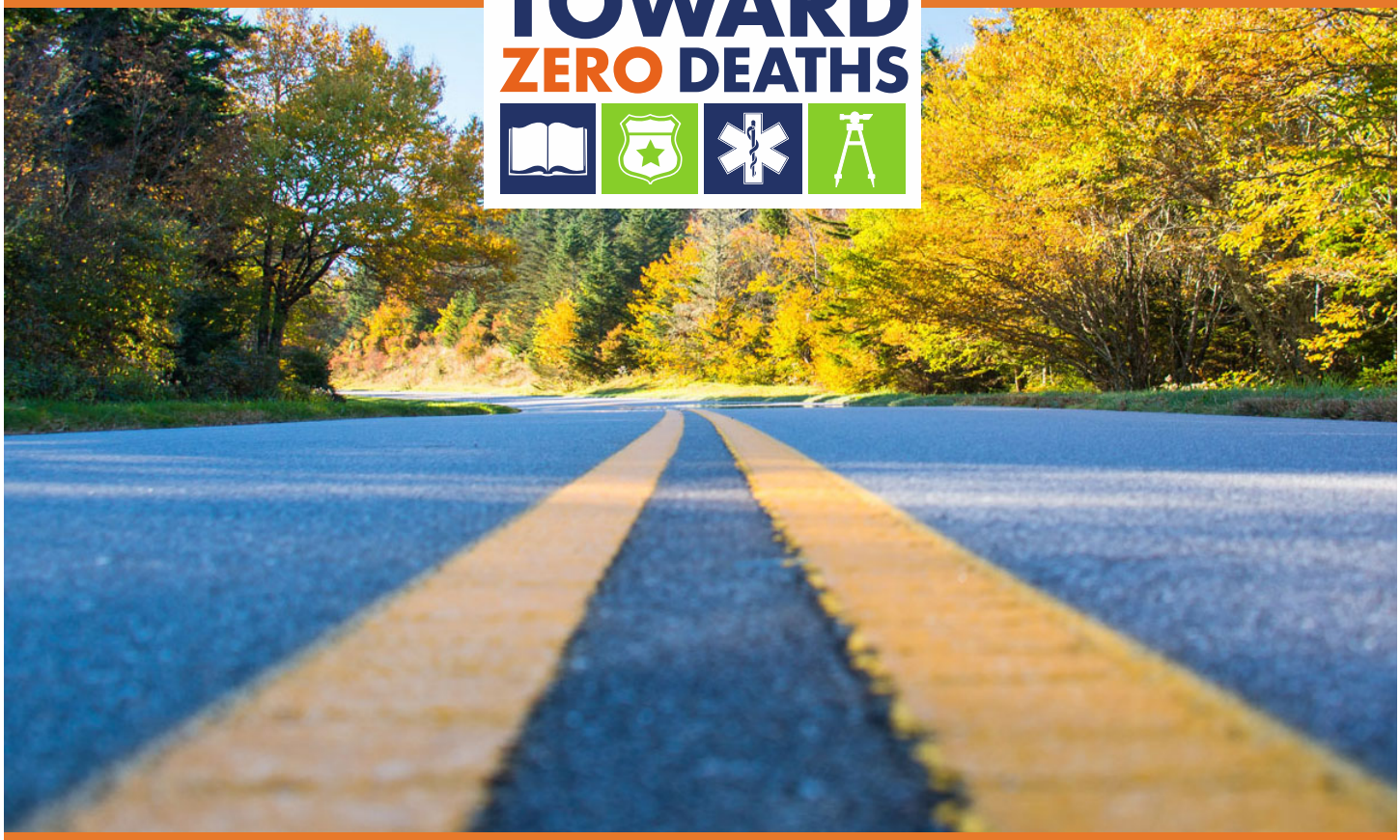
EVERY MOVE YOU MAKE

TOWARD ZERO DEATHS



Erie Regional Planning Commission

Road Safety Plan

April 2020

(Amended August 2022)

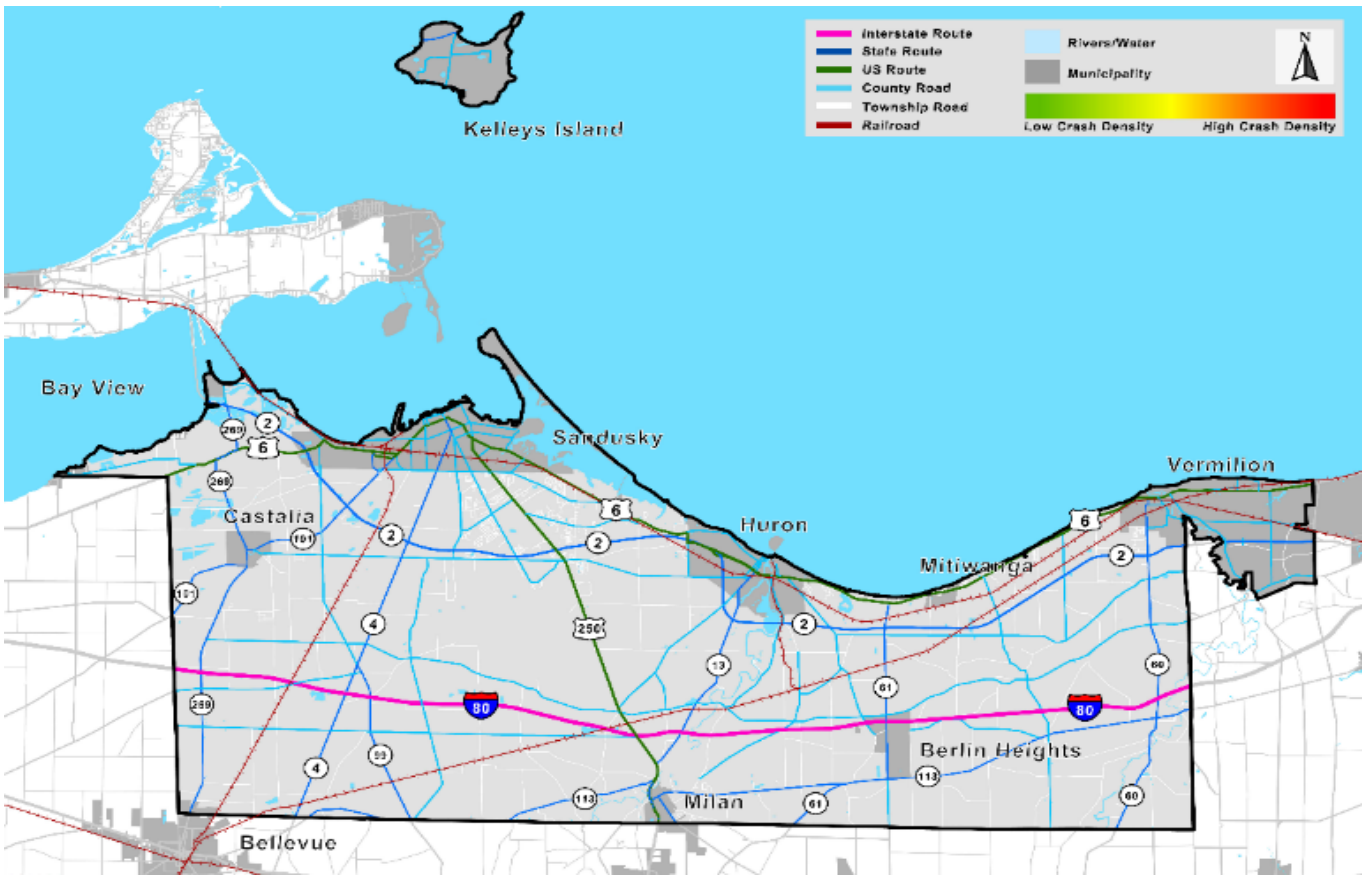
TABLE OF CONTENTS:

1 EXECUTIVE SUMMARY

ODOT recognizes the need to address fatal and serious injury crashes and is encouraging the development of Regional Safety Plans to reduce them. The Erie Metropolitan Regional Planning Commission (ERPC) Road Safety Plan provides a framework for identifying, analyzing and prioritizing road safety improvements. This plan provides stakeholders with a prioritized list of high crash locations along with mitigating strategies and projects that will be eligible for ODOT safety funding.

The area encompassed by the ERPC Metropolitan Planning Organization (MPO) planning area is located in north central Ohio and home to approximately 75,000 residents who live within nine 9 municipalities within the 255 square mile area. For the purpose of this study, the ERPC MPO planning area, which includes all of Erie County and the Lorain County portion of the City of Vermillion, is referred to as the “Erie region”. The study area also includes Cedar Point, the Lake Erie shoreline and islands, which are significant tourist destination. Although transit, bicycle, and pedestrian infrastructure are modal options within the Erie region, motor vehicle travel is the most common travel mode.

The study included a 9-year analysis period (2009 through 2017) based on available crash data. During that period, 2,401 transportation-related injury crashes were reported. Annual average data reflects 267 crashes with 9 fatalities, 99 serious injuries and 29 non-serious injuries. Motor vehicle crashes are often preventable. Crash mitigation requires an understanding of crash locations, types and contributing factors to understand why crashes occur and to identify strategies to reduce crashes and crash potential.



Erie Region Map (ERPC Planning Area)

The *ERPC Road Safety Plan* analyzed crash data to understand crash patterns, trends and contributing factors, focusing on fatal and serious injury (FSI) crashes. The analysis results were used to identify mitigation strategies, potential treatments and solutions to address the highest priority safety issues in the region based on crash frequency and severity. Crash data were reviewed with stakeholders to understand:

- **Crash Trends** – Trends in fatal and serious injury crashes over the past 9 years, including a review of crashes by jurisdiction and by roadway type
- **Crash Types** – Types of crashes that are over-represented (i.e., rear end, roadway departure, etc.)
- **Crash Locations** – Segments and intersections in the region that experience more crashes on average than other locations; these locations could be investigated further for safety improvements.
- **Contributing Factors** – Types of crash contributors that are over-represented in the region (i.e., alcohol impairment, age, speed, etc.)
- **Safety Performance** – Treatment(s) and extent of mitigation measures for fatal and serious injury crashes through the implementation of proven solutions for the identified crash types

Local transportation and safety stakeholders met twice to review the crash data and provide input into the foundation of the plan. This plan analyzes crash data; it identifies mitigation measures, treatments and strategies; and it recommends countermeasures to address the highest priority crash locations within the Erie region. Plan components include:

- The plan's **Vision, Goal and Objectives** provide a framework for identifying safety programs, projects and policies.
- Four emphasis areas, **Intersections, Roadway Departures, Distracted Driving, and Speeding** were identified as the most significant traffic safety-related challenges in the region.
- The **Action Plan** identifies high priority intersection and corridor locations that, if mitigated, would make a significant impact on road safety in the region. The *Action Plan* outlines programmatic and project solutions, showing ERPC stakeholders where to focus their time and resources to make the most significant difference in improving road safety.

2 TRANSPORTATION SAFETY PARTNERS

Development of this plan is intended to help stakeholders within the Erie region to understand crash patterns associated with fatal and serious injury crashes, and identify projects, programs and policies to improve transportation safety by mitigating crashes and contributing factors that result in fatalities and serious injuries. The Erie region includes a wide range of transportation and safety stakeholders who are working to reduce fatalities and serious injuries resulting from motor vehicle crashes. Numerous stakeholders were invited to participate in the plan development process. The organizations, agencies and jurisdictions listed below actively participated; representatives came together on two occasions to review crash data and analysis results to provide local perspective which informed the contents of this plan. This group intends to maintain ongoing coordination to implement the safety solutions and strategies identified in this plan to mitigate transportation-related fatal and serious injury crashes.

- Erie Regional Planning Commission (ERPC)
- Erie County Engineer's Office
- Erie County Sheriff's Office
- City of Huron
- City of Sandusky
- City of Vermilion
- Edison Local Schools
- Milan Township
- Village of Milan
- Ohio Department of Transportation, Central Office
- Ohio Department of Transportation, District 3
- Ohio State Highway Patrol
- Ohio Turnpike and Infrastructure Commission
- North Central EMS
- Perkins Police Department
- Perkins Township
- Vermilion Police Department
- Sandusky Police Department

Additional organizations were invited to the workshops and solicited for feedback on the action plan:

- Board of Erie County Commissioners
- City of Sandusky Community Development
- Erie County Department of Environmental Services
- Erie County Economic Development Corporation
- Erie County Health Department
- Erie County Safe Communities
- Erie Metroparks
- Erie Soil & Water
- Federal Highway Administration
- Huron Local Schools
- Margaretta Township
- Milan Police Department
- Ohio Department of Public Service
- Sandusky City Schools
- Sandusky Transit Administrator
- Serving Our Seniors

INTRODUCTION

Setting the Stage

SECTION CONTENT:

Transportation Safety Planning

ERPC Road Safety

Vision Goals & Objectives

3 INTRODUCTION – SETTING THE STAGE

3.1 TRANSPORTATION SAFETY PLANNING

The State of Ohio experiences an average of 1,000 transportation-related fatalities every year. A national strategy called *Toward Zero Deaths* concludes that even if it is unclear when fatalities will reach zero, even one death on the transportation network is unacceptable; this strategy is driven and supported by transportation, enforcement, local government, educators, health professionals and emergency response agencies. The Ohio Department of Transportation (ODOT) has adopted the Toward Zero Deaths strategy and is working toward solutions to ensure safety on Ohio's transportation network.

One effective means to achieve this vision is development of local road safety plans (LRSP). This type of plan empowers local and regional transportation agencies to organize stakeholders; review crash data to understand the unique safety challenges in their areas; and identify and implement customized solutions and countermeasures that will be effective based on the local context.

A SOLUTION – ROAD SAFETY PLAN

ODOT recognizes the need to address fatal and serious injury crashes and is encouraging the development of Regional Safety Plans to reduce them.

The ERPC Road Safety Plan provides a framework for identifying, analyzing and prioritizing road safety improvements. This plan provides stakeholders with a prioritized list of high crash locations along with mitigating strategies and projects that will be eligible for ODOT safety funding.

The *ERPC Road Safety Plan* followed a similar approach to develop multi-disciplinary safety solutions. The planning process focused on the understanding that, in most cases, motor vehicle-related crashes can be prevented. For example, improved roadway features can limit crash severity and in others, stopping people from engaging in unsafe behaviors is key. However, in most cases, it is a combination of both factors. Additional factors influencing potential for motor vehicle safety and crash outcomes are improvements in vehicle smart technologies and safety equipment and improvements in medical treatment. This plan identifies proven strategies, actions, programs and projects to reduce crashes related to infrastructure and driver error, focusing on mitigating fatal and serious injury (FSI) crashes.

3.2 ERIE REGION TRANSPORTATION SAFETY

THE STUDY AREA

The Erie region is located in north central Ohio, bordering the shores of Lake Erie, as illustrated in Figure 1. According to the *Ohio County Profile on Erie County* which is researched and published by the Ohio Development Services Agency, the estimated population of Erie County was 74,615 in 2018. This represents a decline from the official population of 77,079 as recorded by the 2010 United States Census. Of the reported census population, 22 percent was under the age of 18 and 18 percent was over the age of 65.

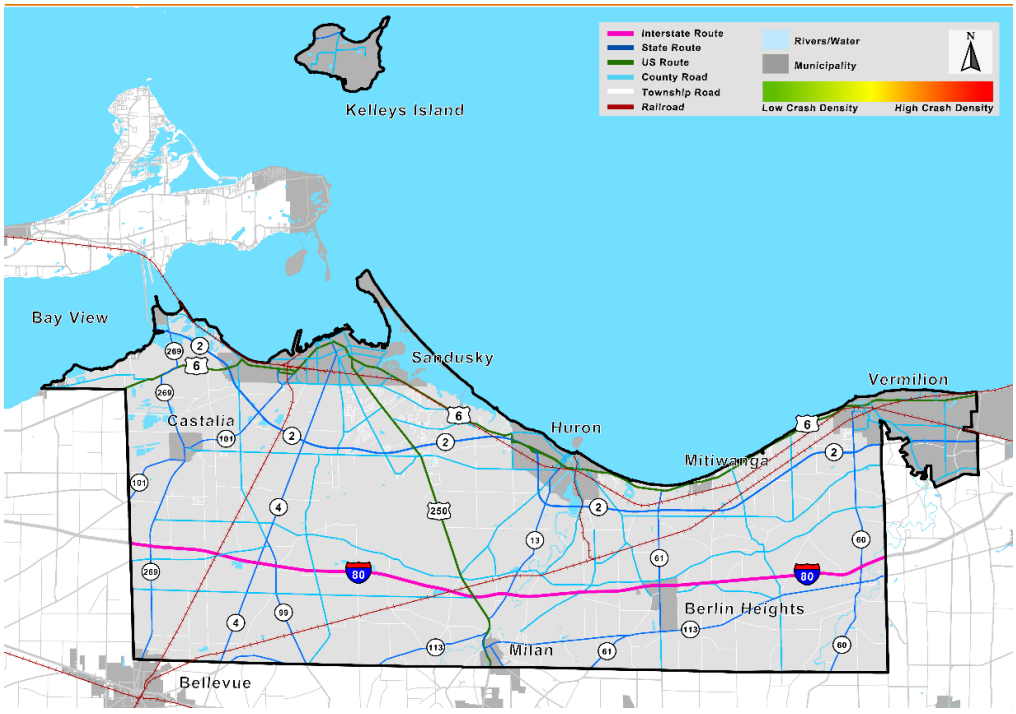
According to the Ohio County Profile for Erie County, less than 17 percent is developed and nearly 81 percent is farmland or natural setting. Significant concentrations of population within the study area are Sandusky (population 24,714) Perkins Township (population 11,728) and Vermilion (population 10,437). The City of Vermillion lies within both Erie and Lorain Counties (Population: 4,635 Erie Co., 5,903 Lorain Co.) Although the Erie region is mostly rural, it includes the significant tourist destinations within and near the City of Sandusky, such as Cedar Point, lakefront attractions, and other destinations which draw significant tourist traffic to the area.

Based on the Ohio County Profile for the Erie region, the Erie region includes approximately 870 miles of public roadways. Nearly 158 miles are state and US routes, 267 miles are township roads, 140 miles are county roads, and 215 are municipal roads. The plan analyzed the entire network of public roads to understand crash patterns, including the locations, severity, types and contributing factors for reported crashes in the Erie region.

EXTERNAL FACTORS IMPACTING CRASHES

This plan focuses on analysis of crash trends to understand the location and cause of reported crashes, particularly fatal and serious injury crashes. Additional safety insights can be gained by understanding how other factors play a role in transportation safety. Population and Vehicle Miles Traveled (VMT) trends were reviewed to better understand the Erie region crash data.

Figure 1: Erie Region Map (ERPC MPO Planning Area)



Population and Fatal and Serious Injury Crashes

Based on population estimates included in the Ohio County Profile, the overall population in the Erie region is decreasing. As shown in Figures 2 and 3, fatal crashes are on a generally upward trend while serious injury crashes are on a downward trend similar to the decreasing population.

Figure 2: Fatalities from Crashes and Population within the Erie Region, 2009–2017

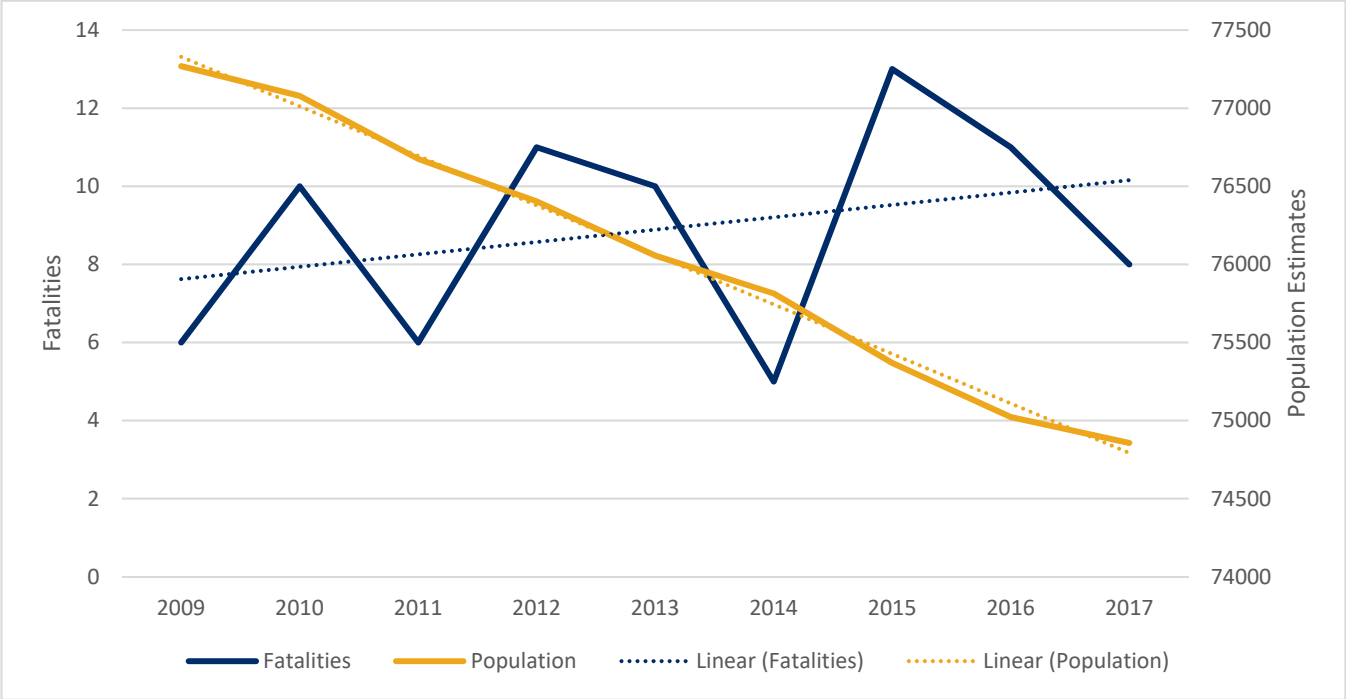
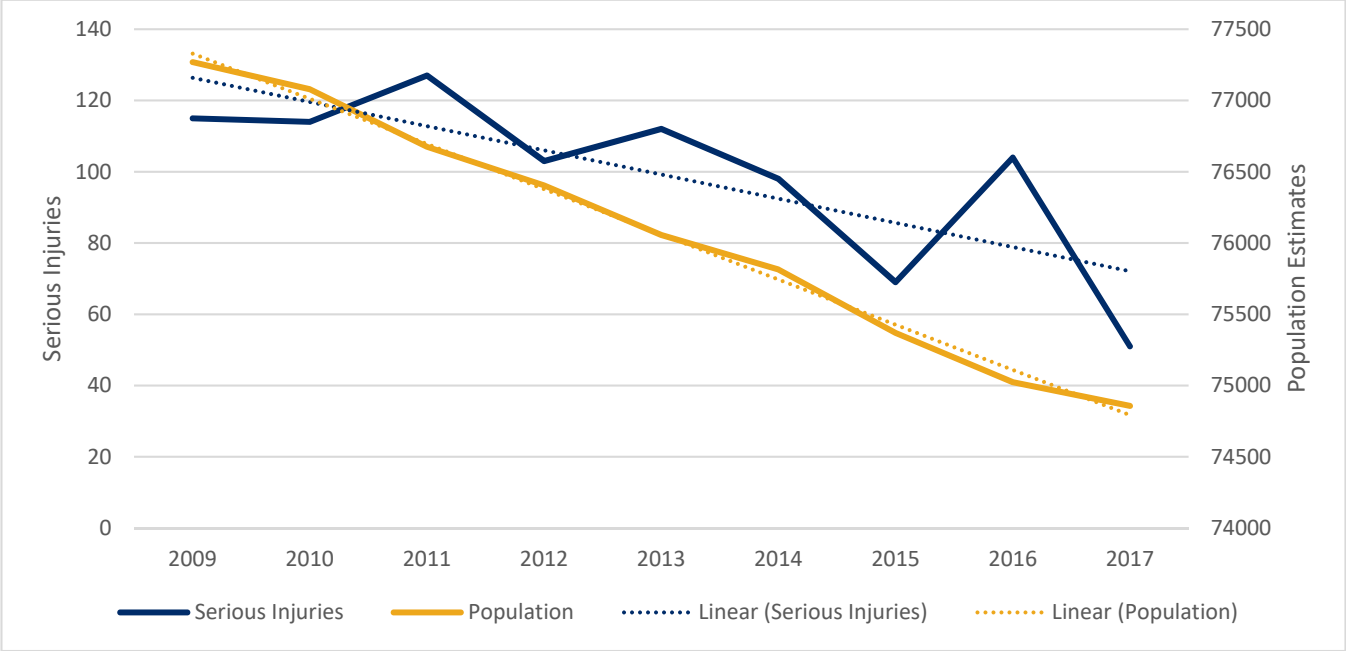


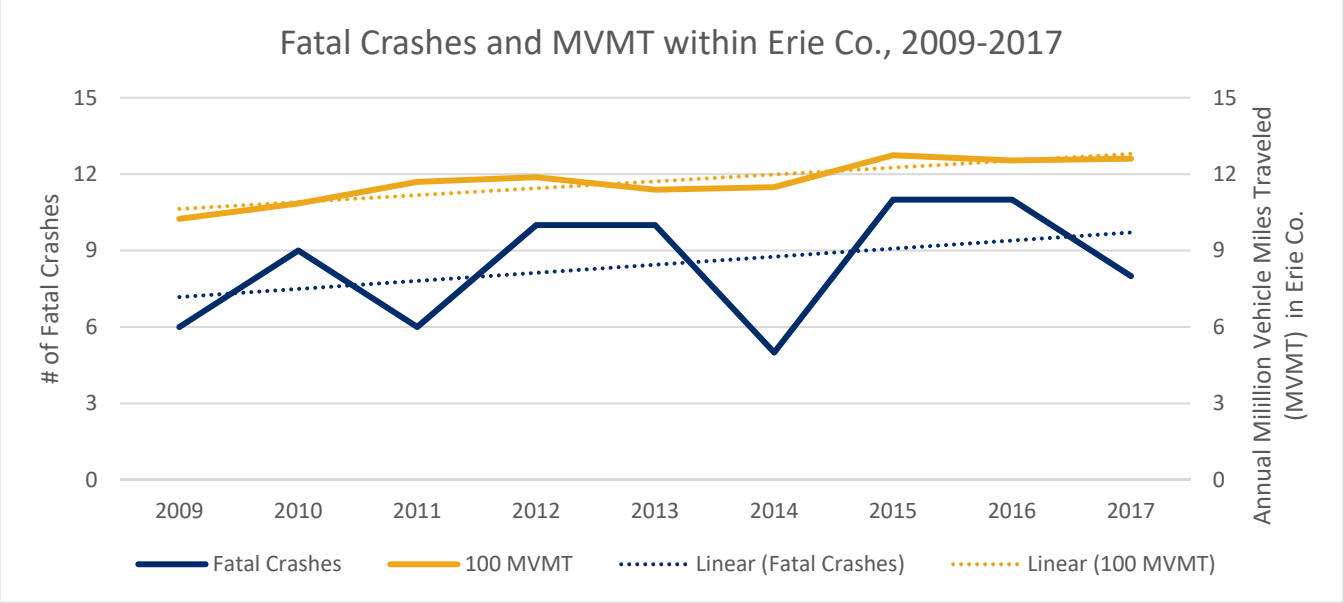
Figure 3: Serious Injuries from Crashes and Population within the Erie Region, 2009–2017



Vehicle Miles Traveled

Although the Erie region's population provides a reasonable estimation of the concentration of people living in an area, it does not fully capture vehicle travel patterns, which include visitors to the area as well as residents. This is notable in the Erie region with its popular tourist destinations. Vehicle Miles Traveled (VMT) presents a clearer indication of regional travel patterns. VMT reflects the number of vehicles traveling on identified roadways within a specified year, independent of the ERPC population. VMT is calculated by multiplying the number of roadway centerline miles by the Average Daily Traffic (ADT) volumes. Based on calculations provided by ODOT, VMT in the Erie region demonstrates an upward trend during the analysis period.

