	0.00	0.23	Y & O RD	County	84.2
21	CR	509	0.18	0.34	UNION AVE	Municipal	83.4
22	SR	170	14.62	14.74	MARKET ST	Municipal	81.0
23	SR	170	14.74	14.96	MARKET ST	Municipal	80.4
24	SR	9	14.72	14.87	STATE ST	Municipal	76.9
25	SR	9	14.53	14.72	ELLSWORTH AVE	Municipal	75.8
26	CR	517	0.29	0.39	7TH ST	Municipal	74.1
27	CR	416	4.75	5.02	WALNUT ST	Municipal	67.2
28	CR	413	3.76	4.11	STEUBENVILLE PIKE RD	County	61.1
29	SR	170	13.62	13.87	MARKET ST	Municipal	60.9
30	CR	420	5.03	5.23	ELM ST	Municipal	59.4
31	SR	344	6.53	6.78	COLUMBIA ST	Municipal	58.3
32	CR	420	4.50	4.90	FAIRFIELD AVE	Municipal	57.1
33	CR	422	0.98	2.02	COLUMBIANA-WATERFORD RD	County	52.3
34	TR	882	0.58	1.09	HECK RD	Municipal	50.0
35	CR	409	1.07	1.20	JENNINGS AVE	County	49.9
36	SR	7	6.13	6.26	RAMP	Municipal	49.0
37	CR	435	1.61	1.74	PARKWAY AVE	County	48.3
38	SR	39	13.30	13.46	ATEN AVE	Municipal	48.1
39	TR	902	0.51	0.85	FAIRFIELD SCHOOL RD	Township	46.8
40	CR	409	0.43	0.59	JENNINGS AVE	Municipal	46.5
41	CR	521	0.47	0.68	MARTIN ST	Municipal	45.8
42	SR	164	1.36	1.93	MONROEVILLE-SALINEVILL RD	Municipal	44.3
43	US	30	8.78	8.96	CANAL ST	Municipal	43.5
44	CR	411	0.61	0.89	TEEGARDEN RD	County	42.4
45	CR	411	1.36	1.71	TEEGARDEN RD	County	41.0
46	CR	521	0.68	1.09	MARTIN ST	Municipal	41.0
47	CR	414	0.00	0.42	OLD 344 RD	County	40.8
48	CR	443	1.37	1.53	HUNSTON RD	County	40.7
49	SR	154	2.19	2.37	SR-154	Municipal	38.1
50	SR	164	24.45	24.60	PARK ST	Municipal	37.0

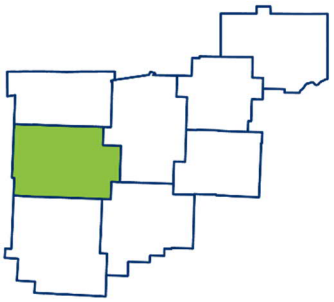
HIGH RISK SEGMENTS

The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Safety improvements and infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.



Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	400	0.00	1.07	GEORGETOWN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	400	1.07	1.18	GEORGETOWN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	400	1.57	5.59	GEORGETOWN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	400	5.59	6.26	GEORGETOWN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	400	6.26	11.24	GEORGETOWN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	404	1.08	4.09	WESTVILLE-LAKE RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	410	1.34	4.06	DEPOT RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	410	4.28	6.08	DEPOT RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	418	1.62	2.08	10TH STREET EXTENSION RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	428	12.48	13.19	SPRUCEVALE RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	443	0.96	1.37	HUNSTON RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	443	1.37	2.20	HUNSTON RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	443	2.20	2.30	HUNSTON RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	449	0.00	0.61	CRESTVIEW RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
SR	39	2.24	2.66	MAIN ST	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	39	2.66	2.97	SR-39	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	46	1.37	1.58	WATERFORD RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	164	14.05	14.26	SR-164	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
US	30	7.50	8.67	US-30	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	400	0.00	1.07	GEORGETOWN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd

COSHOCTON COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Coshocton County is one of the eight member governments that will benefit from being included in this safety plan.

The United States Census Bureau estimates the 2019 population of Coshocton County at 36,600 residents. The county spans an area of 567 square miles with more than 1,255 miles of public roadways[1]. Although bicycle, pedestrian, and other active transportation amenities are available, most residents in this county rely on cars and other vehicles as their main mode of transportation. A small portion of Ohio State Bicycle Route 50 passes through the southeastern corner of the county.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 below shows that within Coshocton County, there were a total of 66 fatalities and 193 serious injuries resulting from traffic collisions from 2010-2019. There was a spike in fatalities in 2016 (11) and two years, 2013 and 2018, are tied for the lowest frequency (3). The overall trend of fatalities is relatively flat. Similarly, serious injuries peaked at 27 in 2019 while hitting a ten year low of 13 in 2018. Table 1 also shows that the frequency of fatalities and serious injuries that occur each year typically hovers around the ten-year annual average.

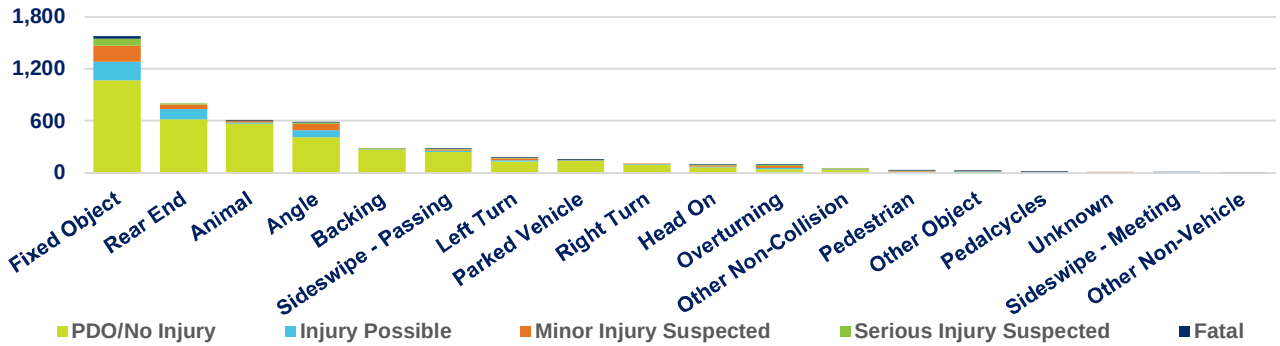
Table 1: Coshocton County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	7	19
2011	6	16
2012	9	23
2013	3	17
2014	7	17
2015	8	21
2016	11	22
2017	6	18
2018	3	13
2019	6	27
10-YEAR TOTAL	66	193
ANNUAL AVERAGE	7	19

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash type for all crash severities in Coshocton County is fixed object crashes (32%) followed by rear end crashes (16%) and animal-related crashes (12%). The Coshocton County crash type distribution follows the same general trends as the OMEGA regional crash breakdown.

Figure 1: Coshocton County Crashes by Type and Severity, 2010-2019



[1] Ohio County Profiles 2020 Edition, Ohio Development Services Agency Office of Research, https://development.ohio.gov/files/research/C1017.pdf

COUNTY SAFETY STRATEGIES

Coshocton County is currently working to improving safety on their roadways and to reduce crashes through a variety of efforts including:

- Installing centerline and edge line (where applicable) rumble strips as part of their annual resurfacing program.
- Improving the visibility of signage and pavement markings as part of their annual resurfacing program.
- Installing centerline raised pavement markers and guardrails as part of their annual resurfacing program.
- Installing intersection advanced warning signs.
- Vegetation control to improve sight distance and visibility.
- Community outreach to high-risk drivers and the general motoring public through Safe Communities and billboards at major employers.
- Participation in national education and enforcement campaigns.
- Installing four solar speed warning signs/ trailers in areas where speeding is a concern.
- Developing a sidewalk master plan and a bicycle master plan to improve connectivity within the City of Coshocton.

Talking Points

Representatives from Coshocton County identified several areas of concern for the county including:

- The random nature of roadway departures crashes means improvements may need to be deployed systematically.
- The terrain/ natural environment limits the width of the clear zones and the ability to achieve ideal roadside conditions.
- Distracted driving.
- Amish buggies and active transportation related to Amish travel and truck traffic.
- The Safe City program, through Safe Communities, should be reinstated.
- Seatbelt usage and enforcement is difficult because it is challenging to change the culture and mindset of local motorists.
- Pedestrian fatalities and accidents.
- Challenges surrounding an aging population.
- Performance and safety of E-bikes and performance tractors.

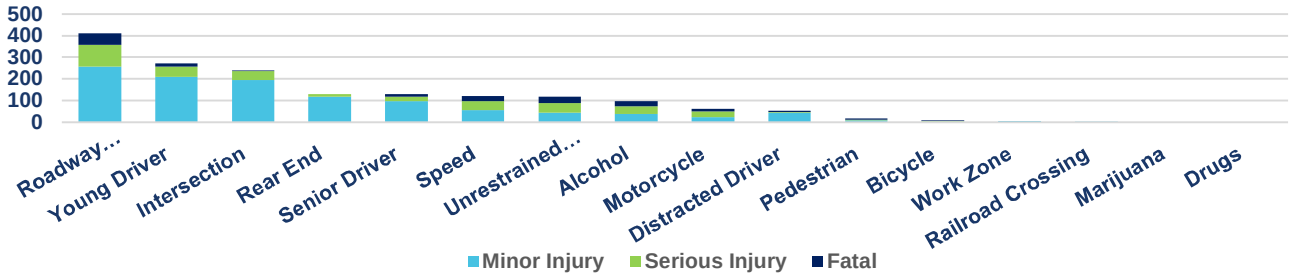
EMPHASIS AREAS

Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crash would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). The Strategic Highway Safety Plan developed by ODOT identifies ten emphasis areas to improve safety across the state. The OMEGA RSP evaluated ten years of crash data (2010-2019) to determine which emphasis areas from the SHSP best captured the traffic safety challenges within the region. Five emphasis areas were chosen to represent the OMEGA region including:

- Roadway departures
- Intersections
- Speed
- Unrestrained occupants
- Non-motorized users (bicycle/pedestrian/buggies/other non-motorists)

These emphasis areas help to define the regional safety challenges and focus the RSP towards the most critical crash trends.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Coshocton County, 2010-2019

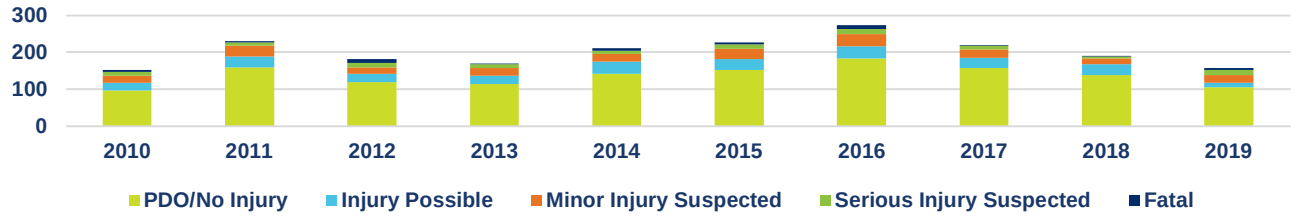


Coshocton County Emphasis Areas

Roadway Departure

Roadway departure crashes accounted for 39% of all crashes that occurred on all roads in the county and 40% of all crashes that occurred on roads that are off the state system in Coshocton County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis areas including unrestrained drivers (51% of fatal roadway departure crashes), speeding (47%), alcohol-related crashes (36%), younger drivers involved (21%), and motorcycles (19%). These crashes typically result in collisions with fixed objects, but also include collisions with oncoming vehicles. Figure 3 shows that the frequency of roadway departure crashes varies year to year. The highest two years were 2011 and 2016 where 231 and 273 roadway departure crashes occurred, respectively. Overall, the number of roadway departure crashes has been decreasing since 2016.

Figure 3: Roadway Departure Total Annual Crashes by Severity in Coshocton County, 2010-2019



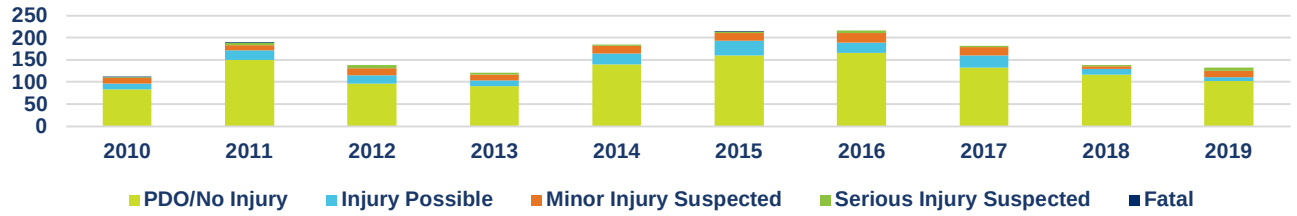
Coshocton County Roadway Departure Action Steps:

- The county will continue their ongoing efforts to widen the clear zone through vegetation control, were possible.
- Continue to install centerline rumble strips on main county roads with resurfacing.
- Continue to install raised pavement markers as enhanced delineation measure along high crash corridors.

Intersections

Intersection related crashes accounted for 33% of all crashes that occurred on all roads in the county and 37% of all crashes that occurred on roads that are off the state system in Coshocton County. In terms of overlapping emphasis areas, crashes that involved pedestrians (67%), older drivers (67%), and bicycles (33%) are the most common. As shown in Figure 4, from 2010-2019, the frequency of intersection-related crashes varied year to year. There was a decreasing trend in total intersection-related crashes from 2017-2019 with 2019 nearly tied with the next lowest year, 2013, at 120 crashes. Within Coshocton County, 36% of fatal intersection-related crashes were angle crash types followed by rear-end crashes and fixed object crashes at 18% each.

Figure 4: Intersection-Related Total Annual Crashes by Severity in Coshocton County, 2010-2019



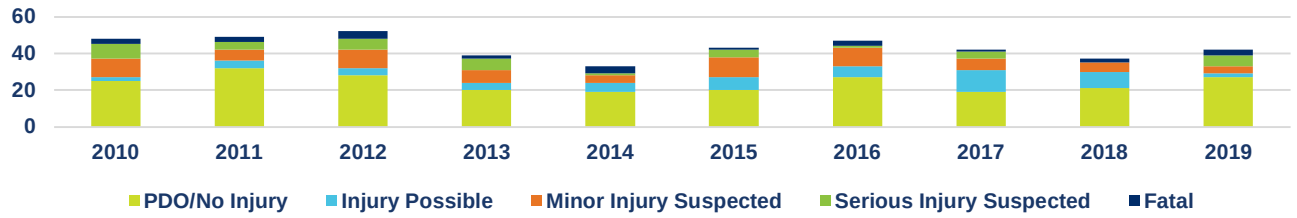
Coshocton County Intersections Action Steps:

- Continue intersection signal equipment upgrade in the City of Coshocton.
- Implement enhanced stop signs (LED, Oversized, dual stop signs, or reflective strips) at minor stop controlled intersections.

Speed

Speed-related crashes accounted for 8% of the crashes that occurred on all roads in the county and 7% of the crashes that occurred on roads that are off the state system countywide. After a high of 52 crashes in 2012, speeding-related crashes saw a slight downward trend for two years as shown in Figure 5. Since 2015, the crash frequency has varied each year but remained somewhere between 40 and 50 crashes per annum. The most significant contributing factor within speeding-related crashes were roadway departure crashes (96% of fatal speeding crashes) followed by unrestrained occupants (58%), alcohol-related crashes (50%), and younger drivers (31%). Approximately 59% of fatal speeding-related crashes occurred off of the state system. Of these crashes, 27% occurred on county roads, 11% occurred on township roads and 21% occurred on city/village roads.

Figure 5: Speed-Related Total Annual Crashes by Severity in Coshocton County, 2010-2019



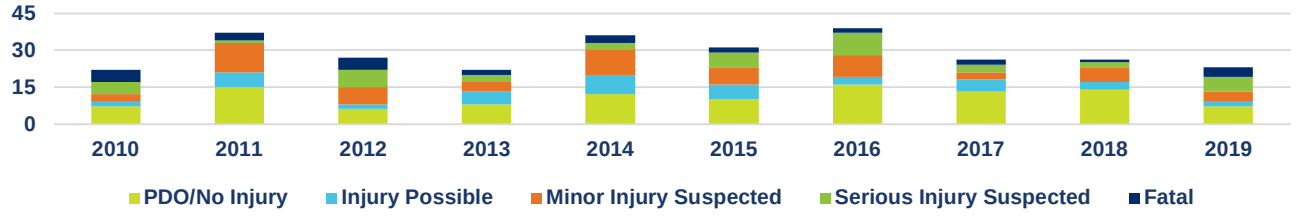
Coshocton County Speeding Action Steps:

- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- Continue to expand the use of speed feedback signs in the City of Coshocton.
- Engage law enforcement by sharing the Coshocton County Sub-Plan with the Sherriff's Office.

Unrestrained Occupants

Crashes that involved unrestrained occupants were the second highest contributor to fatalities, following roadway departure crashes, from 2010-2019. As shown in Figure 6, unrestrained occupant crashes accounted for 29 fatalities in Coshocton County during this time. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occurred throughout the day and night with no discernable tie to traffic trends.

Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Coshocton County, 2010-2019



Coshocton County Unrestrained Occupants Action Steps:

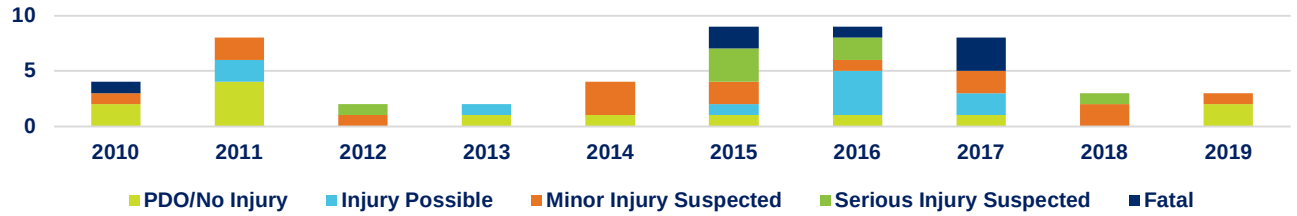
- The County and OMEGA will continue ongoing efforts to collaborate with local employers to educate citizens about seat belt safety.
- The County, Cities, Villages and other public agencies will maintain and enforce their ongoing seatbelt usage rules in County, City and Village vehicles.
- Engage law enforcement by sharing the Coshocton County Sub-Plan with the Sherriff's Office.

Non-Motorized Users (Bicycle/Pedestrian/ Buggies/ Other Non-Motorists)

Non-Motorized Users was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active

transportation, as shown in Figure 7. Throughout both the region and Coshocton County, , pedestrians, bicyclists, riders on animals, or animal-drawn buggies represent a wide array of challenges. This emphasis area includes many scenarios that include developing bike and pedestrian facilities, accommodating the growing Amish community in the southeastern portion of the county, and alerting motorists to potential buggies, pedestrians, modified tractors, and E-bikes on narrow, rural, or remote roadways. Unlike other emphasis areas, active transportation crashes are more likely to result in an injury than a property damage only crash.

Figure 7: Non-Motorized Users Total Annual Crashes by Severity in Coshocton County, 2010-2019



Coshocton County Non-Motorized Users Action Steps:

- Identify locations with high frequencies of buggies and where funding is available, widen county roads to accommodate buggy travel.
- Improve/ provide pedestrian signals as a part of signal equipment upgrades in the City of Coshocton.

Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Coshocton County with the highest EPDO crash frequency are as follows:

CR-151 from MP 0.00 to MP 0.51:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	2	37.93	75.86
Minor Injury (B)	0	6.55	0.00
Possible Injury (C)	0	4.44	0.00
Property Damage Only (O)	1	1	1.00
Total	3	-	76.86

To calculate the EPDO crash rate the following formula is used:

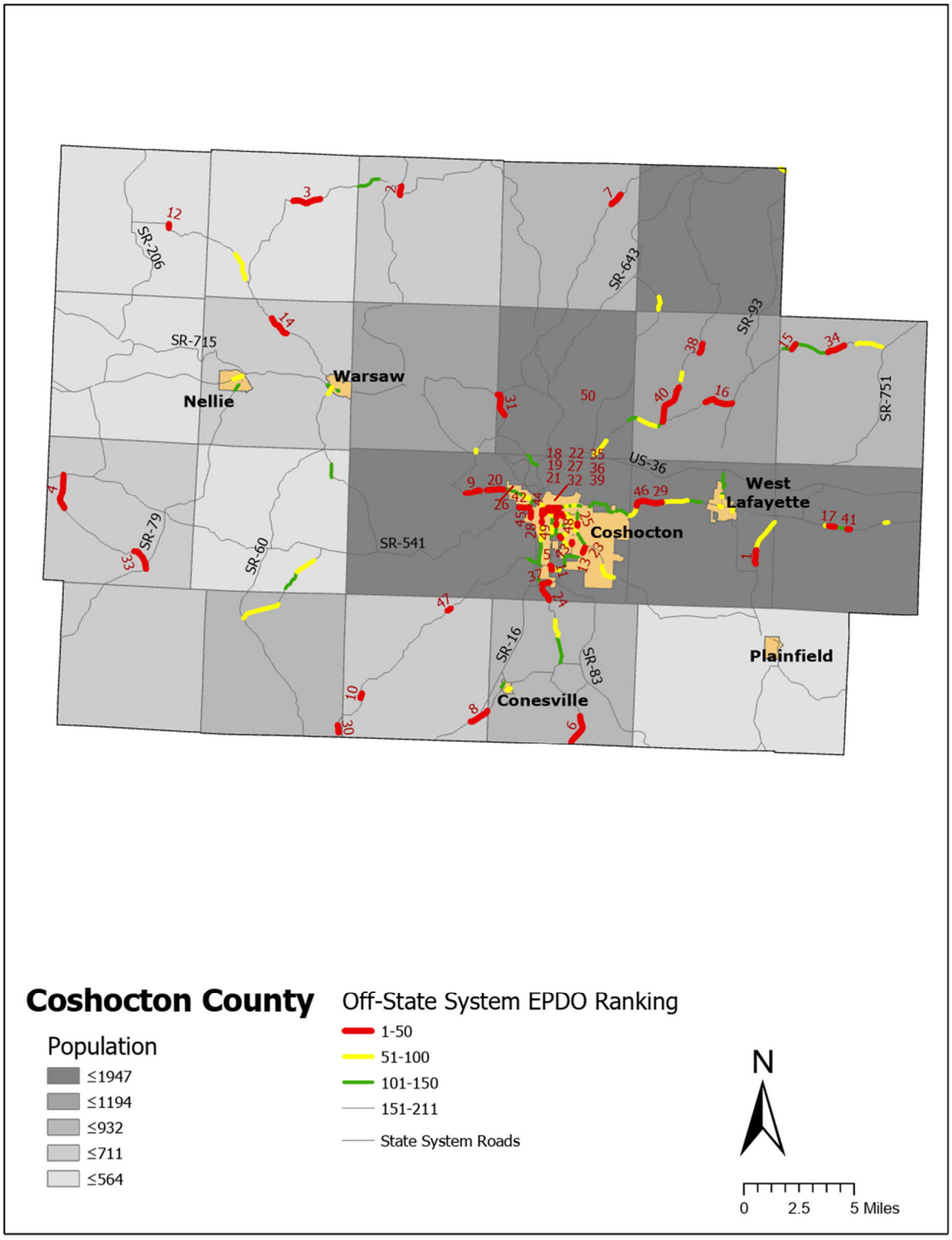
$$EPDO\ Crash\ Rate = \frac{C\ x\ 1{,}000{,}000}{N\ x\ V\ x\ 365\ x\ L} = \frac{76.86\ x\ 1{,}000{,}000}{5\ x\ 397\ x\ 365\ x\ 0.51} = 208.01$$

Where:

- *C* = EPDO Total Value from the table above (76.86)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (397 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.51)

