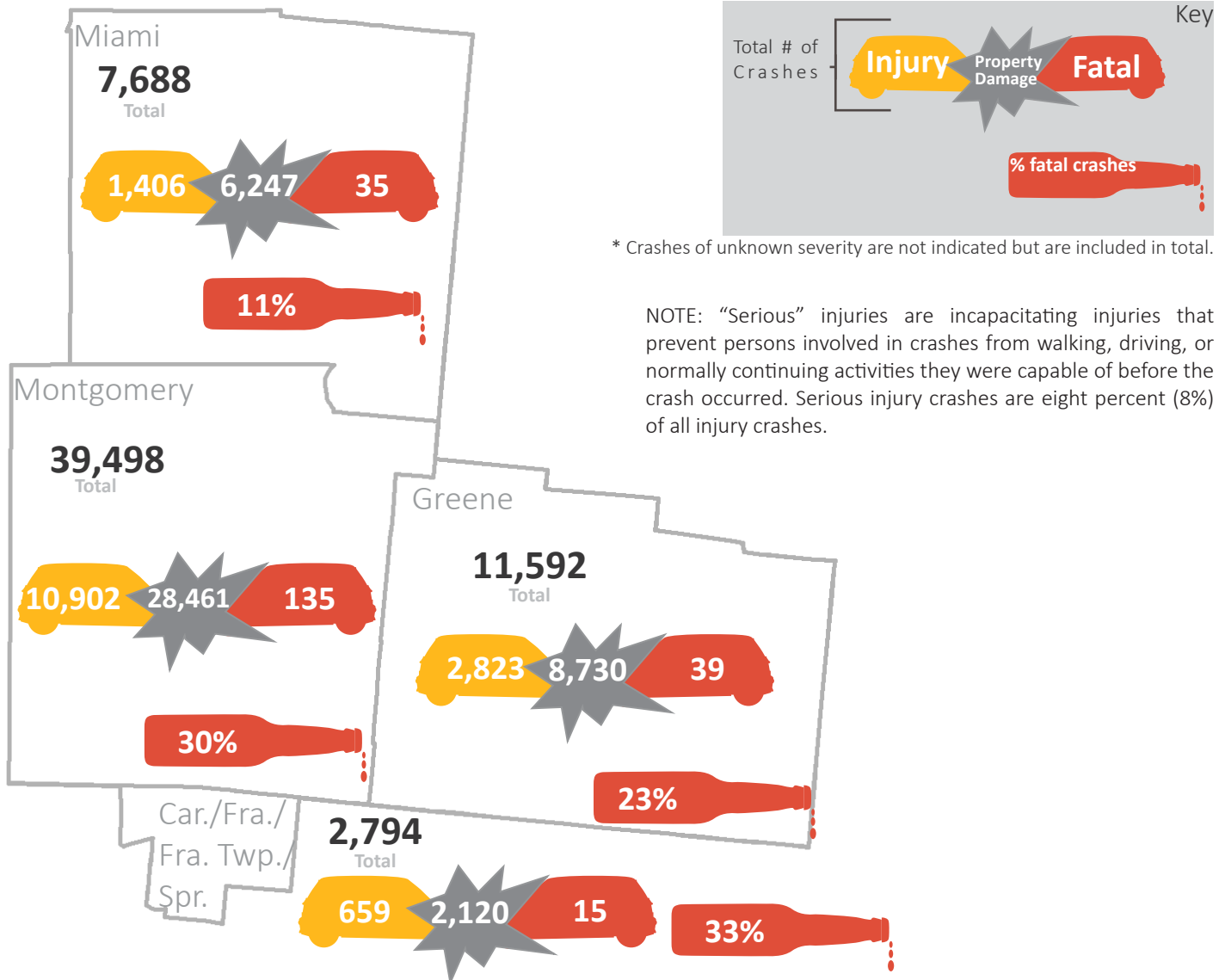


The Miami Valley Regional Planning Commission (MVRPC) analyzes crash data from the Ohio Department of Transportation and the Ohio Department of Public Safety every three years. This report examines the trends found in the crash data from the years 2017 through 2019 for the Miami Valley Region (Montgomery, Miami, Greene, and northern Warren Counties).