Figure 4: Fatal Crashes and VMT within the Erie Region, 2009–2017



CURRENT SAFETY ACTIVITIES

Existing safety programs and projects in the region were considered during the planning process. The plan is intended to build upon, not replace, current activities by implementing additional proven strategies to reduce fatal and serious injury crashes. The results of this analyses were reviewed and discussed during stakeholder meetings and incorporated into the plan.

3.3 VISION, GOAL AND OBJECTIVES

The Erie region safety vision, goal and objective describe the safety aspirations for the next 25 years and what safety success looks like in the near term, as reflected by the five-year planning horizon for this study. In developing the specific vision, goals and objectives for this plan, stakeholders were presented with examples from ODOT and other agencies as well as local crash data, showing historical safety performance and future forecasts. One of the main objectives of the ERPC is to improve the safety of the existing transportation system through the study of traffic crash data to identify safety improvements. ERPC supports ODOT's statewide safety target of one percent annual reduction across all five performance measures. The five safety performance measures established are 1) Number of fatalities, 2) Number of serious injuries, 3) Fatality rate, 4) Serious injury rate, and 5) Number of non-motorized fatalities and serious injuries. The elements covered in following sections present a framework that will help the Erie region focus funding and resources to implement safety policies, programs and projects that will best achieve the identified safety targets, goal, and objectives.

Existing Conditions

Understanding Safety Needs in the Erie Region

SECTION CONTENT

The Big Picture

Crash Types

4 EXISTING CONDITIONS – UNDERSTANDING SAFETY NEEDS IN THE ERIE REGION

4.1 THE BIG PICTURE

Crashes reported on Erie region roads during the 2009-2017 analysis period were evaluated. This nine-year period provided sufficient information to establish trends and distinguish patterns within the data. The crash data provided by ODOT were analyzed to understand overall crash trends, fatal and serious injury crash trends, how crashes compared across jurisdictions and the types of roads on which crashes occur. The analysis results identify safety conditions, setting the stage for safety planning in the Erie region.

There are 2,401 crashes per year in the Erie region (roughly seven per day). Annual crashes include an average of eight fatal crashes, 99 serious injury crashes and 549 injury crashes.

CRASH STATISTICS

During the analysis period, 21,611 crashes were reported in the Erie region; 76 crashes (0.35 percent) resulted in 80 fatalities and 4,938 crashes (23 percent) resulted in 893 serious injuries. Crash data indicate that on average, there are 2,401 crashes per year in the Erie region (roughly seven per day). Annual crashes include an average of eight fatal crashes, 99 serious injury crashes and 549 injury crashes.

Figure 5: Crash Statistics, 2009–2017

Year	Crash Statistics			
	Fatal	Injury	PDO[1]	Total
2009	6	560	1,764	2,330
2010	9	550	1,893	2,452
2011	6	601	1,948	2,555
2012	10	516	1,715	2,241
2013	10	538	1,629	2,177
2014	5	587	2,007	2,599
2015	11	510	1,952	2,473
2016	11	538	1,874	2,423
2017	8	538	1,815	2,361
9-Year Total	**76**	**4,938**	**16,597**	**21,611**
Annual Average	**8**	**549**	**1,844**	**2,401**

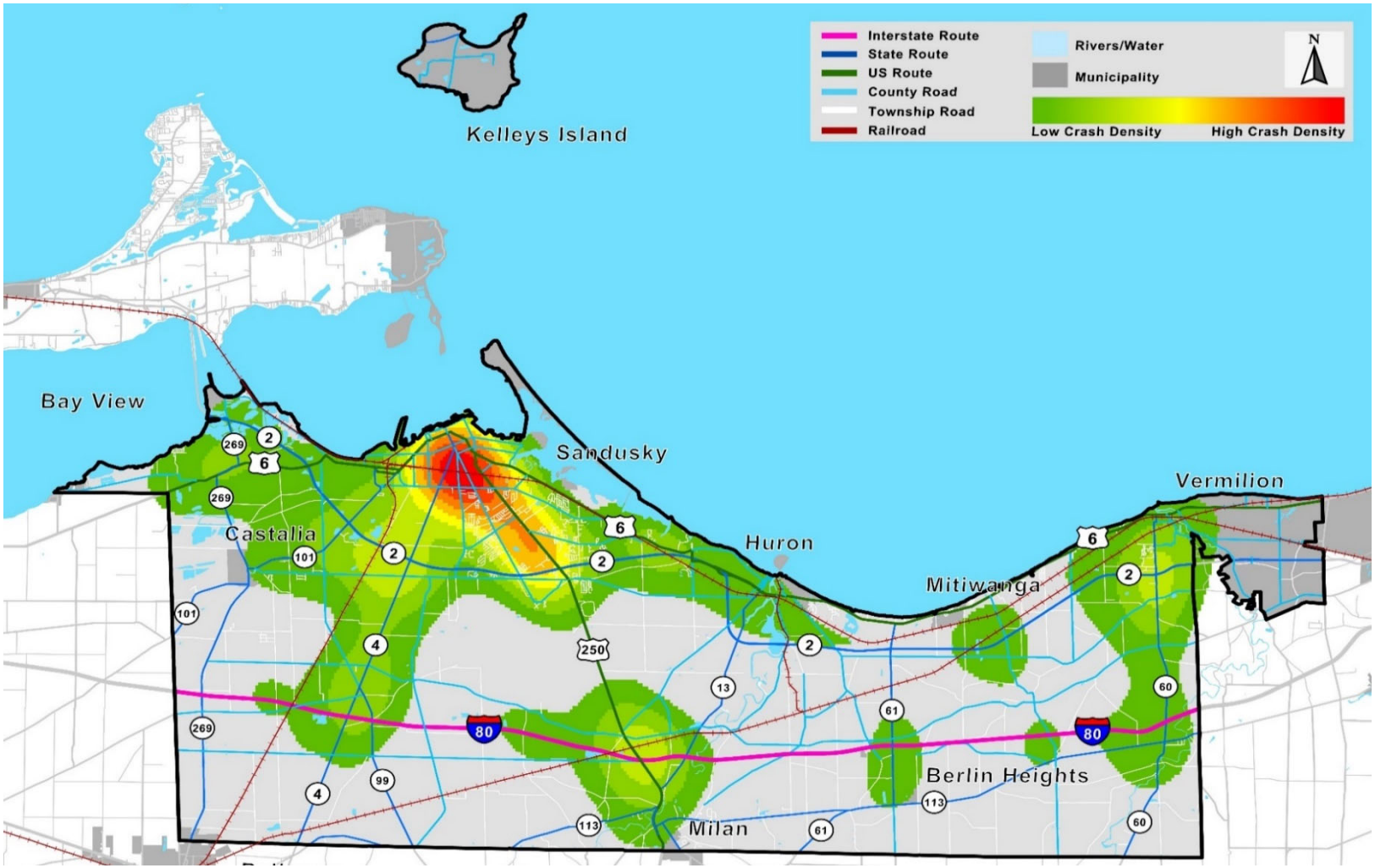
[1] 'PDO' crashes are Property Damage Only; damage to property (i.e., vehicle damage with no injuries to occupants)

Note: Green highlight indicates peaks in analysis period.

FATAL AND SERIOUS INJURY (FSI) CRASH LOCATIONS

Crashes resulting in fatalities and/or serious injuries (FSI crashes) occur predominantly on the higher volume roads, generally located near and within the City of Sandusky and the greater Sandusky area, with notable crash trends along US 250, US 6, SR 4 and SR 60.

Figure 6: Heat Map of Fatal and Serious Injury Crashes, 2009–2017



OCCUPANT STATISTICS

Of the 7,349 people reported as injured and possibly injured in crashes in the Erie region during the analysis period, 80 died and 893 were seriously injured. Annual average data indicate crashes potentially injure nearly 817 people every year in the Erie region, with nine fatalities and 99 seriously injured.

Figure 7: Occupant Statistics, 2009–2017

Year	Crash Statistics				Occupant Statistics					
	Fatal	Injury	PDO[1]	Total	Fatal	Serious Injury	Minor Injury	Possible Injury	Total Injury	No Injury
2009	6	560	1764	2330	6	115	357	395	873	4250
2010	9	550	1893	2452	10	114	318	348	790	4514
2011	6	601	1948	2555	6	127	381	394	908	4735
2012	10	516	1715	2241	11	103	355	311	780	4086
2013	10	538	1629	2177	10	112	272	357	751	4005
2014	5	587	2007	2599	5	98	353	429	885	4831
2015	11	510	1952	2473	13	69	303	372	757	4409
2016	11	538	1874	2423	11	104	317	366	798	4429
2017	8	538	1815	2361	8	51	310	438	807	4155
9-Year Total	**76**	**4,938**	**16,597**	**21,611**	**80**	**893**	**2,966**	**3,410**	**7,349**	**39,414**
Annual Average	**8**	**549**	**1844**	**2401**	**9**	**99**	**330**	**379**	**817**	**4,379**

[1] 'PDO' crashes are Property Damage Only; damage to property (i.e., vehicle damage with no injuries to occupants)
Note: Green highlight indicates peaks in analysis period.

CRASH STATISTICS BY MAINTAINING AUTHORITY

Although 48 percent of reported crashes in the Erie region occur on state-maintained roadways, 52 percent of FSI crashes occurred on state-maintained roadways. In contrast, approximately 33 percent of reported crashes in the Erie region occurred on city-maintained roadways with 21 percent of FSI crashes.

Figure 8: Crash Statistics by Roadway Maintaining Authority, 2009-2017

Maintaining Authority	Fatal Injury	Serious Injury	Visible Injury	Possible Injury	No Injury	Total
City/Village Road	8	150	540	818	5,516	7,032
County Road	18	108	261	281	1,774	2,442
Other/Private Road	0	9	19	21	302	351
State Road	30	303	837	776	5,949	7,895
Interstate Tollway	11	49	308	173	2,000	2,541
Township Road	9	56	133	96	1,056	1,350
Total	76	675	2,098	2,165	16,597	21,611

CRASHES BY MAINTAINING AUTHORITY

Nearly two-thirds of reported crashes in the Erie region occurred on non-state-maintained roadways. As such, it is incumbent upon local jurisdictions to prioritize locations, apply for funding, and develop plans to implement mitigation measures to have a positive impact on reducing FSI crashes. The figure below breaks the fatal, serious, and total amount of crashes down by jurisdiction. The total number of crashes includes non-fatal and serious crashes. Crashes are also categorized by all, non-state maintained, and county-maintained to illustrate the number of crashes occurring on locally-maintained roads compared to state- and county- maintained roads.

Figure 9: Crashes by Jurisdiction and Roadway Maintaining Authority, 2009-2017

Jurisdiction	All Crashes			Non-State Maintained Roadways[1]			County-Maintained Roadways		
	Fatal Injury	Serious Injury	Total	Fatal Injury	Serious Injury	Total	Fatal Injury	Serious Injury	Total
Bay View	0	0	14	0	0	14	0	0	0
Bellevue	0	1	3	0	1	3	0	0	0
Berlin Heights	2	4	194	0	1	66	0	0	0
Berlin Twp	5	30	724	3	10	259	2	3	139
Castalia	0	4	113	0	4	113	0	0	0
Florence Twp	5	39	1069	0	8	165	0	3	69
Groton Twp	6	47	1091	1	14	197	1	9	150
Huron	2	17	432	2	17	432	0	0	0
Huron Twp	4	36	1315	0	7	291	0	6	130
Kelleys Island	0	3	31	0	3	31	0	0	0
Margaretta Twp	11	85	1490	5	27	380	4	13	183
Milan	0	4	175	0	4	175	0	0	0
Milan Twp	8	53	1659	3	14	370	0	7	187
Norwalk Twp	0	0	1	0	0	1	0	0	1
Oxford Twp	3	32	1000	1	16	174	1	14	121
Perkins Twp	16	131	4731	11	51	1791	8	40	1297
Sandusky	4	102	5463	4	102	5463	0	0	0
Vermilion	2	22	952	2	22	952	0	0	0
Vermilion Twp	8	65	1154	3	22	298	2	13	165

[1] *'Non-State Maintained Roads' are roads maintained by counties and local jurisdictions (cities, villages, and townships).*

4.2 CRASH TYPES

Crash types reflect the basic nature of the crash, such as fixed object, head-on, rear end, left turn, and angle crashes. Crash type analysis is a common method of categorizing crashes to understand key issues and subsequently identify crash mitigation countermeasures.

REGIONAL CRASH TYPES

Based upon input from the stakeholder group meetings, the study focused on the most prevalent crash types. The four most prevalent crash types that occurred during the analysis period were rear end, fixed object, animal and sideswipe-passing crashes with just over 4,800 rear end crashes; only 2.3 percent of these most prevalent crash types resulted in a fatality or serious injury. By comparison, although there are fewer pedestrian crashes, more than 25 percent of reported pedestrian crashes resulted in a fatality or serious injury. As such, pedestrian crashes are studied along with the most prevalent crash types. The total crash frequency and the percentage of FSI crashes can be compared to total crashes to identify appropriate crash mitigation strategies.

The four most prevalent crash types that occurred during the analysis period rear end, fixed object, animal and sideswipe-passing crashes.

Figure 10: Region-Wide Crash Types, 2009–2017

	Total Crashes	Fatal Crashes	Serious Injury Crashes	FSI Rate
Rear End	4808	7	104	2.3%
Fixed Object	4212	24	205	5.4%
Animal	2703	2	13	0.6%
Sideswipe-Passing	2194	1	36	1.7%
Angle	1536	10	83	6.1%
Left Turn	1501	6	68	4.9%
Backing	1133	0	4	0.4%
Parked Vehicle	1016	1	18	1.9%
Other Object	553	1	2	0.5%
Other Non-Collision	463	0	5	1.1%
Right Turn	439	0	6	1.4%
Head On	305	5	37	13.8%
Overturning	217	6	39	20.7%
Sideswipe-Meeting	184	6	5	6.0%
Pedestrian	145	5	32	25.5%
Pedalcycles	135	0	15	11.1%
Unknown	57	0	3	5.3%
Train	10	2	0	20.0%

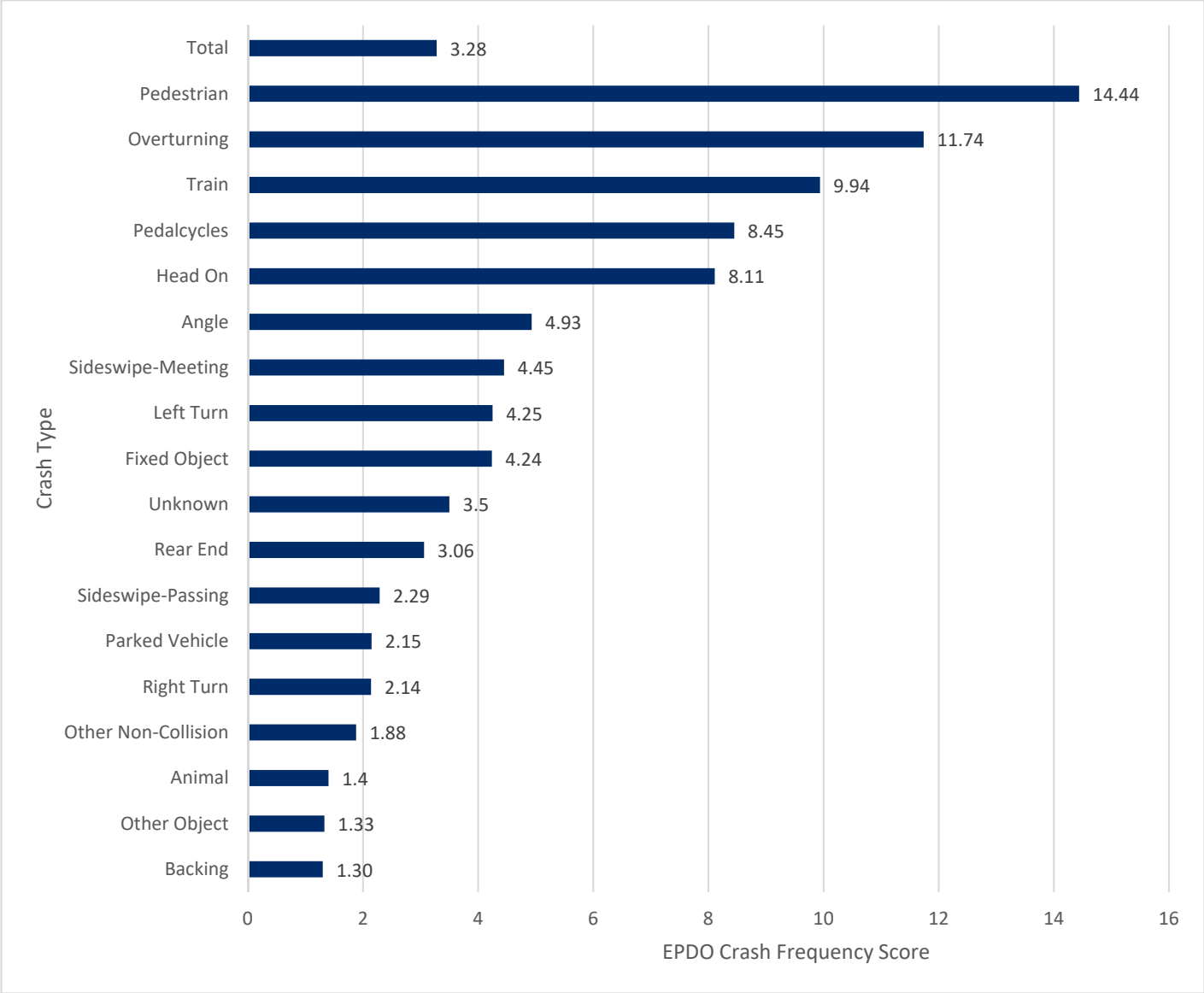
Note: Green highlight indicates peaks in analysis period.

EQUIVALENT PROPERTY DAMAGE ONLY CRASHES

Equivalent property damage only (EPDO) crash frequency reflects the relative severity of the crashes within the study area. EPDO crash frequency normalizes the data, providing another means of informing prioritization of crash locations. It also provides an estimate of economic effect that a fatal or injury crash has on society. The EPDO Crash Frequency Equation was applied to the data using information provided in the ODOT Economic Crash Analysis Tool (ECAT). High EPDO values indicate crash types with high levels of fatalities and/or serious injuries, like pedestrian crashes. This information helped informed decision-making by the stakeholder group.

EPDO Crash Frequency = (41.18 x Fatal and Serious Injury Crashes + 6.55 x Visible Injury Crashes + 4.44 x Possible Injury Crashes + Property Damage Only Crashes) / Total number of crashes

Figure 12: EDPO for Crash Types, 2009–2017



CRASH TYPES BY JURISDICTION

The table below provides an assessment of the four most prevalent over-represented crash types by community. Crash type percentages are based on number of crashes for each crash type within each community as compared to total crashes within the community.

Figure 13: Over-Represented Crash Types by Jurisdiction, 2009–2017

	Rear End	Fixed Object	Animal	Sideswipe Passing
Bay View	0%	36%	7%	7%
Bellevue	0%	33%	0%	0%
Berlin Heights	9%	33%	13%	13%
Berlin Township	5%	31%	40%	3%
Castalia	19%	26%	7%	3%
Florence Township	7%	35%	24%	14%
Groton Township	17%	25%	19%	11%
Huron	18%	20%	5%	9%
Huron Township	20%	22%	24%	8%
Kelleys Island	13%	16%	3%	10%
Margaretta Township	12%	37%	17%	7%
Milan	22%	16%	6%	7%
Milan Township	12%	27%	26%	11%
Norwalk Township	0%	0%	100%	0%
Oxford Township	9%	43%	12%	16%
Perkins Township	47%	10%	4%	9%
Sandusky	20%	9%	1%	12%
Vermilion	21%	16%	16%	10%
Vermilion Township	10%	26%	33%	6%

CRASH TYPES FOR FSI CRASHES BY MAINTAINING AUTHORITY

Crash data indicate that roughly half of FSI crashes occur on state-maintained roadways. In comparison, the majority bicycle and pedestrian crashes occur on non-state-maintained roadways, with 87 percent of bicycle crashes (pedacycles) and 73 percent of pedestrian crashes.

Figure 14: Crash Types for FSI Crashes by Maintaining Authority, 2009–2017

	State	County	Municipal	Township	Total
Fixed Object	116	45	28	40	229
Angle	46	18	25	4	93
Rear End	74	12	21	4	111
Overturning	21	12	4	8	45
Head On	22	6	10	4	42
Left Turn	45	11	13	5	74
Sideswipe-Passing	29	4	3	1	37
Pedestrian	10	5	18	4	37
Animal	9	3	1	2	15
Pedalcycles	2	2	11	0	15
Sideswipe-Meeting	6	2	3	0	11
Other Non-Collision	2	1	2	0	5
Right Turn	4	1	1	0	6
Parked Vehicle	4	1	13	1	19
Backing	0	2	2	0	4
Unknown	1	0	1	1	3
Other Object	2	0	1	0	3
Train	0	1	1	0	2
TOTAL	393	126	158	74	751

Note: Green highlight indicates peaks in analysis period.

4.2.1 Over-Represented Crash Types

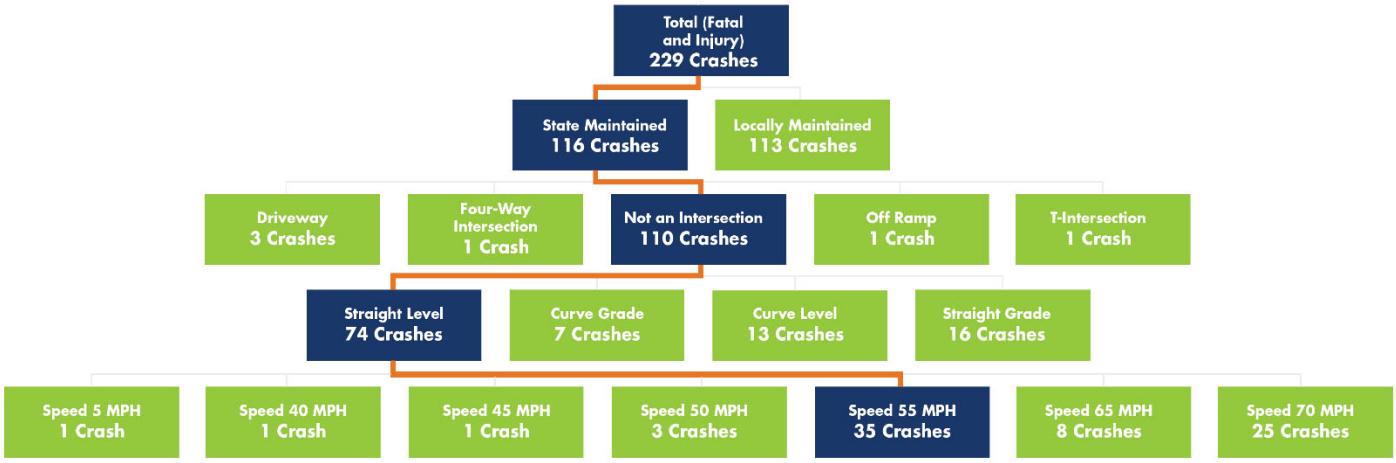
The most prevalent FSI crash types that occurred in the Erie region during the analysis period are fixed object, rear end and angle crashes. In-depth analysis was performed for these crash types to enable focusing on treatments, measures and methods to mitigate FSI crashes.