HIGH CRASH SEGMENTS

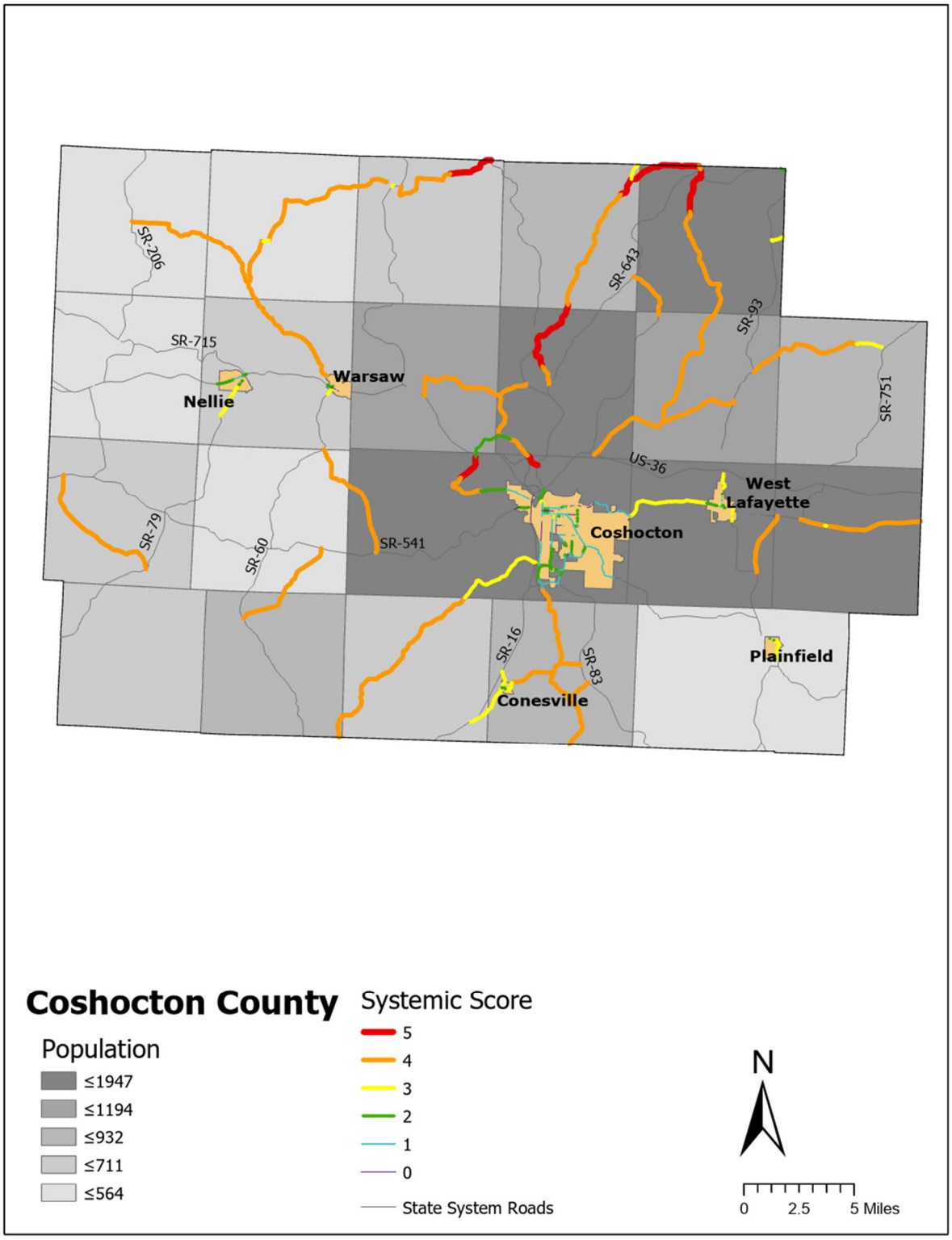
The following segments represent the top crash rate segments by crash severity in Coshocton County. The road segment with the highest frequency and severity of crashes in Coshocton County is County Road 151 between the mile points 0.0 and 0.51. Safety improvements and infrastructure projects at these locations will address the areas in the county with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	CR	151	0.00	0.51	C-151 RD	County	208.0
2	CR	19	3.99	4.32	C-19 RD	County	171.2
3	CR	19	7.62	8.64	C-19 RD	County	97.0
4	CR	367	2.43	3.67	C-367 RD	County	83.5
5	TR	453	0.53	0.65	T-453 RD	Township	80.2
6	CR	274	0.12	1.17	C-274 RD	County	77.4
7	CR	12	5.72	6.19	C-12 RD	County	73.7
8	TR	483	0.00	0.68	T-483C RD	Township	66.0
9	CR	55	0.54	1.06	C-55 RD	County	61.7
10	CR	6	1.85	2.04	MILL FORK RD	County	60.4
11	TR	453	0.36	0.53	T-453 RD	Township	59.7
12	CR	20	4.66	4.80	C-20 RD	County	57.8
13	TR	267	0.73	0.94	PLEASANT VALLEY DR	Municipal	49.5
14	CR	22	2.73	3.49	BEAVER RUN RD	County	47.7
15	CR	2	1.63	1.86	C-2 RD	County	43.8
16	CR	425	1.70	2.72	C-425 RD	County	42.9
17	CR	9	1.01	1.22	C-9 RD	County	40.9
18	CR	507	0.34	0.54	ORANGE ST	Municipal	40.2
19	SR	541	20.26	20.37	CAMBRIDGE RD	Municipal	39.4
20	CR	55	1.29	1.87	C-55 RD	County	36.9
21	CR	16	0.10	0.29	CHESTNUT ST	Municipal	35.4
22	CR	505	0.31	0.56	MAIN ST	Municipal	34.5
23	CR	91	1.70	1.87	OSTEGO AVE	County	34.0
24	CR	271	4.05	4.50	C-271 RD	County	33.1
25	CR	506	0.00	0.15	16TH ST	Municipal	31.2
26	SR	541	18.77	19.11	CAMBRIDGE RD	Municipal	28.3
27	CR	504	0.00	0.09	WALNUT ST	Municipal	27.7
28	CR	271	6.87	7.10	2ND ST	Municipal	26.8
29	CR	16	4.44	4.72	C-16 RD	County	26.7
30	CR	6	0.16	0.42	MILL FORK RD	County	25.9
31	CR	24	2.57	3.44	C-24 RD	County	25.0
32	CR	505	0.00	0.19	MAIN ST	Municipal	22.2
33	CR	18	3.53	4.32	C-18 RD	County	21.8
34	CR	2	3.07	3.68	C-2 RD	County	21.3
35	CR	16	0.29	0.45	CHESTNUT ST	Municipal	19.9
36	CR	16	0.45	0.57	CHESTNUT ST	Municipal	19.6
37	SR	83	8.32	8.59	SR-83	Municipal	18.8
38	CR	10	6.16	6.51	C-10 RD	County	18.7
39	SR	541	20.37	20.48	CAMBRIDGE RD	Municipal	18.2
40	CR	10	3.05	4.49	C-10 RD	County	18.1
41	CR	9	1.66	1.76	C-9 RD	County	17.9
42	SR	541	19.11	19.67	CAMBRIDGE RD	Municipal	15.5
43	CR	510	0.34	0.44	14TH ST	Municipal	15.1
44	CR	271	7.10	7.29	2ND ST	Municipal	14.9
45	SR	16	9.14	9.35	SR-16	Municipal	14.8
46	CR	16	3.73	4.44	C-16 RD	County	14.5
47	CR	6	6.53	6.65	MILL FORK RD	County	14.4
48	CR	91	2.51	2.63	7TH ST	Municipal	13.1
49	CR	91	2.23	2.36	7TH ST	Municipal	13.1
50	CR	505	0.19	0.31	MAIN ST	Municipal	12.6

HIGH RISK SEGMENTS

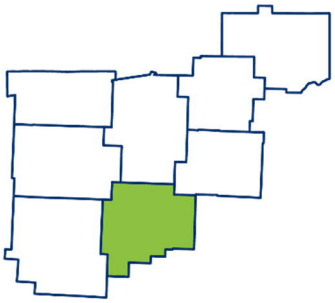
The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Safety improvements and infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.



Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	1	0.00	0.72	C-1 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	1	0.72	1.78	C-1 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	2	0.00	4.15	C-2 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	5	3.25	3.54	C-5 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	6	0.00	7.30	MILL FORK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	9	0.00	0.88	C-9 RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	9	1.01	4.25	C-9 RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	10	0.00	12.10	C-10 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	10	12.10	13.75	C-10 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	0.00	1.75	C-12 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	1.75	6.19	C-12 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	6.19	9.54	C-12 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	9.54	9.66	C-12 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	17	0.00	4.53	C-17 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	18	2.93	4.32	C-18 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	0.00	1.65	C-19 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	1.65	4.32	C-19 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	4.96	10.56	C-19 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	20	4.66	6.08	C-20 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	22	0.51	6.65	BEAVER RUN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	23	1.33	2.30	C-23 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	23	2.30	2.75	C-23 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	24	0.00	0.53	C-24 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	24	0.53	1.36	C-24 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	24	1.80	6.24	C-24 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	28	0.00	0.66	C-28 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	54	0.00	3.91	C-54 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	55	0.00	1.06	C-55 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	151	0.00	1.93	C-151 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	190	0.00	1.84	C-190 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	207	0.00	1.07	C-207 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	271	0.00	4.50	C-271 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	273	0.00	1.58	C-273 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	274	0.00	1.90	C-274 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	275	0.00	0.72	C-275 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	367	0.00	3.67	C-367 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	401	0.00	3.92	C-401 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	425	0.00	2.84	C-425 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	429	0.00	0.94	C-429 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

GUERNSEY COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Guernsey County is one of the eight member governments that will benefit from being included in this safety plan.

The United States Census Bureau estimates the 2019 population of Guernsey County at 38,875 residents. The county spans an area of 528 square miles with more than 1,340 miles of public roadways[1]. Although bicycle, pedestrian, and other active transportation amenities are available along US Bicycle Route 50, Ohio State Bicycle Routes 77 and 85, and the Great Guernsey Trail (designated as a National Recreational Trail by the Secretary of the Interior), most residents in this county rely on cars and other vehicles as their main mode of transportation.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 below shows that within Guernsey County, there were a total of 66 fatalities and 548 serious injuries resulting from traffic collisions from 2010-2019. There was a spike in fatalities in 2016 (9) and 2017 (10) and a dip in 2015 (1). However, the overall trend of fatalities is relatively flat. Similarly, serious injuries peaked at 79 in 2014 while hitting a ten year low of 37 in 2019. Table 1 also shows that the frequency of fatalities and serious injuries that occur each year typically hovers around the ten-year annual average.

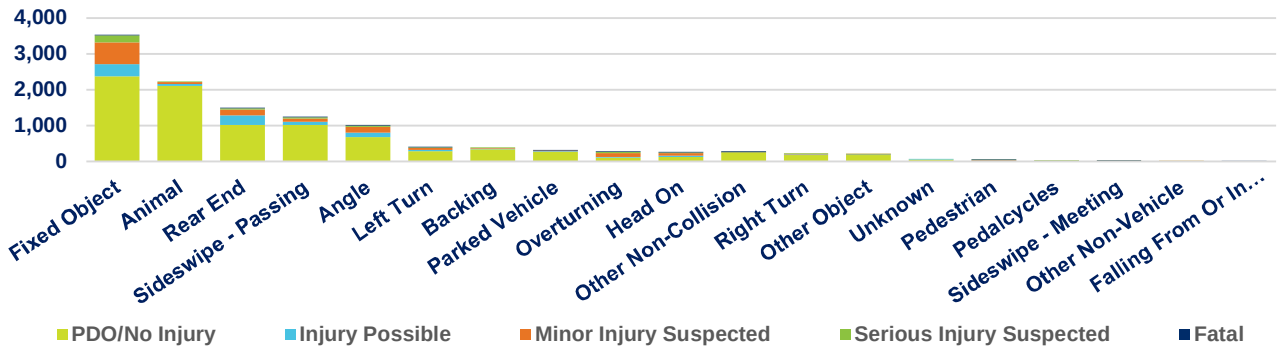
Table 1: Guernsey County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	8	53
2011	6	62
2012	6	48
2013	9	48
2014	7	79
2015	1	73
2016	9	60
2017	10	47
2018	6	41
2019	4	37
10-YEAR TOTAL	66	548
ANNUAL AVERAGE	7	55

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash type for all crash severities in Guernsey County is fixed object crashes (30%) followed by animal-related crashes (19%) and rear end crashes (12%). The Guernsey County crash type distribution follows the same general trends as the OMEGA regional crash breakdown.

Figure 1: Guernsey County Crashes by Type and Severity, 2010-2019



[1] **Ohio County Profiles 2020 Edition, Ohio Development Services Agency Office of Research https://www.development.ohio.gov/files/research/C1031.pdf**

COUNTY SAFETY STRATEGIES

Guernsey County is currently working to improve safety on their roadways and to reduce crashes through a variety of efforts including:

- Improving the visibility of signage and pavement markings as part of their annual resurfacing program.
- Installing centerline raised pavement markers and guardrails as part of their annual resurfacing program.
- Vegetation control to improve sight distance and visibility.
- Participation in national education and enforcement campaigns.

Talking Points

Representatives from Guernsey County identified several areas of concern for the county including:

- The terrain/ natural environment limits the width of the clear zones and the ability to achieve ideal roadside conditions.
- Distracted driving.
- Intersections that lack advanced warning signs.
- Seatbelt usage and enforcement is difficult because it is challenging to change the culture and mindset of local motorists.
- Pedestrian fatalities and accidents.
- Challenges surrounding an aging population.
- Motorcycle and bicycle safety at locations where surface type transitions from pavement to gravel.

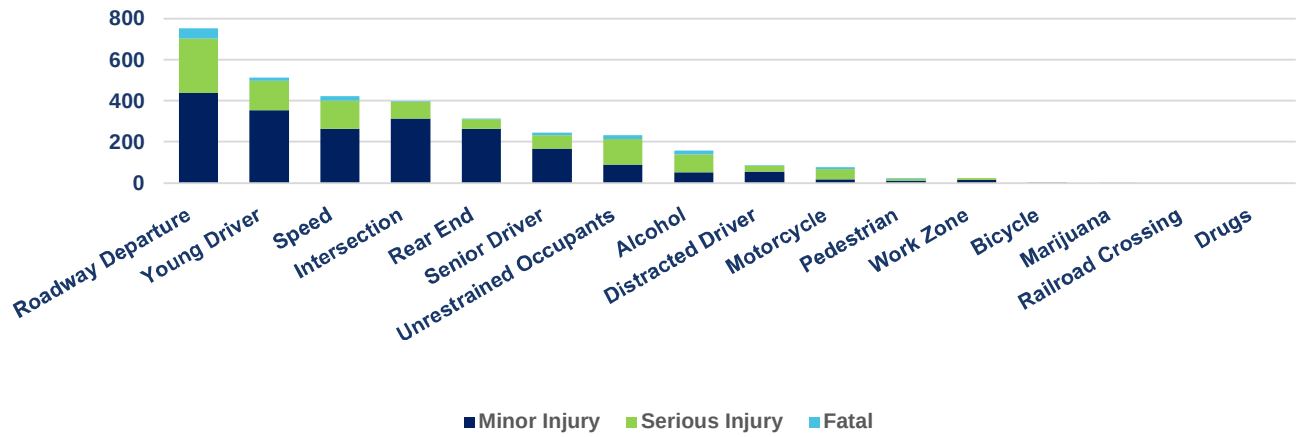
EMPHASIS AREAS

Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crash would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). The Strategic Highway Safety Plan developed by ODOT identifies ten emphasis areas to improve safety across the state. The OMEGA RSP evaluated ten years of crash data (2010-2019) to determine which emphasis areas from the SHSP best captured the traffic safety challenges within the region. Five emphasis areas were chosen to represent the OMEGA region including:

- Roadway departures
- Intersections
- Speed
- Unrestrained occupants
- Non-motorized users (bicycle/pedestrian/buggies/other non-motorists)

These emphasis areas help to define the regional safety challenges and focus the RSP towards the most critical crash trends in Guernsey County. Figure 2 shows how the regional emphasis areas are represented in Guernsey County.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Guernsey County, 2010-2019

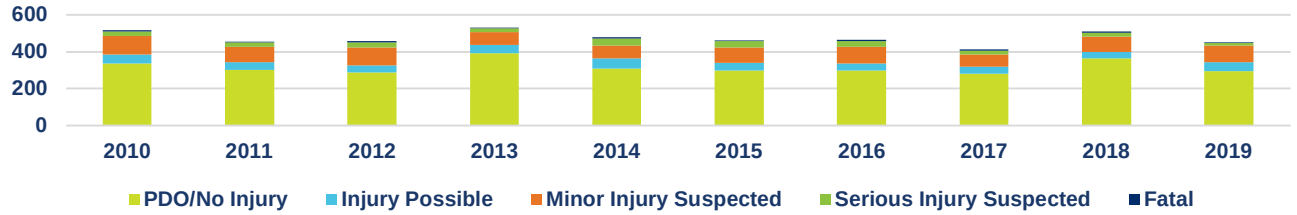


Guernsey County Emphasis Areas

Roadway Departure

Roadway departure crashes accounted for 37% of all crashes that occurred on all roads in the county and 36% of all crashes that occurred on roads that are off the state system in Guernsey County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis areas including speeding (42% of fatal roadway departure crashes), alcohol-related (35%), unrestrained drivers (35%), younger drivers involved (27%), and motorcycles (21%). These crashes typically resulted in collisions with fixed objects, but also include collisions with oncoming vehicles. Figure 3 shows that 2010, 2013 and 2018 were the highest years for roadway departures crashes with 518, 532, and 508 crashes, respectively. From 2013 to 2017, the number of roadway departure crashes decreased.

Figure 3: Roadway Departure Total Annual Crashes by Severity in Guernsey County, 2010-2019



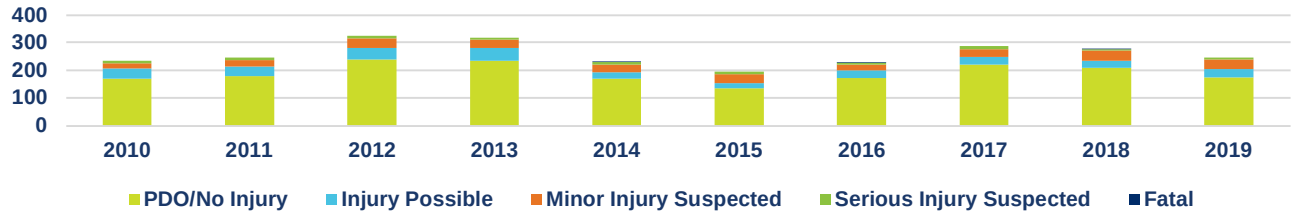
Guernsey County Roadway Departure Action Steps:

- Evaluate and update signing, and delineation as needed as a part of annual resurfacing.
- The county will continue their ongoing efforts to widen the clear zone, were possible, as part of the ongoing resurfacing program.

Intersections

Intersection-related crashes accounted for 21% of all crashes that occurred on all roads in the county and 34% of all crashes that occurred on roads that are off the state system in Guernsey County. In terms of overlapping emphasis areas, crashes that involved older drivers (67%), motorcycles (33%), unrestrained occupants (33%), and younger drivers (33%) were the four most common. Figure 4 shows the annual trends in intersection crashes over a ten year span. From 2010-2019, the frequency of crashes spiked in 2012 (324) and 2013 (317), hit a ten-year low in 2016 (194), spiked again in 2017 (286) and has been decreasing since. Within Guernsey County, 34% of fatal intersection-related crashes were angle crash types followed by fixed object crashes at 17% and rear-end crashes at 14%.

Figure 4: Intersection-Related Total Annual Crashes by Severity in Guernsey County, 2010-2019



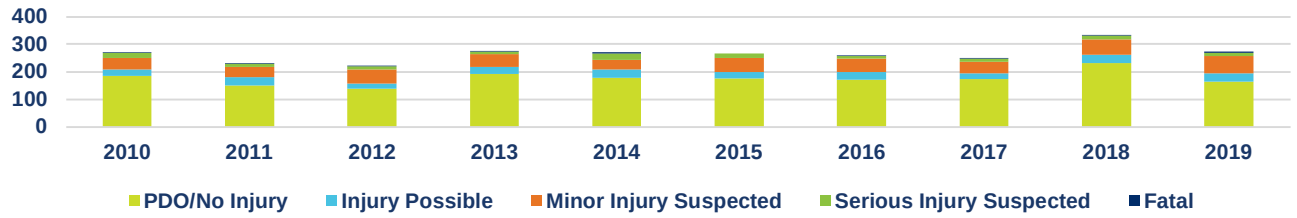
Guernsey County Intersections Action Steps:

- Intersection improvement projects within the County will be evaluated to determine if installing LED advanced warning signs on each approach is an appropriate safety countermeasure that could be included in the proposed improvements.
- Remove unwarranted signals (Steubenville Ave in City of Cambridge)
- The County will continue their ongoing efforts to widen the clear zone, where possible, within any intersection improvement project.

Speed

Speed-related crashes accounted for 20% of the crashes that occurred on all roads in the county and 15% of the crashes that occurred on roads that are off the state system countywide. As shown in Figure 5, speeding-related crashes remained relatively constant from 2010 to 2017 with slight decreases in 2011 and 2012. The frequency hit a ten-year high in 2018 when 333 speeding-related crashes occurred and then decreased in 2019. The most significant contributing factor within speeding-related crashes were roadway departure crashes (91% of fatal speeding crashes) followed by younger drivers (27%), alcohol-related (23%), unrestrained occupants (23%), and motorcycles (18%). Approximately 31% of fatal speeding-related crashes occurred off of the state system. Of these crashes, 21% occurred on county roads, 7% occurred on township roads and 3% occurred on city/ village roads.

Figure 5: Speed-Related Total Annual Crashes by Severity in Guernsey County, 2010-2019



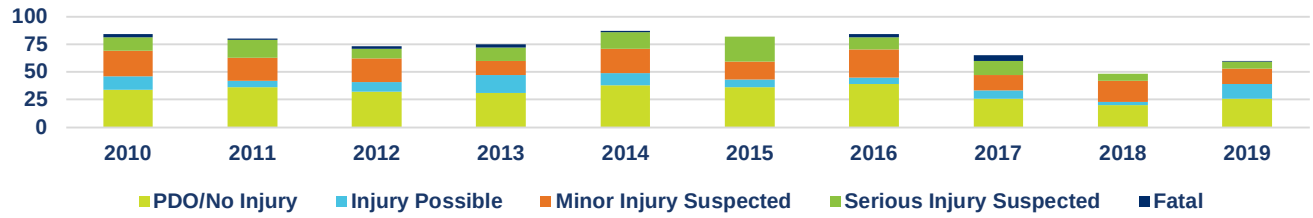
Guernsey County Speeding Action Steps:

- County and City road crews can install safety campaign materials in highly visible locations (need banners provided by OSHP/ ODPS).
- Implement dynamic speed feedback signs.
- Engage law enforcement by sharing the Guernsey County Sub-Plan with the Sherriff's Office.

Unrestrained Occupants

Crashes that involved unrestrained occupants are the third highest contributor to fatalities, following roadway departures and speed-related crashes, from 2010-2019. As shown in Figure 6, unrestrained occupant crashes accounted for 19 fatalities in Guernsey County during this time. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occurred throughout the day and night with no discernable tie to traffic trends.

Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Guernsey County, 2010-2019



Guernsey County Unrestrained Occupants Action Steps:

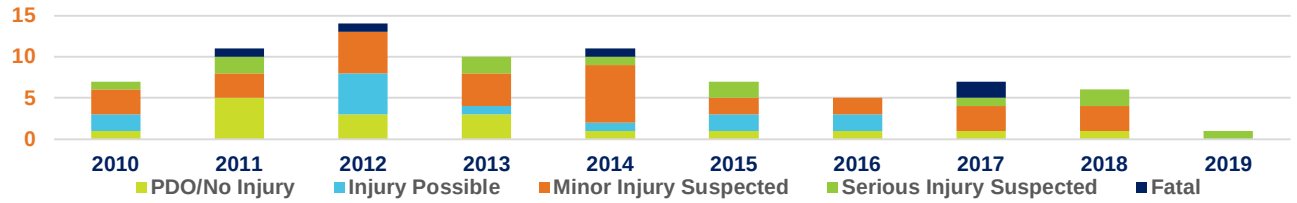
- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- The County, Cities, Villages and other public agencies will maintain and enforce their ongoing seatbelt usage rules in County, City and Village vehicles.
- Engage law enforcement by sharing the Guernsey County Sub-Plan with the Sherriff's Office.

Non-Motorized Users (Bicycle/Pedestrian/Buggies/Other Non-Motorists)

Active transportation was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active

transportation, as shown in Figure 7. Throughout both the region and Guernsey County, bicycle and pedestrian crashes pose a wide array of challenges. From developing bike and pedestrian facilities in urban areas like Cambridge to warning bicyclists of changing pavement types and alerting motorists to pedestrians on rural/ remote roadways, this emphasis area includes many high-risk scenarios. Unlike other emphasis areas, active transportation crashes are more likely to result in an injury than a property damage only crash.

Figure 7: Non-Motorized Users Total Annual Crashes by Severity in Guernsey County, 2010-2019



Guernsey County Non-Motorized Users Action Steps:

- OMEGA will partner with the City of Byesville to implement the new Mobility and Connectivity Plan currently being written for the City of Byesville.

Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table below use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Guernsey County with the highest EPDO crash frequency are as follows:

CR-26 from MP 5.76 to MP 5.90:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	1	37.93	37.93
Minor Injury (B)	0	6.55	0.00
Possible Injury (C)	0	4.44	0.00
Property Damage Only (O)	0	1	0.00
Total	1		37.93

To calculate the EPDO crash rate the following formula is used:

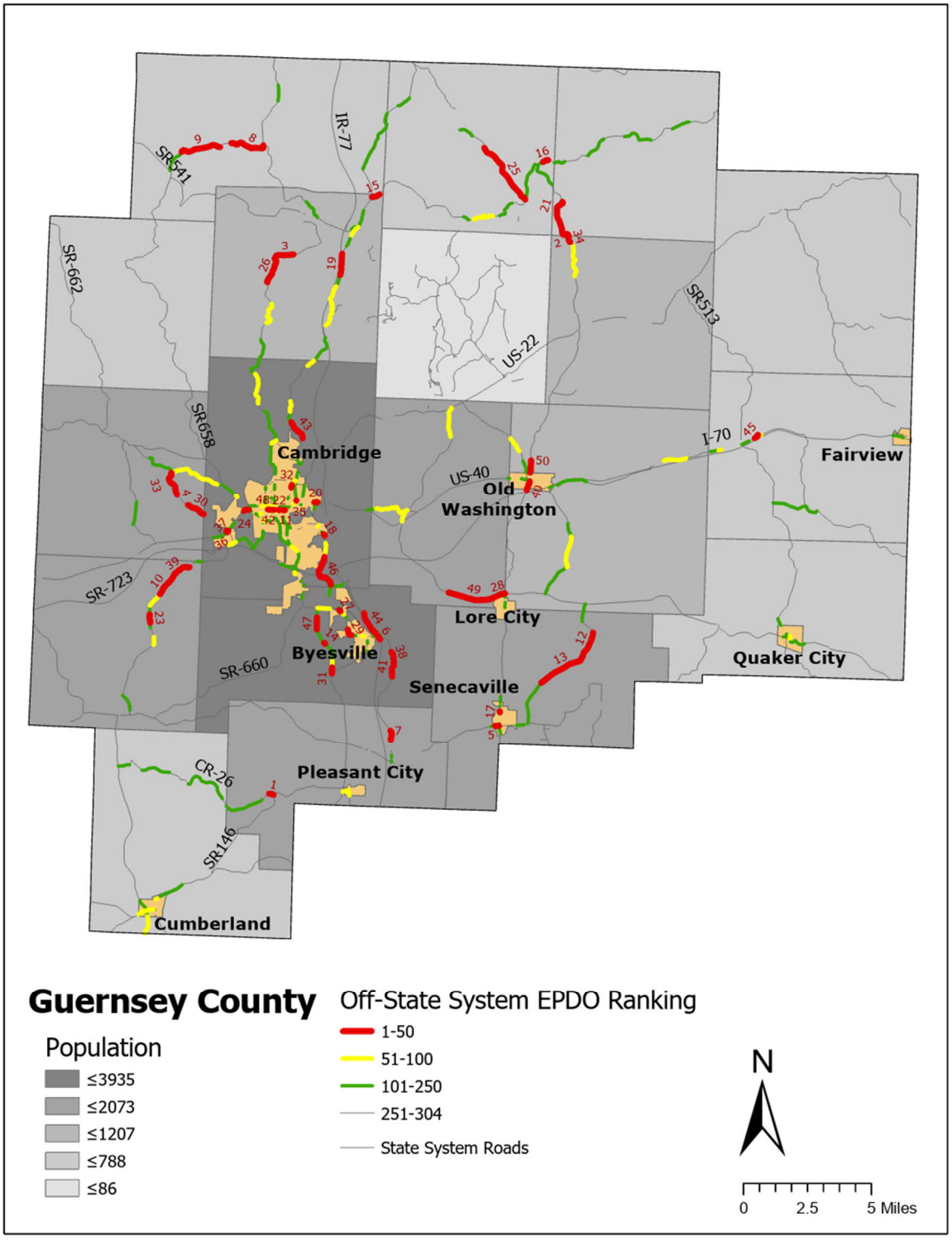
$$\boldsymbol{EPDO\ Crash\ Rate} = \frac{\boldsymbol{C\ x\ 1{,}000{,}000}}{\boldsymbol{N\ x\ V\ x\ 365\ x\ L}} = \frac{\boldsymbol{37.93\ x\ 1{,}000{,}000}}{\boldsymbol{5\ x\ 211\ x\ 365\ x\ 0.14}} = \boldsymbol{710.3}$$

Where:

- *C* = EPDO Total Value from the table above (37.93)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (211 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.14)

HIGH CRASH SEGMENTS

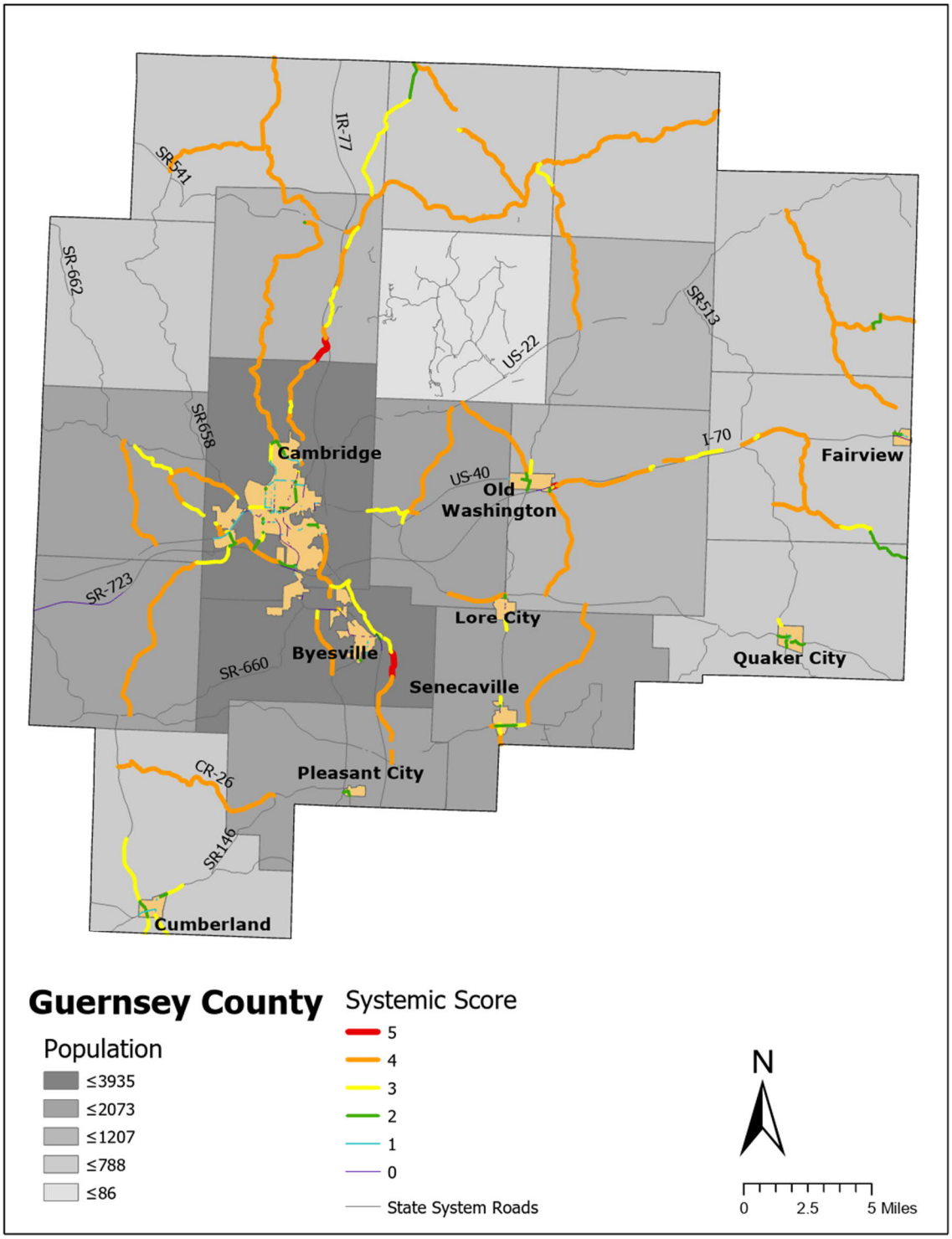
The following segments represent the top crash rate segments by crash severity in Guernsey County. The road segment with the highest frequency and severity of crashes in Guernsey County is Crane Run Road (CR-26) between the mile points 5.76 and 5.90. Safety improvements and infrastructure projects at these locations will address the areas in the county with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	CR	26	5.76	5.90	CRANE RUN RD	County	710.3
2	CR	71	2.96	3.15	BIRMINGHAM RD	County	242.3
3	CR	33	8.82	9.29	8TH RD	County	160.7
4	CR	418	1.83	1.95	SKYLINE DR	County	155.4
5	SR	313	14.90	15.02	CLAY PIKE	Municipal	133.7
6	SR	209	14.88	15.07	RAMP	Municipal	107.4
7	CR	35	0.68	0.97	VOCATIONAL RD	County	105.1
8	CR	86	2.30	3.41	GUERNSEY VALLEY RD	County	89.3
9	CR	86	0.69	1.93	GUERNSEY VALLEY RD	County	81.6
10	CR	15	7.19	7.72	CLAYSVILLE RD	County	80.4
11	US	22	8.17	8.30	HIGHLAND AVE	Municipal	74.8
12	CR	74	3.09	3.66	SALEM RD	County	69.7
13	CR	74	1.36	3.09	SALEM RD	County	60.0
14	CR	42	1.50	1.54	COUNTRY CLUB RD	County	59.8
15	CR	851	0.00	0.25	FREEDOM RD	County	59.3
16	CR	870	0.00	0.17	SLIGO RD	County	59.1
17	SR	285	0.96	1.14	HIGH ST	Municipal	56.5
18	CR	35	8.64	8.76	BYESVILLE RD	County	56.1
19	CR	35	17.88	18.52	OLD 21 RD	County	54.1
20	US	40	9.16	9.28	WHEELING AVE	Municipal	48.9
21	CR	71	3.15	4.28	BIRMINGHAM RD	County	47.9
22	US	22	8.04	8.17	WHEELING AVE	Municipal	46.1
23	CR	15	6.23	6.48	CLAYSVILLE RD	County	41.0
24	US	22	6.85	7.02	US-22	Municipal	40.0
25	CR	585	1.54	3.59	BROADHEAD RD	County	38.6
26	CR	33	7.88	8.82	8TH RD	County	37.8
27	SR	209	12.85	13.00	MAIN ST	Municipal	36.8
28	SR	265	4.31	4.61	LEATHERWOOD RD	Municipal	33.4
29	SR	209	13.52	13.75	MAIN ST	Municipal	33.4
30	CR	418	0.81	1.37	SKYLINE DR	County	33.3
31	CR	345	0.00	0.19	COUNTRY CLUB RD	County	33.1
32	CR	35	10.48	10.64	CLARK ST	Municipal	31.3
33	CR	418	1.95	2.64	SKYLINE DR	County	30.2
34	CR	71	2.75	2.96	BIRMINGHAM RD	County	29.7
35	US	22	8.68	8.92	HIGHLAND AVE	Municipal	29.5
36	CR	430	1.14	1.24	FAIRDALE DR	County	28.0
37	US	22	6.04	6.19	GLENN HWY	Municipal	28.0
38	CR	35	3.43	3.63	VOCATIONAL RD	County	26.9
39	CR	15	7.72	8.47	CLAYSVILLE RD	County	26.0
40	US	40	16.21	16.49	MAIN CROSS ST	Municipal	25.5
41	CR	35	2.85	3.43	VOCATIONAL RD	County	25.0
42	US	22	7.89	8.04	WHEELING AVE	Municipal	24.9
43	CR	35	12.10	12.72	OLD 21 RD	County	24.1
44	CR	35	4.44	5.15	VOCATIONAL RD	County	23.7
45	CR	690	3.29	3.44	BRIDGEWATER RD	County	22.6
46	CR	35	6.93	8.01	BYESVILLE RD	County	22.4
47	CR	345	1.48	1.84	COUNTRY CLUB RD	County	21.9
48	US	22	7.72	7.89	WHEELING AVE	Municipal	21.7
49	SR	265	2.85	4.31	LEATHERWOOD RD	Municipal	21.6
50	SR	285	8.68	9.05	WINTERGREEN RD	Municipal	21.4

HIGH RISK SEGMENTS

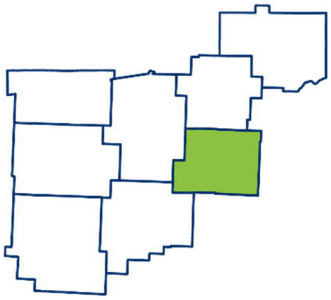
The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Risk factors are any roadway or operations attribute associated with an overrepresentation of fatal and serious injury crashes. For more information on the systemic analysis process, refer to Appendix B of the OMEGA RSP. Safety improvements and infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.



Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	15	1.47	1.61	CLAYSVILLE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	15	3.01	8.74	CLAYSVILLE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	15	10.27	10.99	CLAYSVILLE RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	15	10.99	11.85	GEORGETOWN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	26	0.00	0.35	CRANE RUN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	26	0.49	5.90	CRANE RUN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	33	2.26	11.12	8TH RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	33	11.79	12.74	BOONE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	33	12.74	18.11	8TH ST RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	0.00	0.68	VOCATIONAL RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	35	0.68	2.85	VOCATIONAL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	2.85	3.63	VOCATIONAL RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	6.93	8.76	BYESVILLE RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	35	11.28	13.08	OLD 21 RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	35	13.41	14.95	OLD 21 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	14.95	15.83	OLD 21 RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	15.83	16.23	OLD 21 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	17.52	18.79	OLD 21 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	19.48	20.57	OLD 21 RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	42	1.50	1.54	COUNTRY CLUB RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	49	3.72	5.18	OXFORD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	49	5.18	6.05	JOHNSONS MILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	54	0.40	4.08	ENDLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	57	3.92	6.91	BEEHAM RUN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	71	0.00	4.93	BIRMINGHAM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	73	0.00	3.56	COUNTY HOME RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	74	0.00	4.67	SALEM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	82	9.06	10.47	MCCOY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	86	0.00	3.41	GUERNSEY VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	94	1.22	3.85	PISGAH RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	95	0.95	8.43	PENNYROYAL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	98	0.00	1.06	SKULLFORK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	164	0.00	2.67	BOBS RUN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	345	0.00	0.98	COUNTRY CLUB RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	345	1.02	1.84	COUNTRY CLUB RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	347	0.00	0.83	OAKWOOD RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	416	3.47	4.41	PETERS CREEK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	418	0.00	0.34	SKYLINE DR	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	418	1.52	2.64	SKYLINE DR	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	430	0.93	1.14	FAIRDALE DR	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	450	1.38	1.68	OLD NATIONAL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	585	1.54	4.60	BROADHEAD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	585	5.32	7.32	BROADHEAD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	615	0.00	1.73	COLLEGE HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	670	0.10	0.24	EASTON RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	670	0.24	3.19	EASTON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	690	0.45	1.13	BRIDGEWATER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	690	2.86	3.29	BRIDGEWATER RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	690	3.44	4.57	BRIDGEWATER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	831	0.00	0.42	PLAINFIELD RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	851	0.00	7.07	FREEDOM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	870	0.00	6.23	SLIGO RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
SR	209	6.58	7.11	BLOOMFIELD RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	265	2.85	4.61	LEATHERWOOD RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	285	0.00	0.32	WINTERGREEN RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	313	14.77	14.90	SR-313	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph

HARRISON COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Harrison County is one of the eight member governments that will benefit from being included in this safety plan.

The United States Census Bureau estimates the 2019 population of Harrison County at 15,040 residents. The county spans an area of 411 square miles with more than 897 miles of public roadways[1]. A master bike trail plan was completed by the county in 2019. US bicycle route 50, Ohio State Bicycle Route 85, and the Conotton Creek Trail provide bicycle, pedestrian, and other active transportation amenities. However, most residents in this county rely on cars and other vehicles as their main mode of transportation.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 shows that within Harrison County, there were a total of 49 fatalities and 247 serious injuries resulting from traffic collisions from 2010-2019. While there is a significant spike in fatalities in 2012 and 2018 (both 9) and a low in 2011 (1), the overall trend of fatalities is relatively flat. Similarly, serious injuries peaked at 33 in 2013 while hitting a ten year low of 17 in 2011. Table 1 also shows that the frequency of fatalities and serious injuries that occur each year typically hovers around the ten-year annual average.

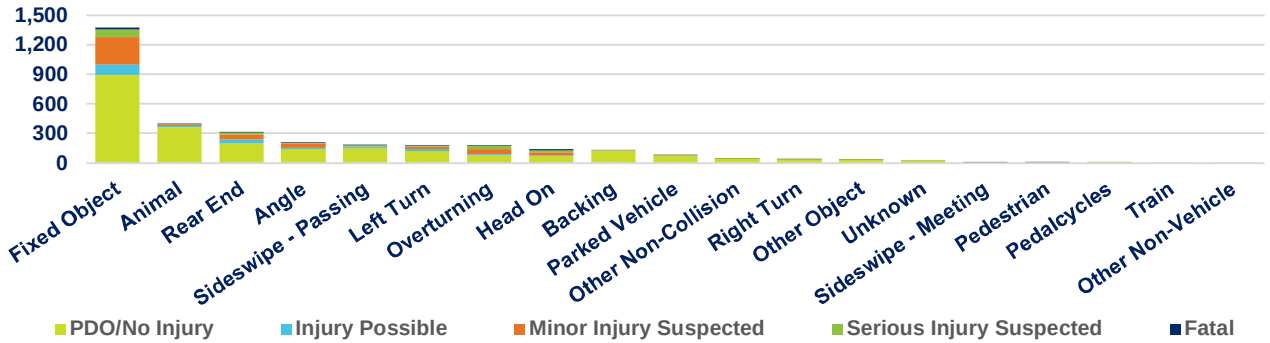
Table 1: Harrison County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	5	30
2011	1	17
2012	9	24
2013	5	33
2014	6	20
2015	3	26
2016	5	30
2017	4	21
2018	9	24
2019	2	22
10-YEAR TOTAL	49	247
ANNUAL AVERAGE	5	25

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash types for all crash severities in Harrison County is fixed object crashes (41%) followed by animal-related crashes (12%) and rear end crashes (9%). The Harrison County crash type distribution follows the same general trends as the OMEGA regional crash breakdown.

Figure 1: Harrison County Crashes by Type and Severity, 2010-2019



[1] **Ohio County Profiles 2020 Edition, Ohio Development Services Agency Office of Research, https://www.development.ohio.gov/files/research/C1035.pdf**

COUNTY SAFETY STRATEGIES

Harrison County is currently working to improve safety on their roadways and to reduce crashes through a variety of efforts including:

- Improving the visibility of signage and pavement markings as part of their annual resurfacing program.
- Including a 2-foot-wide aggregate shoulder and Safety Edge as part of their annual resurfacing program.
- Installing an LED flashing stop sign at SR-332 and SR-151.
- Vegetation control to improve sight distance and visibility.
- Community outreach to high-risk drivers and the general motoring public through the Office of Criminal Justice Services and the County Sheriff.
- Participation in national education and enforcement campaigns.

EMPHASIS AREAS

Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crash would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). The Strategic Highway Safety Plan developed by ODOT identifies ten emphasis areas to improve safety across the state. The OMEGA RSP evaluated ten years of crash data (2010-2019) to determine which emphasis areas from the SHSP best captured the traffic safety challenges within the region. Five emphasis areas were chosen to represent the OMEGA region including:

- Roadway departures
- Intersections
- Speed
- Unrestrained occupants
- Non-motorized user (bicycle/pedestrian/buggies/other non-motorists)

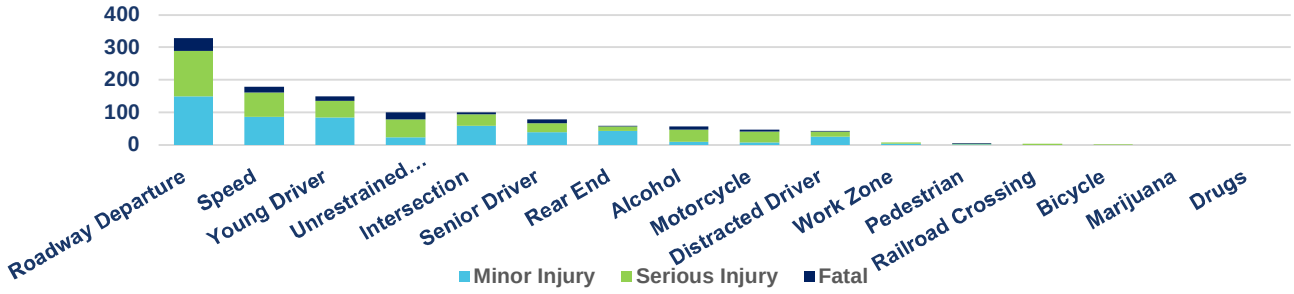
Talking Points

Representatives from Harrison County identified several areas of concern for the county including:

- The terrain/ natural environment limits the width of the clear zones and the ability to achieve ideal roadside conditions.
- Distracted driving.
- Funding for guardrail installation.
- Narrow lane widths impact bicycle and pedestrian safety as well as the ability to install edge line rumble strips.
- Amish buggies and active transportation related to Amish travel.
- Funding for overhead flashing lights at the intersection of county roads and state routes.
- Speed limit enforcement.
- Seatbelt usage and enforcement is difficult because it is challenging to change the culture and mindset of local motorists.
- Pedestrian fatalities and accidents.
- Challenges surrounding an aging population.

While these emphasis areas help to define the regional safety challenges and focus the RSP towards the most critical crash trends, it was decided to also include distracted driving as an additional emphasis area for Harrison County. While distracted driving may not be a top emphasis area for fatal and severe crashes, as shown in Figure 2, there was a strong agreement that distracted driving is on the rise and should be addressed now, before crashes escalate to a significant share of fatal and serious injuries in the county.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Harrison County, 2010-2019

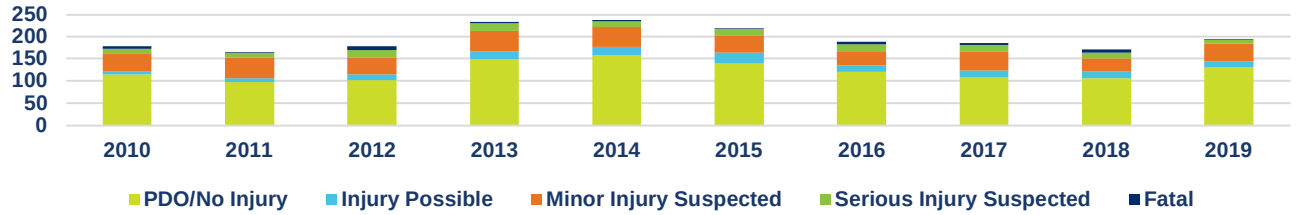


Harrison County Emphasis Areas

Roadway Departure

Roadway departure crashes accounted for 55% of all crashes that occurred on all roads in the county and 55% of all crashes that occurred on roads that are off the state system in Harrison County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis areas including unrestrained drivers (50% of fatal roadway departure crashes), speeding (40%), alcohol-related crashes (28%), younger drivers involved (28%), and older drivers involved (25%). These crashes typically resulted in collisions with fixed objects, but also include collisions with oncoming vehicles. Figure 3 shows slight fluctuations over the years. The highest two years were 2013 and 2014 with 233 and 238 crashes, respectively. The number of roadway departure crashes decreased from 2014 to 2018 with a slight uptick in 2019.

Figure 3: Roadway Departure Total Annual Crashes by Severity in Harrison County, 2010-2019



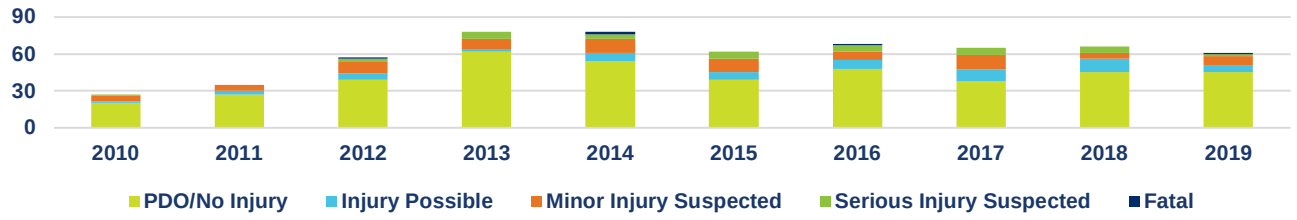
Harrison County Roadway Departure Action Steps:

- The County will continue including SafetyEdge within the annual resurfacing program.
- As part of the county's ongoing resurfacing program each segment of roadway being resurfaced will be evaluated to determine whether to include raised pavement markings, LED curve warning signs, chevron signs within curves, and/or upgraded pavement markings as part of the resurfacing project.
- The county will continue their ongoing efforts to widen the clear zone through vegetation maintenance.
- Contact Greene Township to gauge interest and assist with a Township Sign Grant application through ODOT.

Intersections

Intersection-related crashes accounted for 18% of all crashes that occurred on all roads in the county and 23% of all crashes that occurred on roads that are off the state system in Harrison County. In terms of overlapping emphasis areas that happened at an intersection, crashes involving no restraints (60%), younger drivers (60%), and roadway departure (60%) are the three most common followed by older drivers (41%). As shown in Figure 4, there was a slight decreasing trend in total intersection-related crashes from 2013-2019. Within Harrison County, 26% of fatal intersection-related crashes were angle crash types followed by sideswiping-passing (14%) and fixed-object (14%).

Figure 4: Intersection-Related Total Annual Crashes by Severity in Harrison County, 2010-2019



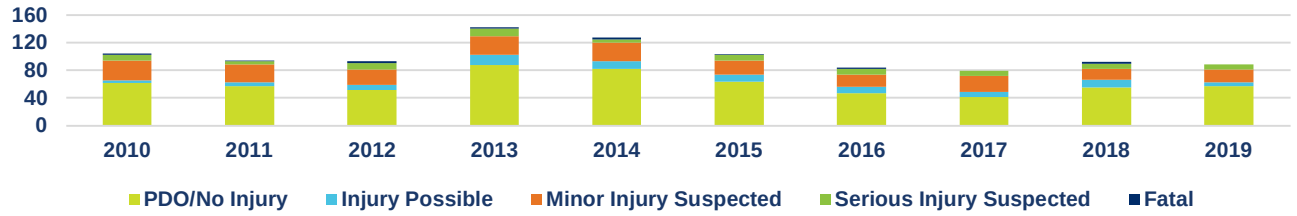
Harrison County Intersections Action Steps:

- Intersection improvement projects within the County will be evaluated to determine if installing LED advanced warning signs on each approach is an appropriate safety countermeasure that could be included in the proposed improvements.
- Develop long term strategy to eliminate "triangle intersections".

Speed

Speed-related crashes accounted for 27% of the crashes that occurred on all roads in the county and 26% of the crashes that occurred on roads that are off the state system countywide. After a high of 142 crashes in 2013, speeding-related crashes saw a downward trend for four years but began increasing in 2018 as shown in Figure 5. The most significant contributing factor within speeding-related crashes were roadway departure crashes (94% of fatal speeding crashes) followed by unrestrained occupants (59%), alcohol-related crashes (47%), and younger drivers (24%). Approximately 37% of fatal speeding-related crashes occurred off of the state system. Of these crashes, 24% occurred on county roads, 9% occurred on township roads and 4% occurred on city/ village roads.

Figure 5: Speed-Related Total Annual Crashes by Severity in Harrison County, 2010-2019



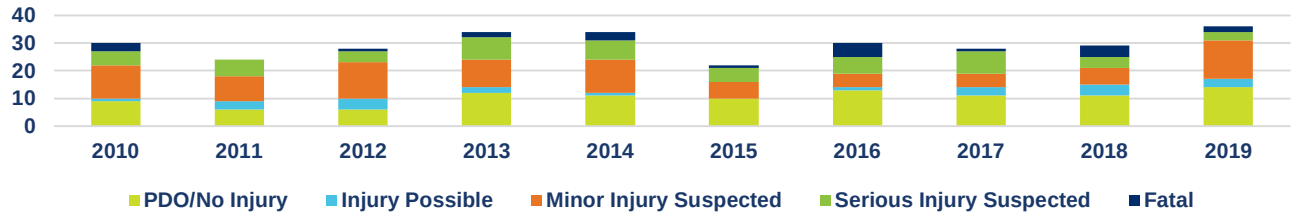
Harrison County Speeding Action Steps:

- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- Determine locations suitable for NHTSA Speeding and/or Seatbelt Usage information using billboards or signs (signs/ banners will need to be obtained from OSHP/ ODPS).

Unrestrained Occupants

Crashes that involved unrestrained occupants were the second highest contributor to fatalities, following roadway departure crashes, from 2010-2019. As shown in Figure 6, unrestrained occupant crashes accounted for 22 fatalities in Harrison County during this time. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occurred throughout the day and night with no discernable tie to traffic trends.

Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Harrison County, 2010-2019



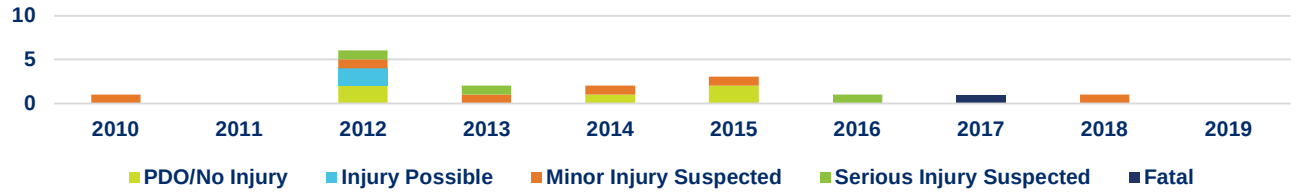
Harrison County Unrestrained Occupants Action Steps:

- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- The County, Cities, Villages and other public agencies will maintain and expand their ongoing seatbelt usage rules in County, City and Village vehicles.

Non-Motorized Users (Bicycle/Pedestrian/ Buggies/ Other Non-Motorists)

Active transportation was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active transportation, as shown in Figure 7. Throughout both the region and Harrison County, bicycle and pedestrian crashes pose a wide array of challenges. From developing bike and pedestrian facilities in urban/ suburban areas like Cadiz to accommodating Amish communities and alerting motorists to potential buggies/ pedestrians on rural/ remote roadways, this emphasis area includes many scenarios that can be classified as rare but high risk. Unlike other emphasis areas, active transportation crashes are more likely to result in an injury than a property damage only crash.

Figure 7: Non-Motorized Users Total Annual Crashes by Severity in Harrison County, 2010-2019



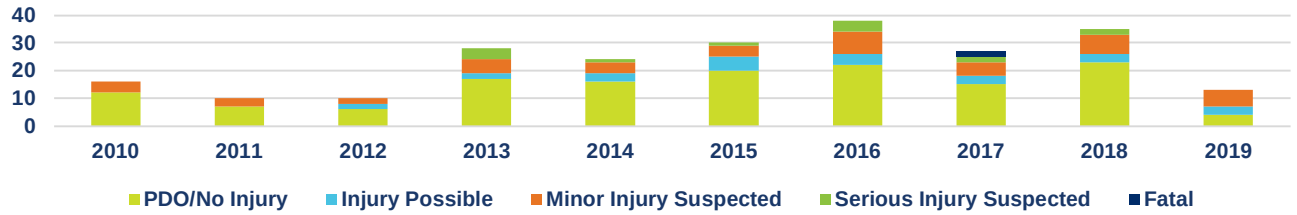
Harrison County Non-Motorized Users Action Steps:

- Erect LED bicycle/pedestrian crossing warning signs at existing trail crossings.
- OMEGA will partner with the Harrison Hills School District to maintain and update the Harrison Hills Safe Routes to School plan.

Distracted Driving

Based on discussions with representatives from Harrison County and Safe Communities, it was decided to add distracted driving as the sixth emphasis area for Harrison County. While these crashes do not rank high on the ten-year analysis, the perception is that they are increasing at an alarming rate in the county. While some of this increase represents efforts by law enforcement to better capture distracted driving on crash reports, the anecdotal evidence backs up the data that drivers are distracted now more than ever.

Figure 8: Distracted Driving Total Annual Crashes by Severity in Harrison County, 2010-2019



Harrison County Distracted Driving Action Steps:

- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.

Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table below use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Harrison County with the highest EPDO crash frequency are as follows:

CR-21 from MP 2.46 to MP 2.63:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	1	37.93	37.93
Minor Injury (B)	0	6.55	0.00
Possible Injury (C)	0	4.44	0.00
Property Damage Only (O)	0	1	0.00
Total	1	-	37.93

To calculate the EPDO crash rate the following formula is used:

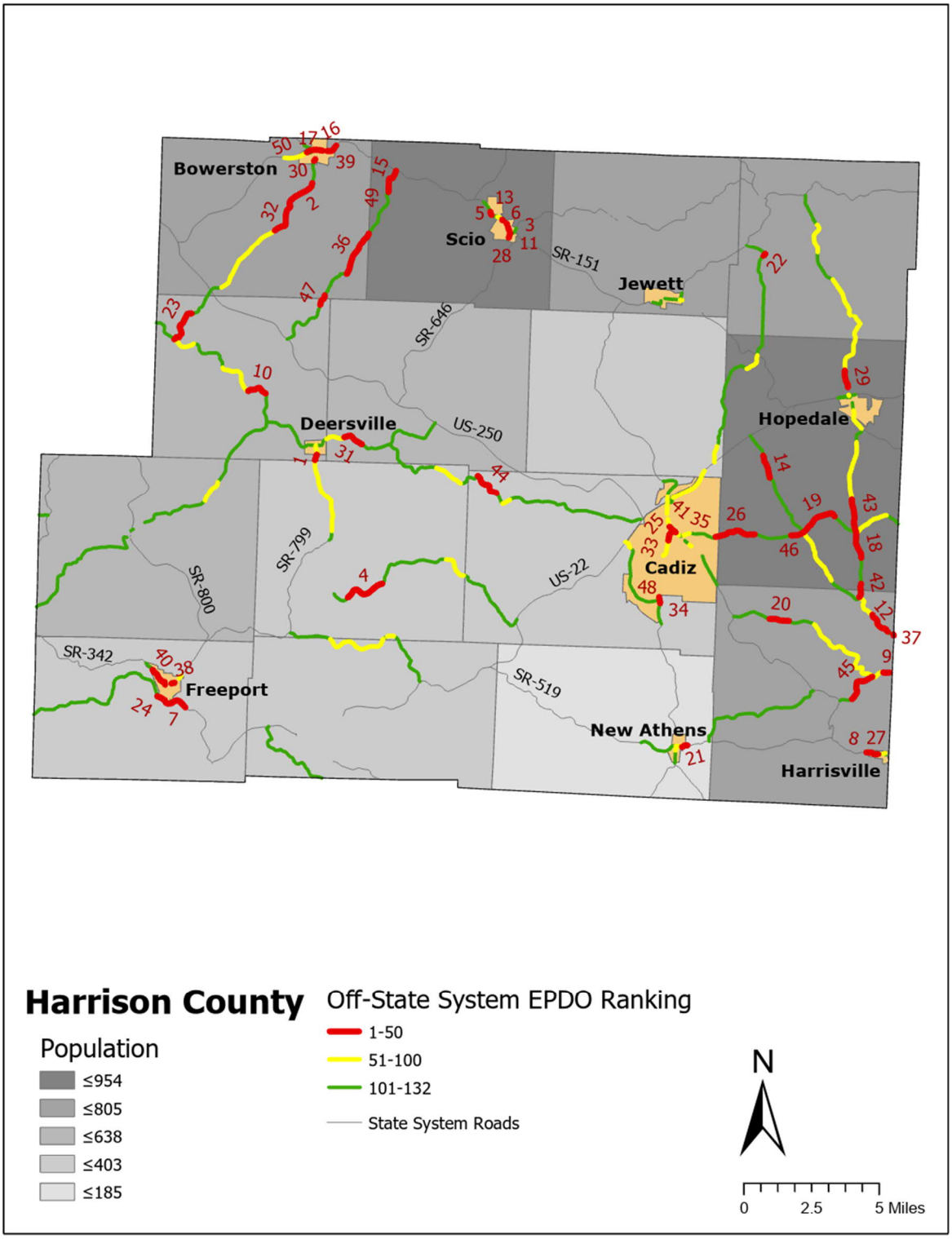
$$\boldsymbol{EPDO\ Crash\ Rate} = \frac{\boldsymbol{C\ x\ 1{,}000{,}000}}{\boldsymbol{N\ x\ V\ x\ 365\ x\ L}} = \frac{\boldsymbol{37.93\ x\ 1{,}000{,}000}}{\boldsymbol{5\ x\ 473\ x\ 365\ x\ 0.17}} = \boldsymbol{258.5}$$

Where:

- *C* = EPDO Total Value from the table above (37.93)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (473 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.17)

High Crash SEGMENTS

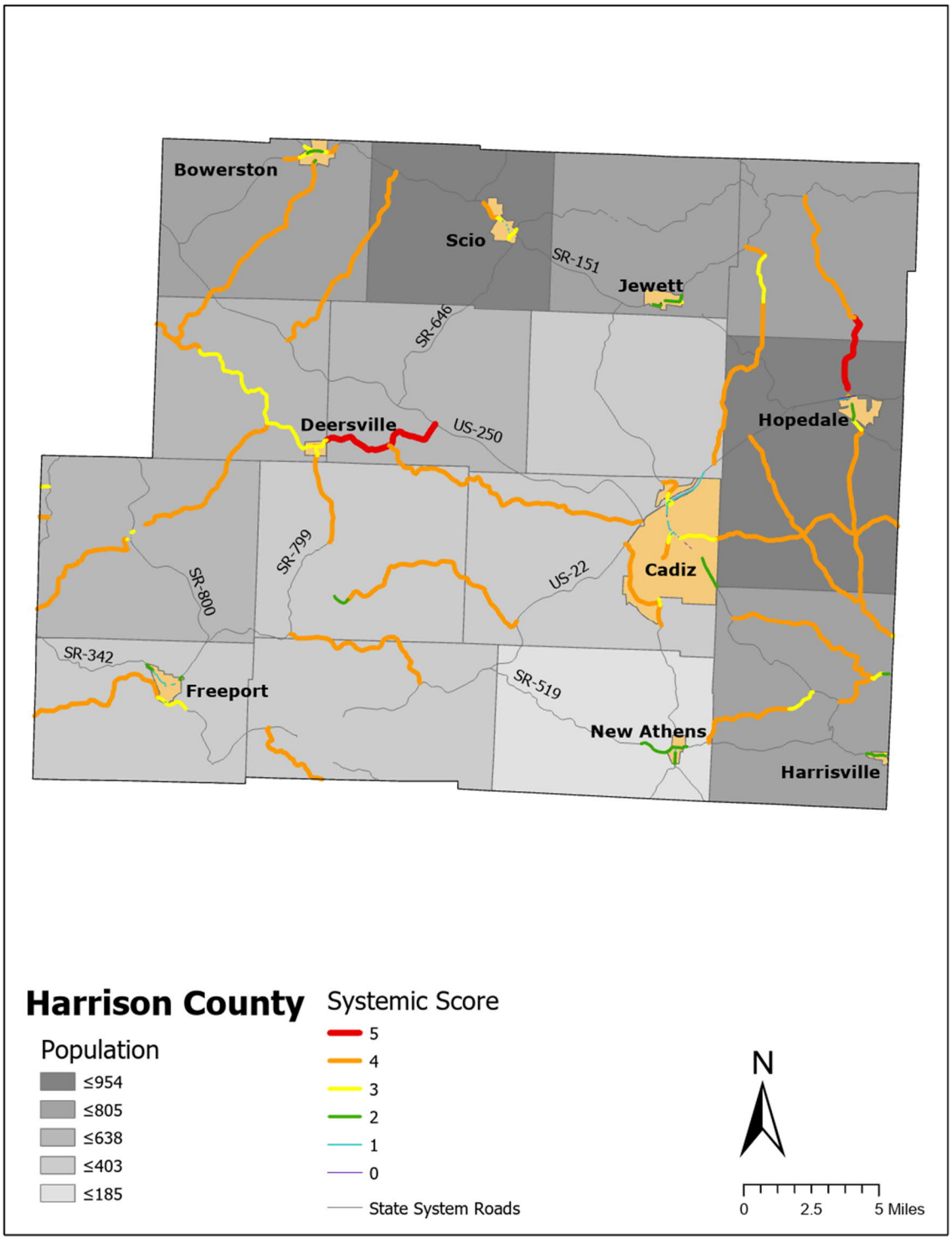
The following segments represent the top crash rate segments by crash severity in Harrison County. The road segment with the highest frequency and severity of crashes in Harrison County is Mallarnee Road (CR-21) between the mile points 2.46 and 2.63. Safety improvements and infrastructure projects at these locations will address the areas in the County with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	CR	21	2.46	2.63	MALLARNEE RD	County	258.5
2	CR	8	8.74	9.58	PLUM RUN RD	County	114.0
3	SR	151	11.55	11.67	MAIN ST	Municipal	92.0
4	CR	1	5.39	6.60	BRUSHY FORK RD	County	89.0
5	SR	151	10.84	10.94	SR-151	Municipal	86.1
6	SR	151	11.43	11.55	MAIN ST	Municipal	63.4
7	SR	800	2.48	3.30	SR-800	Municipal	59.2
8	US	250	30.16	30.40	MAIN ST	Municipal	57.2
9	CR	41	6.44	6.71	GEORGETOWN-ADENA RD	Municipal	57.1
10	CR	2	3.89	4.47	MORAVIAN TRAIL RD	County	53.4
11	SR	151	11.67	11.96	MAIN ST	Municipal	53.2
12	CR	13	11.15	11.85	BLAIRMONT RD	County	51.3
13	SR	151	11.28	11.43	MAIN ST	Municipal	48.3
14	CR	13	5.19	5.86	UPPER CLEARFORK RD	County	38.5
15	CR	25	0.00	0.11	CONOTTON RD	County	37.2
16	SR	151	5.50	5.74	SR-151	Municipal	32.1
17	SR	151	4.96	5.28	SR-151	Municipal	31.4
18	CR	14	1.13	1.88	ROSE VALLEY RD	County	29.6
19	CR	12	3.97	5.10	UNIONVALE RD	County	29.2
20	CR	15	3.45	4.02	FOX'S BOTTOM RD	County	27.6
21	SR	519	6.60	6.78	WHEELING ST	Municipal	26.5
22	CR	51	6.99	7.10	AMSTERDAM RD	County	22.7
23	CR	8	3.05	4.36	PLUM RUN RD	County	19.9
24	CR	10	6.81	7.08	BURRELL AVE	Municipal	18.9
25	SR	9	8.41	8.51	MAIN ST	Municipal	17.7
26	CR	12	1.14	2.52	UNIONVALE RD	County	17.1
27	US	250	30.40	30.51	MAIN ST	Municipal	16.4
28	SR	646	6.39	6.53	SR-646	Municipal	16.2
29	CR	4	0.23	0.73	MILLER STATION RD	County	15.6
30	CR	8	10.22	10.57	LIBERTY ST	Municipal	15.3
31	CR	2	8.04	8.64	DEERSVILLE RIDGE RD	County	14.6
32	CR	8	7.66	8.74	PLUM RUN RD	County	14.3
33	SR	9	8.16	8.41	ST CLAIR AVE	Municipal	13.6
34	SR	9	6.27	6.37	CADIZ-NEW ATHENS RD	Municipal	13.3
35	US	250	19.99	20.17	MARKET ST	Municipal	13.2
36	CR	25	2.11	3.46	BEAVER DAM RD	County	12.1
37	CR	13	12.03	12.25	BLAIRMONT RD	County	11.6
38	SR	800	3.91	4.19	MAIN ST	Municipal	11.5
39	SR	151	5.40	5.50	SR-151	Municipal	11.2
40	SR	342	4.18	4.87	MAIN ST	Municipal	11.0
41	US	250	19.84	19.99	MARKET ST	Municipal	10.3
42	CR	14	0.00	0.40	ROSE VALLEY RD	County	9.4
43	CR	14	1.88	2.84	ROSE VALLEY RD	County	9.3
44	CR	2	12.84	13.64	DEERSVILLE RIDGE RD	County	9.0
45	CR	41	5.05	6.08	GEORGETOWN-ADENA RD	County	8.8
46	CR	12	3.58	3.97	UNIONVALE RD	County	8.7
47	CR	25	4.41	4.73	BEAVER DAM RD	County	8.5
48	SR	9	6.37	7.71	CADIZ-NEW ATHENS RD	Municipal	7.9
49	CR	25	0.11	0.72	CONOTTON RD	County	7.9
50	SR	151	4.82	4.96	SR-151	Municipal	7.7

HIGH RISK SEGMENTS

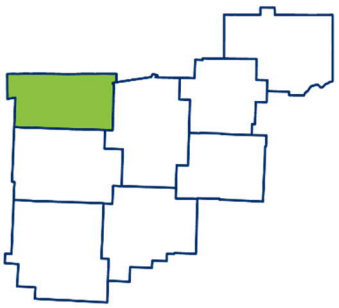
The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Risk factors are any roadway or operations attribute associated with an overrepresentation of fatal and serious injury crashes. For more information on the systemic analysis process, refer to Appendix B of the OMEGA RSP. Safety improvements and infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.



Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	1	0.00	6.60	BRUSHY FORK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	2	0.00	1.70	MORAVIAN TRAIL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	2	7.00	7.16	MAIN ST	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	2	7.51	9.47	DEERSVILLE RIDGE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	2	9.47	18.25	DEERSVILLE RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	4	0.00	0.23	MILLER STATION RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	4	0.23	2.48	MILLER STATION RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	4	2.48	6.54	MILLER STATION RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	6	0.00	3.95	NORRIS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	6	4.75	9.78	NORRIS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	8	3.05	10.22	PLUM RUN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	10	0.00	2.63	BELMONT RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	10	7.08	11.78	BIRMINGHAM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	1.14	7.34	UNIONVALE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	13	4.50	7.77	UPPER CLEARFORK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	13	7.81	10.45	UNIONVALE-KENWOOD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	13	10.45	12.03	BLAIRMONT RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	14	0.00	5.00	ROSE VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	15	0.00	5.09	FOX'S BOTTOM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	0.00	0.61	BROWN HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	20	0.00	4.30	KENNEDY RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	21	0.00	2.63	MALLARNEE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	24	0.00	0.25	MAYS SCHOOL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	25	0.00	0.96	CONOTTON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	25	0.96	6.38	BEAVER DAM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	29	0.00	2.37	INDUSTRIAL PARK RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	33	0.00	0.76	DOUGLAS TURN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	41	0.00	2.95	GEORGETOWN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	41	4.69	6.08	GEORGETOWN-ADENA RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	51	0.26	4.66	BAKER'S RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	51	4.66	5.67	AMSTERDAM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	55	0.00	1.82	DEERSVILLE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
SR	9	5.66	6.27	CADIZ-NEW ATHENS RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	9	7.71	8.16	ST CLAIR AVE	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	9	9.65	10.39	CADIZ-JEWETT RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	151	4.15	4.58	SR-151	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	151	5.40	5.74	SR-151	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	151	10.49	11.12	SR-151	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph

HOLMES COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Holmes County is unique among the OMEGA region on the safety front as they have their own county specific safety plan. In March 2020, Holmes County developed an independent Local Road Safety Plan (LRSP) that analyzed crashes occurring between 2009 to 2018. As it relates to the OMEGA RSP, the Holmes County LRSP identifies specific emphasis areas, goal, and actions/ strategies which signify the County's contribution to improving safety in the OMEGA region.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 below shows that within Holmes County, there were a total of 50 fatalities and 336 serious injuries resulting from traffic collisions from 2010-2019. Fatalities range from 2 to 9 per year. Serious injuries peaked at 40 in 2010 and reached a ten year low of 26 in 2019. Table 1 also shows that the frequency of fatalities and serious injuries that occur each year typically hovers around the ten-year annual average.

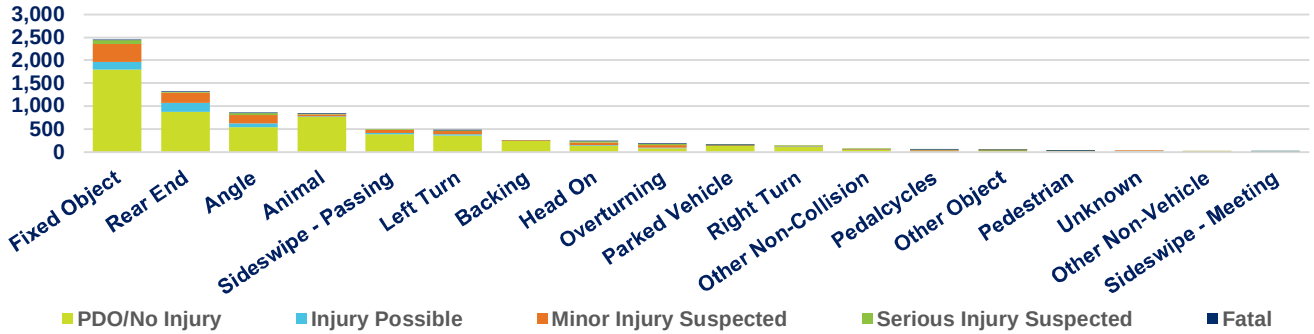
Table 1: Holmes County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	4	40
2011	4	39
2012	7	20
2013	6	39
2014	3	34
2015	4	37
2016	4	39
2017	7	26
2018	2	36
2019	9	26
10-YEAR TOTAL	50	336
ANNUAL AVERAGE	5	34

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash types for all crash severities in Holmes County is fixed object crashes (32%) followed by rear end crashes (17%), angle crashes (11%), and animal-related crashes (11%). The Holmes County crash type distribution follows the same general trends as the OMEGA regional crash breakdown.

Figure 1: Holmes County Crashes by Type and Severity, 2010-2019



HOLMES COUNTY SAFETY STRATEGY DEVELOPMENT

The Holmes County Local Road Safety Plan was developed to address the vision and objective of a safer Holmes County by reducing the fatalities and serious injuries resulting from crashes by 2% per year. This aligned with the Toward Zero Deaths initiative to reduce road fatalities to zero per year by 2050. Crash data from 2009 to 2018 for Holmes County was analyzed to find patterns in crash trends, safety performance, crash

types, contributing factors, and crash locations. This data was used to recognize emphasis areas and specific hazardous locations that required improvement, especially focusing on active transportation, and making roadways more accessible and safer for Amish buggies.

EMPHASIS AREAS

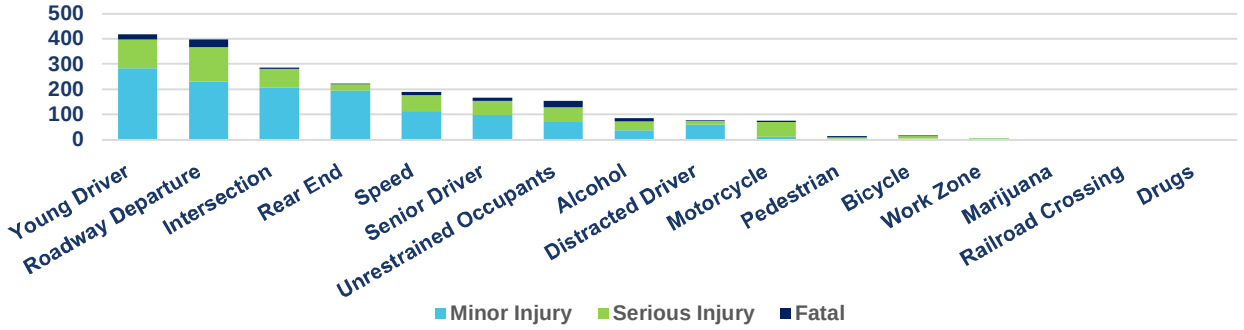
Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may fall represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crashes would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). Through the development of the Holmes County LRSP, the County selected the following emphasis areas:

- Roadway departures*
- Younger driver
- Unrestrained occupants*
- Older driver
- Bicycle*
- Pedestrian*
- Motorcycle
- Amish buggy*

Note: An asterisk (*) indicates the EA is represented in the OMEGA RSP.

While these emphasis areas are not one-for-one with the emphasis areas selected for the OMEGA RSP, it's clear that the Holmes County LRSP emphasis areas have significant overlap with the RSP emphasis areas.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Holmes County, 2010-2019

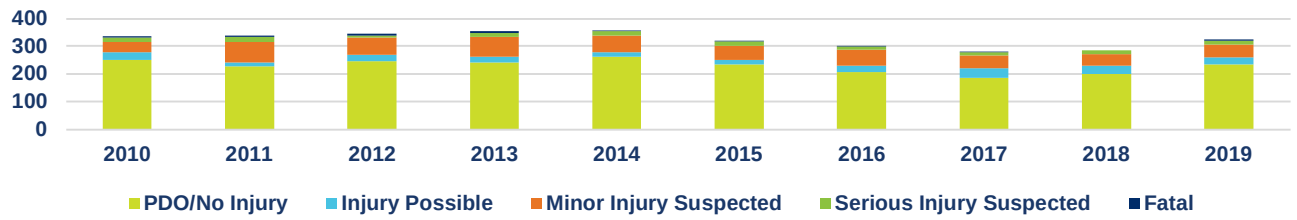


OMEGA RSP Emphasis Areas (as they relate to Holmes County)

Roadway Departure

Roadway departure crashes accounted for 42% of all crashes that occurred on all roads in the county and 38% of all crashes that occurred on roads that are off the state system in Holmes County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis area including speeding (35% of fatal roadway departure crashes), unrestrained drivers (61%), younger drivers involved (42%), and alcohol-related crashes (32%). These crashes typically resulted in collisions with fixed objects, but also included collisions with oncoming vehicles. Figure 3 shows that despite slight fluctuations overs the years, the number of roadway departure crashes has remained relatively constant over the last ten years.

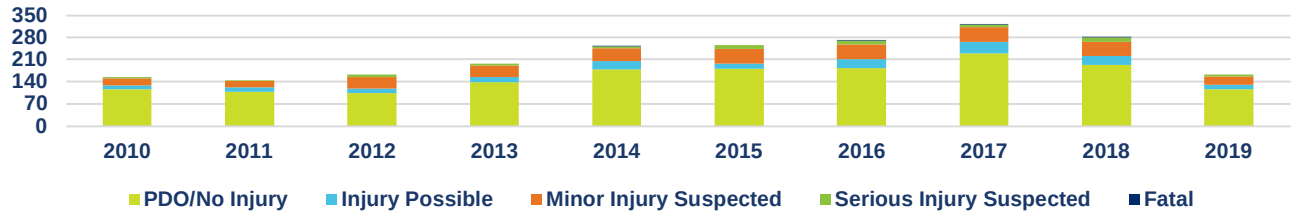
Figure 3: Roadway Departure Total Annual Crashes by Severity in Holmes County, 2010-2019



Intersections

Intersection-related crashes accounted for 28% of all crashes that occurred on all roads in the county and 30% of all crashes that occurred on roads that are off the state system in Holmes County. In terms of overlapping emphasis area crashes for intersections, crashes involving older drivers (67%), unstrained occupants (50%), and young drivers (50%) were the three most common. From 2010-2019, there was an increasing trend in total intersection-related crashes, with the five-year average increasing at 1.5 crashes per year within the county. Within Holmes County, 40% of fatal intersection-related crashes were angle crash types followed by rear-end crashes at 18%.