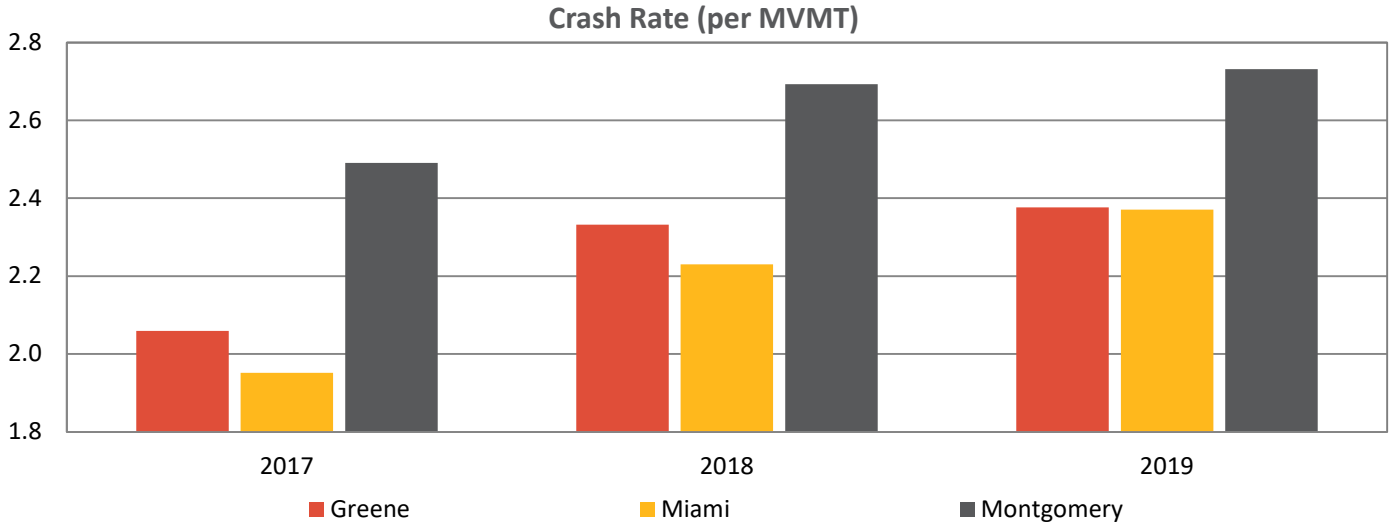
The Region as A Whole

A total of 61,572 reported crashes occurred in the Miami Valley from 2017 to 2019. These crashes include only those costing \$1,000 or greater in property damage, injury-causing, or fatal. Of that total, 224 crashes were fatal, and 15,790 crashes led to injuries where 1,134 of injury crashes lead to serious injuries. Alcohol was reported to be involved in 26% of all fatal crashes. On average, a crash occurred in the Region every 26 minutes.



Comparison Across the Region

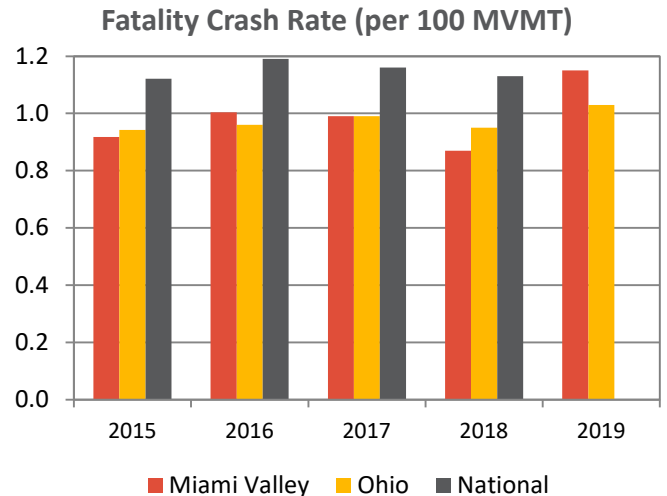
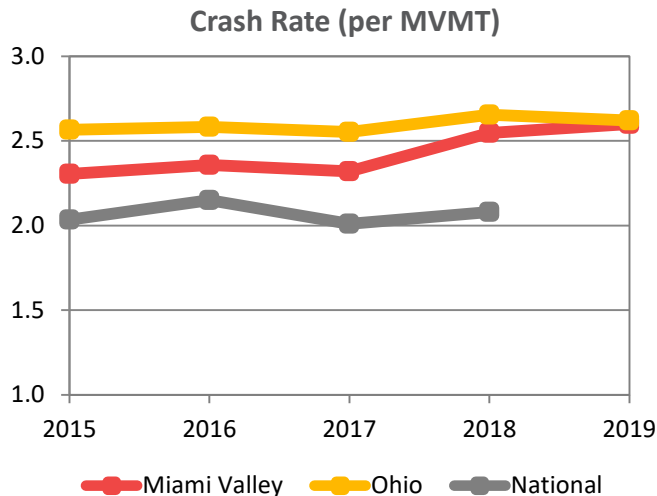
The total crash rate, calculated by the number of crashes per million vehicle miles travelled (MVMT), was varied across the Region’s three counties. On average, Montgomery County experienced the highest crash rate with a three-year (3) average of 2.6 crashes for every 1 million miles traveled within the county.



Vehicle Miles Traveled (VMT) is an estimation of the total number of miles driven within a specific time period and geographic area.

Comparison to Ohio and the Nation

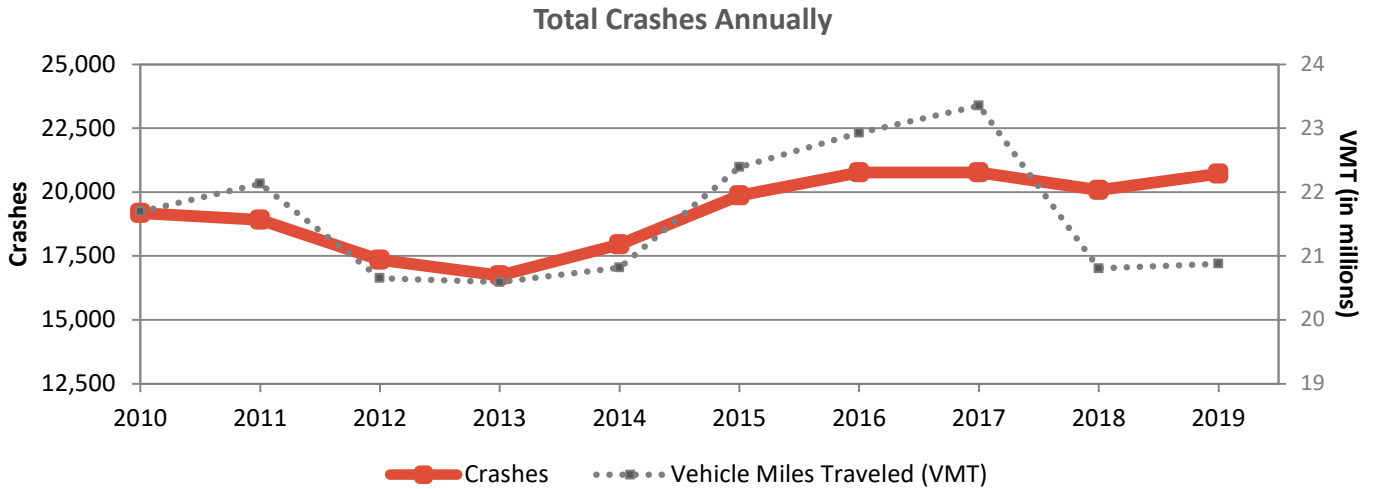
The total crash rate in the Miami Valley has been above the National rate but below Ohio’s rate. From 2015 to 2019, the average crash rate was 2.1 nationally, 2.4 in the Miami Valley, and 2.6 statewide. On average, the Region had a lower rate of roadway fatalities than Ohio and the Nation.