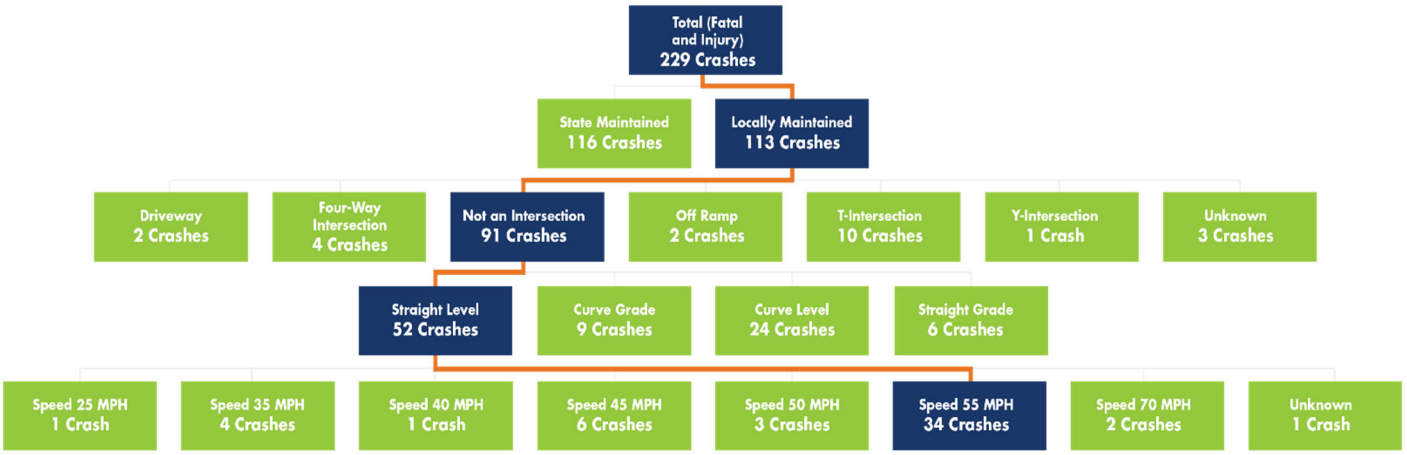
FIXED OBJECT CRASHES

Fixed object crashes occur when a vehicle leaves the roadway and collides with a stationary object such as a tree, utility pole, mailbox or other permanent feature along the roadway. There were 4,212 fixed object crashes reported during the analysis period; these crashes resulted in 24 fatalities and 205 serious injuries. The speeds shown in the crash tree diagrams are the stated speed from the OH-1 Crash Reports.

Fixed object crashes account for over 27% of FSI crashes in the Erie region.

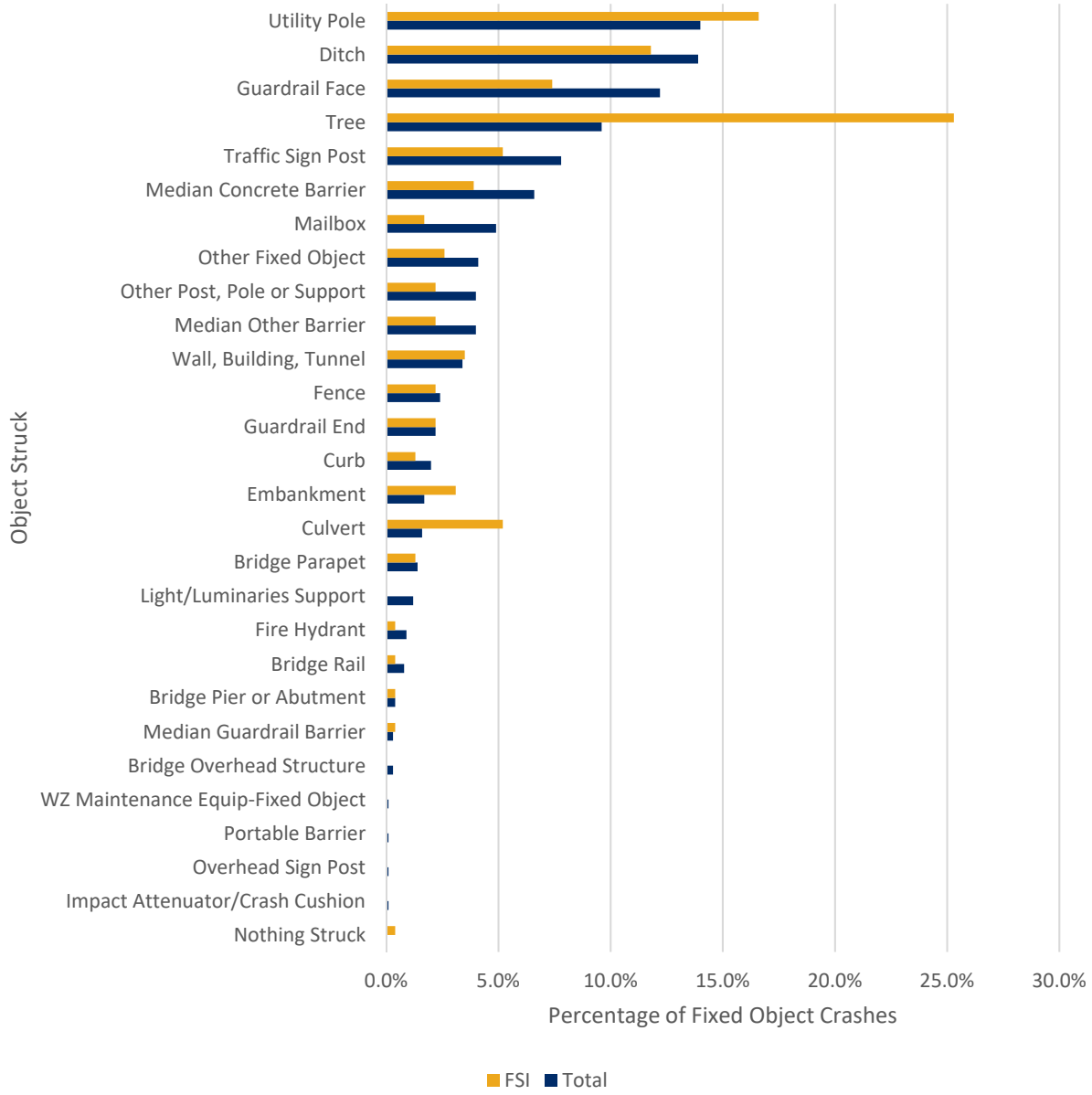
Figure 15: Crash Tree Diagrams of Fixed Object-Related FSI Crashes, 2009–2017





The crash tree diagrams in Figure 15 show that about half of fixed object crashes occur on state-maintained roads. Crash data reflect the majority of crashes on both State and locally maintained roads occurred on straight, level roadway segments. Crash data shown in Figure 16 indicate that utility poles, trees, ditches and guardrail faces were the most commonly types struck fixed objects. Although trees were struck in 9 percent of fixed object crashes, they represent 25 percent of FSI crashes. Some fixed objects are designed roadway features that are intended to improve roadway safety. It is likely that crashes into these fixed objects likely involve other contributing factors like speed, driver age, impairment, and/or distracted drivers, the most common contributing factors identified within the study's analyses. The roadway design features include guardrail face, median concrete barrier, median other barrier, guardrail end, curb, bridge parapet, bridge rail, median guardrail barrier, portable barrier and impact attenuator/crash cushion.

Figure 16: Object Struck in Fixed Object-Related FSI Crashes, 2009–2017

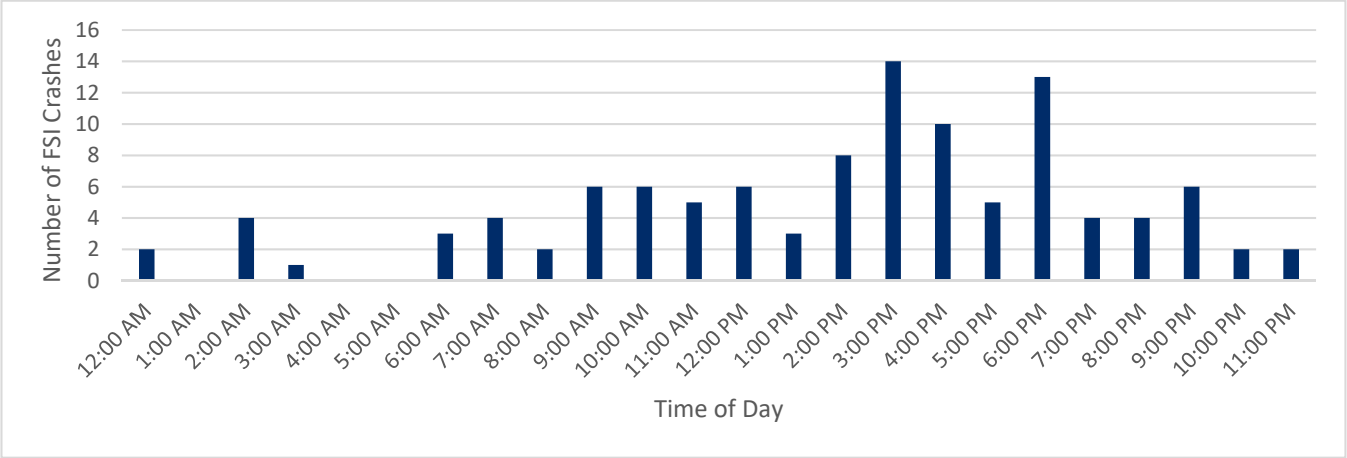


"Nothing Struck" indicates data not reported.

REAR END CRASHES

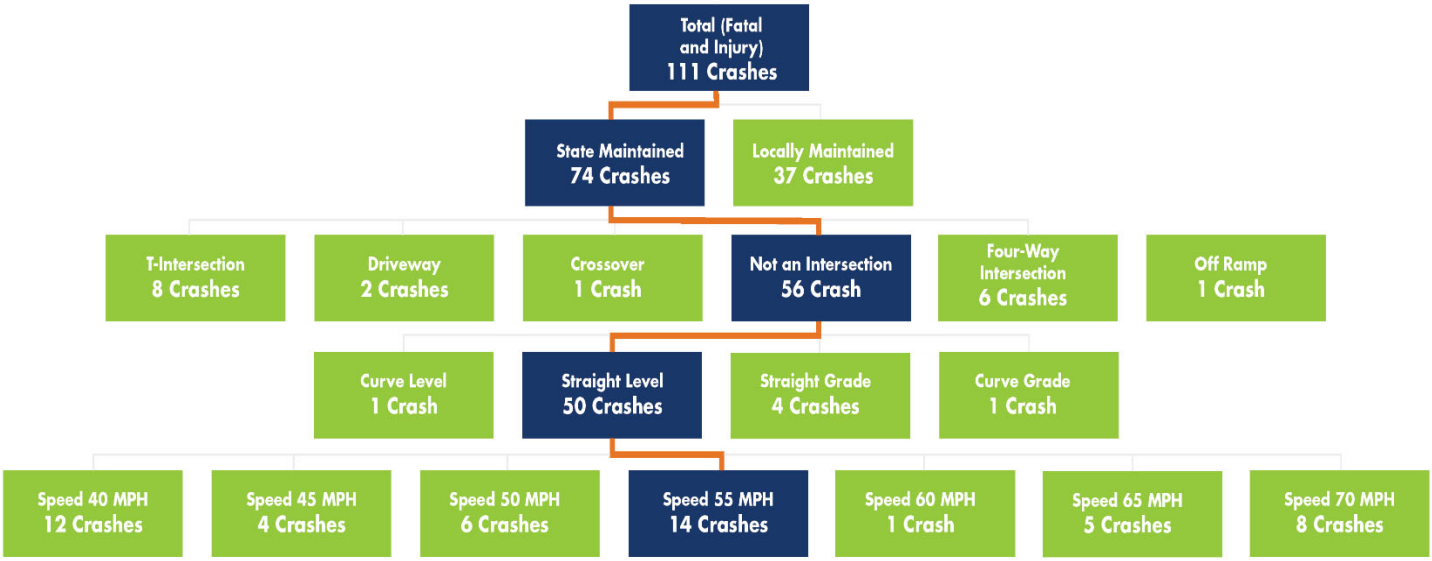
During the analysis period, 4,808 rear end crashes were reported, resulting in seven fatalities and 104 serious injuries. Peaks in FSI rear end crashes occurred during peak traffic volumes, particularly the afternoon/evening peak. Furthermore, FSI rear end crashes were less likely to occur late at night through early morning hours.

Figure 17: Time of Day for Rear End FSI Crashes, 2009–2017



Two-thirds of FSI rear end crashes occur on state-maintained roads, predominantly on principal arterials. Most rear end crashes did not occur at intersections. Based on typical driver behaviors and roadway characteristics, non-intersection rear end crashes are likely related to unanticipated slowing traffic which could be caused by turning vehicles or downstream congestion.

Figure 18: Tree Diagram of Rear End FSI Crashes, 2009–2017



ANGLE CRASHES

There were 710 reported injuries associated with angle crashes and of these, 10 were fatalities and 83 were serious injuries. FSI angle crashes happened throughout the day, peaking in the afternoon/evening between the hours of 3:00 PM and 7:00 PM. The crash tree diagram in Figure 20 shows that roughly half of FSI angle crashes on locally-maintained roads occurred at stop-controlled, four-legged intersections involving young drivers (ages 16-25). Crashes on state-maintained roads exhibit similar crash factors.

Figure 19: Time of Day for FSI Angle Crashes, 2009–2017

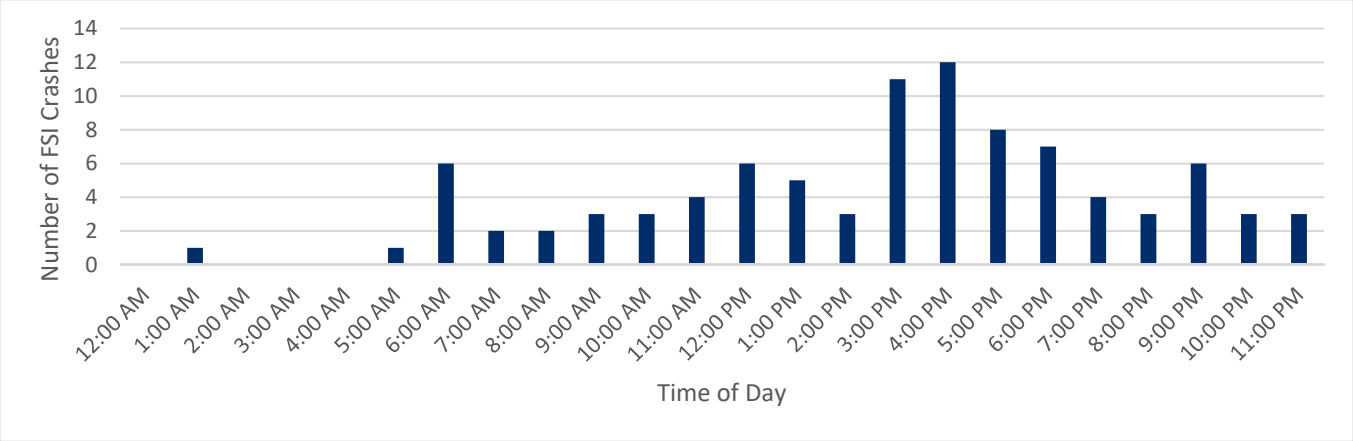
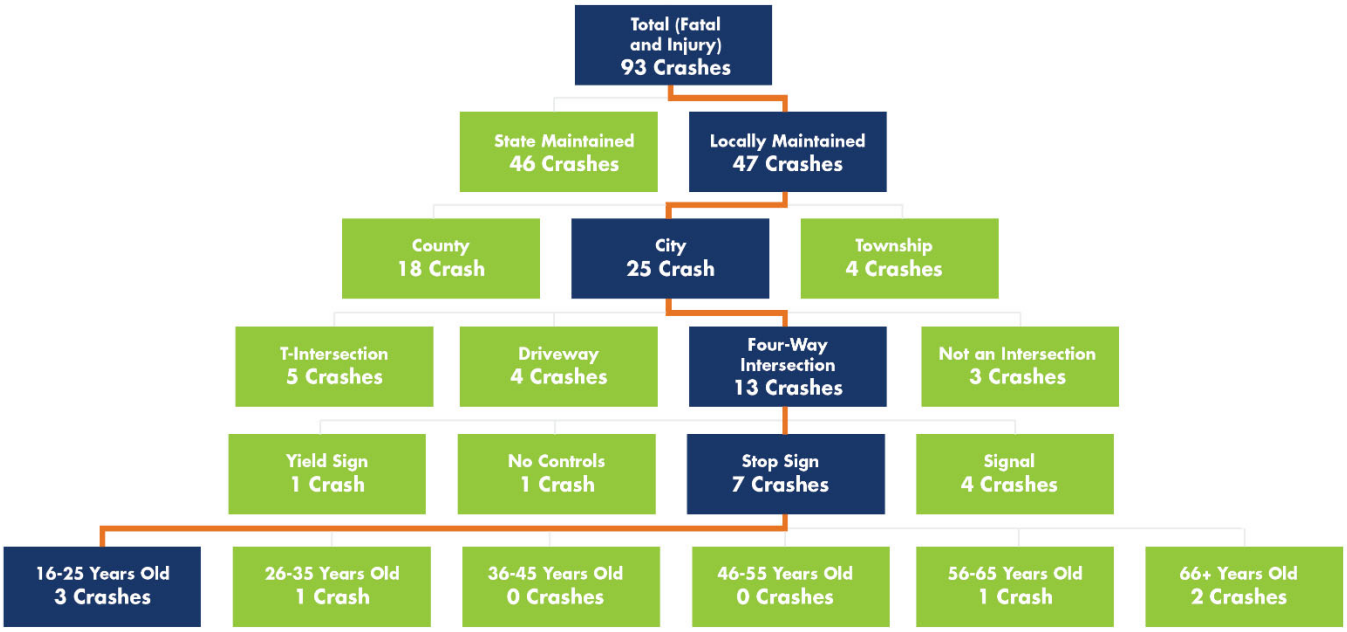
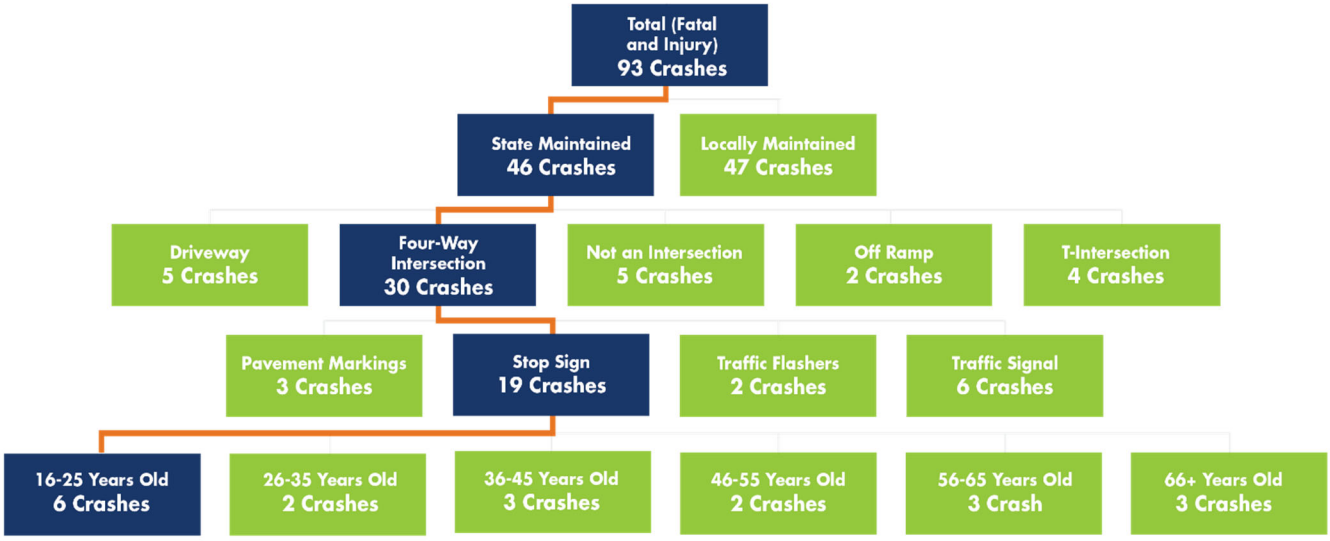


Figure 20: Tree Diagram of Angle FSI Crashes, 2009–2017





Emphasis Areas

Prioritized Focus Areas

SECTION CONTENT

Intersections

Roadway Departures

Distracted Driving

Speeding

5 EMPHASIS AREAS

Several different factors may cause or contribute to a motor vehicle crash, such as driver impairment, vehicles speed, distracted driver, roadway geometrics, etc. At the statewide level, the Ohio Strategic Highway Safety Plan (SHSP) identifies a range of potential factors as primary contributors to FSI crashes. The Ohio SHSP has developed strategies and actions to address these factors. Agencies often refer to these primary contributing factors as emphasis areas, which means they receive additional "emphasis," in the form of time and resources. Figure 21 lists the ODOT emphasis areas and the percent of related crashes where they are factors at the state, county and municipal levels.

Figure 21: Contributing Factors by Roadway Maintenance Authority for FSI Crashes, 2009–2017

Contributing Factors	State	County	Municipal
Roadway Departure	37.6%	47.5%	47.5%
Young Driver	36.9%	35.2%	35.5%
Intersection	36.7%	32.0%	34.4%
Speed-Related	24.0%	21.0%	19.6%
Unrestrained Occupants	18.9%	21.0%	24.3%
Older Driver	18.4%	18.0%	16.2%
Alcohol-Related	16.5%	20.1%	26.8%
Rear End	12.4%	14.8%	10.3%
Motorcycle	10.9%	17.7%	19.6%
Drug-Related	8.1%	7.3%	9.5%
Pedestrian	6.6%	4.9%	7.5%
Distracted Driver	6.4%	5.1%	4.2%
Railroad Crossing	0.3%	0.3%	0.6%
Bicycle	2.0%	2.0%	3.6%

Crash data were analyzed to assess the most frequent emphasis areas that contribute to crashes in the Erie region. The emphasis areas for further analysis were identified based on the results of the crash analysis results, stakeholder input, feasibility to address the crash factors in the region and alignment or relationship to the Ohio SHSP. The emphasis areas listed below were identified by the stakeholder committee for focused implementation efforts for the Erie region.

1. ***Intersections***
2. ***Roadway Departures***
3. ***Distracted Driving***
4. ***Speeding***

INTERSECTIONS

During the analysis period, 5,888 intersection crashes were reported. These crashes contributed to 32 percent of FSI crashes in the Erie region. Contributing factors in intersection crashes may involve obscured lines of sight, signalization, vehicle speed and road geometry. Figure 22 shows the 5-year rolling averages of fatal and serious injury crashes, including future projections. Fatal crashes are projected to increase while serious injury crashes are projected to decrease. Figure 23 indicates that older drivers (age 65+) were the most common factor in intersection crashes resulting in fatalities and younger drivers (age 16-25) were the most common factor in intersection crashes resulting in serious injuries.