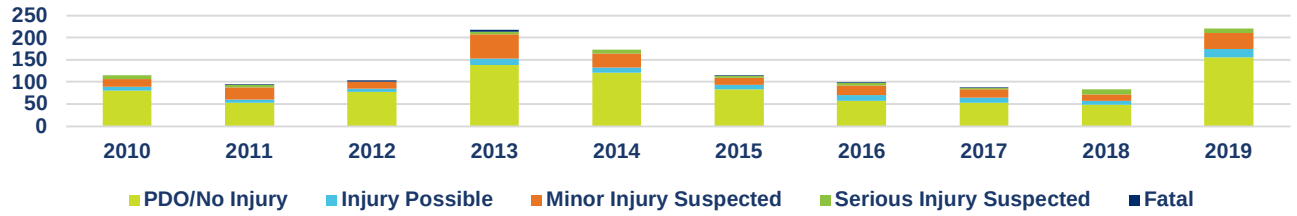
Figure 4: Intersection-Related Total Annual Crashes by Severity in Holmes County, 2010-2019



Speed

Speed related crashes accounted for 16% of the crashes that occurred on all roads in the county and 17% of the crashes that occurred on roads that are off the state system countywide. After a high of 546 crashes in 2013, speeding-related crashes saw a slight downward trend for two years but increased every year from 2015-2019. The most significant contributing factor within speeding-related crashes were roadway departure crashes (92% of fatal speeding crashes) followed by unrestrained occupants (50%) and young driver crashes (42%). 38% of fatal speeding-related crashes occurred on county (21%), township (12%), or city/ village (5%) roads.

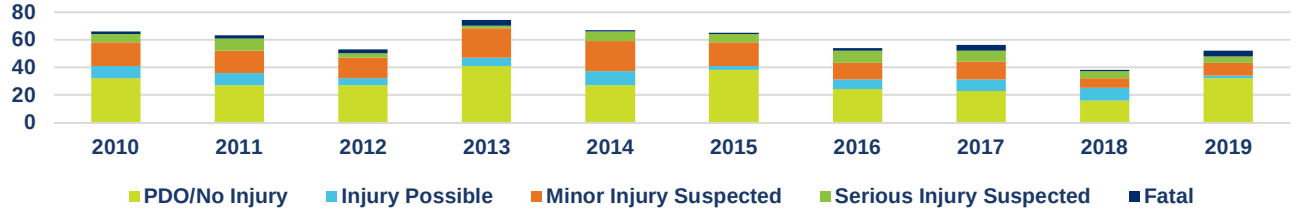
Figure 5: Speed-Related Total Annual Crashes by Severity in Holmes County, 2010-2019



Unrestrained Occupants

Unrestrained occupants were the third highest contributor to fatalities, following roadway departures and speed-related crashes. As shown in Figure 6, unrestrained occupant crashes accounted for 24 fatalities in Holmes County from 2010-2019. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occur throughout the day and night with no discernable tie to traffic trends.

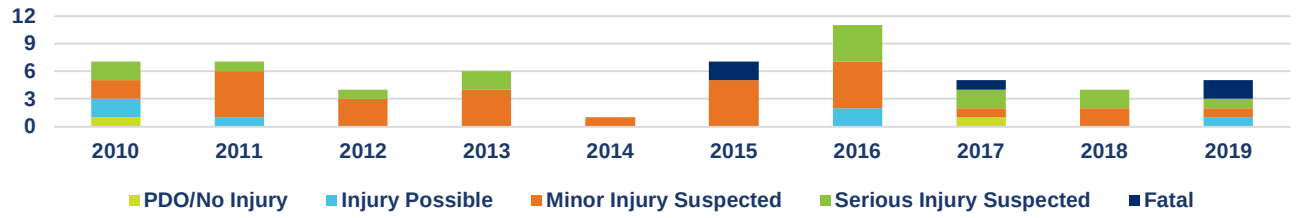
Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Holmes County, 2010-2019



Non-Motorized Users (Bicycle/Pedestrian/ Buggies/ Other Non-Motorists)

Non-Motorized Users was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active transportation, as shown in Figure 7. Throughout the region and throughout Holmes County, pedestrians, bicyclists, riders on animals, or animal-drawn buggies represent a wide array of challenges. From developing bike and pedestrian facilities in larger urban/ suburban areas to accommodating Amish communities and alerting motorists to potential buggies/ pedestrians on rural/ remote roadways, this emphasis area includes many scenarios that can be classified as rare but high risk. Unlike other emphasis areas, active transportation crashes are more likely to result in an injury than property damage only.

Figure 7: Non-Motorized Users Total Annual Crashes by Severity in Holmes County, 2010-2019



Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Holmes County with the highest EPDO crash frequency are as follows:

CR-160 from MP 1.76 to MP 2.20:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	1	37.93	37.93
Minor Injury (B)	2	6.55	13.10
Possible Injury (C)	2	4.44	8.88
Property Damage Only (O)	3	1	3.00
Total	8	-	62.91

To calculate the EPDO crash rate the following formula is used:

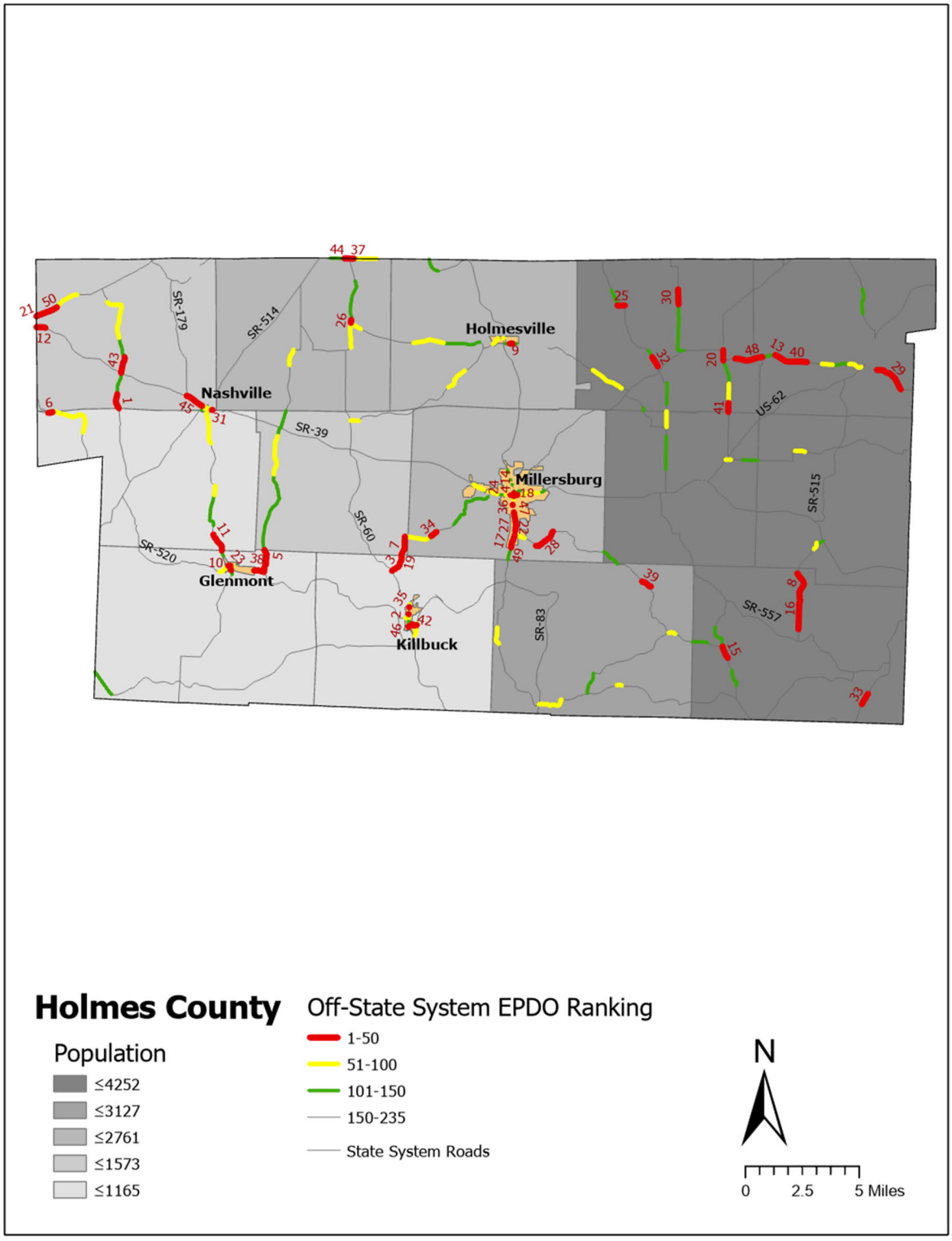
$$EPDO\ Crash\ Rate = \frac{C\ x\ 1{,}000{,}000}{N\ x\ V\ x\ 365\ x\ L} = \frac{62.91\ x\ 1{,}000{,}000}{5\ x\ 2227\ x\ 365\ x\ 0.436} = 35.50$$

Where:

- *C* = EPDO Total Value from the table above (62.91)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (2227 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.436)

HIGH CRASH SEGMENTS

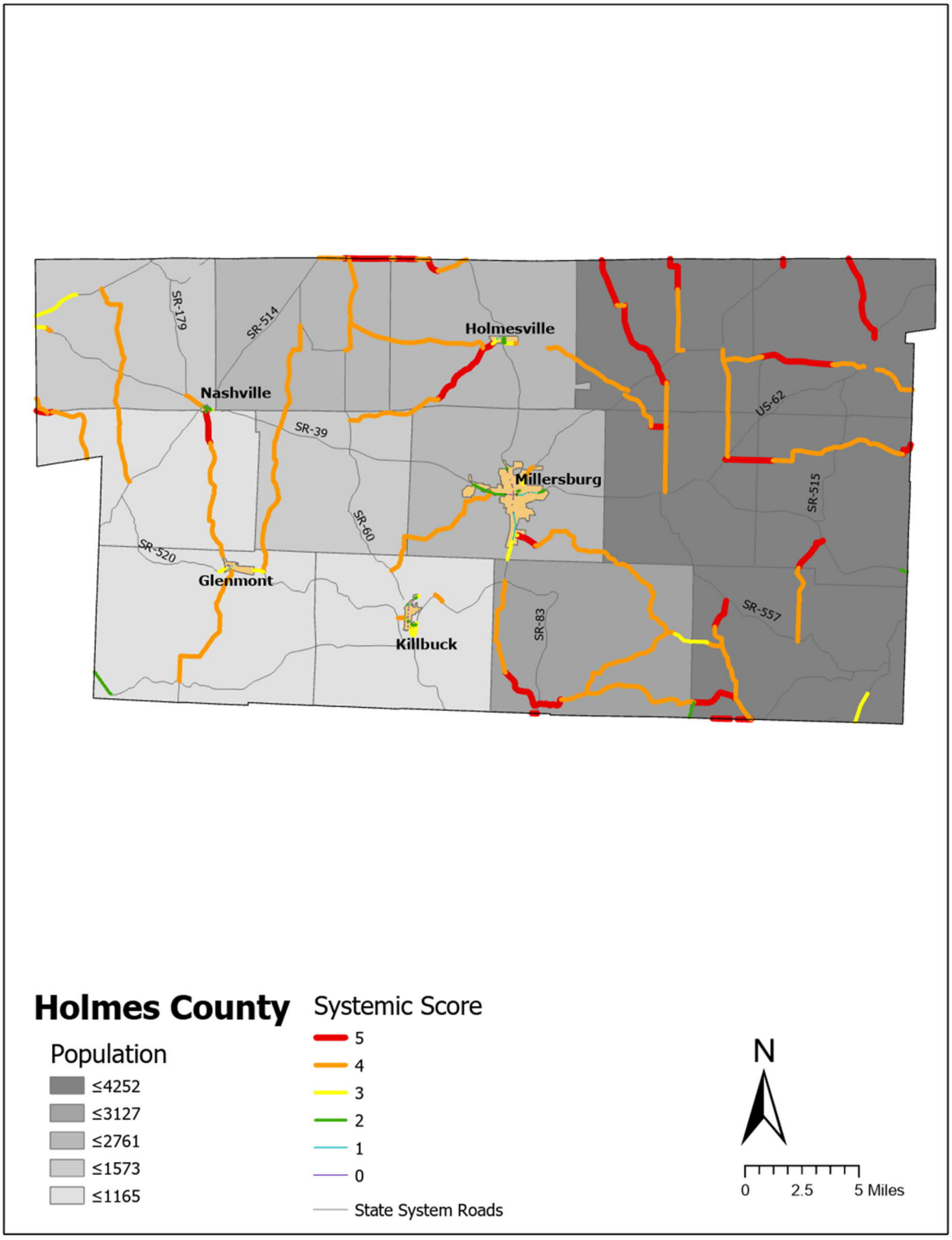
The following segments represent the top crash rate segments by crash severity in Carroll County. The road segment with the highest frequency and severity of crashes in Holmes County is CR-22 between the mile points 4.70 and 5.20. Safety improvements and infrastructure projects at these locations will address the areas in the county with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	CR	22	4.70	5.20	CR 22	County	88.4
2	SR	60	3.87	4.00	MAIN ST	Municipal	87.2
3	CR	292	0.00	0.51	CR 292	County	81.7
4	SR	241	0.00	0.14	CRAWFORD ST	Municipal	75.4
5	CR	51	0.00	0.77	CR 51	County	66.1
6	CR	23	2.55	2.70	CR 23	County	61.7
7	CR	292	0.66	1.31	CR 292	County	59.9
8	CR	70	3.06	4.06	CR 114	County	54.1
9	CR	189	0.14	0.31	BENTON AVE	County	47.4
10	SR	520	5.32	5.46	MAIN ST	Municipal	45.6
11	CR	52	0.56	1.19	CR 52	County	37.1
12	SR	39	0.00	0.31	MAIN ST	Municipal	36.1
13	CR	160	1.76	2.20	CR 160	County	35.5
14	US	62	19.60	19.71	CLAY ST	Municipal	34.0
15	CR	600	2.31	2.74	CR 600	County	31.6
16	CR	114	1.75	2.74	CR 114	County	29.7
17	US	62	18.13	18.30	WASHINGTON ST	Municipal	29.7
18	SR	39	17.26	17.38	JACKSON ST	Municipal	29.1
19	CR	292	0.51	0.66	CR 292	County	25.4
20	CR	77	4.69	5.04	CR 77	County	24.9
21	SR	3	0.00	0.51	WOOSTER RD	Municipal	24.9
22	US	62	18.75	19.03	WASHINGTON ST	Municipal	24.7
23	CR	25	4.79	4.94	CLIFTON ST	Municipal	24.3
24	SR	83	9.02	9.17	CLAY ST	Municipal	23.8
25	CR	201	6.85	7.11	CR 201	County	21.7
26	CR	318	1.03	1.14	CR 318	County	21.5
27	US	62	18.43	18.75	WASHINGTON ST	Municipal	19.8
28	CR	68	0.00	0.80	CR 68	County	19.5
29	CR	160	5.33	6.45	CR 160	County	19.3
30	CR	235	1.72	2.23	CR 235	County	19.1
31	SR	39	6.70	7.06	MILLERSBURG	Municipal	19.0
32	CR	201	4.36	4.73	CR 201	County	18.7
33	SR	93	0.65	1.05	SR-93	Municipal	18.6
34	CR	292	2.23	2.46	CR 292	County	18.5
35	SR	60	4.10	4.22	MAIN ST	Municipal	18.1
36	US	62	19.30	19.49	CLAY ST	Municipal	17.9
37	CR	1	1.00	1.15	CR 1	County	16.7
38	SR	520	6.28	6.62	SR-520	Municipal	16.4
39	CR	68	4.62	4.99	CR 68	County	16.3
40	CR	160	2.20	2.89	CR 160	County	16.2
41	CR	77	2.94	3.25	CR 77	County	15.7
42	CR	35	0.18	0.36	CR 35	Municipal	15.7
43	CR	22	5.92	6.48	CR 22	County	15.7
44	CR	1	0.83	1.00	CR 1	County	15.5
45	SR	39	5.72	6.35	SR-39	Municipal	15.1
46	SR	60	3.45	3.58	MAIN ST	Municipal	14.5
47	US	62	19.03	19.30	WASHINGTON ST	Municipal	14.5
48	CR	160	0.40	1.33	CR 160	County	13.9
49	US	62	17.86	18.13	WASHINGTON ST	Municipal	13.7
50	SR	3	0.51	0.74	WOOSTER RD	Municipal	13.7

HIGH RISK SEGMENTS

The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Safety improvements and infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.

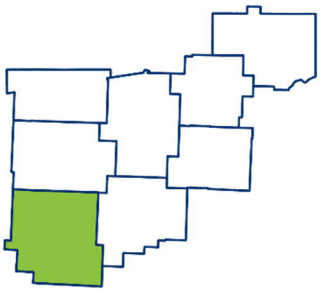


Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	1	0.00	0.83	CR 1	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	1	0.83	2.40	CR 1	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	1	2.40	2.54	CR 1	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	1	2.54	3.26	CR 1	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	1	3.26	3.67	CR 1	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	1	3.67	4.21	CR 1	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	1	4.21	5.27	CR 1	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	8.24	8.84	CR 12	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	9.08	9.54	CR 12	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	0.00	0.93	CR 19	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	0.00	0.18	CR 19	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	19	0.93	5.87	CR 19	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	22	2.18	9.27	CR 22	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	23	0.00	2.55	CR 23	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	23	2.55	3.07	CR 23	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	25	0.00	4.79	CR 25	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	51	0.00	5.16	CR 51	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	51	5.19	8.95	CR 51	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	52	0.37	4.50	CR 52	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	52	4.50	5.53	CR 52	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	58	5.69	6.39	CR 58	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	59	0.00	4.03	CR 59	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	59	4.03	5.62	CR 59	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	68	0.00	6.92	CR 68	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	70	3.06	4.06	CR 114	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	77	1.46	5.04	CR 77	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	114	1.34	2.74	CR 114	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	114	3.73	3.92	CR 114	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	114	3.92	5.22	CR 114	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	150	0.00	1.77	CR 150	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	150	1.77	5.00	CR 150	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	160	0.00	0.40	CR 160	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	160	0.40	1.33	CR 160	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	160	1.33	3.75	CR 160	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	160	3.75	4.31	CR 160	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	160	4.31	4.77	OLD MAIN ST	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	160	4.86	5.33	CHESTNUT ST	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	160	5.33	6.86	CR 160	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	168	0.00	1.60	CR 168	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	168	1.60	6.48	CR 168	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	168	6.48	7.02	CR 168	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	186	0.00	2.93	CR 186	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	189	0.31	1.49	BENTON	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	189	1.49	4.63	CR 189	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	201	0.00	3.66	CR 201	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	201	3.66	6.85	CR 201	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	201	6.85	7.11	CR 201	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	201	7.11	8.71	CR 201	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	207	0.28	1.81	CR 207	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	207	1.81	2.31	CR 207	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	216	0.00	0.23	CR 216	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	229	0.00	0.49	CR 229	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	230	0.00	0.68	CR 230	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	235	0.00	2.23	CR 235	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	235	2.23	2.99	CR 235	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	292	0.00	5.07	CR 292	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	318	0.00	3.25	CR 318	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	320	0.00	3.22	CR 320	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	320	3.22	5.94	CR 320	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	329	0.00	4.75	CR 329	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	600	0.00	3.52	CR 600	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	600	3.52	4.51	CR 600	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	621	0.00	0.23	CR 621	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	622	1.05	1.39	CR 622	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
SR	39	0.31	0.53	SR-39	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	39	5.72	6.35	SR-39	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	241	0.71	1.15	MASSILLON RD	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
TR	119	1.20	1.72	TR 119	Township	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph

MUSKINGUM COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Muskingum County is one of the eight member governments that will benefit from being included in this safety plan.

The United States Census Bureau estimates the 2019 population of Muskingum County at 86,215 residents. The county spans an area of 673 square miles with more than 1,680 miles of public roadways[1]. Although bicycle, pedestrian, and other active transportation amenities are available, and Ohio State Bicycle Route 50 runs through the northern part of the county, most residents in this county rely on cars and other vehicles as their main mode of transportation.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 below shows that within Muskingum County, there were a total of 111 fatalities and 723 serious injuries resulting from traffic collisions from 2010-2019. Two years, 2010 and 2019 (with 15 fatalities), are tied for the highest number of fatalities with 2012 (14) and 2014 (13) in second and third place, respectively. The frequency of fatalities that occurred each year typically hovered around the ten-year annual average. Serious injuries peaked at 105 in 2017 while hitting a ten-year low of 54 in 2011. Table 1 shows that the frequency of serious injuries that occurred each year typically hovered within 10 injuries on either side of the ten-year annual average.

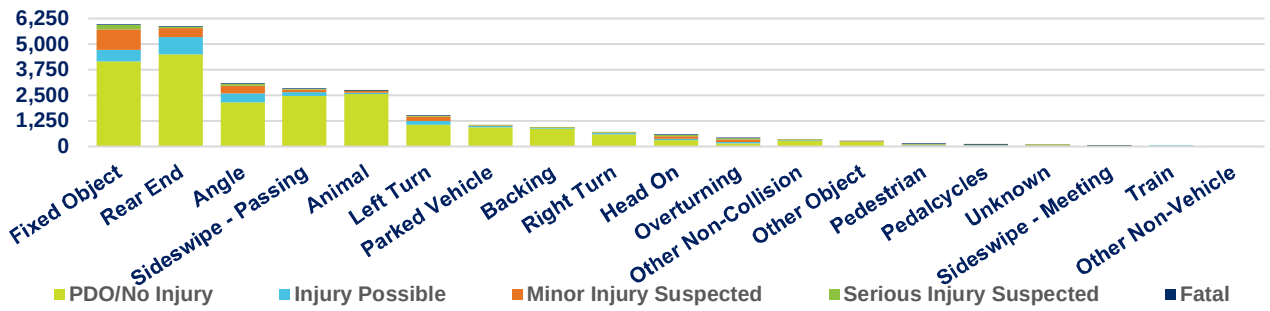
Table 1: Muskingum County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	15	64
2011	9	62
2012	14	54
2013	9	82
2014	13	66
2015	10	91
2016	6	81
2017	9	105
2018	11	56
2019	15	62
10-YEAR TOTAL	111	723
ANNUAL AVERAGE	11	72

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash types for all crash severities in Muskingum County is fixed object crashes (23%) followed by rear end crashes (22%), angle crashes (12%), and sideswiping-passing crashes (11%). The Muskingum County crash type distribution follows the same general trends as the OMEGA regional crash breakdown.

Figure 1: Muskingum County Crashes by Type and Severity, 2010-2019



[1] **Ohio County Profiles 2020 Edition, Ohio Development Services Agency Office of Research, https://www.development.ohio.gov/files/research/C1061.pdf**

COUNTY SAFETY STRATEGIES

Muskingum County is currently working to improve safety on their roadways and to reduce crashes through a variety of efforts including:

- Improving signage and pavement markings as part of their annual resurfacing program.
- Vegetation control to improve sight distance and visibility.
- Community outreach to high-risk drivers and the general motoring public through Safe Communities.
- Participation in national education and enforcement campaigns.

Talking Points

Representatives from Muskingum County identified several areas of concern for the county including:

- The terrain/ natural environment limits the width of the clear zones and the ability to achieve ideal roadside conditions.
- Seatbelt usage and enforcement is difficult because it is challenging to change the culture and mindset of local motorists.
- Distracted driving.
- Amish buggies and active transportation related to Amish travel.
- Pedestrian fatalities and accidents.
- Challenges surrounding an aging population.

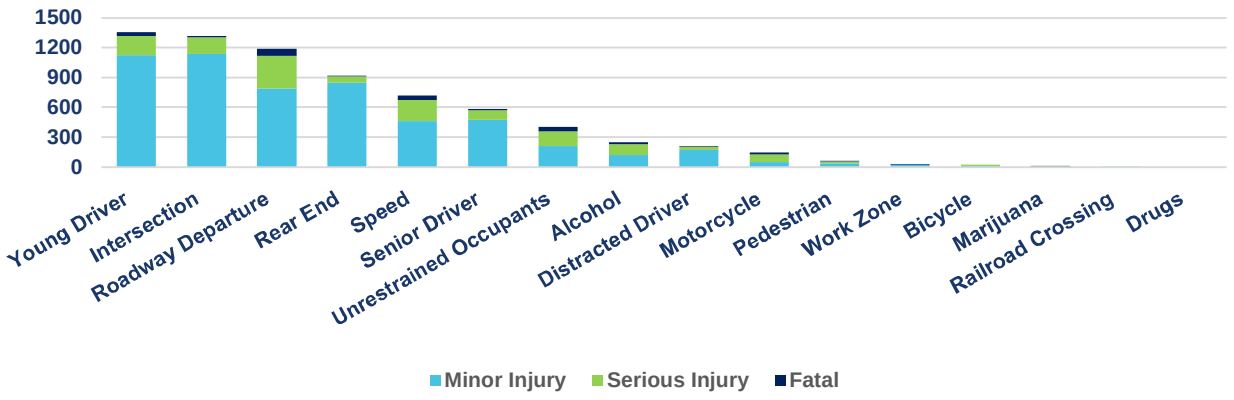
EMPHASIS AREAS

Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crash would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). The Strategic Highway Safety Plan developed by ODOT identifies ten emphasis areas to improve safety across the state. The OMEGA RSP evaluated ten years of crash data (2010-2019) to determine emphasis areas from the SHSP that best captured the traffic safety challenges within the region. Five emphasis areas were chosen to represent the OMEGA region including:

- Roadway departures
- Intersections
- Speed
- Unrestrained occupants
- Non-motorized users (bicycle/pedestrian/buggies/other non-motorists)

While these emphasis areas help to define the regional safety challenges and focus the RSP towards the most critical crash trends, it was decided to also include distracted driving as an additional emphasis area for Muskingum County. While distracted driving may not be a top emphasis area for fatal and severe crashes, as shown in Figure 2, there was a strong agreement that distracted driving is on the rise and should be addressed now, before crashes escalate to a significant share of fatal and serious injuries in the county.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Muskingum County, 2010-2019

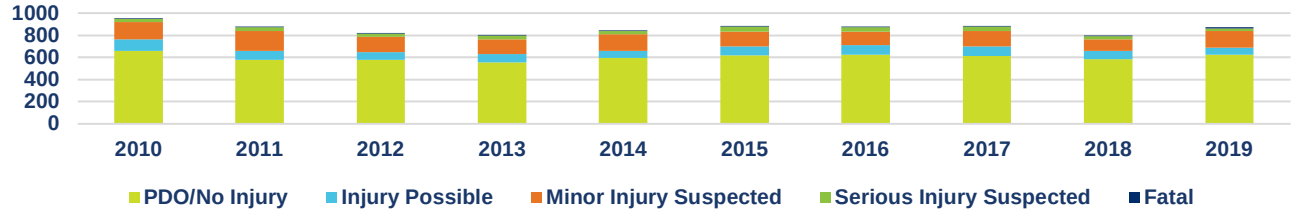


Muskingum County Emphasis Areas

Roadway Departure

Roadway departure crashes accounted for 31% of all crashes that occurred on all roads in the county and 30% of all crashes that occurred on roads that are off the state system in Muskingum County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis area including speeding (53% of fatal roadway departure crashes), unrestrained drivers (53%), younger drivers (31%), alcohol-related crashes (24%), and older drivers (16%). These crashes typically resulted in collisions with fixed objects, but also include collisions with oncoming vehicles. Figure 3 shows that despite slight fluctuations over the years, the number of roadway departure crashes has remained relatively constant from 2010-2019.