2019 National crash rate data unavailable. Warren County is excluded due to unavailable MVMT data.

Change Through Time

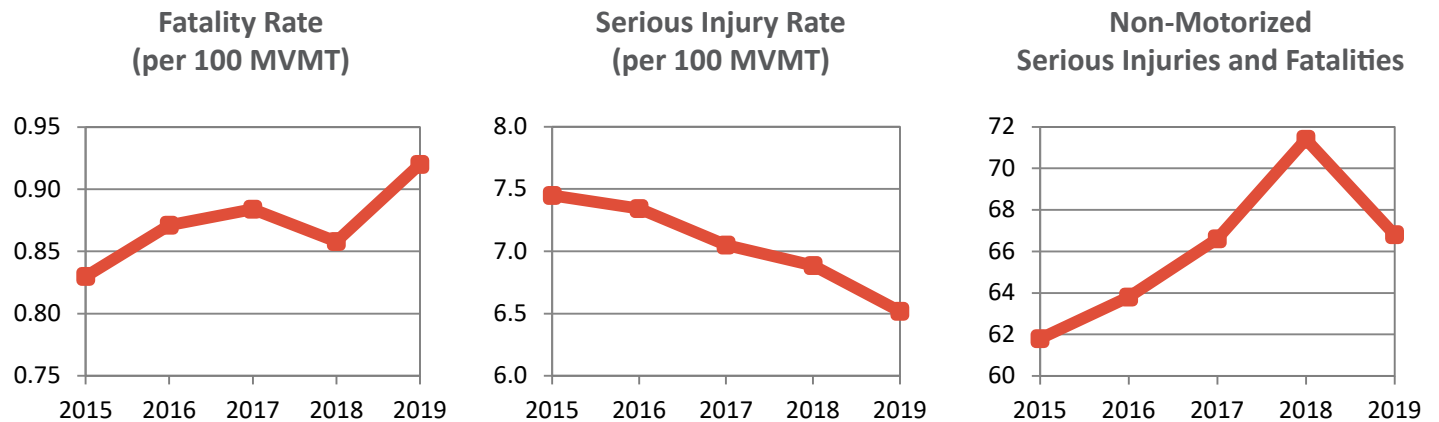
In the last 10 years, the number of crashes reported annually in the Miami Valley has increased. From 2010 to 2019, total reported crashes increased by 8%. In 2010, 19,174 crashes were reported compared to 20,721 in 2019. This increase has been noticeable despite average VMT remaining relatively constant during the same period.



5-Year Performance

Federal rules require regions to set goals to improve roadway safety and measure performance. Goals will be based on the five-year (5) rolling average number and rate of serious injuries and fatalities.

Overall, the Miami Valley Region seeks improvements to counter against these measures. The five-year (5) average rate of serious injuries decreased from 7.8 injuries per 100 million miles traveled from 2011 to 2015 to 7.2 from 2015 to 2019. In contrast, the fatality rate, along with the number of non-motorized serious injuries and fatalities, usually experienced an increase.



Regional Road Network Crashes

To further analyze regional road safety, focus was placed on the regional road network (primarily the Region’s collectors, arterials, and freeways). Only crashes that occurred on those roads were selected and examined. Crashes on local roads were omitted. Road construction or animal crashes were also omitted.

From 2017 to 2019, a total of 47,653 crashes were reported on the regional road network.

Road Network Crashes by County		2017				2018				2019				County Total
		Fatal	Injury	PDO	Total	Fatal	Injury	PDO	Total	Fatal	Injury	PDO	Total	
County	Greene	12	831	2,053	2,896	3	809	2,110	2,922	17	822	2,114	2,953	8,771
	Miami	11	386	1,220	1,617	10	359	1,298	1,667	9	396	1,365	1,770	5,054
	Montgomery	40	3,365	7,626	11,031	43	3,052	7,310	10,405	37	3,123	7,136	10,296	31,732
	Warren (MPO Area)	5	200	580	785	3	160	446	609	4	182	516	702	2,096
Region Total		68	4,782	11,479	16,329	59	4,380	11,164	15,603	67	4,523	11,131	15,721	47,653

PDO - Property Damage Only crashes

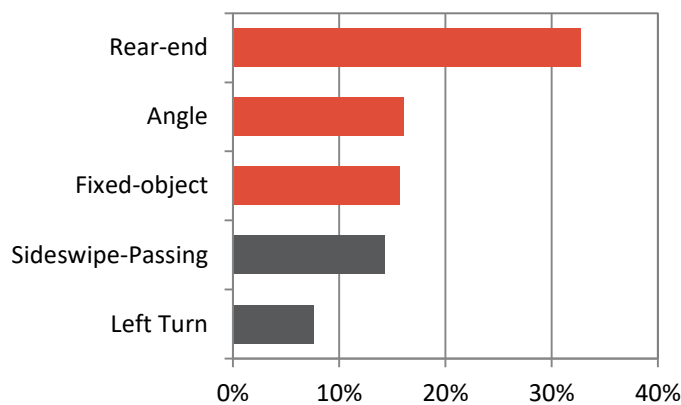
The remainder of this report focuses on crashes that occurred on the regional roadway network.