Figure 22: 5-Year Rolling Average of Intersection-Related FSI Crashes, 2009–2017

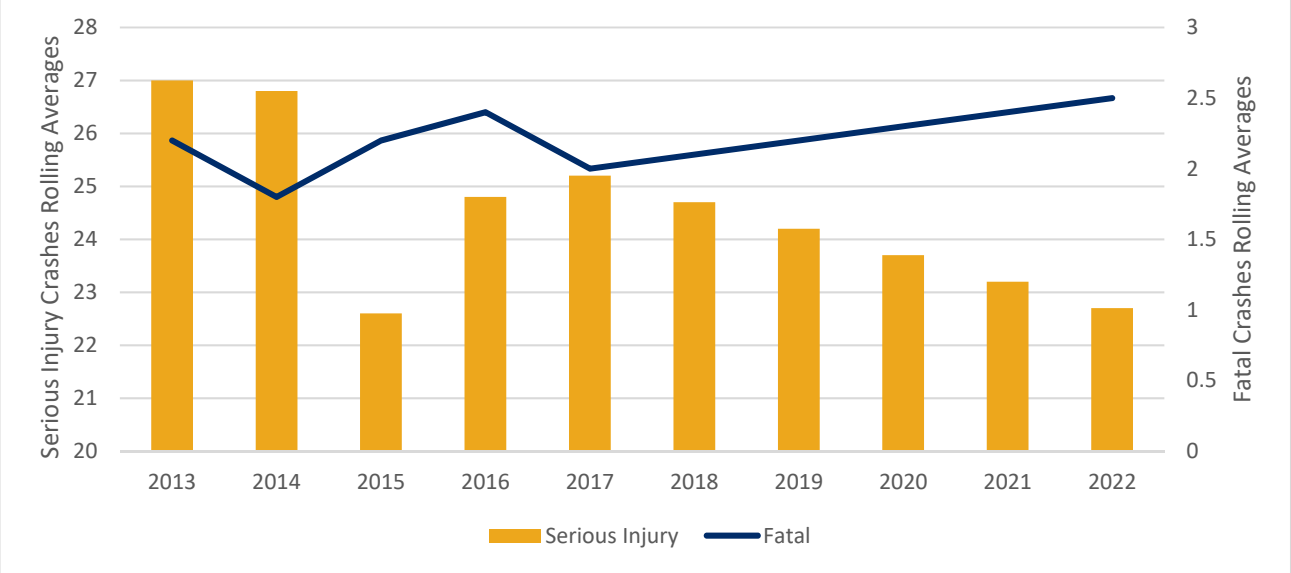
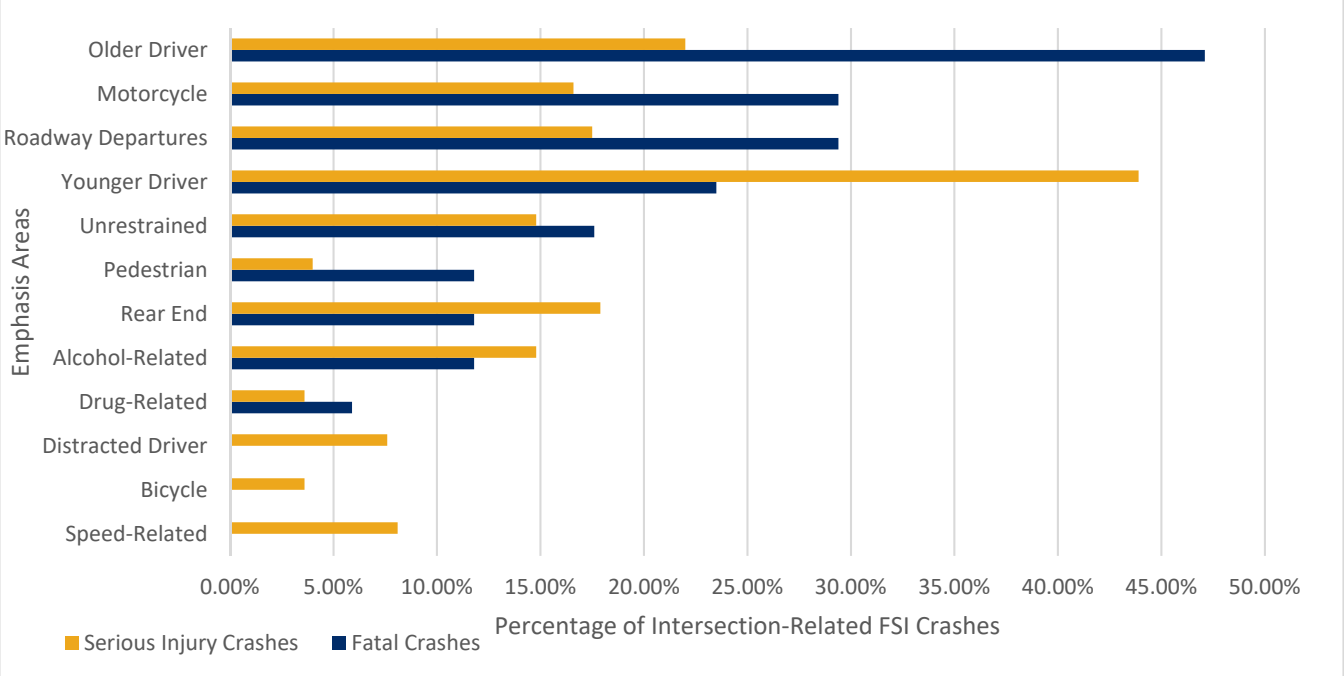
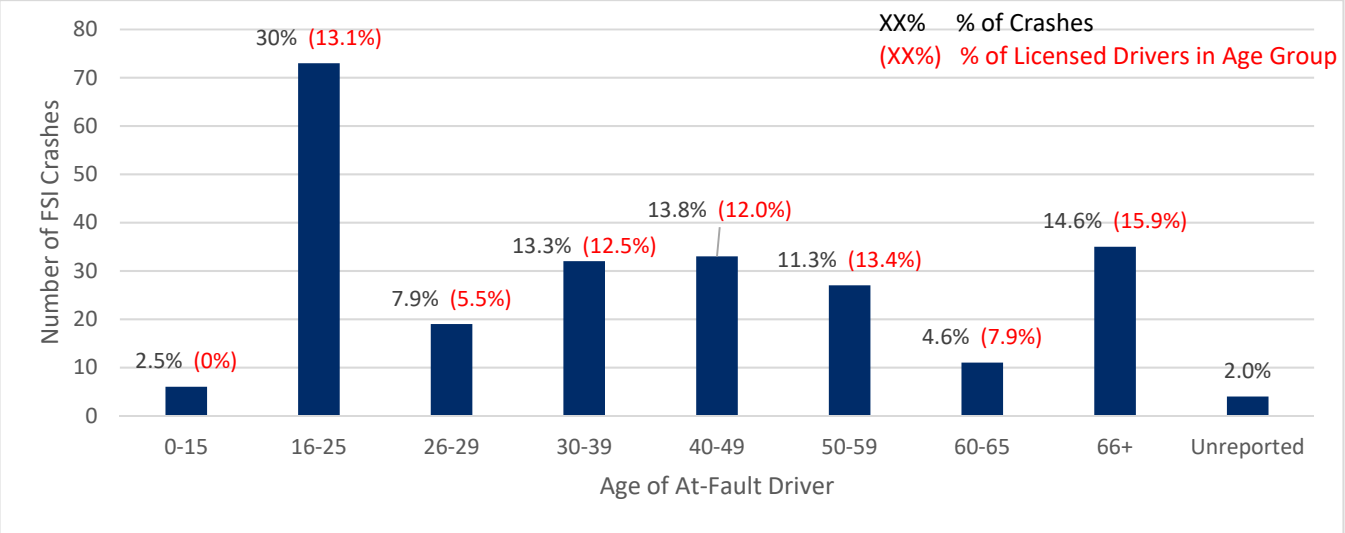


Figure 23: Intersection-Related FSI Crashes and Emphasis Area Overlaps, 2009–2017



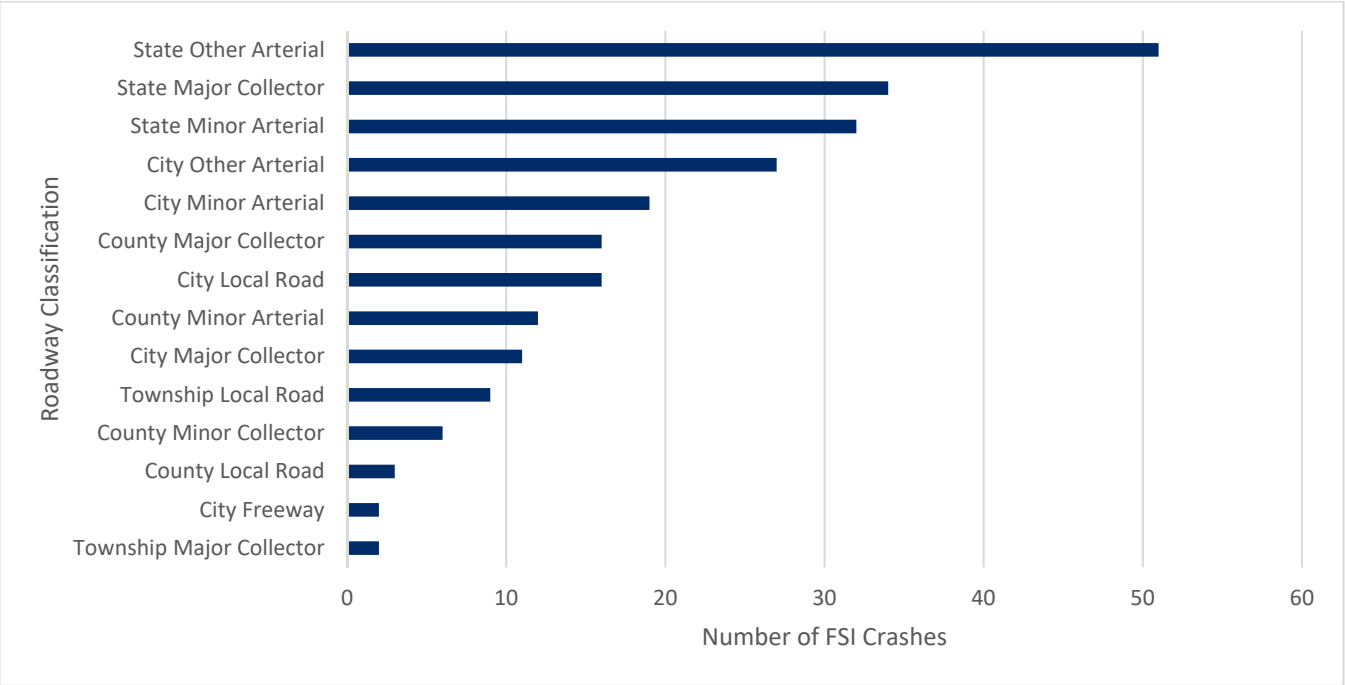
WHO? As reflected by the information in Figure 24, younger drivers (ages 16 to 25) are over-represented in intersection crashes. This trend reflects lack of driver experience, characteristic riskier behaviors and risk tolerance.

Figure 24: Age of At-Fault Driver of Intersection-Related FSI Crashes, 2009–2017



WHERE? Nearly 50 percent of FSI intersection crashes occurred at intersections on state-maintained facilities. Of those crashes, more than 21 percent involved state-maintained arterials (i.e., US-6, US-250, SR-4, etc.). More than 31 percent of FSI crashes at intersections occurred on roads maintained by cities or villages. Figure 25 illustrates the number of crashes by roadway functional class.

Figure 25: Intersection-Related FSI Crashes by Roadway Classification and Jurisdiction, 2009–2017



WHEN? FSI intersection crashes happen throughout the day with peaks that corresponds to school dismissal and the end of the business day. Comparison of daily crash trends indicates fairly consistent numbers of crashes throughout the week. Annual crash data show more than 16 percent of FSI intersection crashes occurred in June, the end of the school year. The fewest FSI intersection crashes occurred in January and February.

Figure 26: Time of Day of Intersection-Related FSI Crashes, 2009–2017

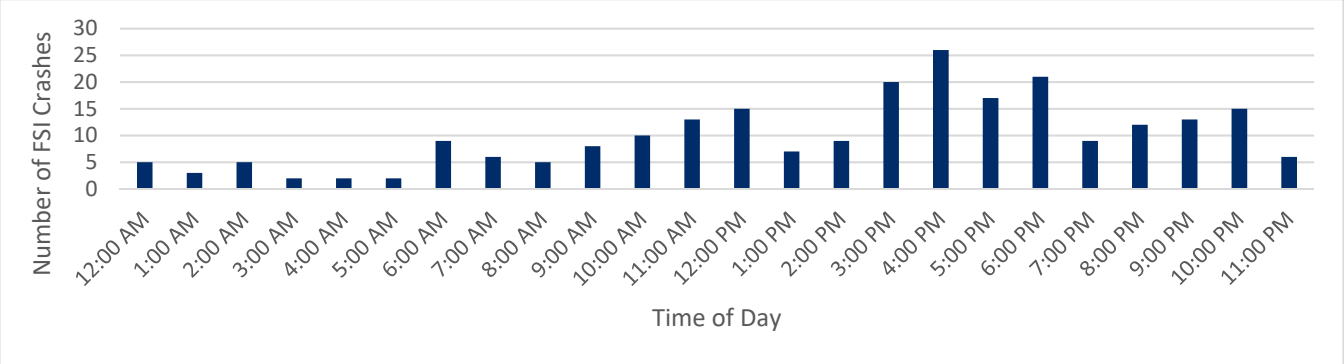


Figure 27: Day of Week of Intersection-Related FSI Crashes, 2009–2017

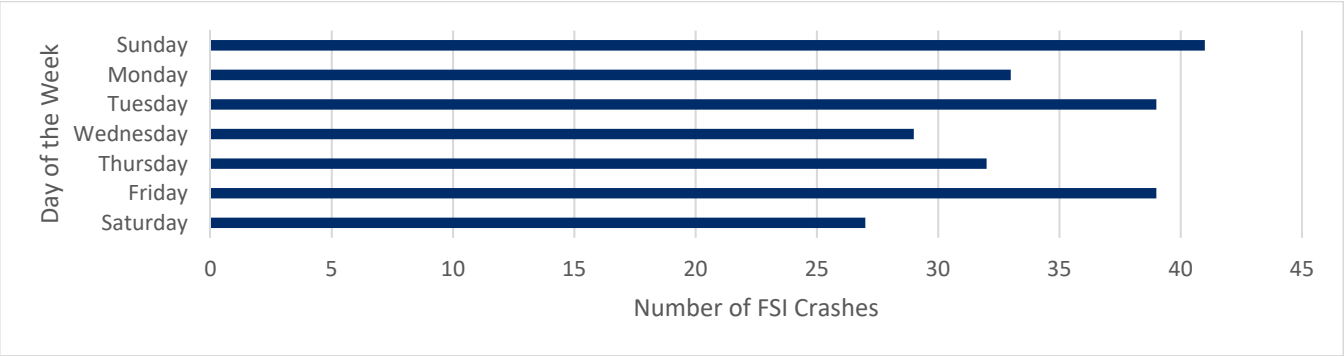
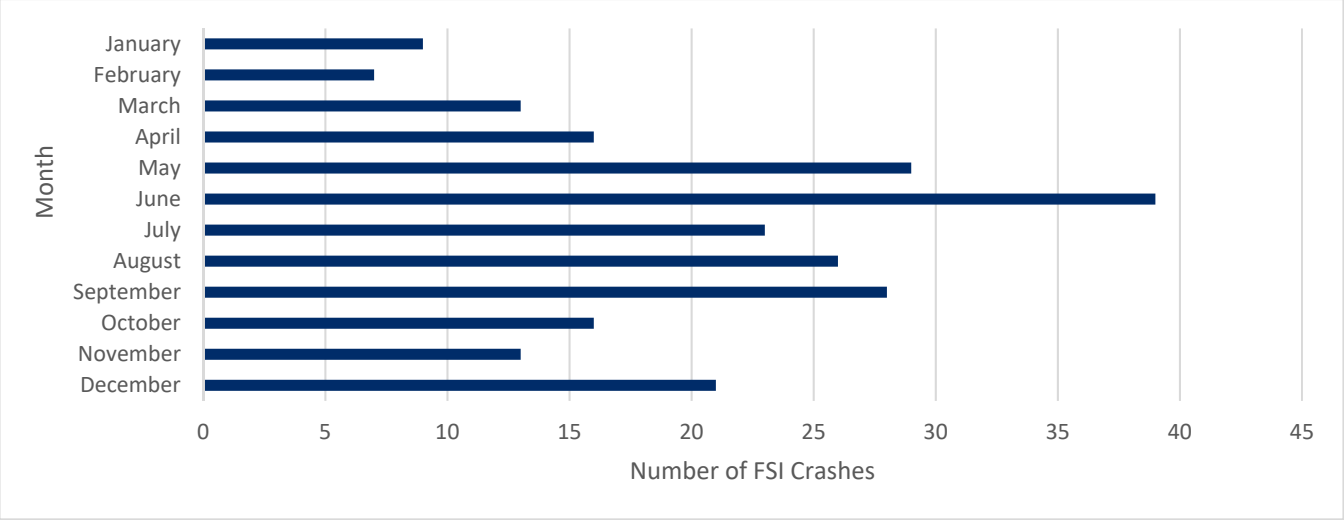


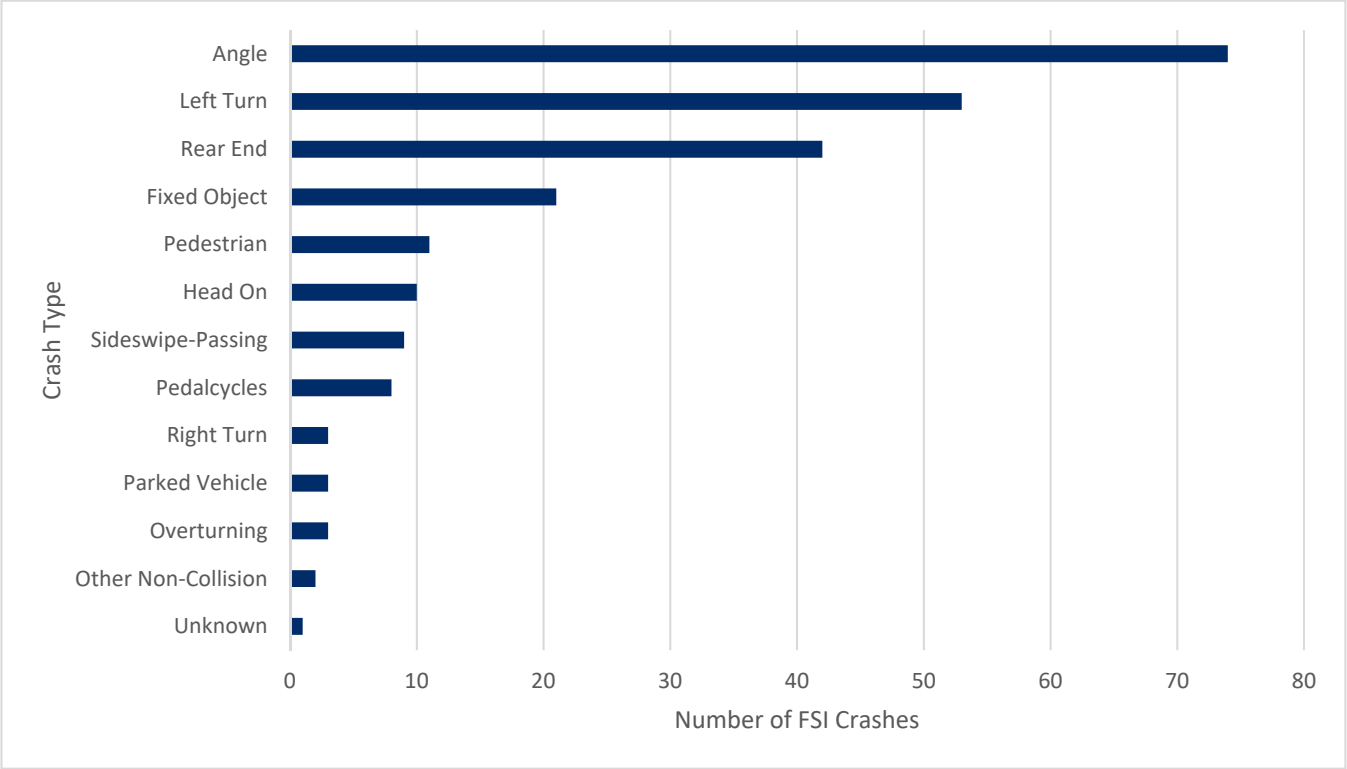
Figure 28: Month of Year of Intersection-Related FSI Crashes, 2009-2017



INTERSECTIONS

WHAT? Figure 29 illustrates the number of intersection-related crashes by crash type. Predominant FSI crash types are angle, left turn and rear end crashes. Assessment of the age of drivers involved in these types of crashes shows an over-representation of older drivers (65+); older drivers are involved in 28 percent of angle crashes at intersections and 34 percent of left turn crashes at intersections.

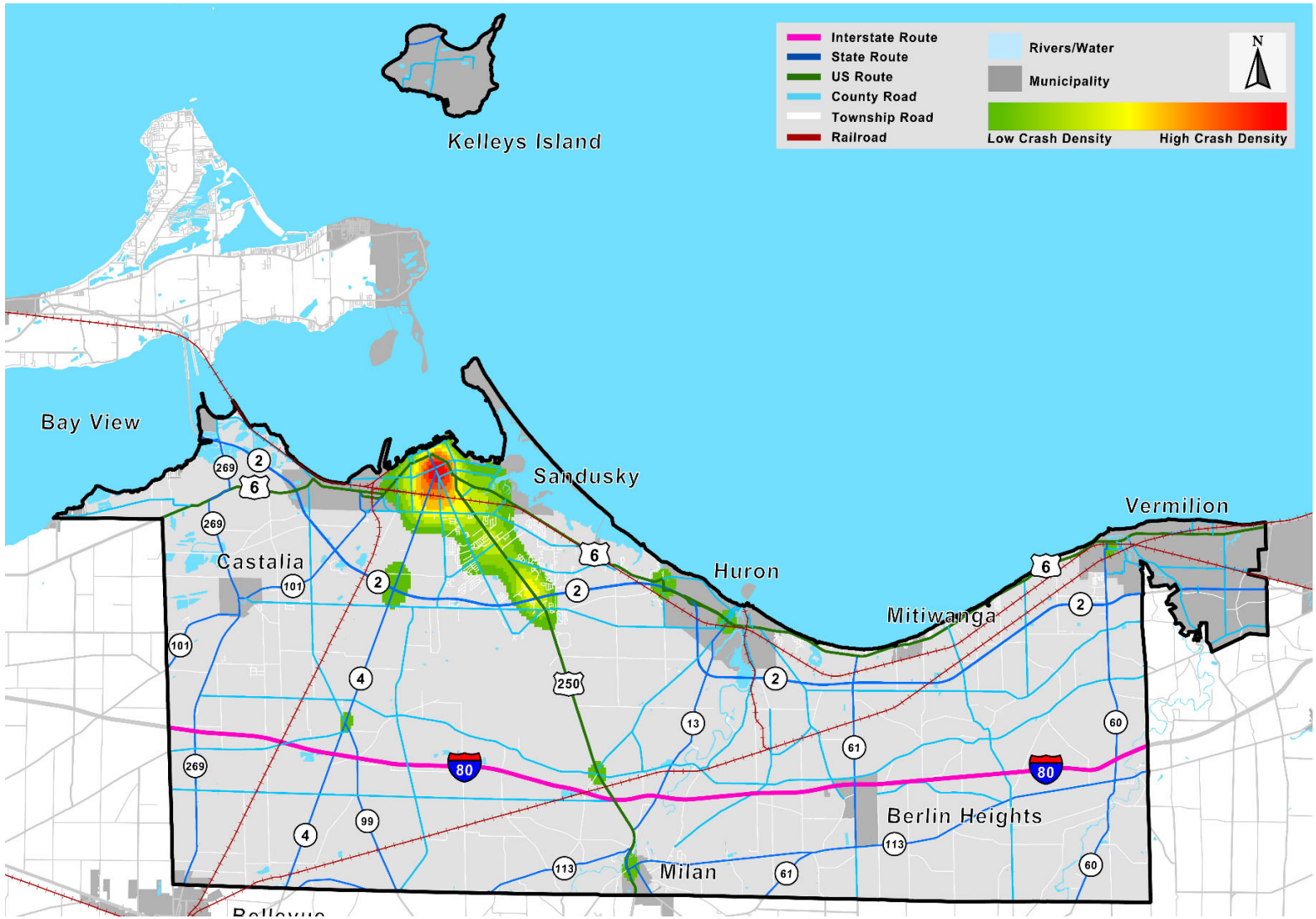
Figure 29: Type of Intersection-Related FSI Crashes, 2009–2017



INTERSECTIONS

The greatest concentration of FSI intersection crashes is located in or near Sandusky, with additional concentrations of intersection crashes along US-250 and SR-6. The crash data generally corresponds to traffic volumes within the Erie region.