Figure 3: Roadway Departure Total Annual Crashes by Severity in Muskingum County, 2010-2019



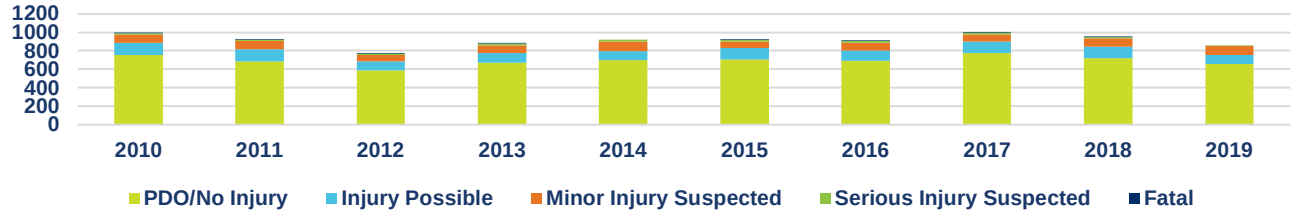
Muskingum County Roadway Departure Action Steps:

- As part of the county's ongoing resurfacing program each segment of roadway being resurfaced will be evaluated to determine whether to include raised pavement markings, LED curve warning signs, chevron signs within curves, and/or upgraded pavement markings as part of the resurfacing project.
- Expand rumble strip use.
- Identify and prioritize corridors that need to be widened.

Intersections

Intersection-related crashes accounted for 34% of all crashes that occurred on all roads in the county and 42% of all crashes that occurred on roads that are off the state system in Muskingum County. In terms of overlapping emphasis area crashes for intersections, crashes involving younger drivers (56%) are the most common followed by unrestrained drivers (44%), speed-related (38%), and crashes involving motorcycles, alcohol, and older drivers (31% each). Annual crash trends by year are shown in Figure 4. From 2010-2019, the frequency of intersection-related crashes fluctuated. The lowest number occurred in 2012 (772). The trend increased each year until 2017 when 1,002 crashes occurred. After 2017, the trend decreased. Within Muskingum County, 39% of fatal intersection-related crashes were angle crash types followed by rear-end crashes at 15% and left turn crashes at 14%.

Figure 4: Intersection-Related Total Annual Crashes by Severity in Muskingum County, 2010-2019



Muskingum County Intersections Action Steps:

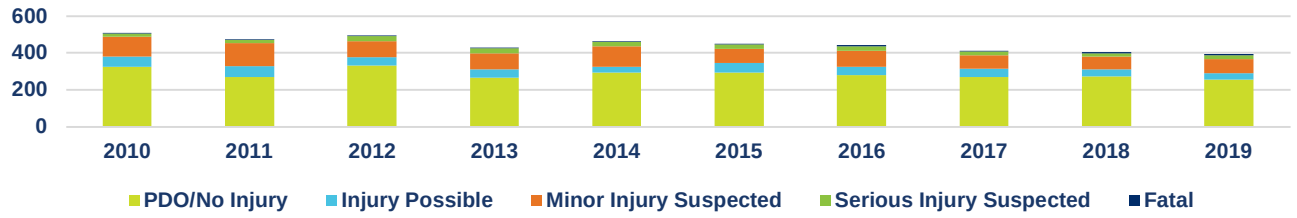
- Work to upgrade signal equipment and retime signals in the City of Zanesville.
- Use LED advanced warning signs at hot-spot intersections (City and County Roads).

Speed

Speed-related crashes accounted for 15% of the crashes that occurred on all roads in the county and 13% of the crashes that occurred on roads that are off the state system countywide. As shown in Figure 5, after a high of 507 crashes in 2010, speeding-related crashes fluctuated each year until

2014. Since 2014, speeding-related crashes decreased each year. The most significant contributing factor within speeding-related crashes were roadway departure crashes (86% of fatal speeding crashes) followed by unrestrained occupants (56%), young driver (42%), and alcohol-related crashes (30%). Approximately 60% of fatal speeding-related crashes occurred off of the state system. Of these crashes, 34% occurred on county roads, 10% occurred on township roads and 15% occurred on city/ village roads.

Figure 5: Speed-Related Total Annual Crashes by Severity in Muskingum County, 2010-2019



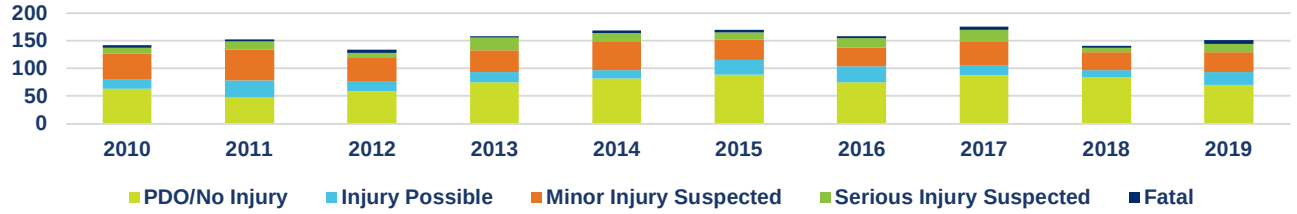
Muskingum County Speeding Action Steps:

- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- Implement dynamic speed feedback sign program in City of Zanesville.
- Engage law enforcement by sharing the Muskingum County Sub-Plan with Zanesville City Police.

Unrestrained Occupants

Crashes that involved unrestrained occupants were the second highest contributor to fatalities, following roadway departures, from 2010-2019. As shown in Figure 6, unrestrained occupant crashes accounted for 44 fatalities in Muskingum County during this time. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occur throughout the day and night with no discernable tie to traffic trends.

Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Muskingum County, 2010-2019



Muskingum County Unrestrained Occupants Action Steps:

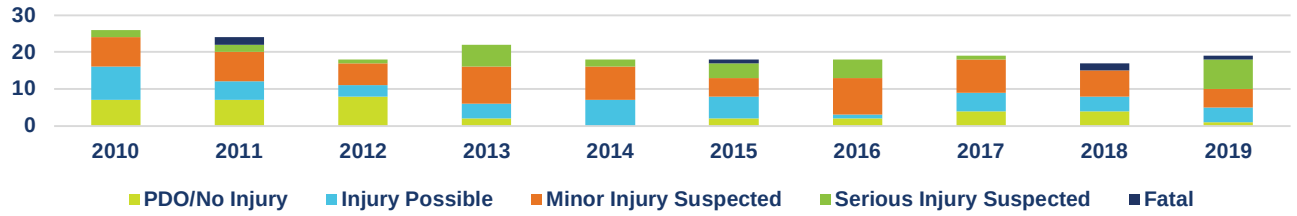
- Work with OMEGA to develop a region-wide list of traffic safety stakeholders, public agencies, and local businesses as a mailing list for dissemination of national traffic safety marketing campaign materials from NHTSA's Traffic Safety Marketing services.
- The County, Cities, Villages and other public agencies will maintain and expand their ongoing seatbelt usage rules in County, City and Village vehicles.
- Engage law enforcement by sharing the Muskingum County Sub-Plan with Zanesville City Police.

Non-Motorized Users (Bicycle/Pedestrian/ Buggies/ Other Non-Motorists)

Non-Motorized Users was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active transportation, as shown in Figure 7. Throughout both the region and Muskingum County, bicycle and pedestrian crashes represent a wide array of challenges. From developing bike and pedestrian facilities in larger

urban/ suburban areas like Zanesville to alerting motorists to potential bicycles/ pedestrians on rural/ remote roadways, this emphasis area includes many scenarios that can be classified as rare but high risk. Unlike other emphasis areas, active transportation crashes are more likely to result in an injury than a property damage only crash.

Figure 7: Non-Motorized User Total Annual Crashes by Severity in Muskingum County, 2010-2019



Muskingum County Non-Motorized User Action Steps:

- Work with OMEGA and Zanesville City Schools on developing Safe Routes to School Plan.

Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Muskingum County with the highest EPDO crash frequency are as follows:

CR-7 from MP 3.43 to MP 3.61:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	1	37.93	37.93
Minor Injury (B)	1	6.55	6.55
Possible Injury (C)	0	4.44	0
Property Damage Only (O)	0	1	0
Total	1	-	44.48

To calculate the EPDO crash rate the following formula is used:

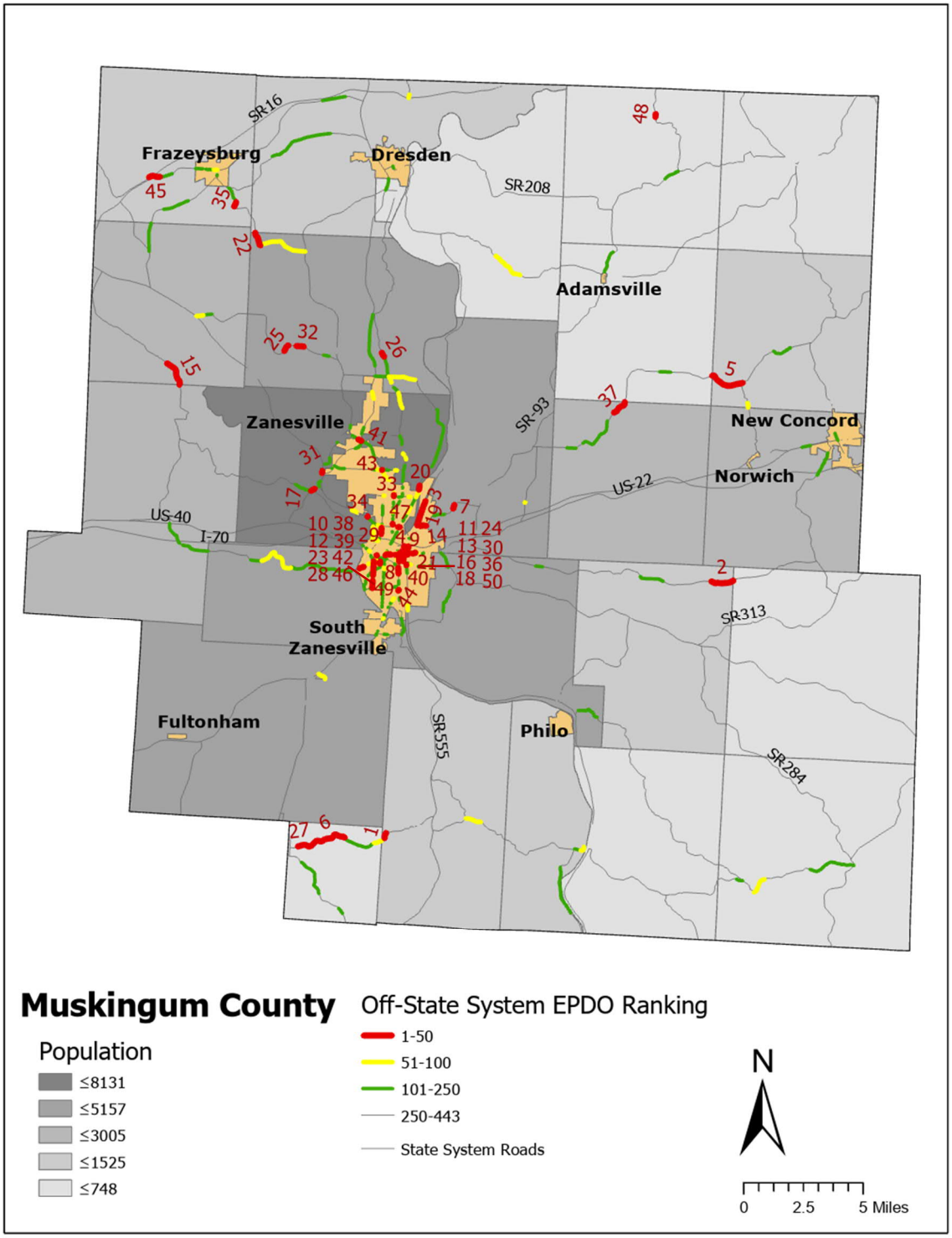
$$EPDO\ Crash\ Rate = \frac{C\ x\ 1{,}000{,}000}{N\ x\ V\ x\ 365\ x\ L} = \frac{44.48x\ 1{,}000{,}000}{5\ x\ 551\ x\ 365\ x\ 0.184} = 240.40$$

Where:

- *C* = EPDO Total Value from the table above (44.48)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (551 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.184)

HIGH CRASH SEGMENTS

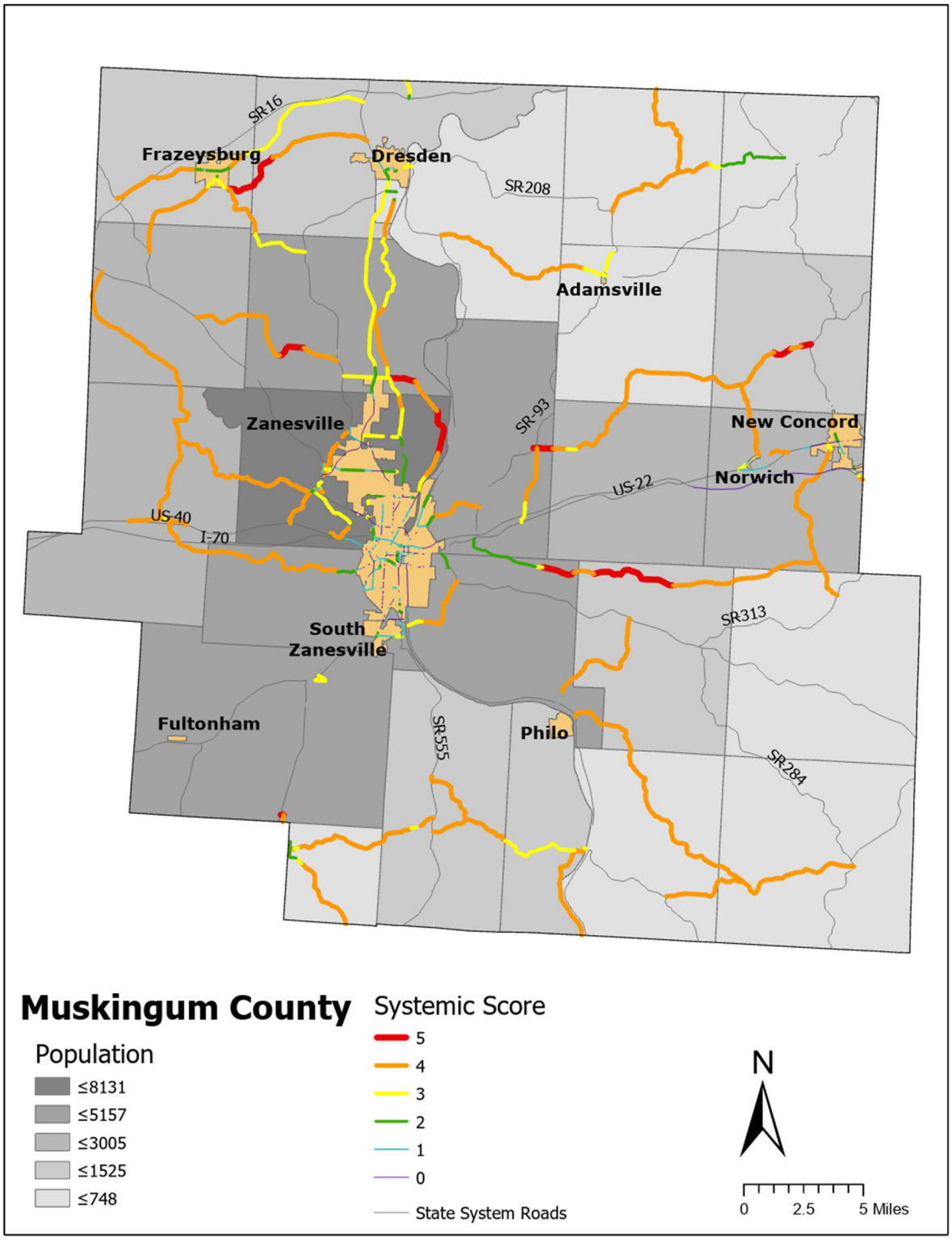
The following segments represent the top crash rate segments by crash severity in Muskingum County. The road segment with the highest frequency and severity of crashes in Muskingum County is Cannelville Road (CR-7) between the mile points 3.43 and 3.61. Safety improvements and infrastructure projects at these locations will address the areas in the county with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	CR	7	3.43	3.61	CANNELVILLE RD	County	240.4
2	CR	22	2.54	3.28	CLAY PIKE RD	County	142.4
3	SR	666	1.31	1.51	LEWIS DR	Municipal	122.7
4	US	40	11.57	11.77	MAIN ST	Municipal	120.0
5	CR	64	7.52	8.64	NORFIELD RD	County	96.2
6	CR	7	0.96	1.97	CANNELVILLE RD	County	85.7
7	CR	694	1.31	1.43	ADAMSVILLE RD	County	72.6
8	SR	60	0.24	0.42	7TH ST	Municipal	70.1
9	US	22	12.06	12.21	9TH ST	Municipal	69.6
10	CR	2009	0.12	0.23	LUCK AVE	Municipal	67.1
11	US	22	12.21	12.40	GREENWOOD AVE	Municipal	67.0
12	CR	34	7.46	7.65	RIDGE AVE	Municipal	65.2
13	SR	60	0.13	0.24	7TH ST	Municipal	61.8
14	CR	694	0.00	0.19	ADAMSVILLE RD	Municipal	56.9
15	CR	408	1.05	1.91	PLEASANT VALLEY RD	County	55.2
16	CR	2016	0.14	0.34	MARKET ST	Municipal	54.9
17	SR	146	10.39	10.71	NEWARK RD	Municipal	54.5
18	US	22	0.48	0.67	7TH ST	Municipal	51.6
19	SR	666	0.69	1.31	LEWIS DR	Municipal	51.3
20	CR	3	2.33	2.47	LINDEN AVE	County	50.1
21	US	22	12.40	12.53	GREENWOOD AVE	Municipal	49.2
22	CR	48	1.57	2.02	SHANNON RD	County	48.3
23	CR	2003	0.00	0.24	BRIGHTON BLVD	Municipal	48.3
24	US	22	11.88	12.06	6TH ST	Municipal	47.4
25	CR	500	3.98	4.21	CREAMERY RD	County	45.3
26	CR	2	5.25	5.40	DRESDEN RD	County	44.6
27	CR	7	0.27	0.96	CANNELVILLE RD	County	41.4
28	US	40	10.93	11.24	MAIN ST	Municipal	38.2
29	SR	60	0.49	0.69	BLUE AVE	Municipal	35.9
30	CR	2020	0.00	0.27	5TH ST	Municipal	35.5
31	CR	35	5.48	5.61	DILLON FALLS RD	County	35.4
32	CR	500	4.47	4.70	CREAMERY RD	County	35.2
33	SR	60	18.91	19.01	MAPLE AVE	Municipal	34.4
34	TR	297	0.00	0.45	ADAMS LN	Township	34.2
35	CR	48	3.32	3.48	SHANNON RD	County	33.9
36	US	40	11.24	11.44	MAIN ST	Municipal	32.4
37	CR	64	3.31	3.83	NORFIELD RD	County	31.7
38	CR	2003	0.41	0.62	BRIGHTON BLVD	Municipal	31.5
39	SR	60	18.00	18.16	MAPLE AVE	Municipal	31.2
40	SR	60	16.32	16.64	9TH AVE	Municipal	30.2
41	SR	60	21.06	21.17	FRAZEYSBURG RD	Municipal	30.1
42	CR	34	7.32	7.46	RIDGE AVE	Municipal	30.1
43	SR	60	19.86	20.10	MAPLE AVE	Municipal	29.8
44	US	22	10.82	11.03	MAYSVILLE AVE	Municipal	29.4
45	CR	616	1.23	1.60	RAIDERS RD	County	29.3
46	CR	2003	0.62	0.86	BRIGHTON BLVD	Municipal	29.2
47	SR	60	17.70	18.00	ADAIR AVE	Municipal	27.7
48	CR	14	2.43	2.53	FERNCLIFF RD	County	27.1
49	US	22	11.38	11.57	PUTNAM AVE	Municipal	26.9
50	SR	60	16.88	17.28	UNDERWOOD ST	Municipal	26.8

HIGH RISK SEGMENTS

The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.

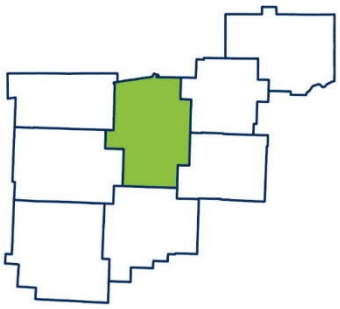


Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	2	3.47	3.97	DRESDEN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	2	4.91	6.68	DRESDEN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	3	2.80	3.19	LINDEN AVE	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	3	3.19	3.72	NORTH RIVER RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	3	3.72	5.19	NORTH RIVER RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	3	5.19	6.40	NORTH RIVER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	3	6.40	7.26	RICHVALE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	5	2.63	3.69	CLAY PIKE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	5	3.69	4.36	CLAY PIKE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	5	4.36	5.90	CLAY PIKE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	6	0.00	3.59	OLD RIVER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	7	0.00	0.14	1ST ST	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	7	0.27	4.45	CANNELVILLE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	7	4.78	5.29	CANNELVILLE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	8	0.00	3.22	CANAL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	0.00	3.93	EDGEMOOR RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	14	0.00	3.39	FERNCLIFF RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	21	0.00	2.50	LODGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	22	0.00	1.28	CLAY PIKE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	22	1.28	3.80	CLAY PIKE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	31	0.00	7.14	RURAL DALE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	34	0.00	6.57	RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	35	0.00	5.48	PINECREST DR	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	40	0.00	5.38	MOLLIES ROCK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	44	0.00	1.70	SALT CREEK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	45	0.00	8.54	CUTLER LAKE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	47	0.00	0.14	RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	47	0.14	0.31	HOPEWELL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	47	0.42	0.70	FLINT RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	47	0.70	4.49	PLEASANT VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	48	2.02	4.14	SHANNON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	49	1.26	1.74	DRESDEN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	55	0.00	5.59	RIX MILLS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	55	5.59	5.78	RIX MILLS RD	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	64	0.00	0.12	NORFIELD RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	64	0.00	0.03	NORFIELD RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	64	0.12	0.63	NORFIELD RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	64	0.63	1.09	NORFIELD RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	64	1.39	10.11	NORFIELD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	64	10.11	10.73	NORFIELD RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	64	10.73	11.08	NORFIELD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	64	11.08	11.41	NORFIELD RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	66	0.00	3.70	VIRGINIA RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	72	0.46	2.65	DIETZ RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	76	0.00	2.04	NARROWS RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	76	2.04	5.36	NARROWS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	87	0.47	3.12	ATHENS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	97	0.00	0.69	CUTLER LAKE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	107	0.00	2.32	CLAY PIKE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	127	2.13	2.24	FULTON ROSE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	144	0.00	1.29	DILLON FALLS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	191	0.67	1.76	JACKSON RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	191	1.76	2.54	JACKSON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	196	0.00	1.79	SALT CREEK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	298	0.00	1.47	OLDE FALLS RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	385	0.00	0.63	SALT CREEK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	408	0.00	3.25	PLEASANT VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	408	3.25	6.21	PLEASANT VALLEY RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	415	0.00	1.06	HOPEWELL NATIONAL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	415	1.34	1.95	HOPEWELL NATIONAL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	416	0.00	0.52	DRESDEN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	420	0.86	1.19	NATIONAL RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	427	0.00	1.19	WILSON RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	472	0.00	0.58	REHL RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	500	0.00	3.79	CREAMERY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	500	3.79	4.70	CREAMERY RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	500	4.70	5.89	CREAMERY RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	616	0.00	2.82	RAIDERS RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	616	3.91	4.64	RAIDERS RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	660	0.00	0.18	DILLON SCHOOL DR	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	660	0.70	1.08	KEARNS DR	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	692	1.22	1.80	NORWICH DR	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	694	0.60	2.30	ADAMSVILLE RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	696	0.00	0.23	ROSE HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
SR	83	0.00	0.17	FRIENDSHIP DR	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	83	1.98	2.19	FRIENDSHIP DR	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
TR	116	0.00	0.77	DRESDEN RD	Township	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph

TUSCARAWAS COUNTY



The Ohio Mid-Eastern Governments Association (OMEGA) has partnered with the Ohio Department of Transportation (ODOT) to develop a Regional Safety Plan (RSP) to improve transportation safety in eastern Ohio. Tuscarawas County is one of the eight member governments that will benefit from being included in this safety plan.