Types of Crashes

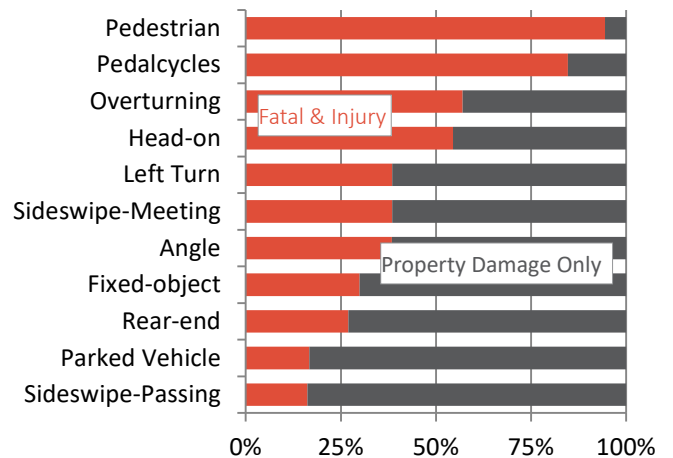
Multiple crash types occurred on the regional roadway network from 2017 to 2019. The most common crash types were rear-end (33% of all crashes), angle (16%), and fixed-object (16%) crashes. Although common, rear-end crashes were not the most severe.

The severity of crashes varied by crash type. Over half of head-on and overturning crashes led to fatalities or injuries. This percentage was even higher for the most vulnerable road users. 95% of reported crashes involving a pedestrian, and 85% of bicycle crashes resulted in a fatality or injury.

Top Crash Types by Percent



Percent Severity of Crash Types

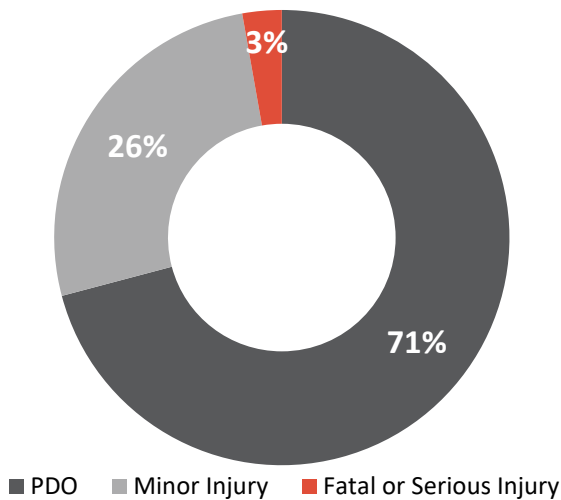


Serious Crashes

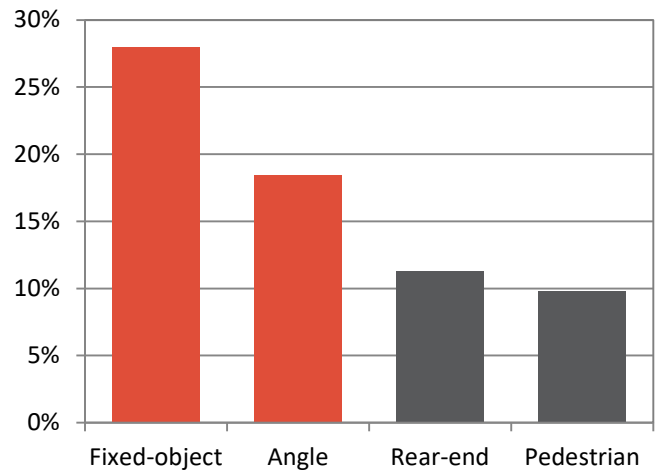
Serious crashes are those that lead to an incapacitating injury or loss of life. Although, serious crashes represented a small percent of total crashes (3%), a total of 1,134 serious injury crashes and 194 fatal crashes occurred. The remaining crashes led to minor injuries or property damage only (PDO).

Twenty-eight percent (28%) of serious crashes were fixed object crashes, and 18% were angle crashes. These crashes varied by age group of drivers involved. Twenty-six percent (26%) of fixed-object crashes involved youth, ages 16 to 25. Similarly, 24% of angle crashes involved seniors, ages 66 and above.