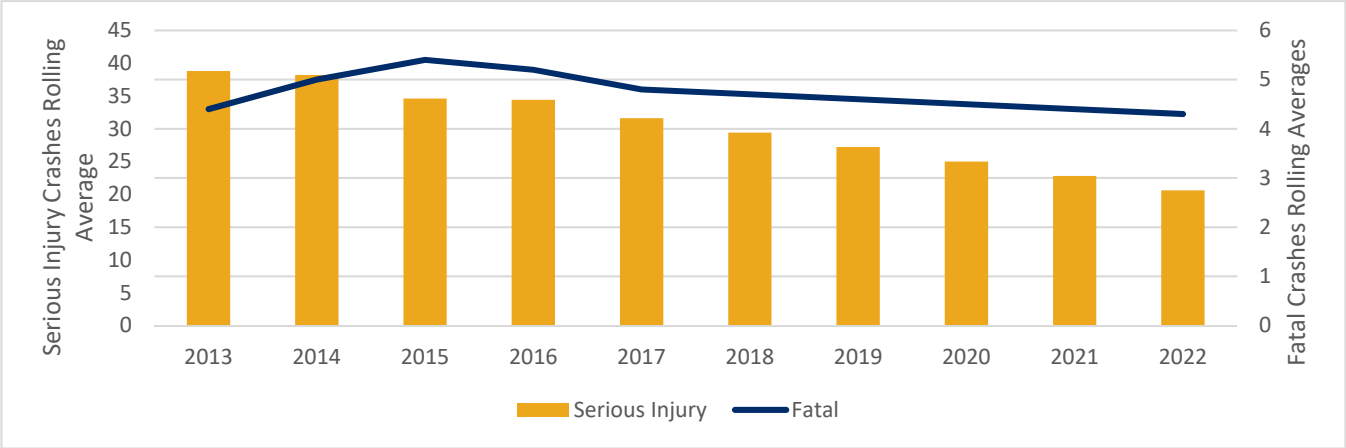
Figure 30: Heat Map of Intersection-Related FSI Crashes, 2009–2017



ROADWAY DEPARTURES

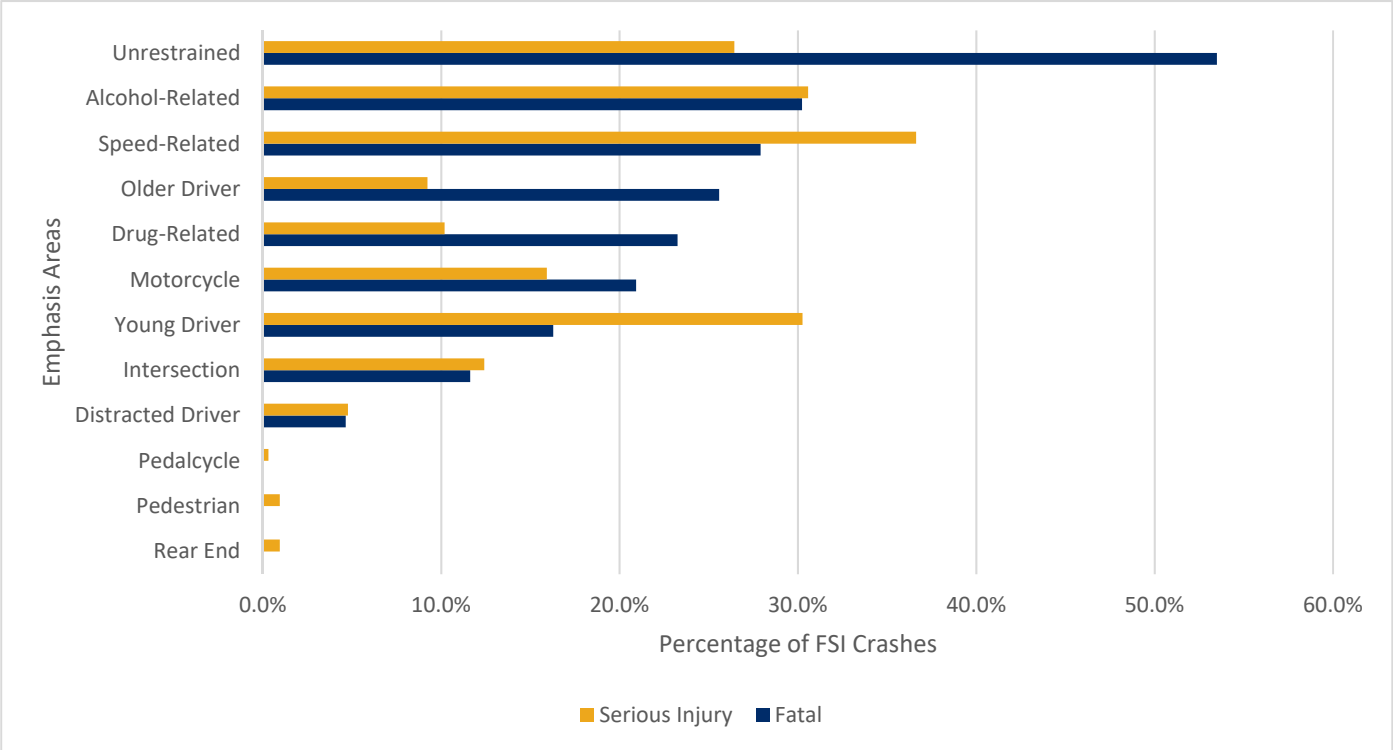
With a total of 357 crashes during the analysis period, roadway departure crashes contributed to 47 percent of FSI crashes in the Erie region. Based on historic data and five-year rolling projections as shown in Figure 31, fatal and serious injuries from roadway departure crashes are trending downward.

Figure 31: 5-Year Rolling Average of Roadway Departure FSI Crashes, 2009–2017



Multiple factors may contribute to roadway departure crashes. Some contributing factors can influence the likelihood of crashes while others can influence the severity of crashes. For example, the emphasis areas of young driver and alcohol, were found to be contributing factors in roadway departure crashes, may influence crash potential. Whereas lack of seat belt use and speed, also found to be contributing factors in roadway departure crashes, may influence crash severity. Furthermore, lack of seat belt use is the most significant contributing factor in roadway departure crashes resulting in fatalities.

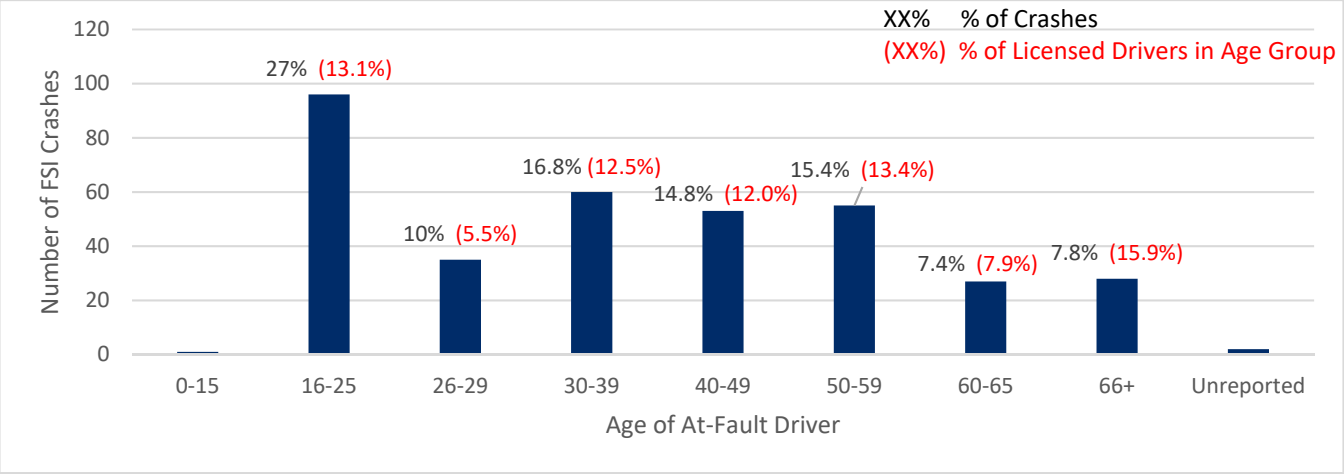
Figure 32: Roadway Departure FSI Crashes and Emphasis Area Overlaps, 2009–2017



ROADWAY DEPARTURES

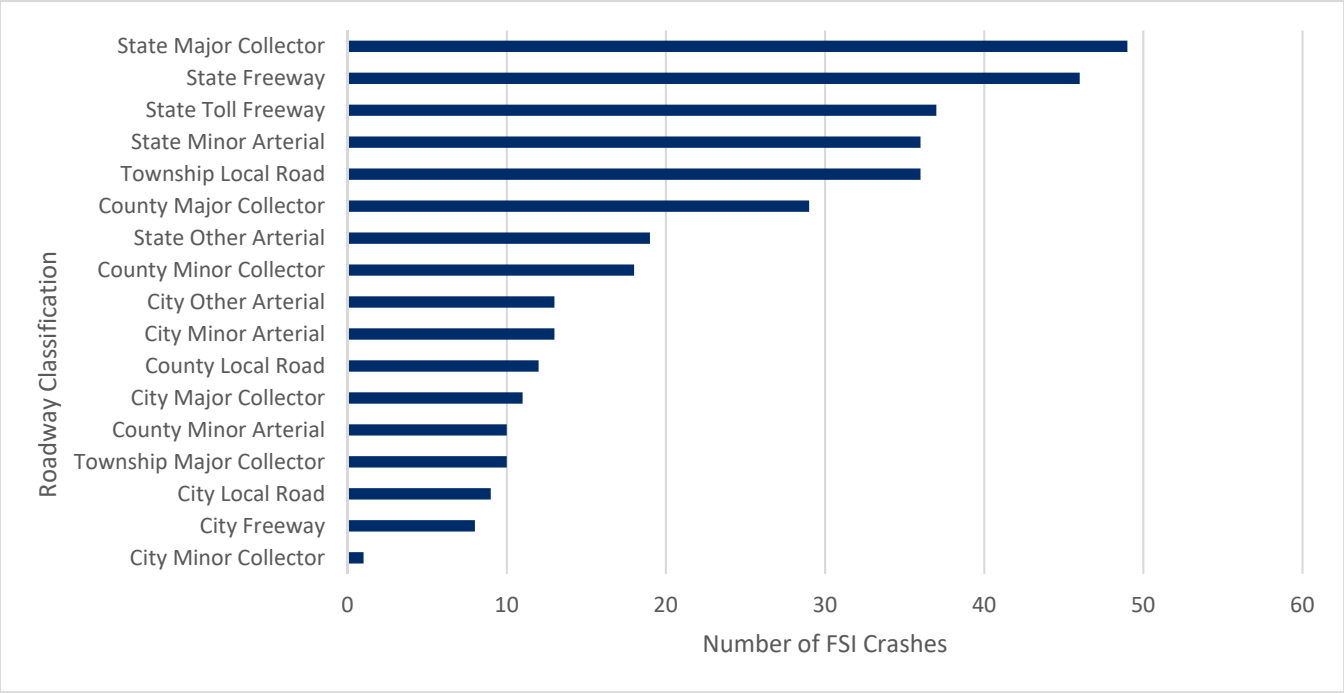
WHO? More younger drivers (ages 16 to 25) were cited as being at-fault in roadway departure crashes than any other identified age group, as illustrated in Figure 33.

Figure 33: Age of At-Fault Driver of Roadway Departure FSI Crashes, 2009–2017



WHERE? Figure 34 illustrates the number of roadway departure crashes by roadway classification. More than 47 percent of roadway departure FSI crashes occurred on state-maintained roadways with 13 percent of roadway departure FSI crashes occurring on state-maintained major collector roads. In comparison, 10 percent of roadway departure FSI crashes occurred on local roads maintained by townships.

Figure 34: Roadway Departure FSI Crashes by Roadway Classification and Jurisdiction, 2009–2017



ROADWAY DEPARTURES

WHEN? Roadway departure crashes occur throughout the day, peaking in the 7:00 AM hour and throughout the extended period between 3:00 PM (after school) and late night/early morning. More FSI roadway departure crashes occur on weekends than weekdays. Monthly crash trends show somewhat consistent crash frequency throughout the year, with annual peaks in May and July.

Figure 35: Time of Day of Roadway Departure FSI Crashes, 2009–2017

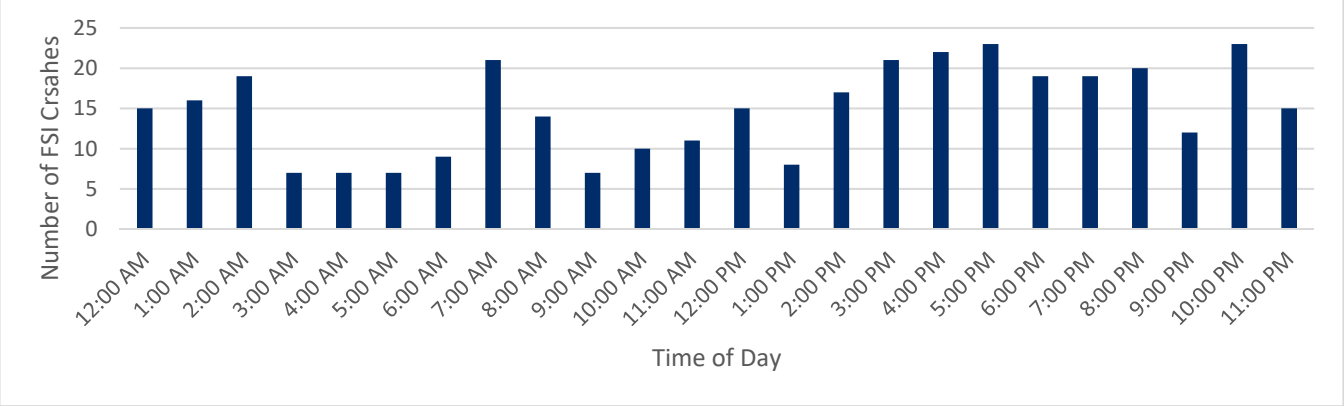


Figure 36: Day of Week of Roadway Departure FSI Crashes, 2009–2017

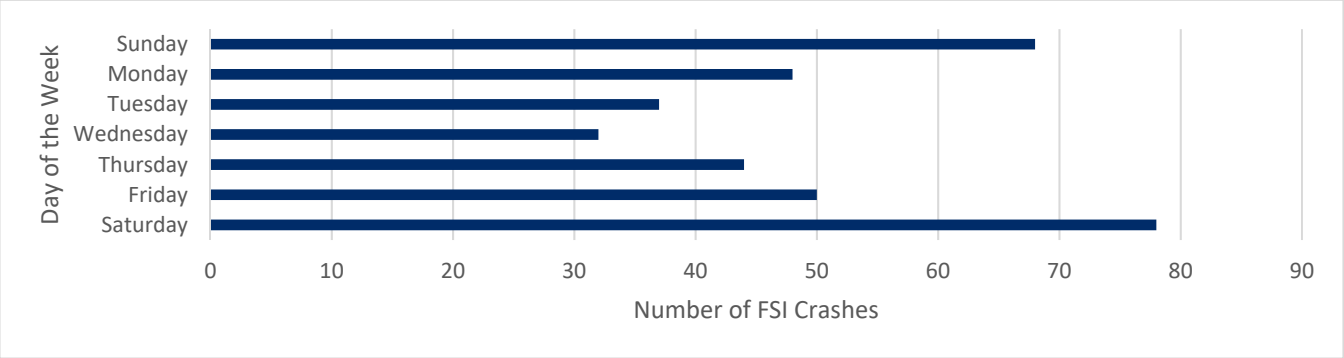
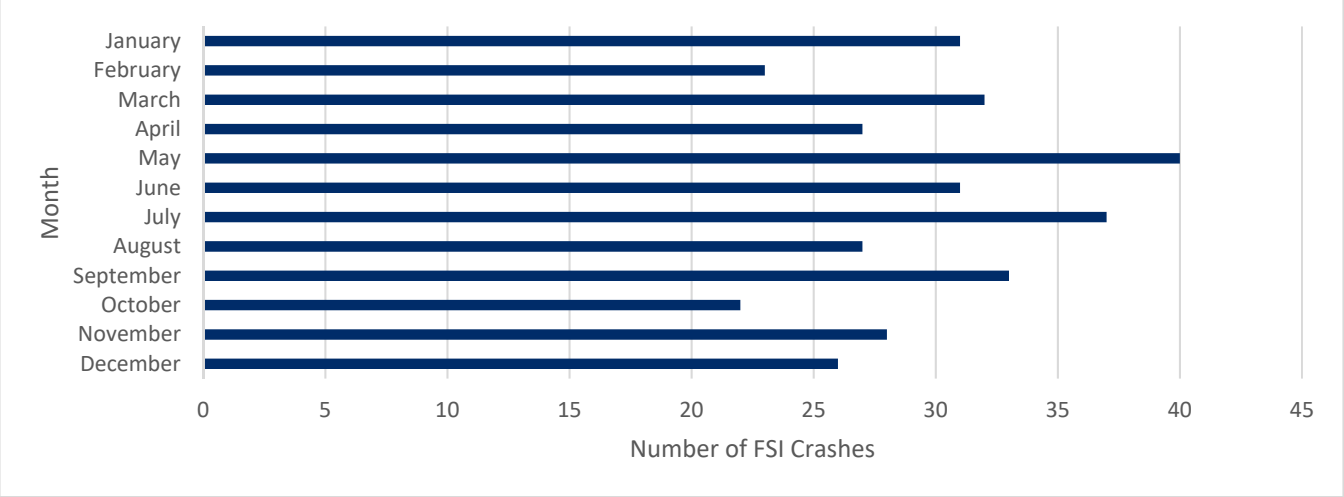


Figure 37: Month of Year of Roadway Departure FSI Crashes, 2009–2017



ROADWAY DEPARTURES

WHAT? Figure 38 illustrates the number of FSI roadway departure crashes by crash type. The vast majority of FSI roadway departure crashes were fixed object crashes. Overturning represents about 10 percent of FSI roadway departure crashes These two crash types account for more than 70 percent of FSI roadway departure crashes in the Erie region.

Figure 38: Type of Roadway Departure FSI Crashes, 2009–2017

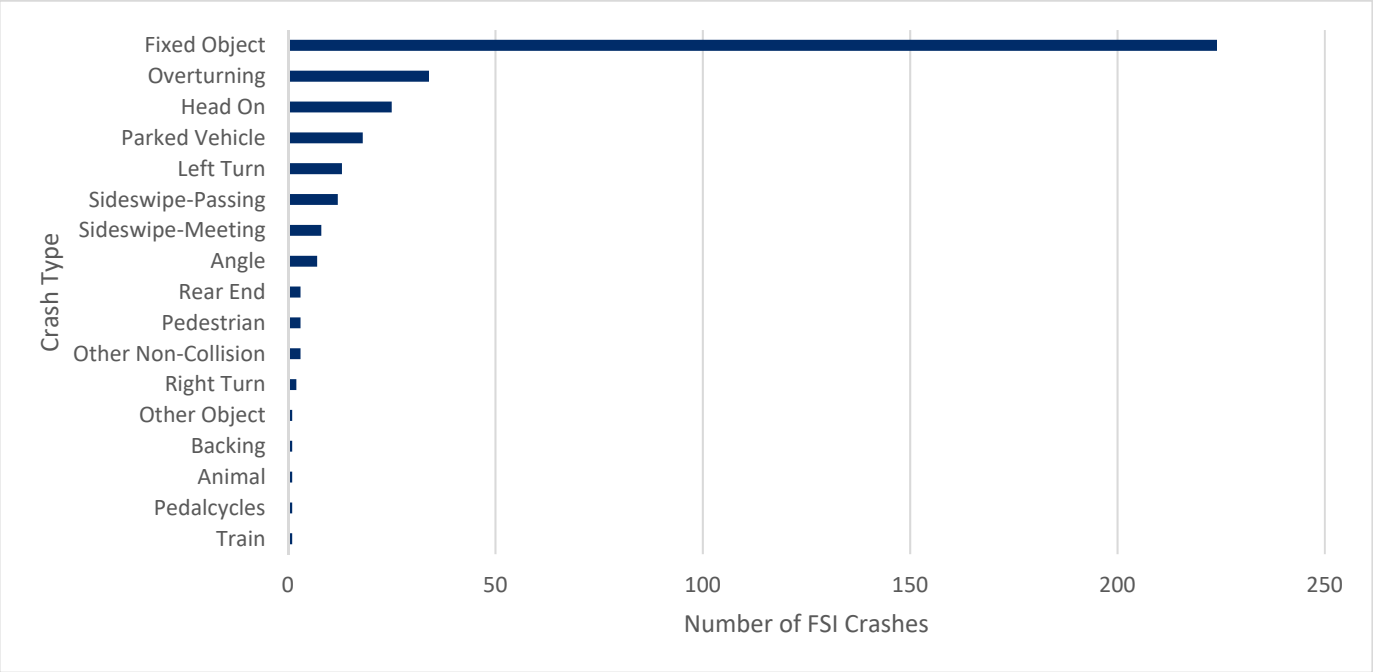
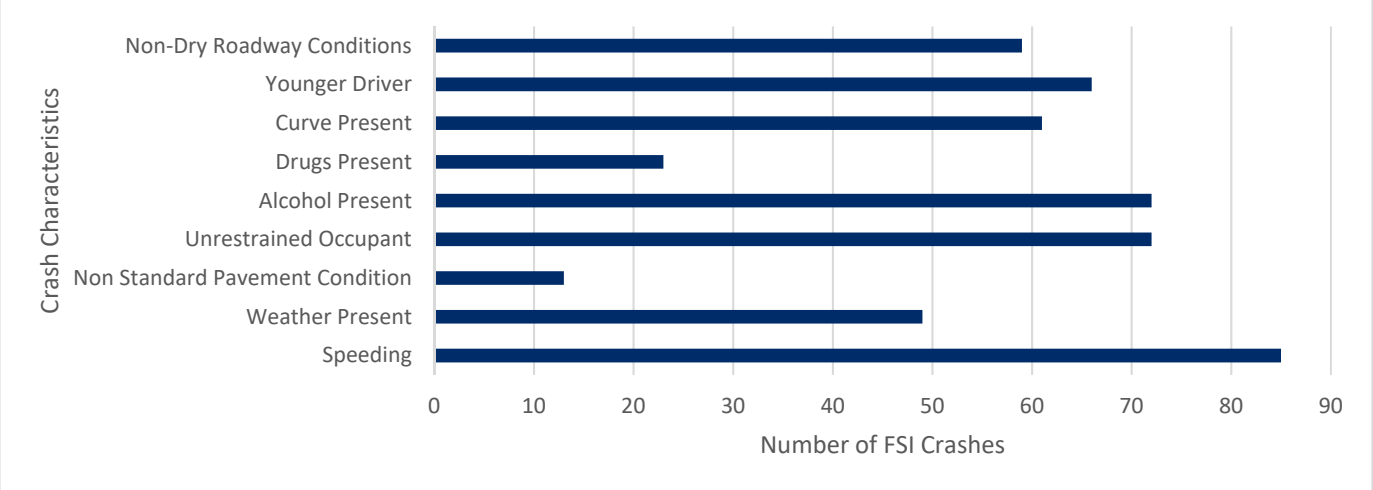


Figure 39 provides crash characteristics (contributing factors) for fixed object, roadway departure FSI crashes. Some crashes are associated with multiple crash characteristics.

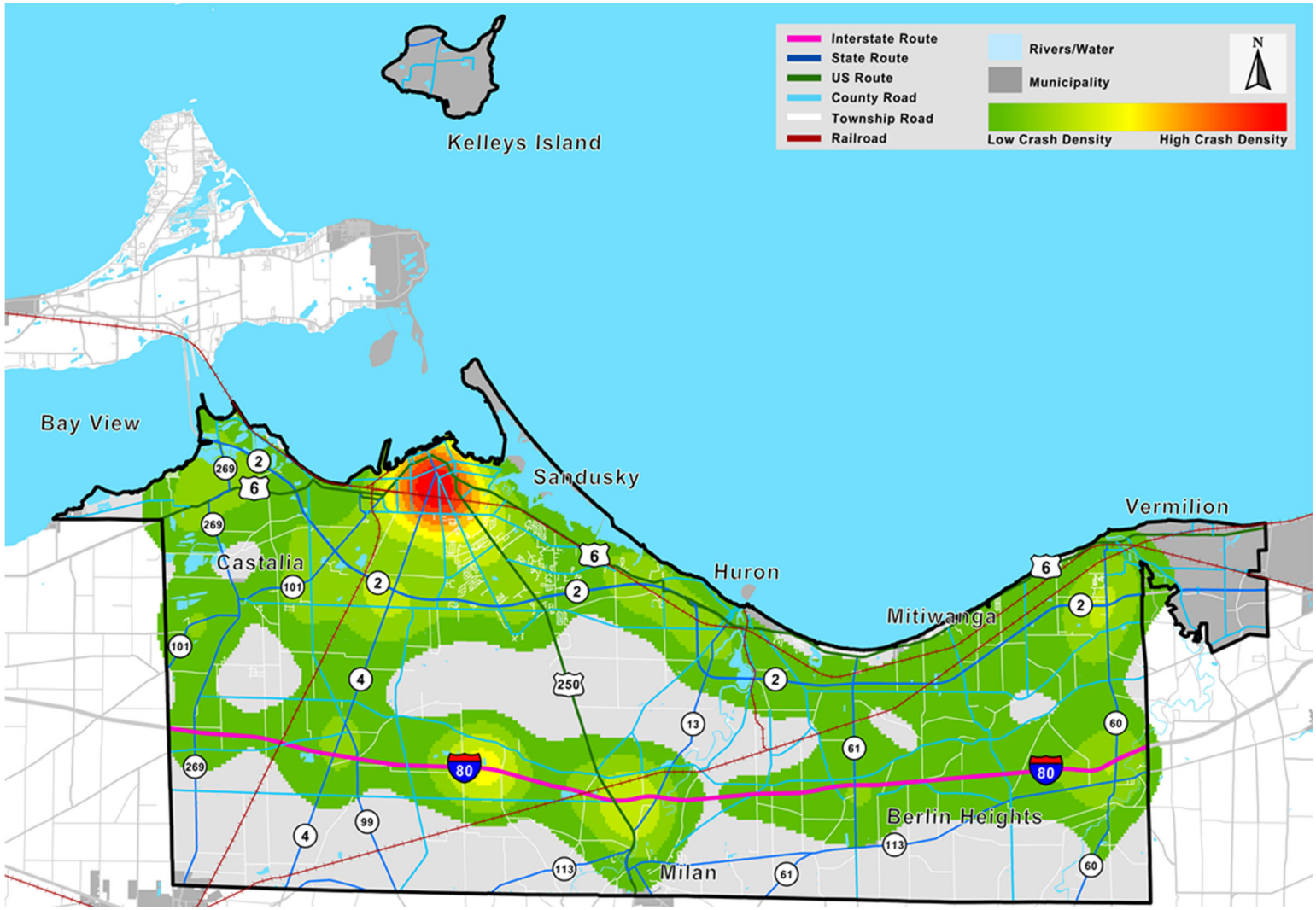
Figure 39: Fixed Object, Roadway Departure FSI Crash Characteristics, 2009–2017



ROADWAY DEPARTURES

The greatest concentration of FSI roadway departure crashes is located in or near Sandusky, with additional concentrations of crashes along the Ohio Turnpike (I-80) and other US and State Routes.