The United States Census Bureau estimates the 2019 population of Tuscarawas County at 91,987 residents. The County spans an area of 571 square miles with more than 1,604 miles of public roadways[1]. Although bicycle, pedestrian, and other active transportation amenities are available (including the Ohio & Erie Towpath Trail, the Buckeye Trail, and the Tuscarawas County Trail and Green Space), most residents in this county rely on cars and other vehicles as their main mode of transportation. Additionally, State Bike Route 77 runs north/ south through the entire length of the County, with a connection to State Bike Route 62 in near the northern border of the County.

SAFETY OVERVIEW

The OMEGA RSP has identified the reduction of fatalities and serious injuries as the primary goal of the plan. Table 1 below shows that within Tuscarawas County, there were a total of 96 fatalities and 754 serious injuries resulting from traffic collisions from 2010-2019. While there is a significant spike in fatalities in 2017 (20) and a low in 2016 (6), the overall trend of fatalities is relatively flat. Similarly, serious injuries peaked at 99 in 2016 while hitting a ten year low of 51 in 2019. Table 1 also shows that the frequency of fatalities and serious injuries that occur each year typically hovers around the ten-year annual average.

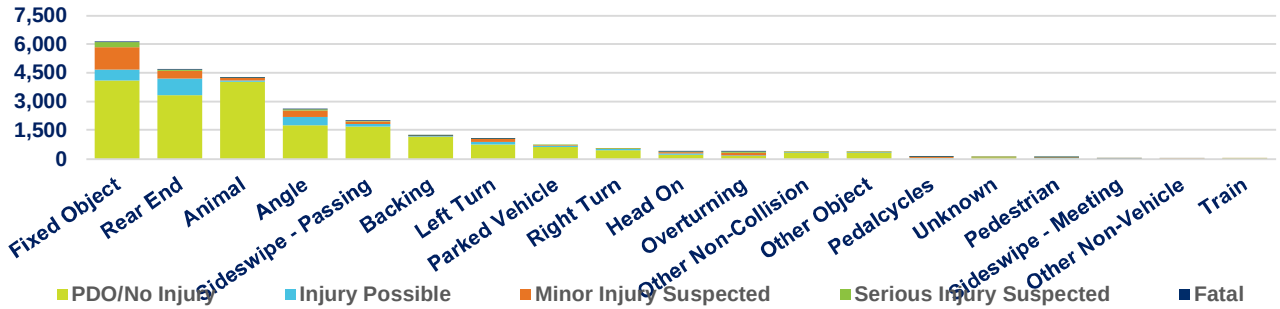
Table 1: Tuscarawas County Fatalities and Serious Injuries, 2010-2019

YEAR	FATALITIES	SERIOUS INJURIES
2010	8	75
2011	9	73
2012	10	85
2013	7	68
2014	8	79
2015	7	73
2016	6	99
2017	20	76
2018	11	75
2019	10	51
10-YEAR TOTAL	96	754
ANNUAL AVERAGE	10	75

YEAR WITH THE HIGHEST VALUE FOR EACH RESPECTIVE COLUMN

Figure 1 shows that the leading crash types for all crash severities in Tuscarawas County is fixed object crashes (25%) followed by rear end crashes (19%) and animal-related crashes (17%). The Tuscarawas County crash type distribution follows the same general trends as the OMEGA regional crash breakdown.

Figure 1: Tuscarawas County Crashes by Type and Severity, 2010-2019



[1] Ohio County Profiles 2020 Edition, Ohio Development Services Agency Office of Research, https://www.development.ohio.gov/files/research/C1080.pdf

COUNTY SAFETY STRATEGIES

Tuscarawas County is currently working to improving safety on their roadways and to reduce crashes through a variety of efforts including:

- Improving signage and pavement markings as part of their annual resurfacing program.
- Vegetation control to improve sight distance and visibility.
- Community outreach to high-risk drivers and the general motoring public through Safe Communities.
- Participation in national education and enforcement campaigns.
- Movable speed warning signs/ trailer in areas where speeding is a concern.

Talking Points

Representatives from Tuscarawas County identified several areas of concern for the county including:

- Distracted driving
- Amish buggies and active transportation related to Amish travel.
- Motorcycle traffic, specifically tourists and travelers to Adventure Harley Davidson.
- Restraint education use and enforcement. Particularly hard to change the culture and mindset of motorists.
- Pedestrian fatalities and accidents.
- Challenges surrounding an aging population.
- Terrain/ natural environment prohibits ideal clear zones and roadside conditions.

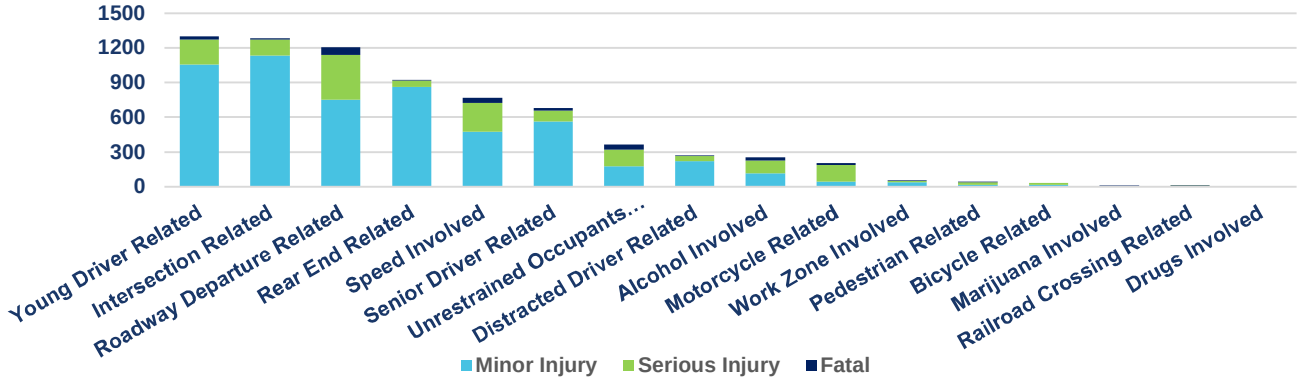
EMPHASIS AREAS

Emphasis areas are groupings of crashes related to circumstances, locations, involved persons, or crash types. One crash may represent several emphasis areas (i.e. an impaired younger driver who is killed in a roadway departure crash would be represented in the young driver, roadway departure, and alcohol involvement emphasis areas). The Strategic Highway Safety Plan developed by ODOT identifies ten emphasis areas to improve safety across the state. The OMEGA RSP evaluated ten years of crash data (2010-2019) to determine which emphasis areas from the SHSP best captured the traffic safety challenges within the region. Five emphasis areas were chosen to represent the OMEGA region including:

- Roadway departures
- Intersections
- Speed
- Unrestrained occupants
- Non-motorized user (bicycle/pedestrian/buggies/other non-motorists)

While these emphasis areas help to define the regional safety challenges and focus the RSP towards the most critical crash trends, it was decided to also include distracted driving as an additional emphasis area for Tuscarawas County. While distracted driving may not be a top emphasis area for fatal and severe crashes, as shown in Figure 2, there was a strong agreement that distracted driving is on the rise and should be addressed now, before crashes escalate to a significant share of fatal and serious injuries in the county.

Figure 2: Emphasis Area Overview for Fatal, Serious Injury and Minor Injury Crashes in Tuscarawas County, 2010-2019

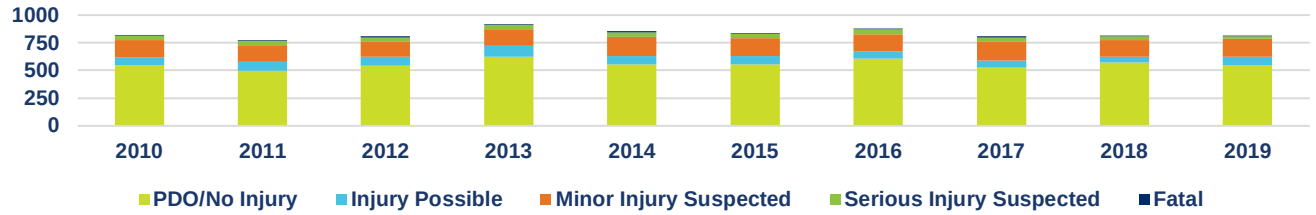


TUSCARAWAS COUNTY EMPHASIS AREAS

Roadway Departure

Roadway departure crashes accounted for 30% of all crashes that occurred on all roads in the county and 29% of all crashes that occurred on roads that are off the state system in Tuscarawas County from 2010-2019. Roadway departure fatal crashes overlapped with other emphasis areas including speeding (64% of fatal roadway departure crashes), unrestrained drivers (56%), alcohol-related crashes (39%), and younger drivers (27%). These crashes typically resulted in collisions with fixed objects, but also include collisions with oncoming vehicles. Figure 3 shows that despite slight fluctuations overs the years, the number of roadway departure crashes has remained relatively constant from 2010-2019.

Figure 3: Roadway Departure Total Annual Crashes by Severity in Tuscarawas County, 2010-2019



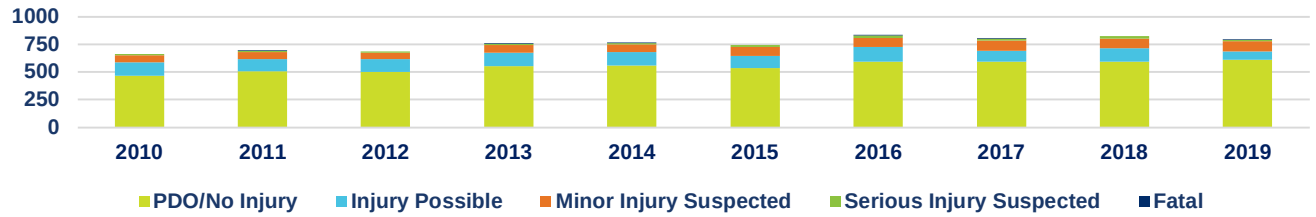
Tuscarawas County Roadway Departure Action Steps:

- Widen hotspot corridors on county roads.
- Work with townships on applying for ODOT Township Signing Grants.

Intersections

Intersection-related crashes accounted for 29% of all crashes that occurred on all roads in the county and 37% of all crashes that occurred on roads that are off the state system in Tuscarawas County. In terms of overlapping emphasis area crashes for intersections, crashes involving motorcycles (40%) and older drivers (30%) are the two most common. Over the ten years, there was an overall increase in total intersection-related crashes, with the five-year average increasing at 1.5 crashes per year within the county on average, though the majority of the increase occurred from 2010 through 2016 with annual crashes remaining relatively constant from 2016 through 2019. Within Tuscarawas County, 32% of fatal intersection-related crashes were angle crash types followed by rear-end crashes at 17%.

Figure 4: Intersection-Related Total Annual Crashes by Severity in Tuscarawas County, 2010-2019



Tuscarawas County Intersections Action Steps:

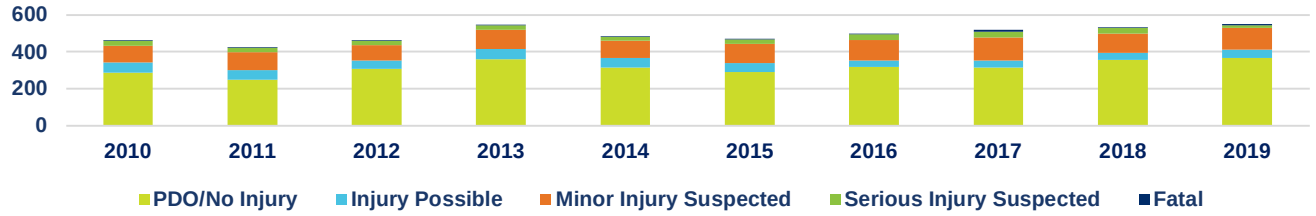
- Intersection improvement projects within the County will be evaluated to determine if installing LED advanced warning signs on each approach is an appropriate safety countermeasure that could be included in the proposed improvements.

Speed

Speed-related crashes accounted for 17% of the crashes that occurred on all roads in the county and 15% of the crashes that occurred on roads that are off the state system countywide. After a high of 546 crashes in 2013, speeding-related crashes saw a slight downward trend for two years but have been increasing every year from 2015-2019. The most significant contributing factor within speeding-related crashes were roadway departure crashes (89% of fatal speeding crashes) followed by unrestrained occupants (53%)

and alcohol-related crashes (43%). 55% of fatal speeding-related crashes occurred on county (35%), township (11%), or city/ village (9%) roads.

Figure 5: Speed-Related Total Annual Crashes by Severity in Tuscarawas County, 2010-2019



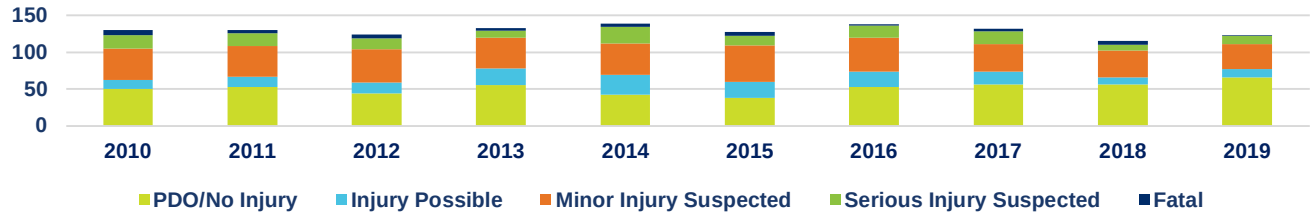
Tuscarawas County Speeding Action Steps:

- Continue working with schools on traffic safety messaging through Tuscarawas County Safe Communities Program.
- Implement/ expand use of dynamic speed feedback signs.
- Identify partnership with local business for use of variable message boards for national traffic safety campaign messaging.

Unrestrained Occupants

Crashes that involved unrestrained occupants were the third highest contributor to fatalities, following roadway departures and speed-related crashes, from 2010-2019. As shown in Figure 6, unrestrained occupant crashes accounted for 42 fatalities in Tuscarawas County during this time. Restraint use is a cross cutting emphasis area as proper restraint use by all occupants is one way to reduce the severity of crashes across almost all other emphasis areas. Unlike other emphasis areas where crashes typically follow hourly traffic trends, unrestrained occupant fatalities and serious injuries occur throughout the day and night with no discernable tie to traffic trends.

Figure 6: Unrestrained Occupants Total Annual Crashes by Severity in Tuscarawas County, 2010-2019



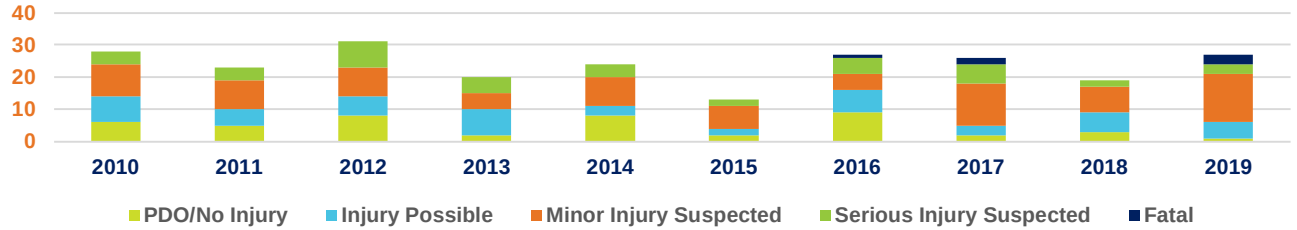
Tuscarawas County Unrestrained Occupants Action Steps:

- Continue working with schools on traffic safety messaging through Tuscarawas County Safe Communities Program.
- Identify partnership with local business for use of variable message boards for national traffic safety campaign messaging.

Non-Motorized Users (Bicycle/Pedestrian/Buggies/Other Non-Motorists)

Active transportation was added as an emphasis area to the OMEGA RSP based on the feedback from representatives across the region and the higher severity of crashes involving active transportation, as shown in Figure 7. Throughout both the region and Tuscarawas County, bicycle and pedestrian crashes represent a wide array of challenges. From developing bike and pedestrian facilities in larger urban/ suburban areas to accommodating Amish communities and alerting motorists to potential buggies/ pedestrians on rural/ remote roadways, this emphasis area includes many scenarios that can be classified as rare but high risk. Unlike other emphasis areas, active transportation crashes are more likely to result in an injury than a property damage only crash.

Figure 7: Non-Motorized Users Total Annual Crashes by Severity in Tuscarawas County, 2010-2019



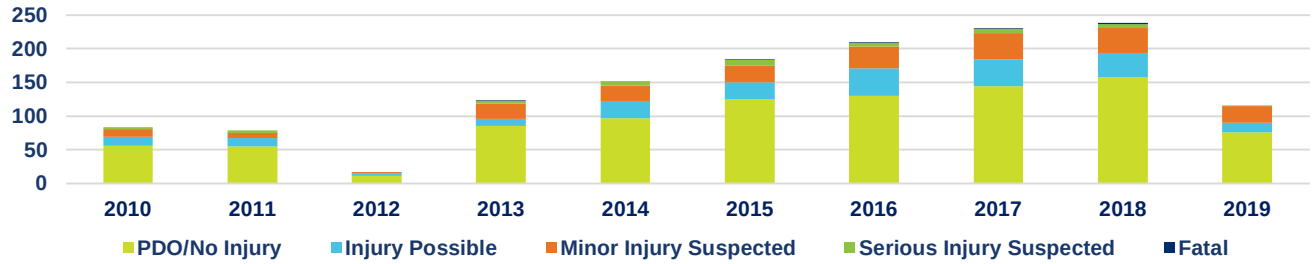
Tuscarawas County Non-Motorized Users Action Steps:

- Continue working with schools on traffic safety messaging through Tuscarawas County Safe Communities Program.

Distracted Driving

Based on discussions with representatives from Tuscarawas County and Safe Communities, it was decided to add distracted driving as the sixth emphasis area for Tuscarawas County. While these crashes do not rank high on the ten-year analysis, the perception is that they are increasing at an alarming rate in the county. While some of this increase represents efforts by law enforcement to better capture distracted driving on crash reports, the anecdotal evidence backs up the data that drivers are distracted now more than ever.

Figure 8: Distracted Driving Total Annual Crashes by Severity in Tuscarawas County, 2010-2019



Tuscarawas County Distracted Driving Action Steps:

- Work on promoting anti-distracted driving safety messages through traditional media campaigns, as well as through Billboard and PSA competitions through Tuscarawas County Safe Communities.
- Identify distracted driver enforcement training needs and joint enforcement opportunities through Tuscarawas County Sherriff's Office and Ohio State Highway Patrol.

Equivalent Property Damage Only Crash Frequency

An important aspect of reducing fatalities and serious injuries is the improvement of targeted locations through the deployment of crash countermeasures. Identification of high crash and high risk segments allow agencies to effectively target both infrastructure and behavioral countermeasures. While there are many ways to screen a roadway network, the equivalent property damage only (EPDO) crash frequency is a way to quantify and compare crash frequencies and severities of crashes by relating them to property damage only (no injury) crashes. Crashes are assigned to roadway segments in the county. Property damage only crashes are assigned a value of 1 then each subsequent severity is given a relatively higher weighted value. The sum of the weighted crashes for each segment is the EPDO score. This method shows a better relationship between crash trends as locations with higher frequency and higher severity of crashes have a higher EPDO score. The 'High Crash Location' map and table below use these scores to highlight road segments that are more susceptible to more frequent crashes or those that result in more serious injuries.

An example EPDO crash rate calculation for a segment in Tuscarawas County with the highest EPDO crash frequency are as follows:

SR-800 from MP 31.18 to MP 31.34:

Crash Severity	2015-2019 Observed Crashes	ODOT Severity Crash Weighting	EPDO Total Value
Fatal and Serious Injury (KA)	1	37.93	37.93
Minor Injury (B)	2	6.55	13.10
Possible Injury (C)	0	4.44	0.00
Property Damage Only (O)	3	1	3.00
Total	6	-	54.03

To calculate the EPDO crash rate the following formula is used:

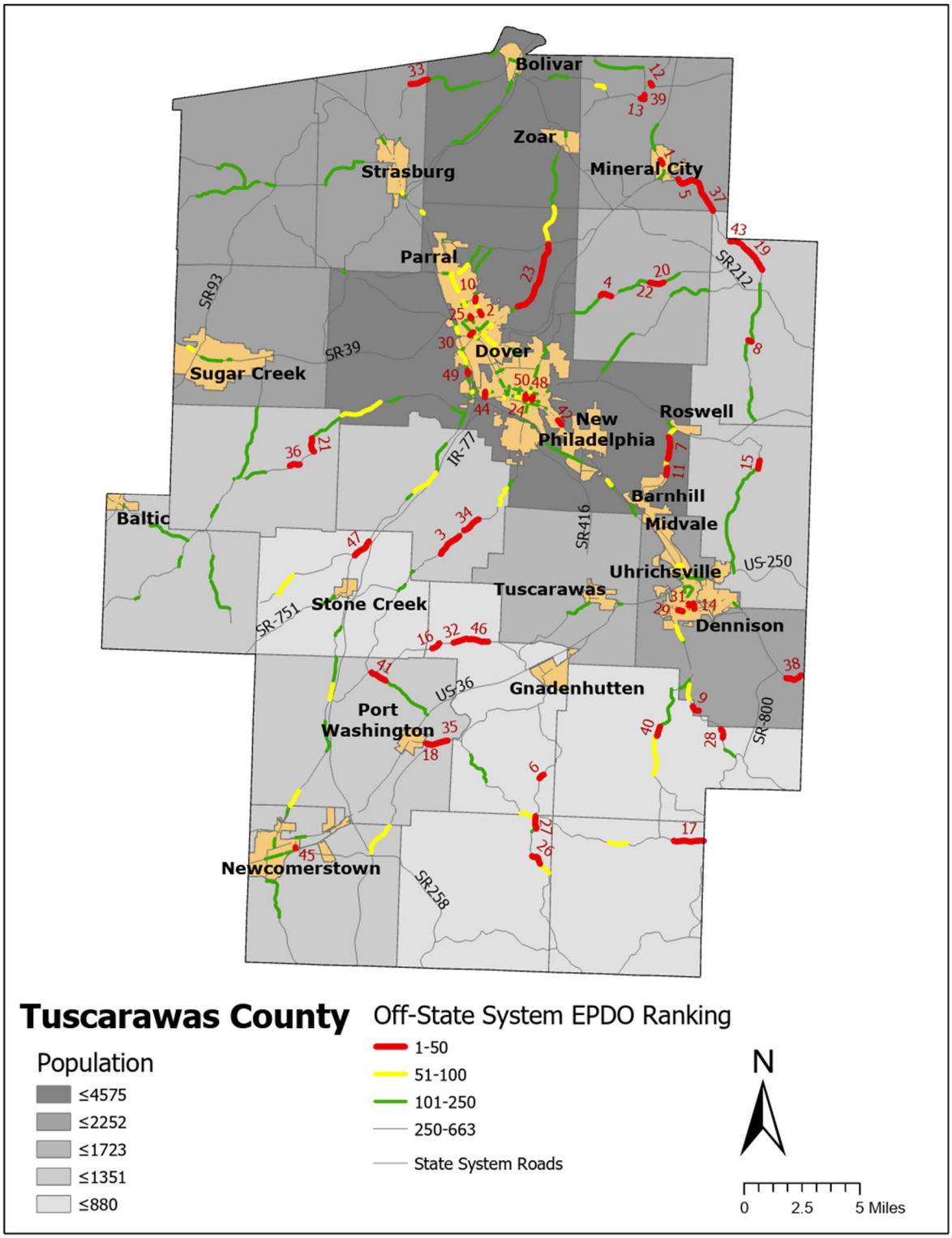
$$\boldsymbol{EPDO\ Crash\ Rate} = \frac{\boldsymbol{C\ x\ 1{,}000{,}000}}{\boldsymbol{N\ x\ V\ x\ 365\ x\ L}} = \frac{\boldsymbol{54.03\ x\ 1{,}000{,}000}}{\boldsymbol{5\ x\ 241\ x\ 365\ x\ 0.16}} = \boldsymbol{767.8}$$

Where:

- *C* = EPDO Total Value from the table above (54.03)
- *N* = Number of years of crash data used (5 years)
- *V* = Streetlight estimated daily traffic volume (241 vpd)
- *365* = days in a year
- *L* = Length of the corridor in miles (0.16)

HIGH CRASH SEGMENTS

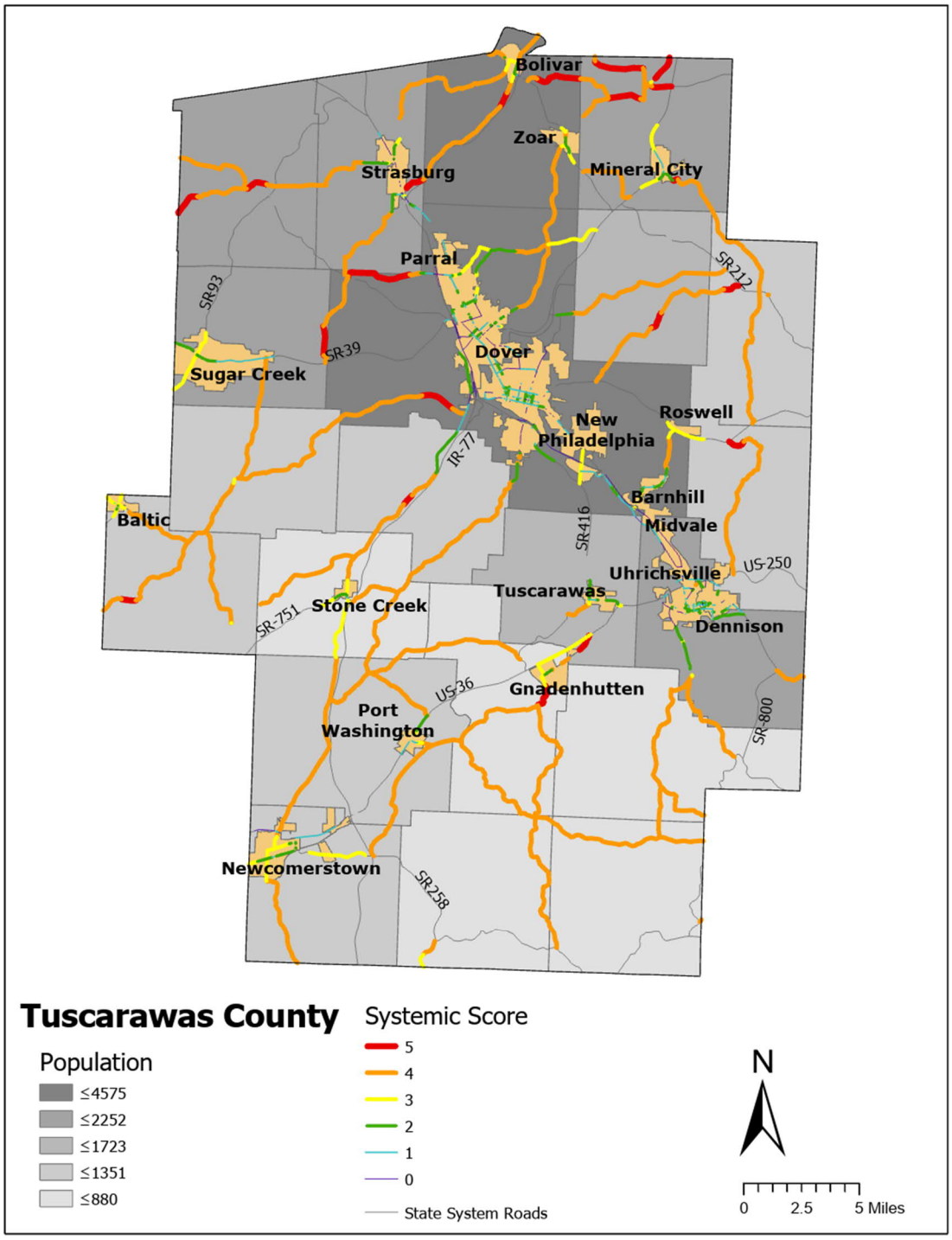
The following segments represent the top crash rate segments by crash severity in Tuscarawas County. The road segment with the highest frequency and severity of crashes in Tuscarawas County is High Street (SR-800) between the mile points 31.18 and 31.34. Safety improvements and infrastructure projects at these locations will address the areas in the county with the highest history of crashes.