Percent Total Crashes by Severity



Top Crash Types Leading to Serious Crashes

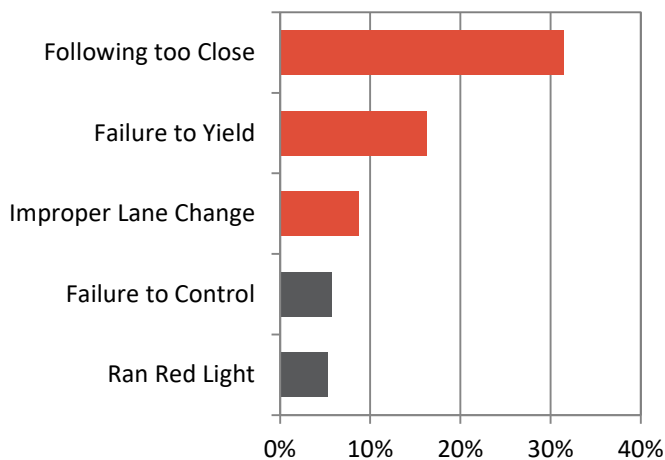


Contributing Factors

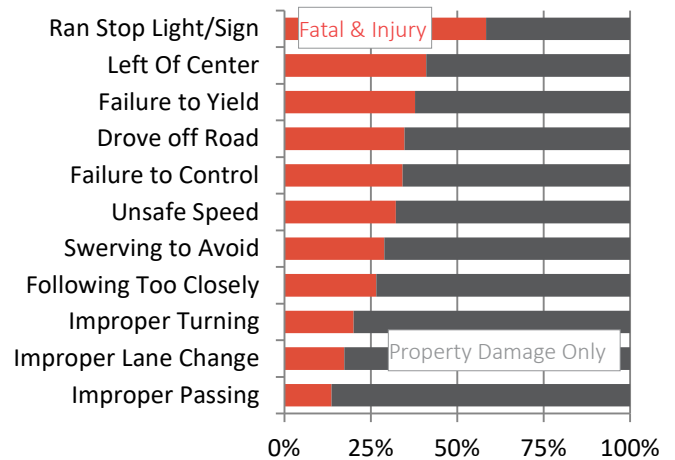
Contributing factors are the driver or non-motorist's actions that may have contributed to the crash, as reported by the law enforcement officer. The most common contributing factors were following too close (31% of all crashes), failure to yield (16%), and improper lane change (9%).

The factors that had the highest severity were running stop light/sign and veering left of center. Fifty-eight percent (58%) of crashes caused by running a stop sign or red light led to injuries or fatalities.

Top Contributing Factors by Percent



Percent Severity of Contributing Factors

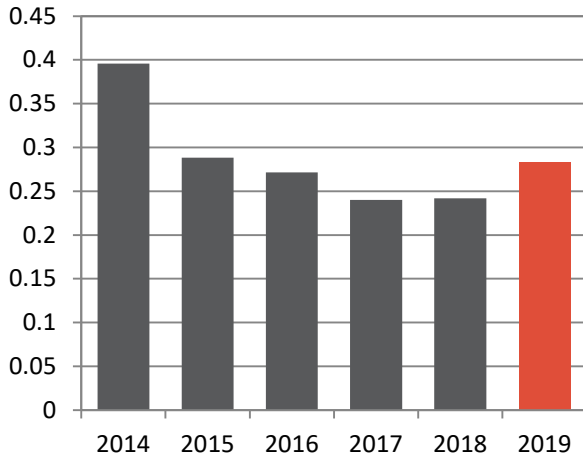


Alcohol and Drug Related Fatalities

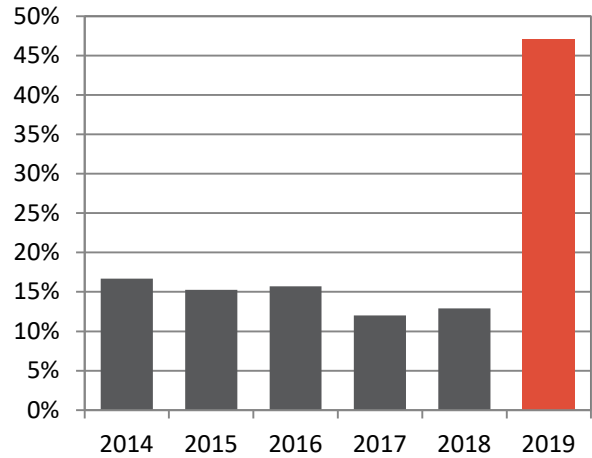
The crash data indicates the dangerous implications of driving while under the influence of alcohol or drugs. A total of 87 fatalities involved alcohol and/or drug related fatal crashes.

Compared to the previously analyzed period, alcohol use decreased from 31 to 26 percent while drug use increased from 15 to 24 percent in fatal crashes.

Alcohol Related Fatalities



Drug Related Fatalities



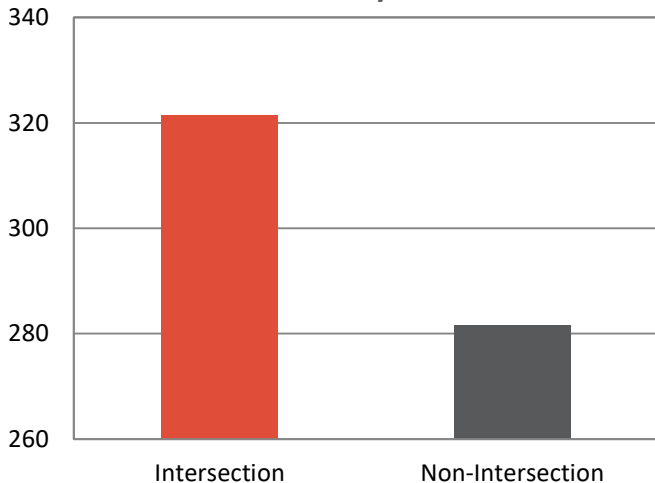
In 2019, crash reports were updated based on toxicology tests resulting in higher but more accurate drug-related fatality statistics