Figure 40: Heat Map of Roadway Departure FSI Crashes, 2009–2017



DISTRACTED DRIVING

Crash data indicate that distracted driving was a factor in five percent of FSI crashes. Based on input from ERPC stakeholders (including law enforcement) along with an understanding of human behavior, the expectation is that distracted driving is under-reported on crash reports. The data reflected in the five-year rolling average reflects an increasing trend in fatalities and serious injury crashes where distracted driving is a contributing factor. Without intervention, this trend is expected to continue in the future.

Figure 41: 5-Year Rolling Average of Distracted Driving-Related FSI Crashes, 2009–2017

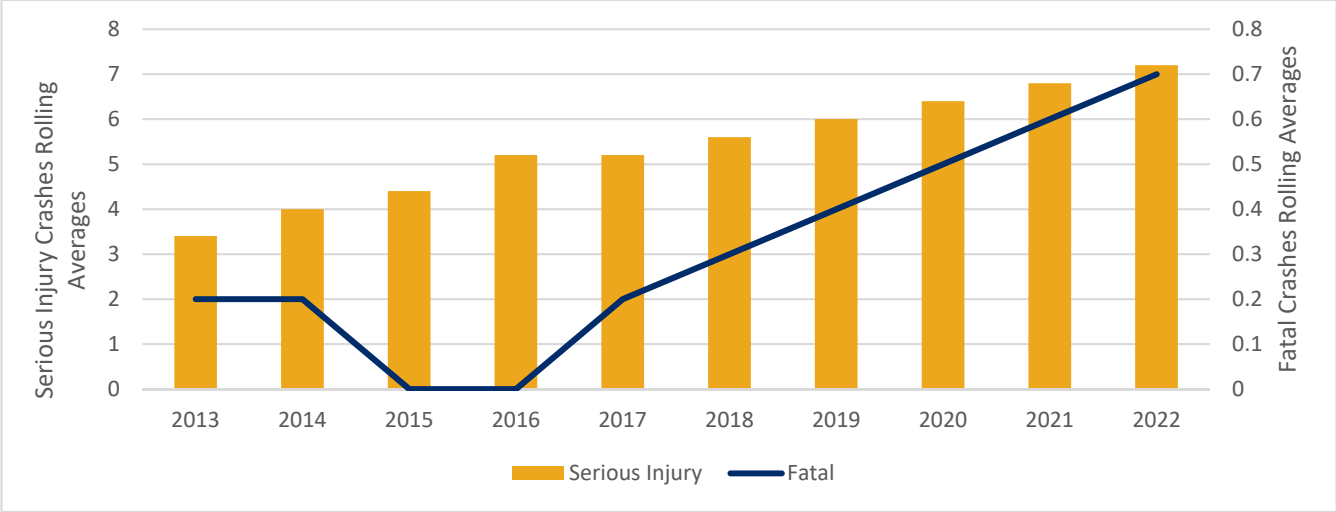
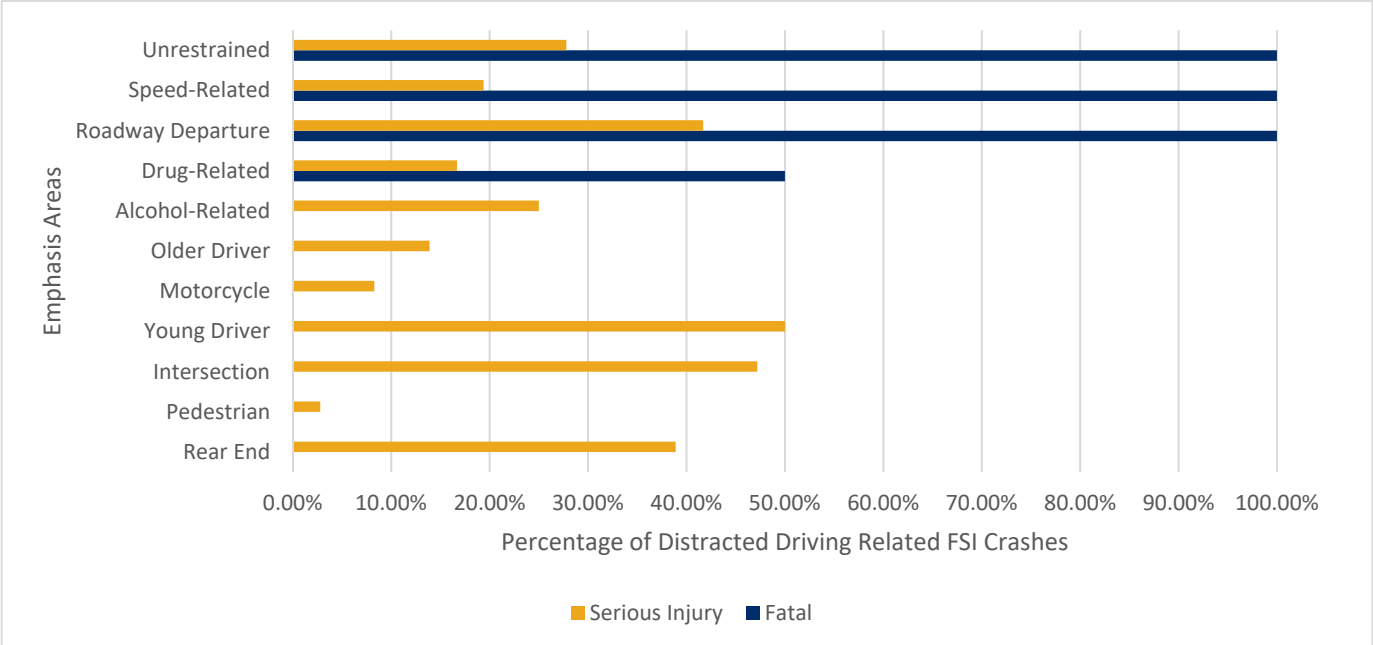


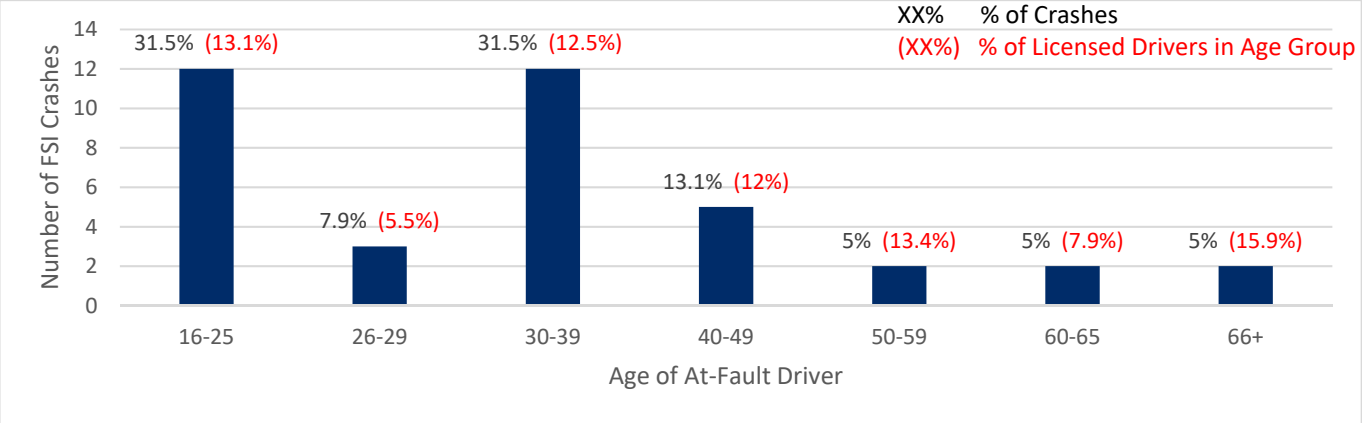
Figure 42 shows that the most predominant emphasis areas that are factors in or characteristics of fatal crashes associated with distracted driving are unrestrained (lack of seatbelt use), speed-related and roadway departure. These three emphasis areas are associated with all distracted-driving related fatal crashes. Drug-related was a contributing factor in half of the distracted-driving related fatal crashes. The most predominant emphasis areas recorded as factors in or characteristics of serious injury crashes associated with distracted driving are roadway departure, young driver, intersection and rear end – contributing factors in 40 to 50 percent of these crashes.

Figure 42: Distracted Driving-Related FSI Crashes and Emphasis Area Overlaps, 2009–2017



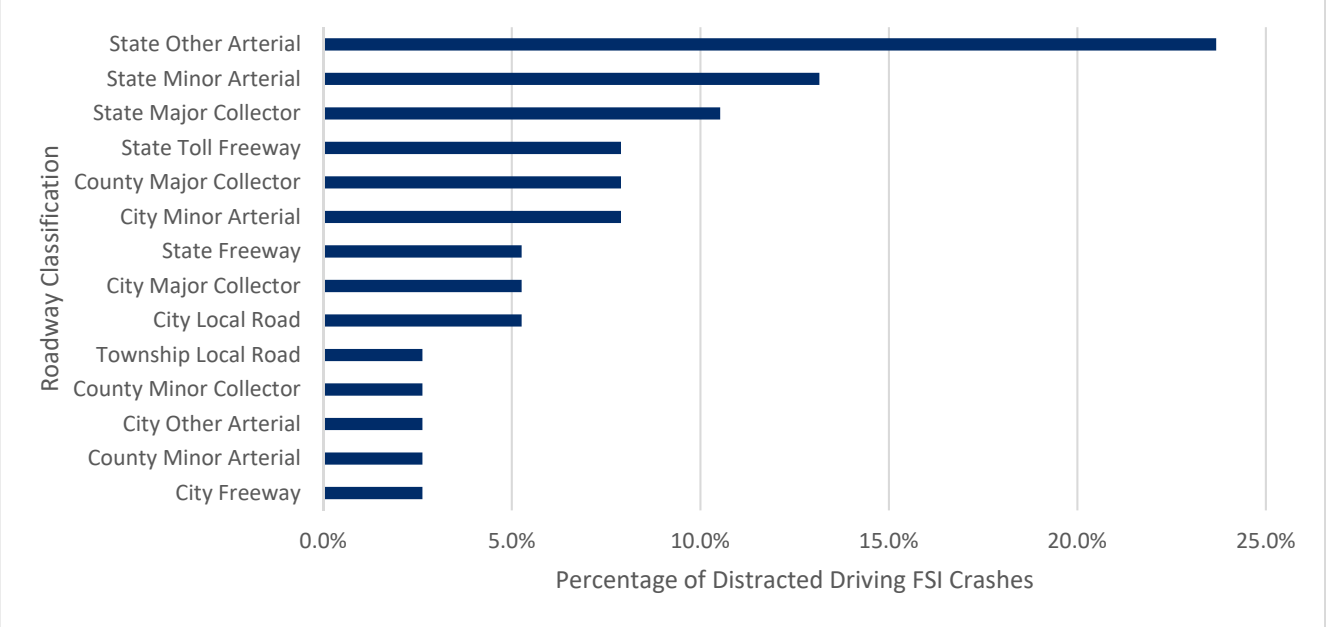
WHO? More drivers cited as being at-fault in distracted driving-related crashes were ages 16 to 25 and drivers ages 30-39 than other age groups.

Figure 43: Age of At-Fault Driver of Distracted Driving-Related FSI Crashes, 2009–2017



WHERE? More than 55 percent of FSI distracted driving-related crashes occurred on state-maintained facilities and with more than 36 percent were on state-maintained arterial roads (i.e., US-6, US-250, SR-4, etc.).

Figure 44: Distracted Driving-Related FSI Crashes by Roadway Classification and Jurisdiction, 2009–2017



WHEN? FSI distracted driving crashes show a peak between 3:00 PM and 5:00 PM. FSI distracted driving crashes are most frequent on Friday, Saturday, and Sunday. These types of crashes are significantly over-represented in the month of May.

Figure 45: Time of Day of Distracted Driving-Related FSI Crashes, 2009–2017

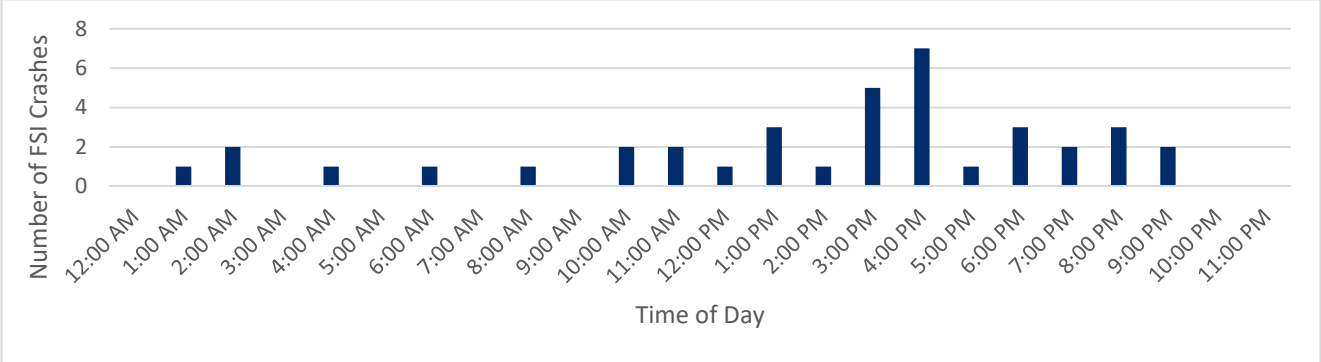


Figure 46: Day of Week of Distracted Driving-Related FSI Crashes, 2009–2017

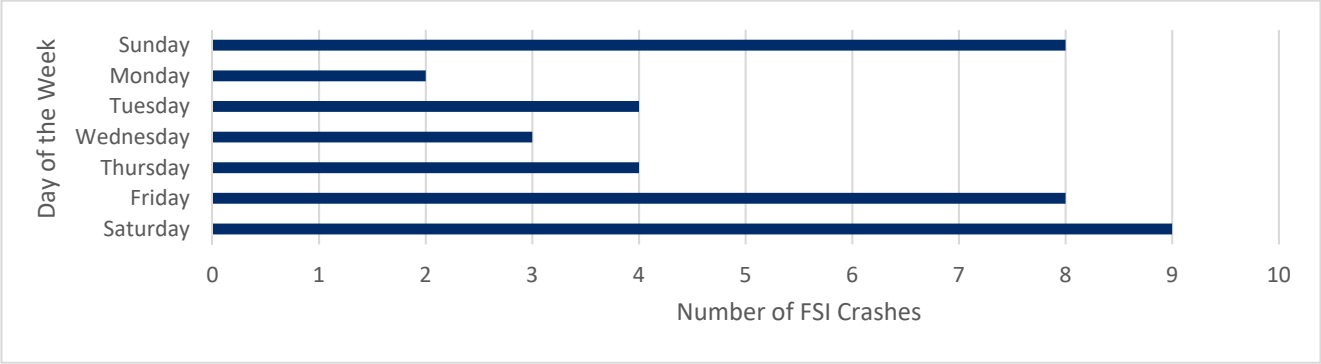
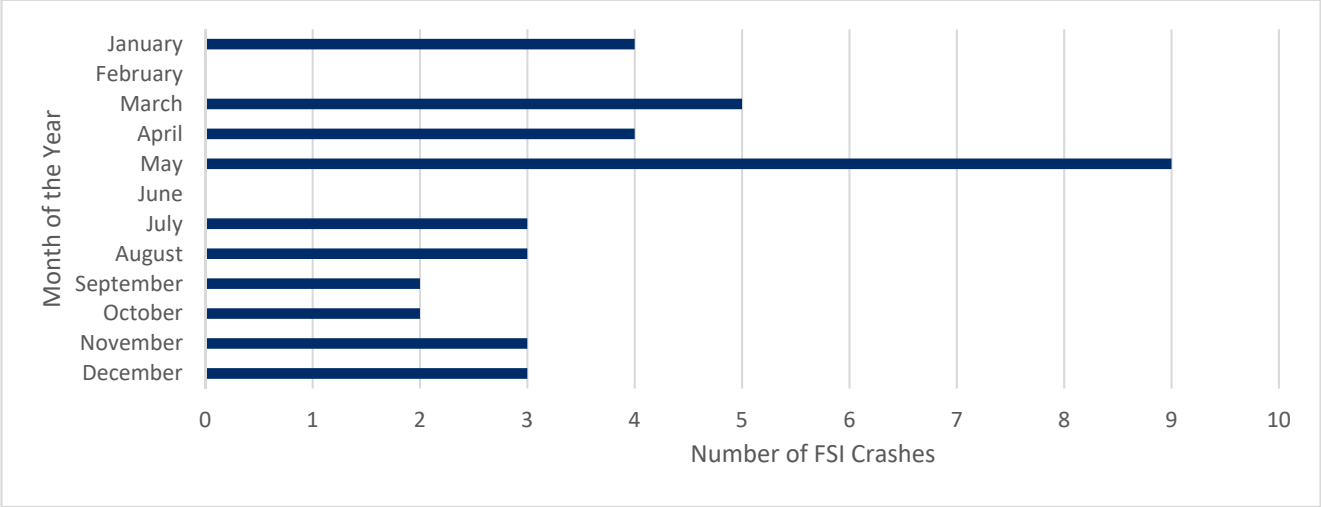
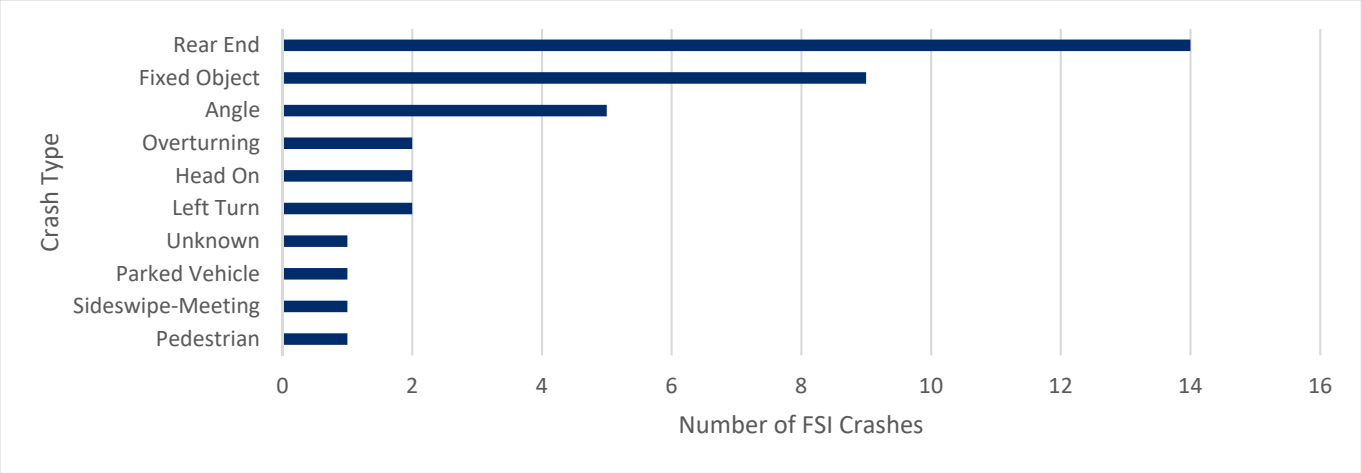


Figure 47: Month of Year of Distracted Driving-Related FSI Crashes, 2009–2017



WHAT? Figure 48 illustrates the number of FSI distracted driving crashes by crash type. Rear end crash is the most frequent crash type for FSI distracted driving-related crashes, followed by fixed object and angle crashes. These three crash types account for almost three-quarters of FSI distracted driving-related crashes in the Erie region. As mentioned, input from the ERPC stakeholders (including law enforcement) along with an understanding of human behavior reflect an expectation that distracted driving is under-reported on crash reports. This means the data shown in Figure 48 is expected to reflect the under-reporting and crash trends for crashes involving distracted drivers, however, the actual data associated with types of distracted-driving related crashes may or may not align with the trends shown.

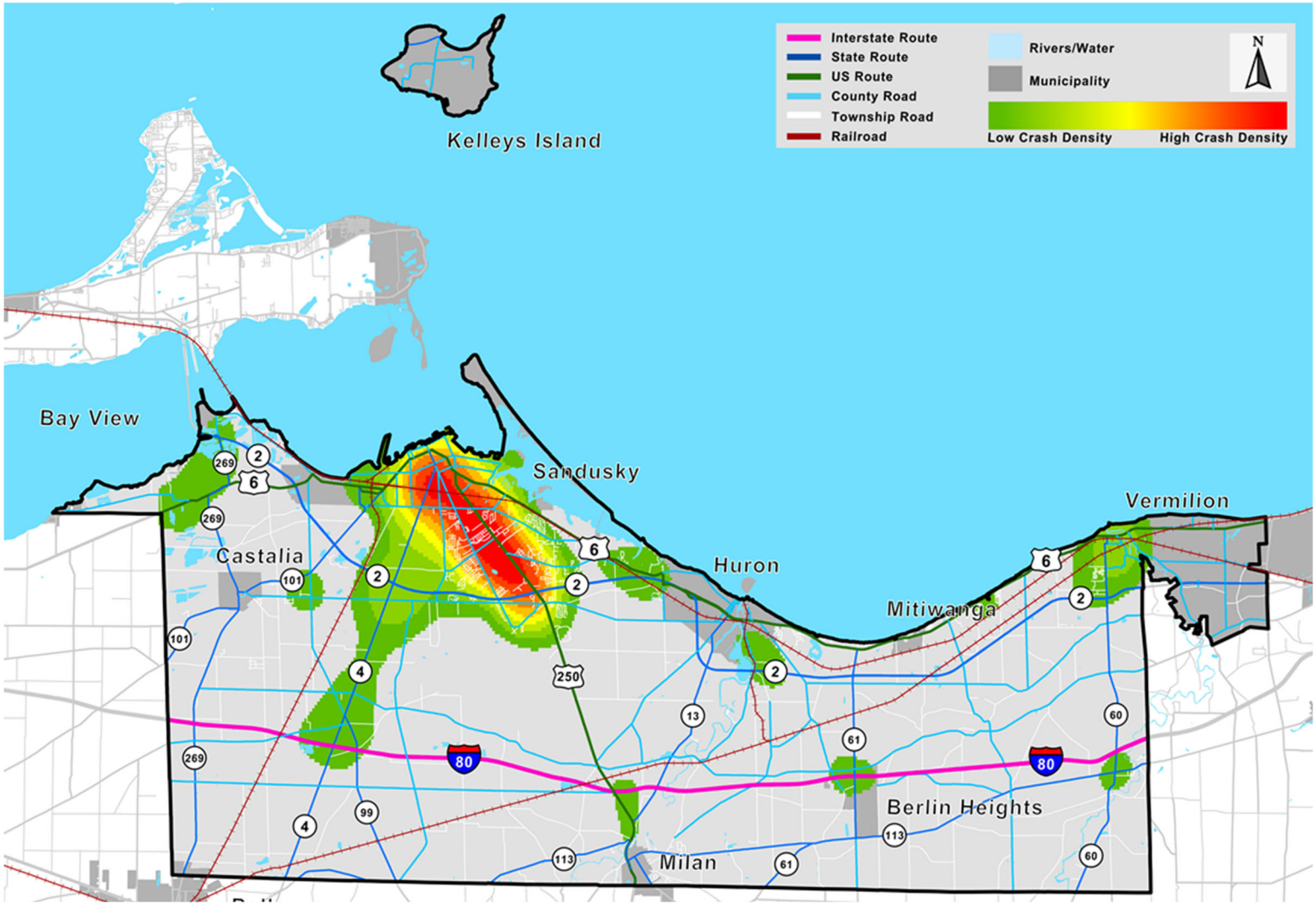
Figure 48: Type of Distracted Driving-Related FSI Crashes, 2009–2017



DISTRACTED DRIVING

Most distracted FSI crashes occurred in or around greater Sandusky with hot spots extending along US-250 and SR-4.

Figure 49: Heat Map of Distracted Driving-Related FSI Crashes, 2009–2017



SPEEDING

Speed was a contributor factor in 21 percent of FSI crashes. Speed-related crash data reflected as five-year rolling averages shows a relatively consistent number of fatal crashes and a slightly decreasing trend in serious injury crashes. When speed is a factor in a crash, there are other crash characteristics and factors, as shown in Figure 51. The most common other characteristic (emphasis area) in speed-related FSI crashes is roadway departure; other common characteristics are lack of seat belt use, alcohol-related and young drivers.

