Bloomington/Monroe County
Metropolitan Planning Organization

Crash Report

Calendar Years 2013 through 2015

October 2018

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Bloomington-Monroe County Metropolitan Planning Organization
2013-2015 Crash Report

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Executive Summary

The Bloomington/Monroe County Metropolitan Planning Organization (BMCMPO) 2013-2015 Crash Report represents a continuation of the MPO's effort to provide an analysis of the crash location causes and trends within Monroe County. This report includes an analysis of raw crash data from the Indiana State Police (ISP) Department ARIES data portal (https://www.in.gov/isp/3147.htm) for Calendar Years 2013, 2014, and 2015.

This crash report prepared by the BMCMPO staff from the ISP raw data provides relevant generalized information for the MPO Citizen's Advisory Committee (CAC), the Technical Advisory Committee (TAC), and the Policy Committee (PC). The crash report shall additionally achieve distribution to local units of government, Indiana University, and the general public through the BMCMPO website hosted by the Bloomington Planning and Transportation Department.

A summary of the specific calendar year crash trends provided below highlights general information on crash data within Monroe County. Detailed tables, charts, and summaries provided in subsequent chapters highlight information on annual and daily observational trends involving frequency, severity, and other related characteristics of crashes that occurred from 2013 to 2015. .

Summary of Crash Trends from 2013 to 2015

The Indiana State Police, the Monroe County Sherriff's Department, the Town of Ellettsville Police Department, the Indiana University Police Department, and the City of Bloomington Police Department reported a total of 12,538 crashes within public right-of-way corridors between Calendar Years 2013 and 2015 (**Table 1**). This figure represents a 0.72% increase from the previous three-year calendar year 2012-2014 rolling average analysis period that tabulated a total of 12,448 crashes.

Table 1 - Monroe County Crash Trends – Calendar Year 2013 - 2015

Crash Type	2013	2014	2015	Total
Property Damage	3269	3335	3456	10,060
Personal Injury	785	824	849	2,458
Fatal	4	8	8	20
Total	**4058**	**4167**	**4313**	**12,538**

Approximately eighty percent (80%) of the total crashes reported in Monroe County during the Calendar Year 2013 - 2015 investigation period involved property damage or unknown crashes, while the balance of the data reported levels of personal injury and, to a much lesser extent, crashes resulting in fatalities.

Introduction

Mobility is a defining aspect of life in the United States and around the world. Transportation infrastructure investments have led to new opportunities for trade, travel, recreation, relocation, and economic growth. The BMCMPO receives approximately $3.1 million per year of federal transportation funding allocated from the Indiana Department of Transportation (INDOT) for local transportation network investments. Despite this continued investment, tangible and intangible costs attributable to motor vehicle crashes undermine the effectiveness of the local transportation system.

The BMCMPO Crash Reports demonstrate that motor vehicle crashes contribute to a significant loss of life, property, and productivity in Monroe County. A better understanding of crash trends is attainable through continued efforts in crash reporting and analysis. Targeted infrastructure investments should further improve safety on roads within Monroe County.

The purpose of this Crash Report is twofold. First, the Crash Report provides a consistent and straightforward means to disseminate annual crash data for use by any interested individual or organization. Second, the Crash Report provides another useful tool for civil engineers, transportation planners, and local policy makers when considering both funding and design strategies aimed at reducing the frequency and severity of transportation-related crashes. Specifically, the Indiana Department of Transportation and the BMCMPO require Local Public Agencies (LPAs) to use crash data as part of the Highway Safety Improvement Program (HSIP). This program provides federal funding to target areas with high incidences of crashes. The HSIP primary goal is reducing fatal and incapacitating injury crashes. The implementation of effective mitigation strategies further curtail crashes within Monroe County through annual reporting and analysis.

This Crash Report focuses on a three-year period from Calendar Years 2013, 2014, and 2015. By focusing on a longer time horizon, random variations in annual crashes do not unduly influence the trends reported. For instance, annual variations in bicycle and pedestrian crashes, fatalities and incapacitating injuries, and location-specific crashes can be significant, even though there may not be an actual change in the likelihood of those crashes. By using a three-year window, identified trends are more likely to be meaningful by using a three-year analyses window. The crash data tabulated from 2015 alone provide a snapshot of the most recent year.