County Rank	Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Jurisdiction	EPDO Crash Rate
1	SR	800	31.18	31.34	HIGH ST	Municipal	767.8
2	CR	81	0.47	0.62	CRATER AVE	Municipal	308.4
3	CR	24	7.77	8.66	OLDTOWN VALLEY RD	County	266.4
4	CR	85	1.76	2.15	JOHNSTOWN RD	County	262.2
5	CR	90	8.82	9.95	NEW CUMBERLAND RD	County	239.0
6	CR	10	6.51	6.70	GILMORE RD	County	229.1
7	CR	68	2.36	3.12	BARNHILL RD	County	185.6
8	CR	90	2.75	2.87	NEW CUMBERLAND RD	County	184.2
9	CR	34	4.29	4.58	EDIE HILL RD	County	174.2
10	CR	81	0.98	1.11	CRATER AVE	County	163.8
11	CR	68	1.83	2.05	BARNHILL RD	County	163.3
12	CR	108	0.18	0.31	CROSS ROADS RD	County	129.6
13	CR	82	10.51	10.64	DOVER-ZOAR RD	County	126.1
14	CR	64	0.13	0.44	MAIN ST	Municipal	118.8
15	CR	66	4.02	4.32	ROXFORD CHURCH RD	County	114.9
16	CR	22	2.98	3.29	FRYS VALLEY RD	County	106.9
17	CR	14	0.00	1.00	FALLEN TIMBER RD	County	105.1
18	CR	14	11.16	11.38	RIVER HILL RD	County	104.0
19	CR	90	5.32	6.48	NEW CUMBERLAND RD	County	94.8
20	CR	85	3.84	4.10	JOHNSTOWN RD	County	94.5
21	CR	52	4.70	5.19	CROOKED RUN RD	County	78.5
22	CR	85	3.61	3.84	JOHNSTOWN RD	County	77.6
23	CR	82	0.91	3.49	DOVER-ZOAR RD	County	74.2
24	SR	39	14.49	14.61	HIGH ST	Municipal	72.1
25	CR	74	2.96	3.15	WOOSTER AVE	Municipal	69.0
26	CR	10	3.22	3.64	GILMORE RD	County	67.6
27	CR	10	4.66	5.10	GILMORE RD	County	63.1
28	CR	34	2.89	3.20	EDIE HILL RD	County	62.7
29	CR	601	0.60	0.86	TRENTON AVE	Municipal	62.2
30	CR	123	0.36	0.51	4TH ST	Municipal	60.5
31	CR	612	0.00	0.27	DAWSON ST	Municipal	56.2
32	CR	22	2.06	2.51	FRYS VALLEY RD	County	55.8
33	CR	99	2.80	3.41	STRASBURG BOLIVAR RD	County	54.7
34	CR	24	8.90	9.52	OLDTOWN VALLEY RD	County	54.5
35	CR	14	10.62	11.16	RIVER HILL RD	County	54.4
36	CR	52	3.70	4.06	CROOKED RUN RD	County	54.2
37	CR	90	8.10	8.82	NEW CUMBERLAND RD	County	52.4
38	CR	36	3.50	4.07	FEED SPRING HILL RD	County	52.3
39	CR	107	1.89	2.04	SANDYVILLE RD	County	51.0
40	CR	30	3.30	3.63	BLIZZARD RIDGE RD	County	50.9
41	CR	24	1.91	2.46	BUNKER HILL RD	County	50.6
42	SR	259	3.32	3.52	HIGH ST	Municipal	49.1
43	CR	90	6.48	6.84	NEW CUMBERLAND RD	County	46.6
44	CR	501	0.00	0.19	BLUEBELL DR SW	Municipal	45.5
45	SR	258	0.31	0.50	PILLING	Municipal	45.1
46	CR	22	1.29	2.06	FRYS VALLEY RD	County	44.8
47	CR	21	10.96	11.64	STONECREEK RD	County	43.9
48	CR	514	0.12	0.24	2ND ST NE	Municipal	43.5
49	SR	39	11.98	12.10	COMMERCIAL PKWY	Municipal	42.9
50	CR	513	0.12	0.24	2ND ST NW	Municipal	42.0

HIGH RISK SEGMENTS

The following segments represent locations most at risk for a fatal and serious injury crash based on risk factors determined for the OMEGA Region and are not based on crash history. Risk factors are any roadway or operations attribute associated with an overrepresentation of fatal and serious injury crashes. For more information on the systemic analysis process, refer to Appendix B of the OMEGA RSP. Safety improvements and infrastructure projects at these locations will address potential safety challenges proactively, potentially preventing or reducing the severity of crashes.



Route Type	Route Number	Begin Mile Point	End Mile Point	Street Name	Juris-diction	Risk Score	Risk Factors Present
CR	1	0.0	3.3	JOHNSON HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	3	5.5	6.2	SALT FORK RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	10	0.0	9.6	GILMORE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	10	9.6	10.5	GILMORE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	12	2.3	2.4	WESTCHESTER SOUTH RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	14	0.0	6.0	FALLEN TIMBER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	14	6.0	11.5	RIVER HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	16	0.0	4.6	RIVER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	16	5.6	8.8	RIVER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	21	1.0	1.4	COLLEGE ST	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	21	1.4	7.4	STONECREEK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	21	10.1	13.4	STONECREEK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	21	13.4	13.8	STONECREEK RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	21	13.8	14.9	STONECREEK RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	22	0.0	7.3	FRYS VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	22	7.3	7.5	HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	24	0.0	2.5	BUNKER HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	24	2.6	11.5	OLDTOWN VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	24	12.2	12.4	OLDTOWN VALLEY RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	24	12.4	12.5	BROADWAY RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	28	8.4	9.3	DUTCH VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	30	1.8	7.2	BLIZZARD RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	32	0.0	2.1	RUSH CHURCH RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	34	2.1	5.5	EDIE HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	36	3.1	4.2	FEED SPRING HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	39	0.3	0.7	MAIN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	39	0.7	1.5	WOLFES CROSSING RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	39	1.5	2.1	WOLFES CROSSING RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	42	3.0	3.9	TROENDLY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	43	0.0	0.8	GUNTHER MILLER RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd
CR	43	0.8	1.3	GUNTHER MILLER RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	43	1.3	3.3	GUNTHER MILLER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	45	0.0	3.5	EVANS CREEK RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	46	0.5	5.3	RAGERSVILLE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	46	5.6	9.8	RAGERSVILLE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	49	2.4	6.4	ANGEL VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	52	1.9	9.3	CROOKED RUN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	52	9.3	10.5	CROOKED RUN RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	52	10.5	10.9	CROOKED RUN RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	53	0.0	1.8	WILLIAMS LAKE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	64	0.9	1.1	EASTPORT AVE	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	66	0.0	5.5	ROXFORD CHURCH RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	66	5.5	6.1	ROXFORD CHURCH RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	68	2.1	3.1	BARNHILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	78	0.0	1.0	BROAD RUN DAIRY RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	78	1.0	2.9	BROAD RUN DAIRY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	78	3.0	6.0	WINFIELD STRASBURG RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	79	0.0	0.2	SCHILLING HILL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	80	0.0	2.2	SCHNEIDERS CROSSING RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	80	2.2	2.6	SCHNEIDERS CROSSING RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	80	6.2	7.4	SCHNEIDERS CROSSING RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	82	0.9	6.9	DOVER-ZOAR RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	82	8.4	9.4	DOVER-ZOAR RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	82	9.4	10.5	DOVER-ZOAR RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	82	10.5	10.6	DOVER-ZOAR RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	85	0.6	6.3	JOHNSTOWN RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	86	0.0	2.8	TABOR RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	86	2.8	3.4	TABOR RIDGE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	86	3.4	6.0	TABOR RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	86	6.0	6.5	TABOR RIDGE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	90	0.0	9.9	NEW CUMBERLAND RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	90	9.9	10.1	NEW CUMBERLAND RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	92	0.0	0.1	OLD ROSWELL RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	93	0.0	1.1	ATWOOD LAKE RD	County	4	<12' Lanes, ADT 2,000 - 4,000, County Rd, 45 - 55 mph
CR	94	0.0	0.9	WALNUT CREEK BOTTOM RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	94	0.9	2.6	WALNUT CREEK BOTTOM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	94	2.6	3.4	WALNUT CREEK BOTTOM RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	94	3.4	3.7	WALNUT CREEK BOTTOM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	94	3.7	7.1	DUNDEE STRASBURG RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	95	0.0	2.8	TRAIL BOTTOM RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	99	1.6	6.5	STRASBURG BOLIVAR RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	102	0.3	0.9	FORT LAURENS RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	102	0.9	4.6	FORT LAURENS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	102	4.6	5.1	FORT LAURENS RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	102	5.1	5.5	FORT LAURENS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	102	6.2	6.5	PARK AVE	Municipal	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
CR	102	6.5	7.3	SHERMAN CHURCH RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	103	0.0	0.4	ORCHARD RD	County	4	ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	103	0.4	1.9	ORCHARD RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	103	1.9	3.2	ORCHARD RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	104	0.0	0.7	RIDGE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	105	0.0	1.7	DUEBER RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	105	1.7	1.8	DUEBER RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	106	0.0	2.4	TUSKY VALLEY RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	107	1.9	2.6	SANDYVILLE RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	107	2.8	3.6	SANDYVILLE RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph

CR	108	0.2	0.3	CROSS RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	108	0.3	1.0	CROSS RD	County	5	<12' Lanes, ADT 2,000 - 4,000, County Rd, Rural 2 Lane Rd, 45 - 55 mph
CR	139	2.2	2.4	OLD SR 39 RD	County	4	<12' Lanes, County Rd, Rural 2 Lane Rd, 45 - 55 mph
SR	212	1.7	2.3	SR-212	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	212	5.9	6.1	MAIN ST	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph
SR	416	3.0	3.8	SR-416	State	4	<12' Lanes, ADT 2,000 - 4,000, Rural 2 Lane Rd, 45 - 55 mph

APPENDIX B
RISK FACTOR ANALYSIS RESULTS

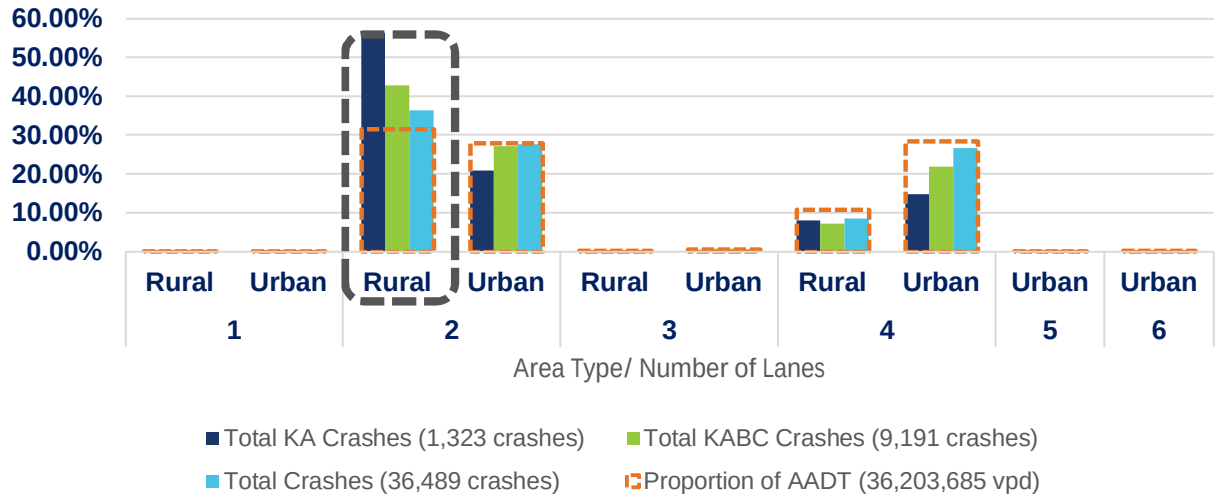
SYSTEMIC SCREENING AND RISK FACTOR ANALYSIS

Risk Factor Analysis Results

More than 30 attributes were tested for overrepresentation in determining the OMEGA RSP risk factors. Of the attributes tested, 5 showed unique overrepresentation and were chosen as risk factors including:

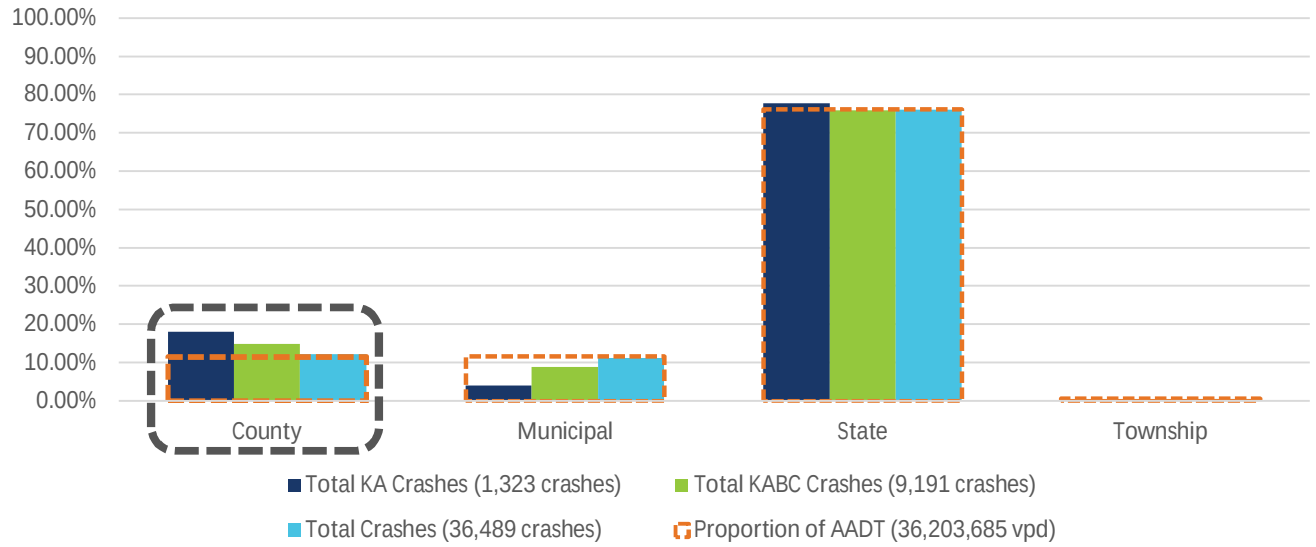
- Area Type and Lane Count – Rural area AND two-lanes
- Jurisdiction – County
- Lane Width – Less than 12 feet
- Speed Limit – 45 or 55 miles per hour
- Traffic Volume – 2,000 to 3,999 vehicles per day

Area Type and Lane Count



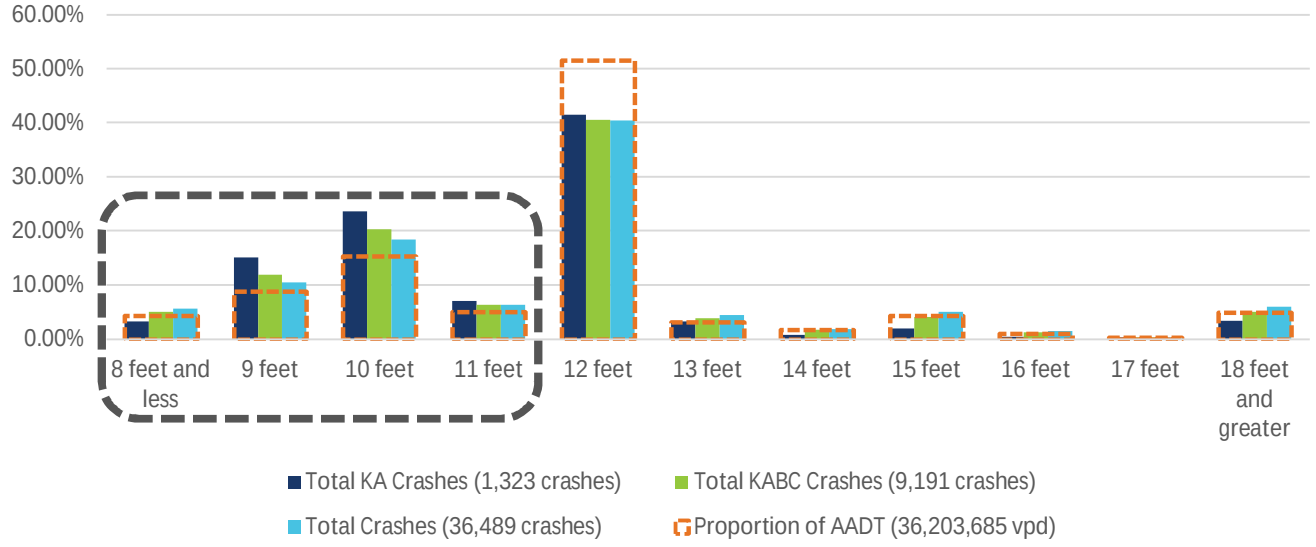
Area type is classified based on urban area code listed in the TIMS roadway information database. Rural areas are the segments that do not fall at least partially within a Census-designated urban area. Lane count is also an attribute within the TIMS roadway database. Individually, rural segments and two-lane segments are each overrepresented, but when the attributes are combined, it's only the combination of rural and two-lanes that are exhibit overrepresentation. From the figure, we can see urban two-lane segments and rural four-lane segments show no overrepresentation. However, rural two-lane roads account for 56% of regional KA crashes but only 31% of regional traffic volume and is considered a risk factor.

Jurisdiction



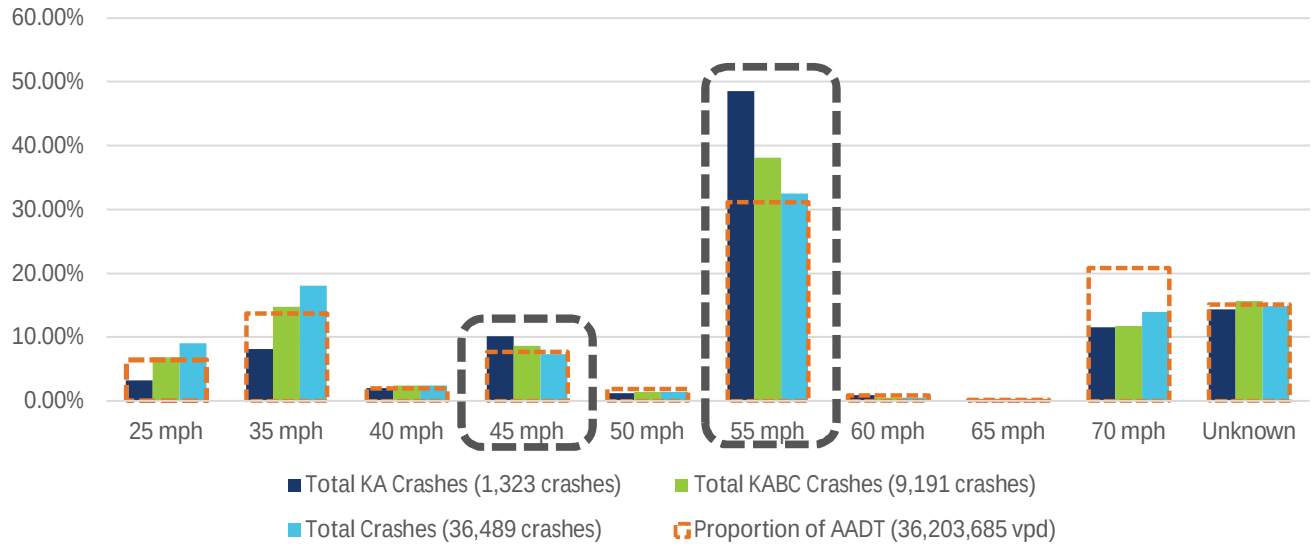
Jurisdiction is defined using the gas tax code information from TIMS roadway information database. Note that jurisdiction does not indicate the responsible maintenance authority as state roads within municipal limits are to be maintained by the municipal authority according to the Ohio Revised Code. However, this breakdown allows for a better understand of “state-system” versus “non-state system”. County roads account for approximately 12% of regional traffic volume but 16% of regional fatal and serious injury crashes. State routes also exhibit a slight overrepresentation of just under 2%, however, the overall trend follows the exposure of these roads as shown by the large share of traffic volume in the region. For these reasons, county roads were selected as the lone jurisdiction risk factor.

Lane Width



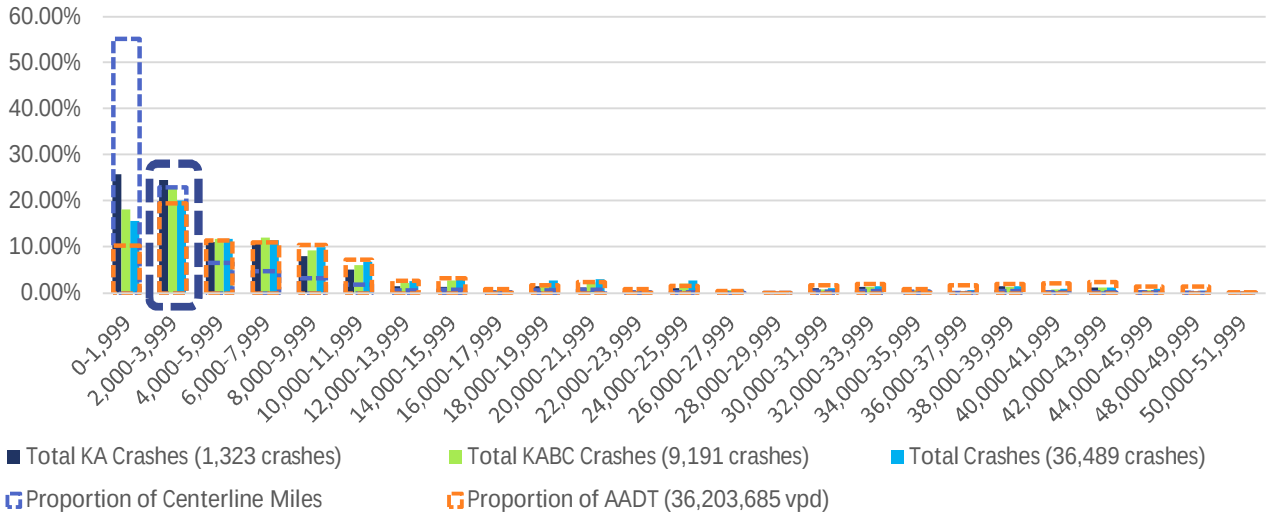
Lane width is a calculated attribute using total pavement width and lane count data from the TIMS roadway information database. Average lane widths of 9 feet, 10 feet, and 11 feet are all overrepresented by 6%, 9% and 2% respectively. While average lane width of 8 feet and less does not show an overrepresentation, it is reasonable to include these roads base on the trend of fatal and serious injury crash overrepresentation and the inherent risks associated with significantly narrow roadways.

Speed Limit



Posted speed limits of 45 mph and 55 mph are overrepresented by 2% and 18% respectively. Posted speed limit data is an attribute contained in the TIMS roadway information database. For the purpose of network screening, roadways with unknown posted speed limits will be estimated using criteria established in ODOT's Level of Traffic Stress analysis for active transportation.

Traffic Volume



Traffic volume data is an available attribute in the TIMS roadway information database but is inconsistent for off-system roadways. For this reason, state system roadways use TIMS volumes, while off-state system roadway utilize Streetlight volume estimates. While the Streetlight volumes are only estimates, they are a method to allow for a uniform comparison of all off-state roadways in the region. Roadways with traffic volumes less than 4,000 vehicles per day (vpd) account for a combined 30% of traffic in the region and 50% of regional fatal and serious injury crashes. However, for this attribute, it's important to consider quantity of miles captured by the risk factor. Segments with volumes below 2,000 vpd account for over half of roads in the region. The large imbalance between volume and centerline miles represented by the lowest volume bin may result in the over application and inflation of risk scores if it's included. Therefore, the risk factor for traffic volume is recommended as 2,000 to 3,999 vpd.