Intersection-Related and Rural Areas Crashes

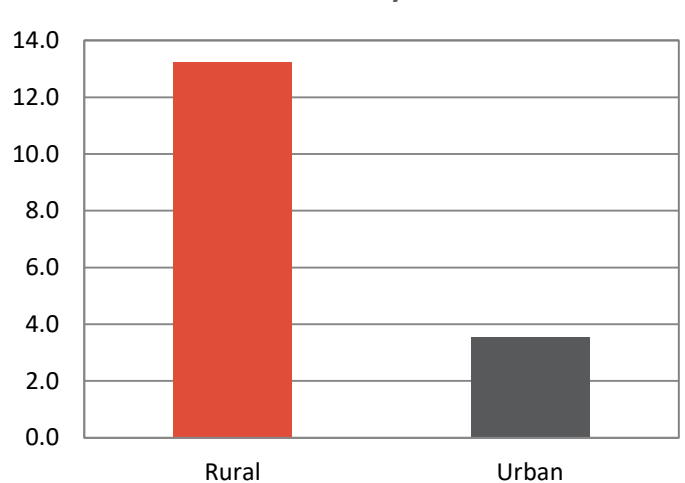
Crashes that occurred at intersections tended to be more severe (causing injury or fatality) than crashes at other locations. There were 322 injury-causing or fatal crashes for every 1,000 total crashes at intersections, compared to a rate of 282 injury or fatal crashes at non-intersection locations.

Similarly, rural areas of the Region were more prone to fatal crashes. For every 1,000 total crashes in rural areas, 13.2 led to a fatality.

Injury and Fatal Crashes per 1,000 Total Crashes by Location



Fatal Crashes per 1,000 Total Crashes by Location

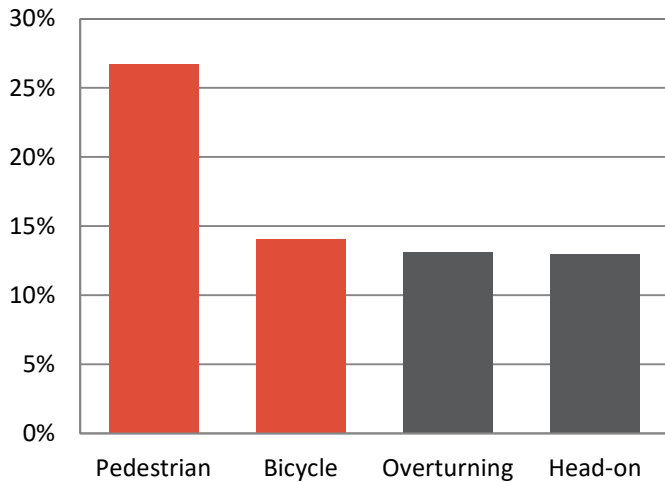


Bicycle and Pedestrian Crashes

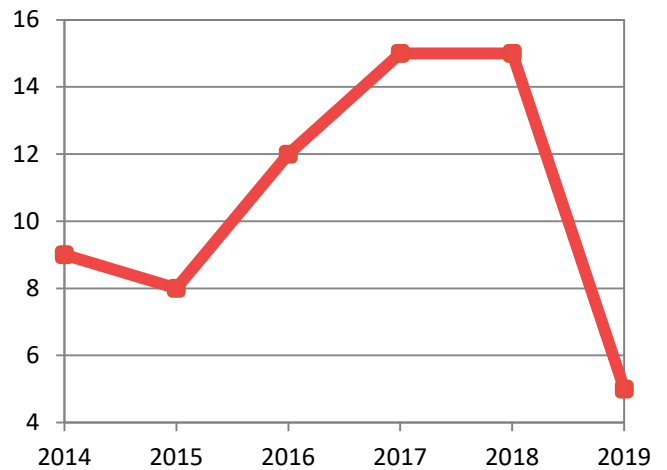
There were 235 bicyclist-motorist and 487 pedestrian-motorist crashes reported. These crashes represented a small fraction of all roadway crashes (only 1.5%). However, they were very severe. Up to 94% of pedestrian crashes and 85% of bicycle crashes resulted in an injury. 23% resulted in a serious crash (serious injury or fatality).

The number of fatal crashes involving a bicycle or pedestrian has increased. From 2014 to 2016, 29 fatal crashes were reported. That number increased to 35 from 2017 to 2019.

Percent of Serious Crashes per Crash Type



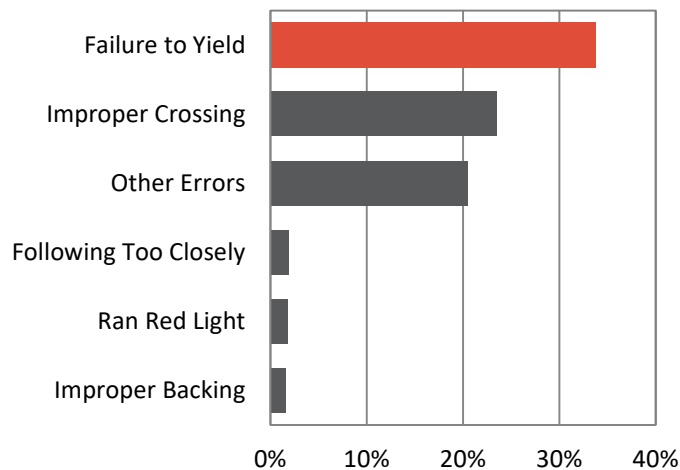
Annual Fatal Bike/Ped Crashes



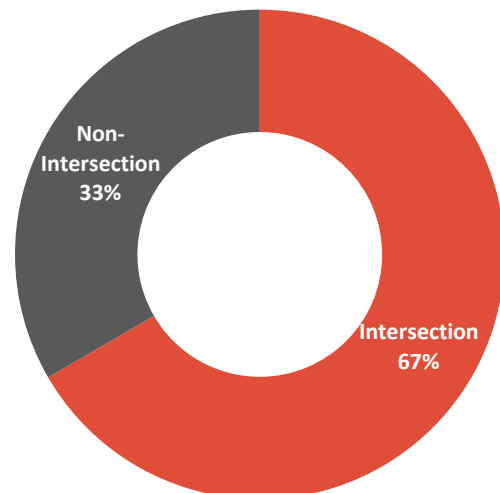
The top contributing factor for bicycle and pedestrian crashes was failure to yield, which was a factor in 34% of these crashes.