Methodology and Data Considerations

The data for the Bloomington/Monroe County Crash Report originates from the "Automated Report and Information Exchange System" (ARIES) of the Indiana State Police (https://www.in.gov/isp/3147.htm). This system maintains statewide crash data from law enforcement agency reports dating back to 2003. The Indiana law enforcement report data are organized by collisions, units (vehicles), and individuals. These data elements, related to one another by a common master field (e.g., Master Record Number) offer independent analysis capability. It is possible to retrieve information regarding collisions (e.g., locations and dates of greatest crash frequency), number of vehicles involved, and individuals involved. It is also possible to perform more complex analyses using attributes from each of these entities.

As with any database, the validity of conclusions resulting from the data is contingent upon accurate and complete data entry. Lack of data information from hit-and-run collisions, confusion surrounding alternate names of roads (e.g., Country Club Drive, Winslow Road), misspelled or mis-

entered street names, GPS errors, and incomplete data entry undoubtedly introduce some error into the results of this report. Therefore, results of the Crash Report should not have a rigid interpretation.

The BMCMPO staff corrected obvious data errors to achieve valid results. Consequently, some minor inconsistencies may be evident when comparing crash reports from prior years. Therefore, the most recently issued Crash Report reflects the best and most accurate crash information. Regardless of methodological changes and slight differences between reports, the overall findings of this report are consistent with those of past years.

Collisions are categorically analyzed given the crash type and severity. If a crash included a moped, motorcycle, bus, and bicyclist or pedestrian, the crash was subsequently classified as a "moped/motorcycle", "bus", "bicycle" or "pedestrian" crash, accordingly, regardless of the number of vehicles involved. If the crash involved only motor vehicles, the "crash modal type" classification identified the number of cars: one car, two cars, or three or more cars (**Figure 1**). The "severity" classification of a collision is dependent upon the most severe injury that resulted from a crash. For example, if a crash resulted in a fatality as well as a non-incapacitating injury, the severity of the crash had an assigned classification as "Fatal Injury." Most data methods used in the report are self-explanatory.

Collisions were analyzed using available geographic, road inventory, and traffic count data. Individual crashes were located according to reported geographic coordinates which were available for more than 93% of all records. A crash frequency was determined for each intersection by tabulating the total number of crashes that occurred within a 250-ft radius of the center of the intersection. Crash rates were determined from available traffic data from the City of Bloomington, the Town of Ellettsville, Monroe County, and the Indiana Department of Transportation using standard adjustments and engineering judgment as necessary.

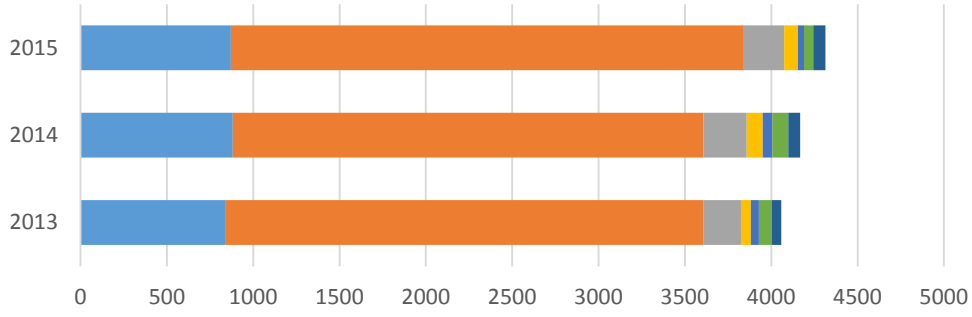
When reading the Crash Report, it is important to understand the distinction between "crashes" and "individuals." The term "crash" refers to the characteristics of the crash itself under consideration. For example, a "Fatal Injury" column (e.g., "Crash by Type and Severity, 2013-2015") shows how many crashes resulted in a fatal injury; it would be incorrect, however, to interpret this column as the number of fatalities since more than one fatality can result from a single crash.

Crash Characteristics

This section provides a summary of crash characteristics in Monroe County, including the type and severity of crashes from 2013-2015. These factors reflect trends in the overall safety of the transportation system.