Figure 50: 5-Year Rolling Average of Speed-Related FSI Crashes, 2009–2017

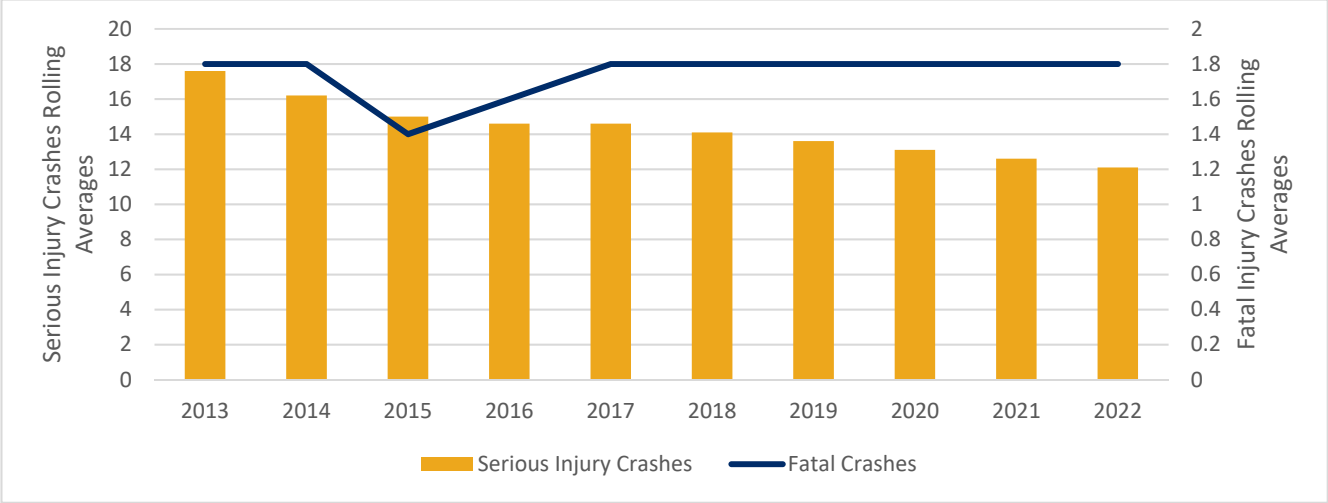
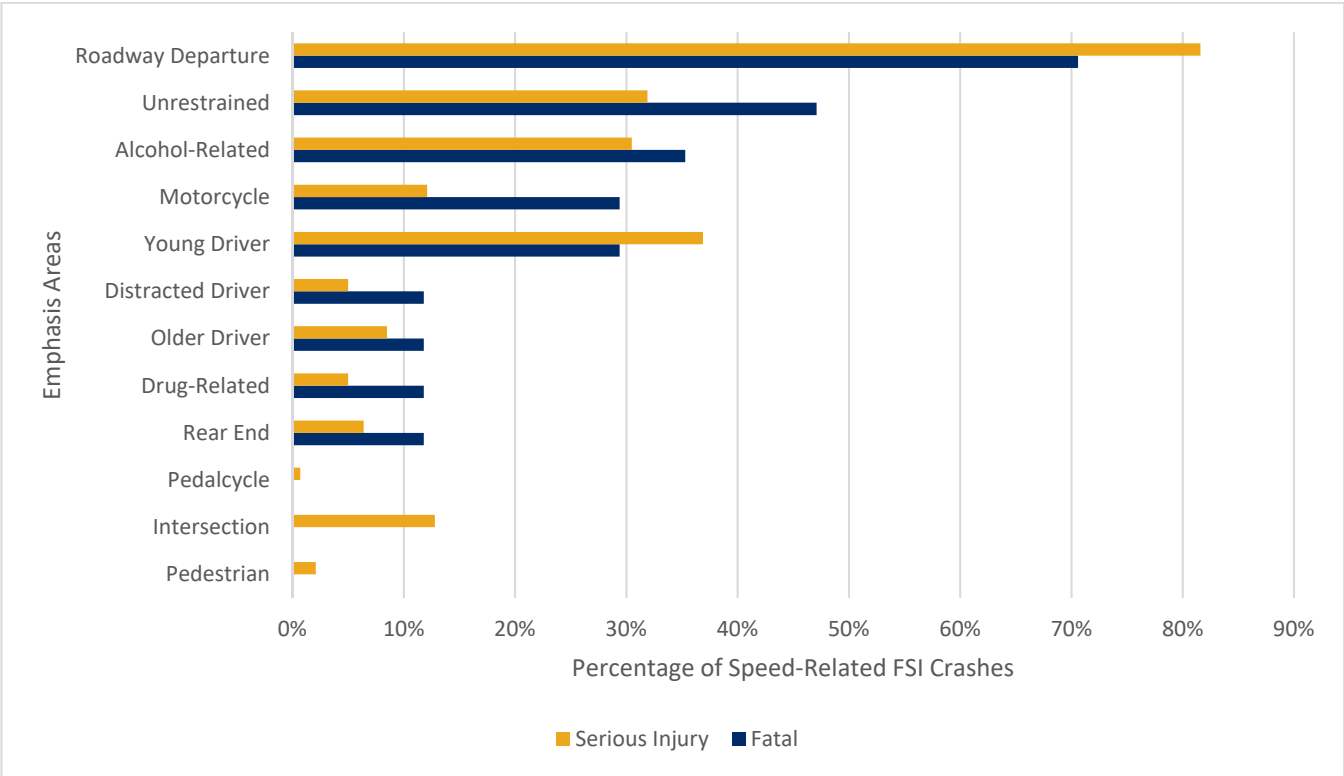
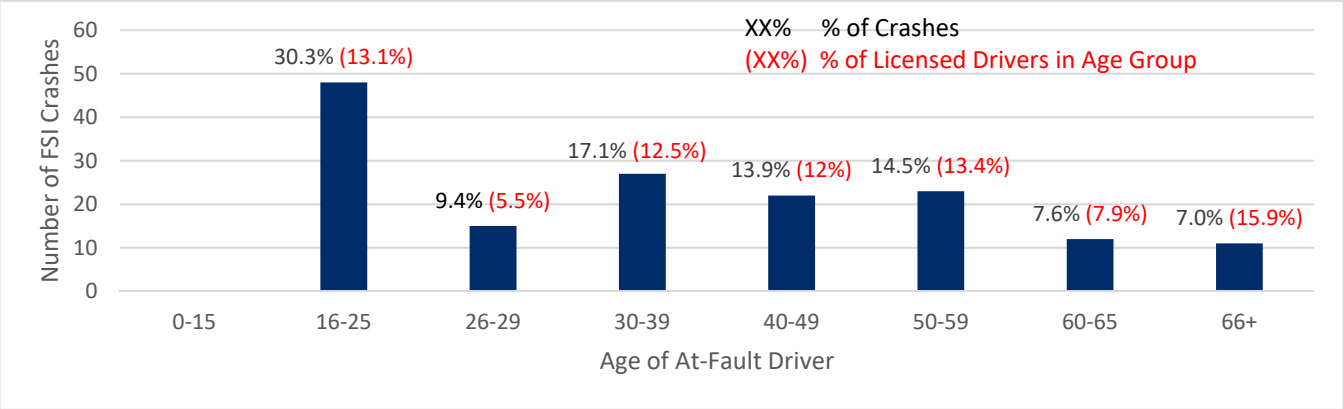


Figure 51: Speed-Related FSI Crashes and Emphasis Area Overlaps, 2009–2017



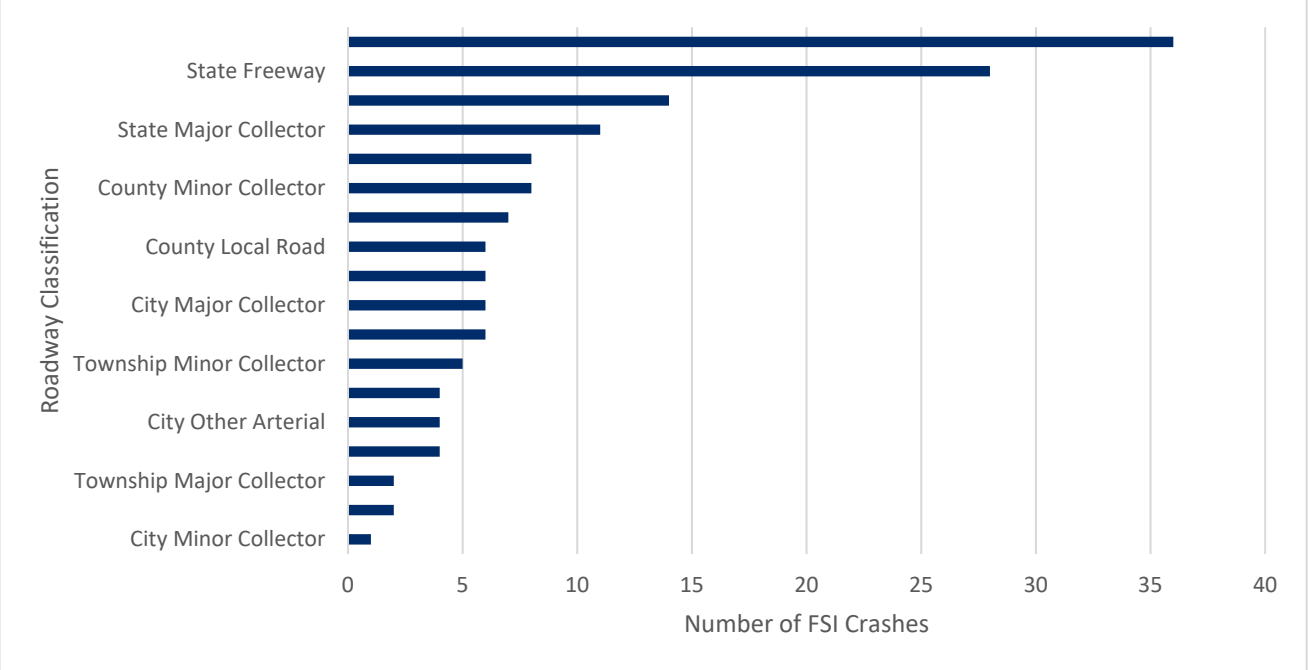
WHO? Young drivers (ages 16-25) are over-represented in FSI speed-related crashes.

Figure 52: Age of At-Fault Driver of Speed-Related FSI Crashes, 2009–2017



WHERE? Figure 52 illustrates the number of speed-related FSI crashes by roadway classification and jurisdiction. More than 55 percent of FSI speed-related crashes occurred on state-maintained roadways; about 17 percent occurred on state-maintained freeways and seven percent occur on state-maintained major collector roads. Approximately 16 percent of FSI speed-related crashes occurred on city-maintained roads.

Figure 53: Speed-Related FSI Crashes by Roadway Classification and Jurisdiction, 2009–2017



WHEN? FSI speed-related crashes occur throughout the day with no distinct peaks, although they are less likely to occur during early morning hours (3:00 AM-7:00 AM). These crashes happen more often on Saturdays and Sundays than other days of the week. Crash frequency is consistent throughout the year, with notable peaks in the months of January, March and July.

Figure 54: Time of Day of Speed-Related FSI Crashes, 2009–2017

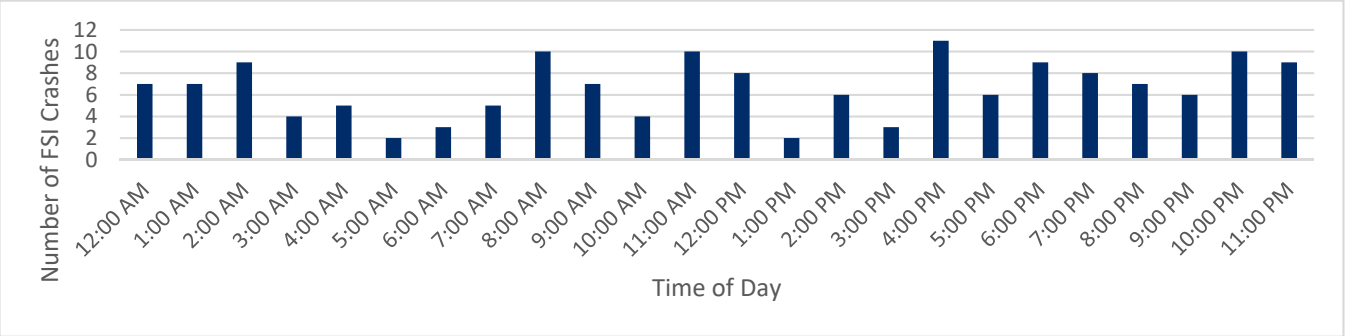


Figure 55: Day of Week of Speed-Related FSI Crashes, 2009–2017

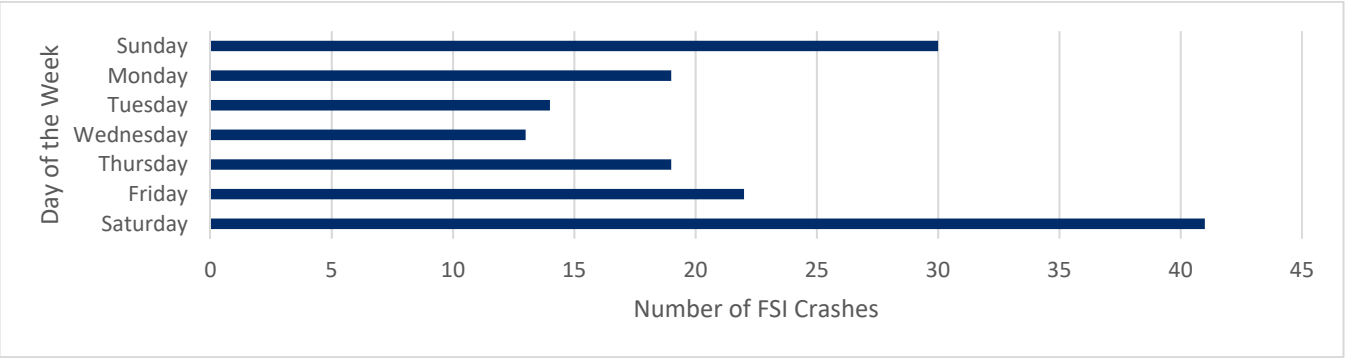
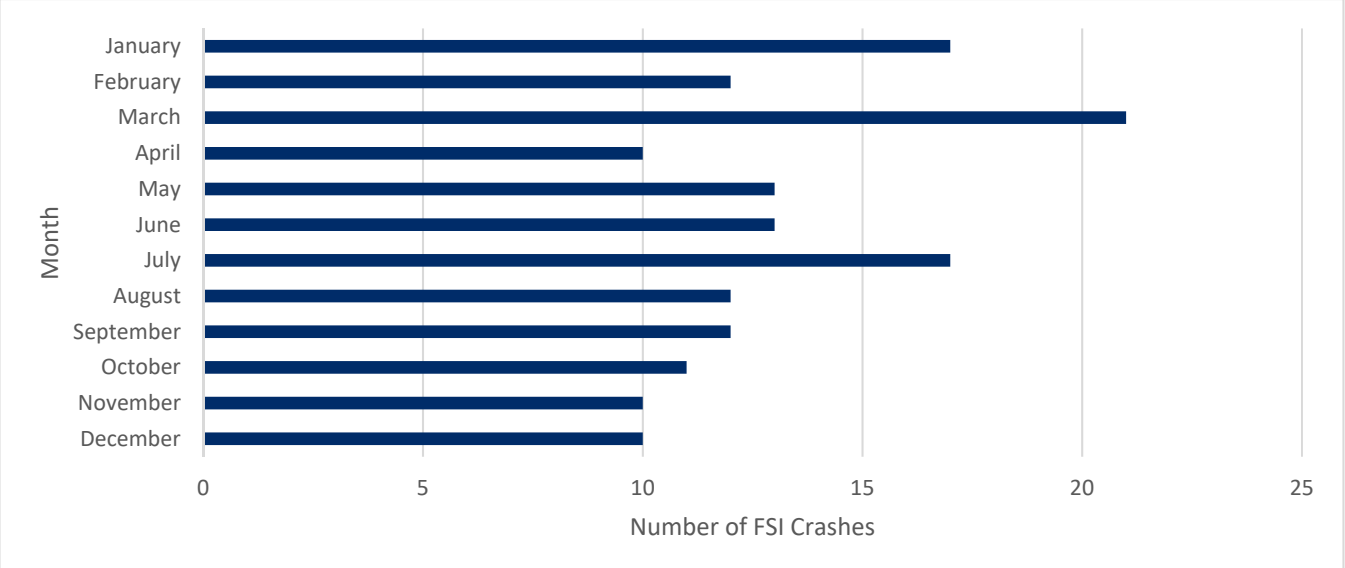
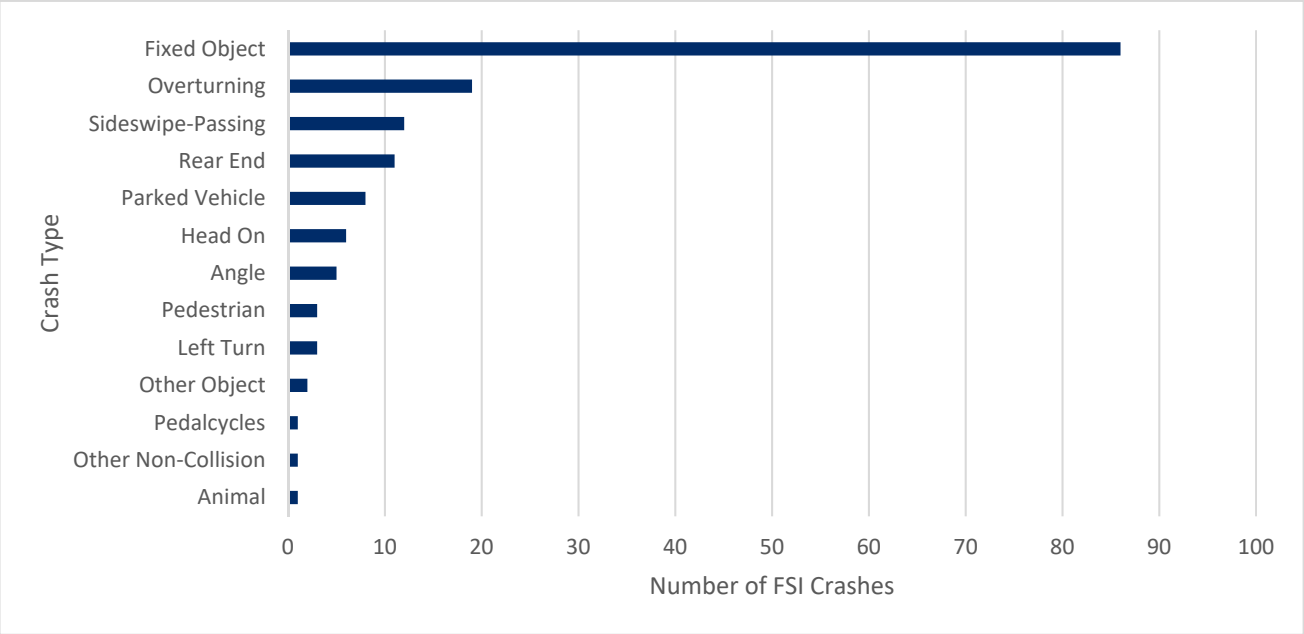


Figure 56: Month of Year of Speed-Related FSI Crashes, 2009–2017



WHAT? Figure 57 illustrates the number of speed-related FSI crashes by crash type. 55 percent of FSI speed-related crashes were fixed object crashes. Together with overturning, these two crash types account for 67 percent of all FSI speed-related crashes in the Erie region.

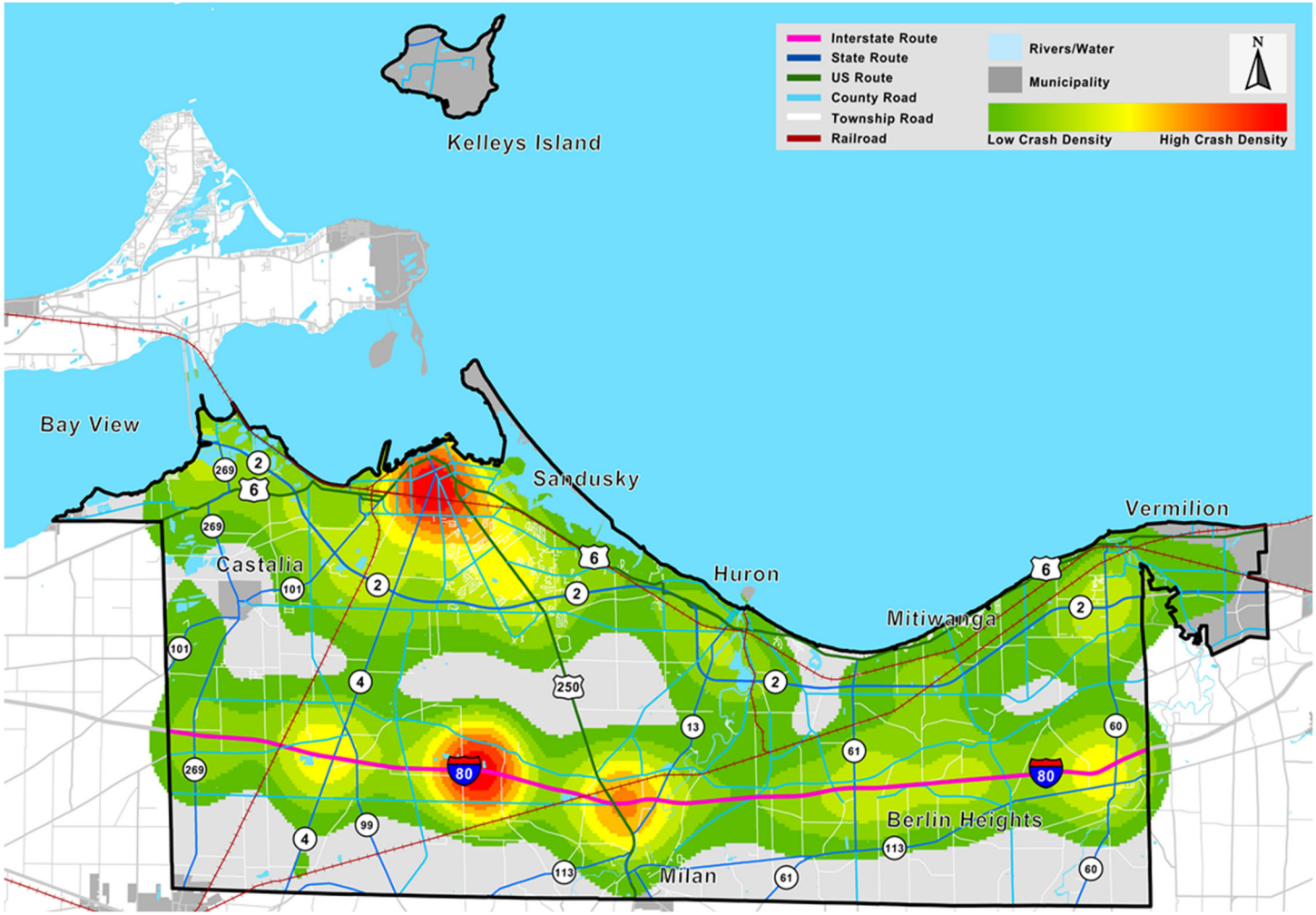
Figure 57: Speed-Related FSI Crash Types, 2009–2017



SPEEDING

Figure 58 shows that speed-related FSI crashes tend to occur on roads with higher speed limits (the Ohio Turnpike) and in the greater Sandusky area. Hot spots occur at 5 distinct areas along the Ohio Turnpike with gaps in between, so factors speed/speed limit is likely not the sole factor. Two locations are turnpike interchanges; turnpike staff noted that crashes at those locations, although recorded as crashes on the turnpike, are actually crashes at toll plazas that are effectively mis-reported because "toll plaza" is not an option on the OH-1. The most significant turnpike crash location is in the vicinity of milepost 114, an area that is difficult to explain with no apparent causal factors that turnpike staff has been troubleshooting in an effort to mitigate the crashes.

Figure 58: Heat Map of Speed-Related FSI Crashes, 2009–2017



Implementation & Action Plan

Creating a Safer System

SECTION CONTENT

- Intersections
- Roadway Departures
- Distracted Driving
- Speeding
- Priority Intersections
- Priority Segments

6 IMPLEMENTATION & ACTION PLAN – CREATING A SAFER SYSTEM

The *ERPC Road Safety Plan* evaluates regional data for reported crashes during the nine-year analysis period of January 2009 through December 2017. Based on the crash data and analyses documented in previous sections and with input from the stakeholder committee, this section outlines specific strategies and actions to mitigate FSI crashes associated with the four priority emphasis areas for the region: intersection crashes, roadway departure crashes, distracting driving, and speeding. The plan identifies the corridors, intersections and road segments that would benefit from safety improvements and mitigating measures intended to result in a measurable positive impact on road safety in the Erie region. The *Action Plan* identifies effective approaches to help transportation and safety stakeholders make progress toward the vision of a safer Erie region transportation network. Development of the *Action Plan* was informed by the data analyses and stakeholder input, together with proven strategies to reduce fatality and serious injury crashes focusing on the four priority emphasis areas. The plan identifies a combination of enforcement, education, engineering and data strategies to best address safety needs. The overarching plan goal is to implement the recommendations over the next five years, coupled with annual evaluations to assess the identified programs, projects and policies, their performance and the associated progress toward achieving performance goals.