Bicycle and pedestrian-related crashes disproportionately occurred at intersections. Sixty-eight percent (68%) of bicycle or pedestrian crashes were non-intersection related. Around half of the intersection crashes occurred at local road intersections.

Top Contributing Factors of Bike/Ped Crashes



Percent of Bike/Ped Crashes at Intersections

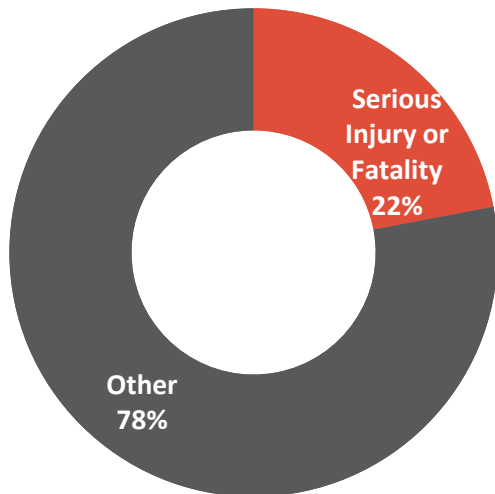


Seat Belt - Fatal and Serious Injuries

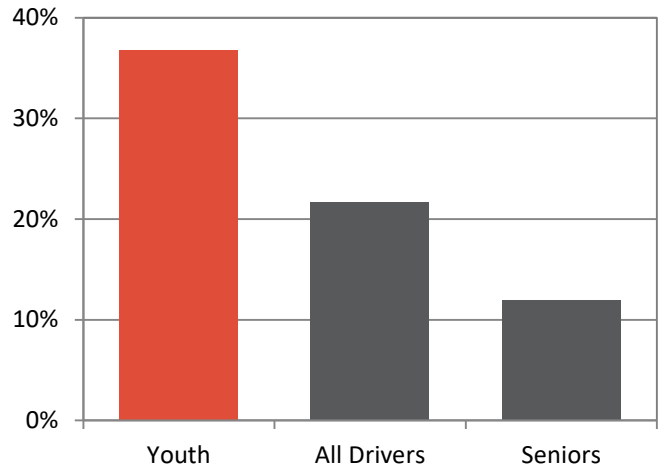
Unrestrained persons (persons without a seat belt) are vulnerable road users. 22% of unrestrained crashes lead to fatalities or serious injuries.

Youth, ages 16 to 25, were the most likely to be involved in single-occupant unrestrained crashes. 37% of serious injury and fatal unrestrained crashes involved youth.

Percent of Serious Injury or Fatality in Unrestrained Crashes



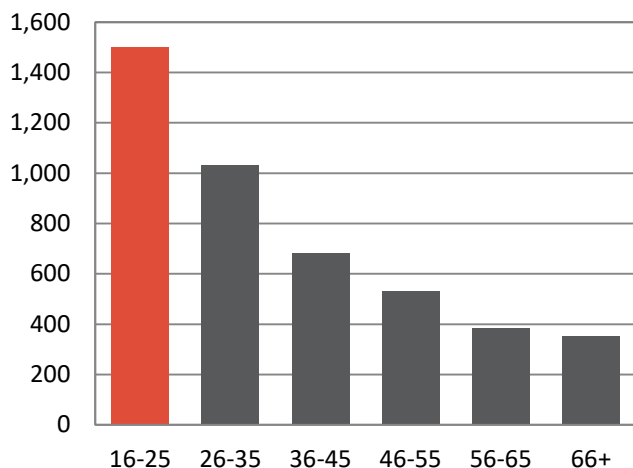
Percent of Serious Injury or Fatality in Unrestrained Crashes by Age Group



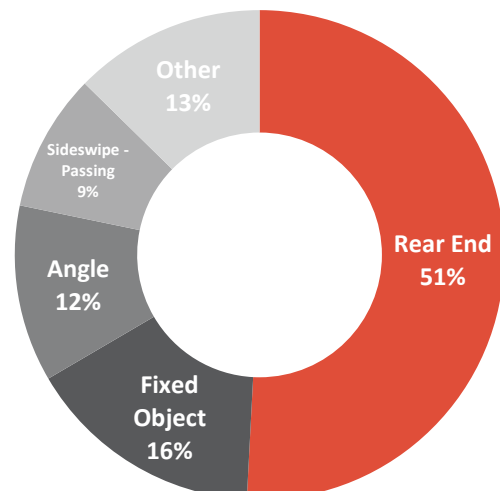
Distracted Driving

In 2012, law enforcement officers started collecting information on distracted driving in crash reports. This data indicates that from 2017 to 2019, 3,801 crashes involving a distracted driver occurred. These included internal distractions, external distractions, phones, and other electronic devices. People aged 16 to 25 were most frequently involved in distracted driving. The top crash type reported with distracted driving was rear ends. Fifty-one percent (51%) of distracted driving crashes were rear ends.