A further breakdown of the Calendar Year 2013 – 2015 crash totals provides insights into trends involving pedestrians, bicyclists, buses, mopeds/motorcycles, and crashes that resulted in fatalities. Over the course of the three years analyzed, there were twenty (20) fatal crashes resulting in twenty-one fatalities (**Table 2**), slightly fewer than the 24 fatalities reported from 2012 to 2014. Of the twenty (20) fatal crashes, seven (7) resulted from two-car crashes, five (5) were from one-car crashes, four (4) involved mopeds/motorcycles, and two (2) involved a pedestrian. As has been the case for each of the prior nine (9) years, there were no fatalities involving a bicycle or a bus.

Figure 1 – Crashes by Modal Type – Calendar years 2013 - 2015



	2013	2014	2015
1-Car	838	882	870
2-Car	2768	2726	2972
3+ Cars	218	249	232
Bus	58	94	80
Cyclist	46	56	36
Moped/Motorcycle	77	92	53
Pedestrian	53	68	70

The time distribution of crashes continues to follow a predictable pattern correlating with peak hour and off-peak hour traffic volumes. The greatest number of crashes occurred during weekday rush hours between 4:00 P.M. and 6:00 P.M., with an average slightly greater than one (1) crash per hour for the entire county. There is also a peak from 12:00 P.M. to 1:00 P.M on weekdays. The weekend also follows a similar pattern in terms of frequency of crashes, but the crash rate has a more even distribution through the day and early evening hours. Between the hours of 7:00 PM and 4:00 AM, the weekend experiences a higher crash frequency compared with weekdays. Friday continued to have the highest number of crashes overall, while Sunday had the lowest number of crashes.

State and federal designated highway routes are prominently featured in the list of the highest crash frequency intersections or the total number of crashes over a given time period. Higher traffic volumes on these roads are undeniably the primary factor. INDOT jurisdictional intersections at SR 37 and 3rd Street, SR 45/46 and 10th Street, and SR 37 and Bloomfield Road are consistently high frequency crash locations. These intersections therefore warrant constant monitoring as do several local jurisdictional intersections that exhibit consistently high crash frequencies.

The leading cause of crashes during the Calendar Year 2013-2015 study period was once again a "failure to yield right of way" with 2,274 incidents. Other leading causes include "following too closely" and "unsafe backing". These causes are addressable through law enforcement and education efforts as well as through selective physical improvements. "Running off the right side of the road" and "speeding in adverse weather" additionally present opportunities for physical safety improvements, such as guard rails, rumble strips, and interactive signage. These types of improvements warrant further exploration for crash reductions.

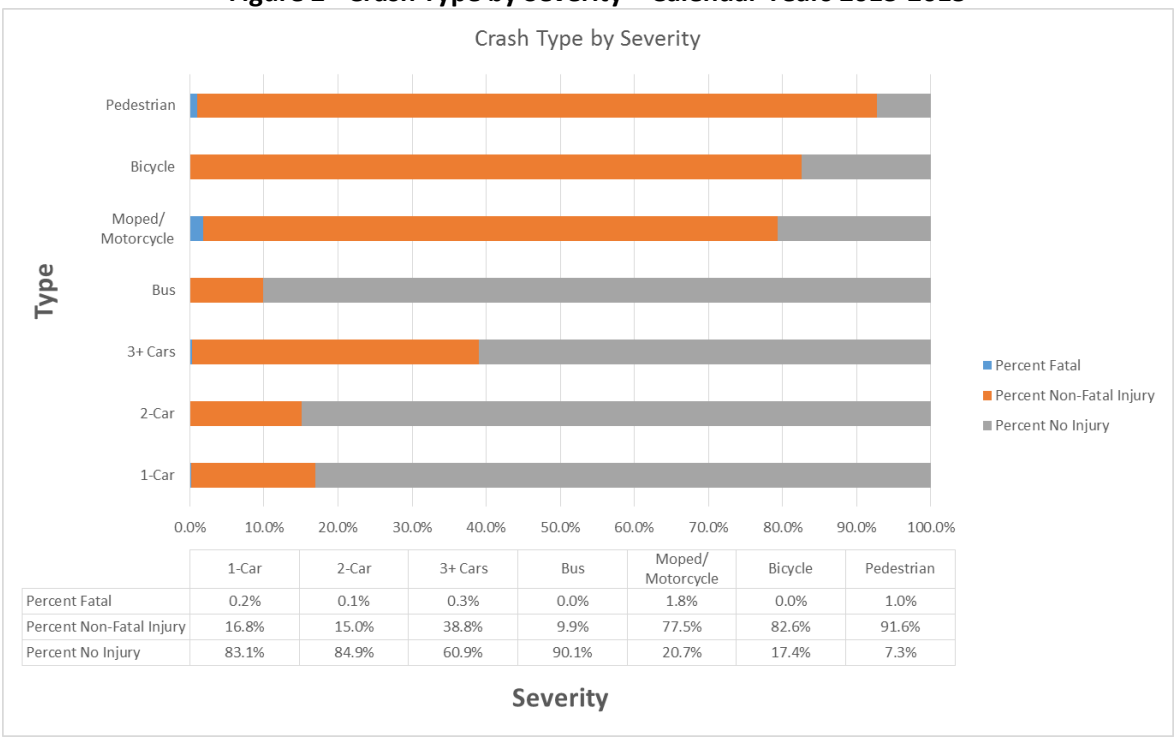
Crashes involving pedestrians and bicyclists are considerably important within the BMCMPO given a relatively high number of urbanized area non-motorized trips, the vulnerability to injury of individuals using these modes, and the BMCMPO's goals for increasing walking and bicycling modal