INTERSECTIONS	**Ensure safety projects are implemented to reduce fatalities and serious injuries at intersections and that the public and others are educated about intersection safety.**
ROADWAY DEPARTURE	**Ensure safety projects are implemented to reduce roadway departure fatalities and serious injuries and that the public and others are educated about roadway safety.**
DISTRACTED DRIVING	**Ensure the public and stakeholders are educated about distracted driving; employers are promoting safety in the workplace; and education and enforcement campaigns are effectively utilized.**
SPEEDING	**Ensure the public, stakeholders and vendors are educated about the consequences of speeding and education and enforcement campaigns are effectively utilized.**
LOCATIONS	**Safety projects along corridors or at specific segments and intersections will minimize the occurrences of fatalities or serious injuries occurring.**

INFRASTRUCTURE STRATEGIES AND ACTIONS

Strategy 1: Implement proven and/or low-cost systematic and systemic safety measures and improvements to reduce intersection crashes.

Timeline: Ongoing

Leaders	Description	Performance Measure
ODOT and Jurisdiction Engineers	From the list of high crash locations, identified skewed intersections that could be benefit from realignment.	Additional Safety Studies completed
ODOT and Consultant Team	Further prioritize the intersection list with an emphasis on which locations/corridors would benefit from systemic, low-cost improvements.	Number of systemic improvements implemented
ODOT	Coordinate with local jurisdictions to implement eligible low-cost countermeasures that could be incorporated into construction projects.	List created and shared with local jurisdictions Number of projects that incorporate safety countermeasures
Jurisdiction Engineers	Evaluate clearance intervals of all signalized intersections.	Number of clearance intervals evaluated and adjusted
Jurisdiction Engineers	Evaluate older equipment for potential systemic improvements like LED signal heads, reflective backplates, and signs; conduct safety studies, as appropriate	Number of upgraded intersections
ODOT	Continue to investigate access management strategies to limit driveway access along main corridors.	Number of corridors studied Number of access points removed or prevented

INFRASTRUCTURE STRATEGIES AND ACTIONS

Strategy 2: Utilize infrastructure-related measures to minimize the potential for and impacts from roadway departure crashes.

Timeline: Ongoing

Leaders	Description	Performance Measure
Jurisdiction Engineers	Provide clear zones to remove obstructions and reduce the potential for occupant ejection from vehicles.	Number of clear zones established
ODOT and Jurisdiction Engineers	Analyze locations to identify areas that could benefit from installation guardrail, rumble strips, safety edge, pavement markings, raised pavement markers, delineators, curve signs, lighting, etc.	Number of installations
ODOT and Jurisdiction Engineers	Analyze locations that would benefit from shoulder/berm maintenance.	Number of locations maintained

EDUCATION STRATEGIES AND ACTIONS

Strategy 1: Conduct safety education.

Timeline: Ongoing

Leaders	Description	Performance Measure
Local Enforcement	Identify and prioritize schools for local law enforcement to give safety presentations.	Number of presentations given
Department of Public Safety District Office	Identify proven distracted driving programs that could be implemented in the region.	Programs identified and implemented in at least one school/year
Department of Public Safety District Office	Develop a safety public service announcement and target viewership in driver education programs and at the Bureau of Motor Vehicles (BMV)	PSA developed and deployed
Local Businesses and School Districts	Work with local business and school districts on initiatives that remind drivers to stay focused on driving.	Number of initiatives developed
Local Enforcement	Engage enforcement at high school events (pep rallies, football games) to share safety messages.	Number of events attended/supported by local enforcement
Erie Regional Planning Commission	Work with safety stakeholders to promote safe driving across the MPO region.	Materials developed and disseminated

ENFORCEMENT STRATEGIES AND ACTIONS

Strategy 1: Utilize enforcement methods, policies and programs to reduce the potential for distracted driving-related FSI crashes.

Timeline: 1-2 years

Leaders	Description	Performance Measure
School Districts & Law Enforcement	Identify if/where significant problems are occurring around high schools; target enforcement at arrival and dismissal times.	Prioritized list of schools and targeted enforcement deployed
Erie Regional Planning Commission	Provide crash maps to local police showing distracted driving crash hot spots.	Crash maps developed and disseminated

DATA STRATEGIES AND ACTIONS

Strategy 1: Continue to review and analyze crash data to support local distracted driving awareness efforts that target mitigation of distracted driving-related FSI crashes.

Timeline: 1 year

Leaders	Description	Performance Measure
Erie Regional Planning Commission	Assess FSI crashes by school district to understand where major problems are occurring to target resources accordingly.	Prioritized list of schools
Erie Regional Planning Commission	Identify potential correlation of distracted driving by month to support education and enforcement campaigns more than once a year.	Additional crash analysis completed

EDUCATION STRATEGIES AND ACTIONS

Strategy 1: Outreach related to mitigating speed related crashes.

Timeline: 1-2 years

Leaders	Description	Performance Measure
School Districts	Review education/information available in driver's education courses and in high schools to determine needs related to reducing speeding. Coordinate with driver education companies.	Drivers education materials reviewed

ENFORCEMENT STRATEGIES AND ACTIONS

Strategy 1: Conduct ongoing review and analysis of crash data to support local efforts.

Timeline: Ongoing

Leaders	Description	Performance Measure
Erie Regional Planning Commission	Provide crash maps showing speed-related crash hot spots to local police departments.	Crash maps developed and disseminated

6.1 PRIORITY INTERSECTIONS

Data analytics indicate crash factors are over-represented at some intersections. The *Action Plan* identifies areas within the Erie region that should be studied further to identify location-specific crash mitigation strategies and countermeasures, based on the results of the analyses and with input from the stakeholders. The locations identified in Table 1 are illustrated in Figure 59.

Table 1. Top 25 Crash Intersections in the Erie Region

Location	Local Rank	State Rank	Maintaining Authority	Fatal Crashes	Serious Injury Crashes	Total Crashes	Emphasis Area Overlap [1]	Location Status
W Mason Rd & US-250	1	182	ODOT Erie County	1	6	37	RWD; INT; DD; SPD	Signal Timing Study completed (2017); red and yellow clearance intervals were lengthened. Recommend reviewing crash data before and after implementation to assess effectiveness. Due to their proximity, this project should be addressed with W. Mason Road/Kelley Road (Local Rank #3).
OH-61/OH-113 & Ceylon Rd	2	--	ODOT Erie County Berlin Heights	1	4	27	RWD; INT; DD	Intersection converted to all-way stop with flashing beacons. Recommend reviewing crashes before and after implementation.
W Mason Rd & Kelley Rd	3	--	Erie County Milan Township	1	5	54	RWD; INT; SPD	Proximity to US-250 creates challenges. EHOVE Career Center west of the intersection is a major traffic generator. Due to their proximity, this project should be addressed with W. Mason Road/US 250 (Local Rank #1).
Milan Rd (US 250) & OH-2 EB Off-Ramp	4	411	ODOT	0	4	24	RWD; INT; DD; SPD	Signal timing study currently being completed. Review results once received. Additional recommendations from a 2005 study were completed in 2018; included new signals, turn lanes, and access management.
SR-4 & Skadden Rd	5	78	ODOT Erie County	0	4	58	RWD; INT; DD; SPD	Roundabout alternative currently being designed.
Lakeshore Ave & Butler Street / Milan Rd (US-250)	6	--	Sandusky	0	3	33	RWD; INT; SPD	Analysis of Butler Street is included in the US-6 Corridor Study
E Mason Rd & SR-60	7	--	ODOT Erie County	1	2	20	RWD; INT	

PRIORITY INTERSECTIONS AND SEGMENTS

Location	Local Rank	State Rank	Maintaining Authority	Fatal Crashes	Serious Injury Crashes	Total Crashes	Emphasis Area Overlap [1]	Location Status
OH-99 & Harris Rd	8	--	ODOT Groton Township	0	3	21	RWD; INT; SPD	
US-250 & Sartor Dr	9	--	ODOT Perkins Township	0	3	35	INT; DD; SPD	Signal timing study currently underway for US-250 corridor. Review results when complete. Additional recommendations from 2005 study were implemented in 2018; included new signals, turn lanes, and access management.
Northwest Rd & US-6	10	--	ODOT Erie County	0	3	16	RWD; INT; DD; SPD	
SR-269 & US-6	11	--	ODOT	0	3	19	RWD; INT	Centerline rumble strips and flashing chevron signs have been installed and pavement was micro milled (2017).
Campbell St & W Bogart Rd	12	--	Erie County Perkins Township	1	1	20	RWD; INT; DD; SPD	Recently converted to a roundabout, opened in 2018.
Camp Rd & Hull Rd	13	235	Erie County Huron Township	0	3	28	RWD; INT; DD	Intersection realigned (2012).
E Mason Rd & Lake St/SR-61	14	--	ODOT Erie County Berlin Heights	1	2	17	RWD; INT; DD; SPD	ODOT installed Stop signs with flashing beacons (2010/2011).
Parkland Dr & US-250	15	--	ODOT Perkins Township	1	2	43	RWD; INT; DD; SPD	Signal timing study currently underway for US-250 corridor. Review results when complete. Additional recommendations from 2005 study were implemented in 2018; included new signals, turn lanes, and access management. Intersection rebuilt w/ Parkland as right-out-only in 2015.
SR-101 & Bardshar Rd	16	--	ODOT Erie County	0	2	43	RWD; INT; DD; SPD	
W Bogart Rd & Old Railroad Rd	17	--	Erie County Margaretta Township	0	2	18	RWD; INT; SPD	Bogart Road widened with safety edge in 2010 and 2012.

PRIORITY INTERSECTIONS AND SEGMENTS

Location	Local Rank	State Rank	Maintaining Authority	Fatal Crashes	Serious Injury Crashes	Total Crashes	Emphasis Area Overlap [1]	Location Status
US-6 & Columbus Ave	18	--	ODOT Sandusky	0	2	28	RWD; INT	
SR-4 & Pierce St	19	--	ODOT Sandusky	0	2	38	RWD; INT	Safety funding is allocated for signal reconstruction (2023).
Strub Rd & Columbus Ave	20	153	Erie County	0	2	17	RWD; INT; DD; SPD	
Camp St & W Perkins Ave	20	--	Erie County Sandusky Perkins Township	0	2	39	RWD; INT; DD; SPD	Signal replaced, added backplates and is part of coordinated system (2014).
SR-2 and SR-60 (EB ramps)	22	--	ODOT	1	1	44	RWD; INT; SPD	
OH-269 & Portland Rd	23	42	ODOT Erie County	0	1	31	RWD; INT; DD; SPD	Flashing beacons have been installed (2019). Recommend analyzing before/after crash data to assess effectiveness.
E Washington Row & Columbus Ave	24	--	Sandusky	0	2	31	RWD; INT; DD	
W Monroe St & Fulton St	25	--	Sandusky	0	2	25	RWD; INT; SPD	

[1] **RWD** = Roadway Departure Crash
INT = Intersection Crash
DD = Distracted Driving-Related Crash
SPD = Speed Related Crash

6.2 PRIORITY SEGMENTS

Data analytics indicate crash factors are over-represented along certain corridors and, more specifically, along several roadway corridor segments. Based on crash analyses and with stakeholder input, the plan identifies areas within the Erie region that should be studied further to identify and implement location-specific crash mitigation strategies and countermeasures. The segments identified in Table 1 are illustrated in Figure 60.

Table 2. Top 25 Crash Segments in the Erie region

Segment	Local Rank	State Rank	Maintaining Authority	Fatal Crashes	Serious Injury Crashes	Total Crashes	Emphasis Area Overlap [1]	Location Status
US-250 between Huron Avery Rd and E Mason Rd	1	--	ODOT	1	5	55	RWD; INT; DD; SPD	Signal timing study currently being completed. Review results once received.
US-6 between SR-269 N (Prairie Rd) and SR-269 S (Martins Point Rd)	2	--	ODOT	1	6	54	RWD; INT; DD; SPD	Rumble strips installed recently along Lima-Sandusky Road.
SR-4 between W Mason Rd and SR-99 (Skadden Rd)	3	--	ODOT	0	6	42	RWD; INT; DD; SPD	Roundabout currently in design.
US-250 between SR-2 and Fun Dr	4	--	ODOT	0	4	21	RWD; INT; SPD	Signal timing study currently being completed. Review results once received. Additional recommendations from a 2005 study were completed in 2018 that include new signals, turn lanes, and access management.
Columbus Ave between Industrial Pkwy and London Rd	5	--	Erie County	0	4	21	RWD; INT; DD; SPD	Resurfaced with safety edge (2019).
Main St/SR-101 between Barden St and Maple Ave	6	--	ODOT Castalia	0	4	19	RWD; INT; SPD	
W Mason Rd between Taft Rd and Kelley Rd	7	--	Erie County	0	4	19	RWD; DD; SPD	Note: EHOVE Career Center is located within this segment.
SR-113 between Main Rd and Cable Rd	7	--	ODOT	0	4	19	RWD; SPD	
SR-2 between Old Railroad Rd (Overpass) and SR-4	9	993	ODOT	0	7	64	RWD; DD; SPD	

PRIORITY INTERSECTIONS AND SEGMENTS

Segment	Local Rank	State Rank	Maintaining Authority	Fatal Crashes	Serious Injury Crashes	Total Crashes	Emphasis Area Overlap [1]	Location Status
SR-4 between Miller Rd and W Bogart Rd	10	214	ODOT	1	8	106	RWD; INT; DD; SPD	ODOT Study recommended left turn lanes on SR-4 and signal timing study.
SR-60 (SLM 6.138-6.414) north of Mason Rd	11	--	ODOT	1	2	25	RWD; INT; DD; SPD	
W Bogart Rd between Schenk Rd and Campbell St	12	--	Erie County	1	1	23	RWD; INT; DD; SPD	The intersection of W Bogart Road and Campbell Street was recently converted to a roundabout, opened in 2018.
US-6 between Wahl Rd and Prairie Rd	13	--	ODOT	0	4	45	RWD; INT; DD; SPD	Resurfaced, added edge and centerline rumble strips (2019). In 2017 sequential flashing chevrons were added at one curve and the surface was micro-milled to improve friction values US 6 SLM 2.22 - 2.32.
Barrett Rd between Newberry Ave and McCartney Rd	14	--	Erie County	2	1	20	RWD; DD; SPD	
Bogart Rd between Bardshar Rd and Old Railroad Rd	15	--	Erie County	0	3	18	RWD; INT; SPD	Widened and resurfaced with safety edge (2012).
SR-2 (SLM 29.644-30.299)	16	--	ODOT	0	5	44	RWD; SPD	
SR-101 between Maple Ave and Bardshar Rd	17	--	ODOT	0	4	48	RWD; DD; SPD	
SR-269 between Portland Rd and Strecker Rd	18	--	ODOT	0	3	50	RWD; INT; DD; SPD	Safety study recommended flashing beacons, rumble strips on minor approach, and pavement marking improvements.
W Mason Rd between Patten Tract Rd and Taylor Rd	19	--	Erie County	0	3	15	RWD; INT; SPD	

PRIORITY INTERSECTIONS AND SEGMENTS

Segment	Local Rank	State Rank	Maintaining Authority	Fatal Crashes	Serious Injury Crashes	Total Crashes	Emphasis Area Overlap [1]	Location Status
Milan Rd/US-250 (SLM 2.935-3.135)	20	--	ODOT	0	6	86	INT; DD; SPD	Recommendations from a 2005 study were completed in 2018 that include new signals, turn lanes, and access management.
I-80 (SLM 12.112-12.585)	21	34 & 47	OTIC	1	3	31	RWD; INT; DD; SPD	
SR-113 between Ceylon Rd and Bellamy Rd	22	--	ODOT Berlin Heights	0	3	30	RWD; INT; SPD	Ceylon Road intersection converted to an all-way stop (2018).
SR-4 between Mason Rd and Fox Road	23	--	ODOT	0	4	59	RWD; INT; DD; SPD	
SR-113 between Joppa Rd and Harrison Rd	23	--	ODOT	0	3	36	RWD; DD; SPD	
SR-60 between Sperry Rd and I-80	25	--	ODOT	0	5	60	RWD; INT; DD; SPD	

[1] **RWD** = Roadway Departure Crash
INT = Intersection Crash
DD = Distracted Driving-Related Crash
SPD = Speed Related Crash
[2] SLM = Straight Line Mileage

PRIORITY INTERSECTIONS AND SEGMENTS

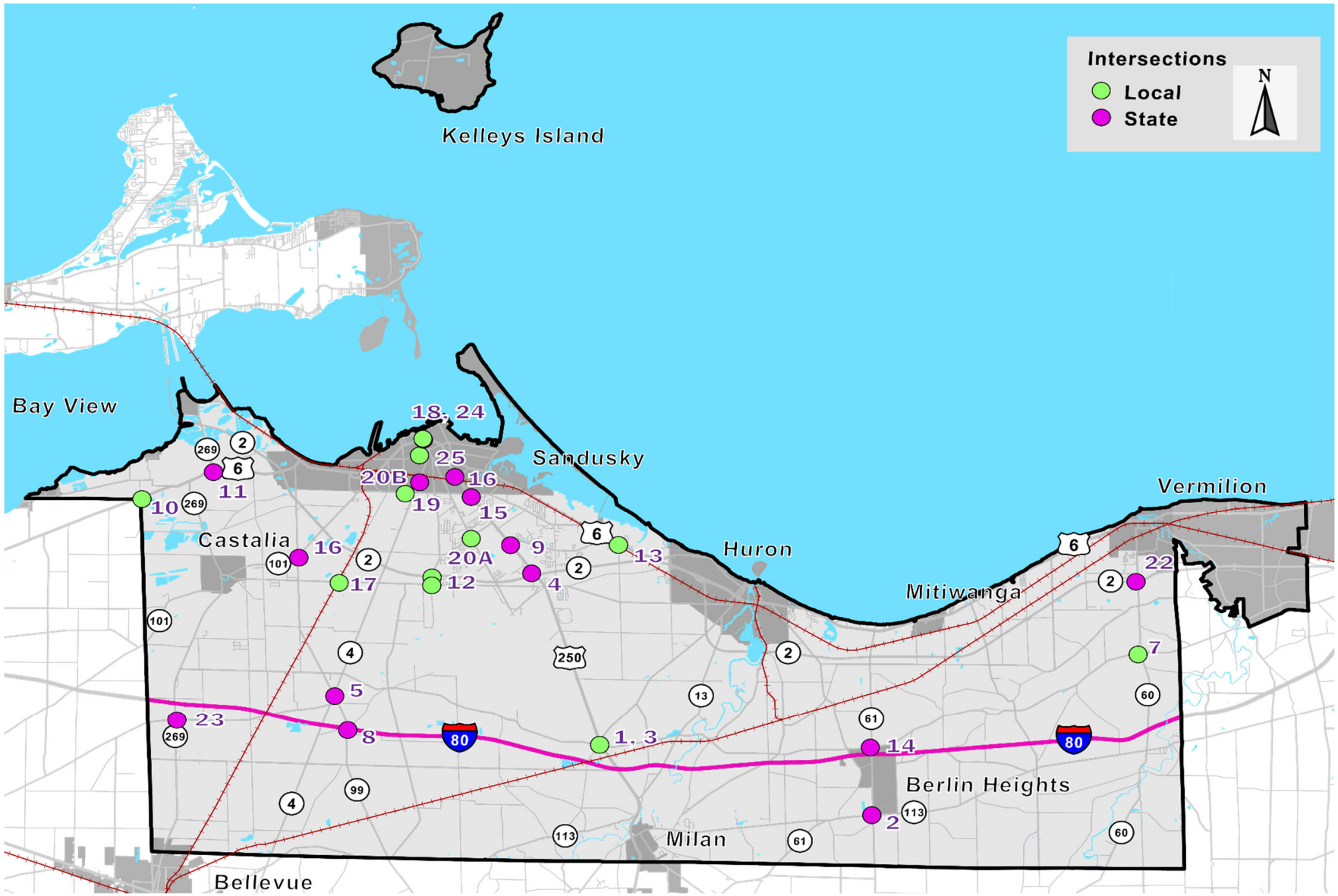


Figure 59. Top 25 Crash Intersections in the Erie region

PRIORITY INTERSECTIONS AND SEGMENTS

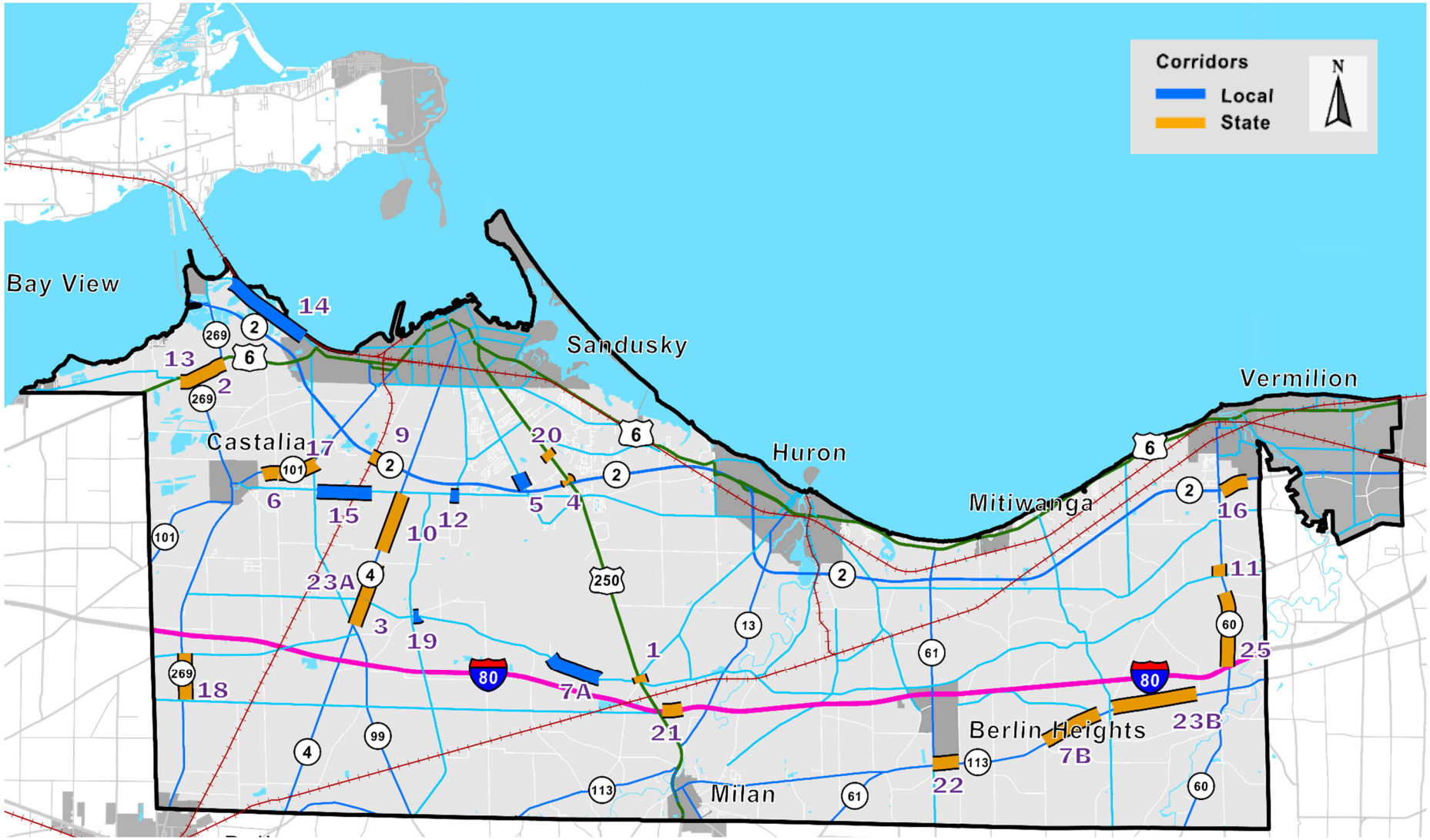


Figure 60. Top 25 Crash Segments in the Erie region

7. RECOMMENDED EARLY ACTION PROJECTS

The projects identified within this section are recommended for near term action (study/implementation) based upon the frequency and severity of crashes at specified locations, as identified in Section 6, along with input from the Project Team and key stakeholders. In addition to the projects located at specific intersection and on identified corridors, the plan recommends programmatic enhancements that could be implemented on a regional basis by the Erie Regional Planning Commission and stakeholder agencies.

Strategy 1: Systemic intersection improvements

Funding Sources: ODOT safety program for systemic safety improvements

Location	Description	Performance Measure
Multiple Intersections	Install upgraded equipment and treatments at intersections to improve safety and performance.	Number of upgraded intersections

Strategy 2: Further prioritization and study

Funding Sources: ODOT Highway Safety Program

Agency	Description	Performance Measure
Erie Regional Planning Commission	Use this local road safety plan to support further study of identified priority intersection and corridor segment locations	Number of funded safety studies
Erie Regional Planning Commission	Evaluation study of the top intersections and segments that countermeasures have been implemented during 2009-2017	Number of evaluated intersections and segments

Strategy 3: Enhance safety for non-motorized users at/between priority listed segments and intersections

Funding Sources: Federal/State/MPO funding programs and grant opportunities

Location	Description	Performance Measure
MPO Region	Construct sidewalk along Columbus Avenue from Strub Road to Bogart Road (area contains two listed priority locations) Estimated cost $358,000.	Number of projects that incorporate bicycle/pedestrian improvements at/between priority listed segments and intersections.