Age Groups of Distracted Drivers



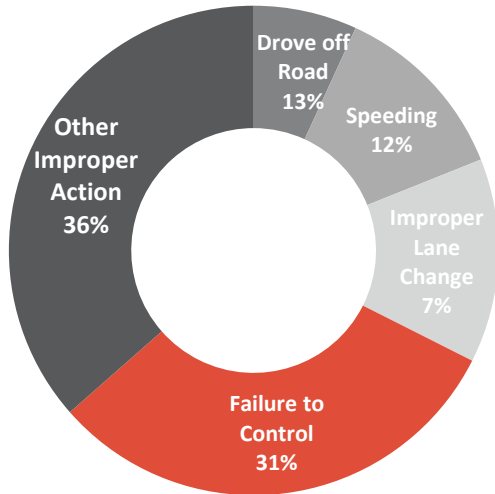
Types of Crashes Involving Distractions



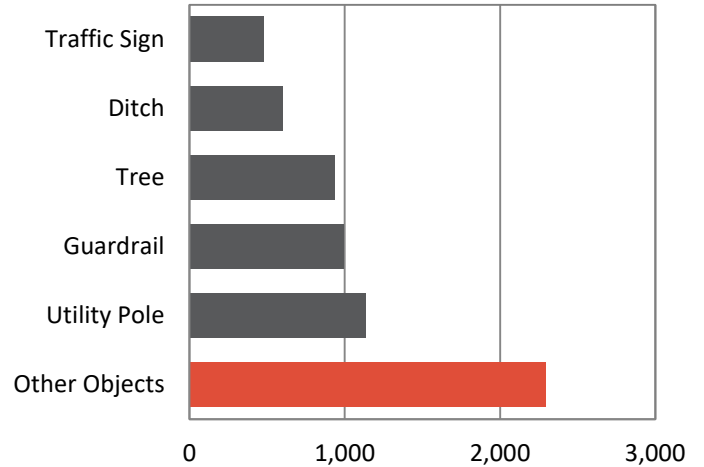
Fixed-Object Crashes

Fixed-object crashes were the top crash type leading to serious injuries or fatalities. Twenty-eight percent (28%) of crashes that led to a severe crash involved a fixed-object crash. The top contributing factor of these crashes was failure to control (31%). Many different types of objects were struck in fixed-object crashes, but the most frequent objects struck were utility poles and guardrails.

Top Contributing Factors of Fixed-Object Crashes



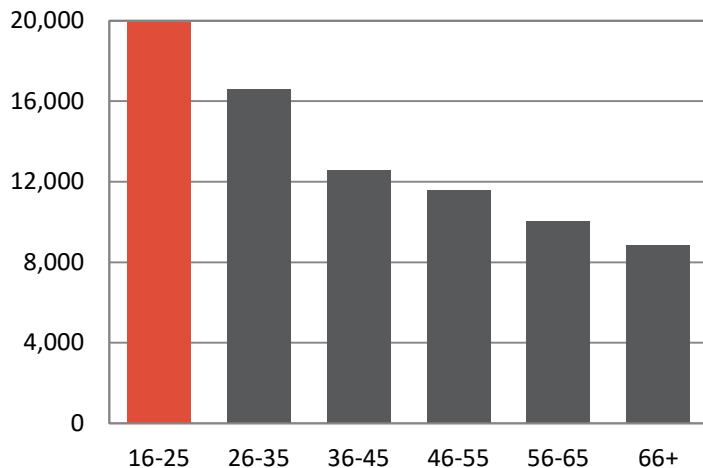
Frequency of Different Objects Struck



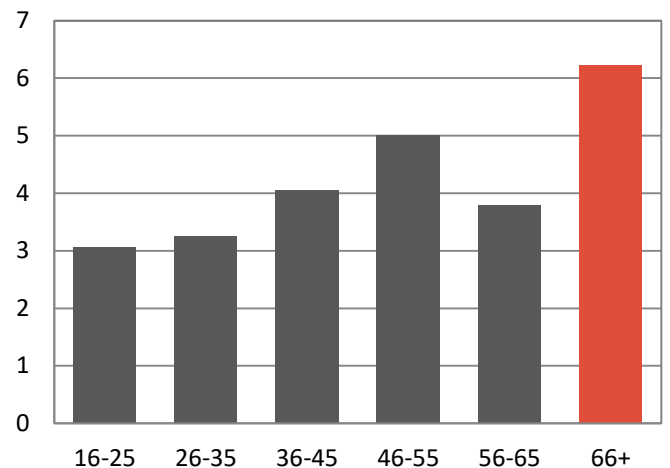
Crashes with Youth and Seniors

Youth (ages 16 to 25) and seniors (66 years or older) are high-risk road users. There were 19,910 youth involved in crashes – the highest of all age groups. Thirty seven percent (37%) of all crashes involved a young person. Similarly, people age 66 or older were involved in 17% of all crashes and 15% of serious crashes. Additionally, 6.2 fatal senior crashes occurred for every 1,000 crashes involving seniors.

Drivers Involved in All Crashes by Age



Fatal Crashes by Age Group (per 1,000 Crashes)



Data analyzed in this report was derived from the Ohio Department of Transportation, the Ohio Department of Public Safety, and the National Highway Traffic Safety Administration crash databases and reports.

May 2021



MIAMI VALLEY

Regional Planning Commission

Shaping Our Region's Future Together