shares. Compared to other types of crashes, those involving pedestrians and bicyclists are much more likely to result in a fatality or an incapacitating injury. Reducing the frequency and severity of these crashes is therefore a priority.

Table 2 - Crashes by Type and Severity – Calendar Years 2013-2015

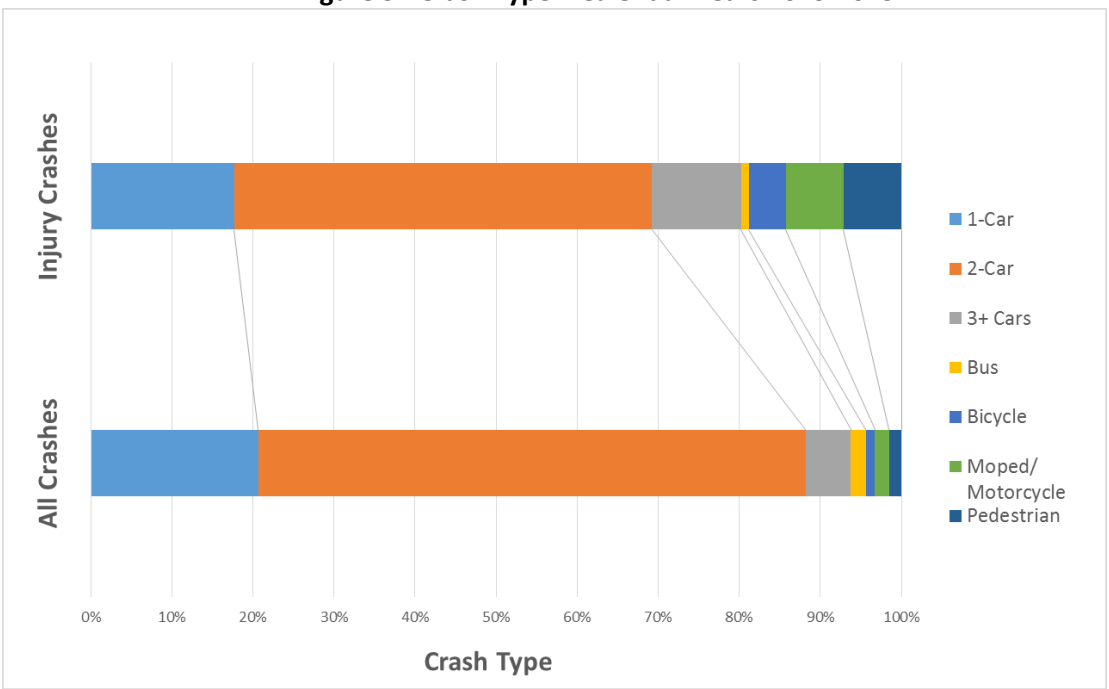
	Crash Type	Severity				Annual Total	Percent of Annual Total
		Fatal	Incapacitating	Non-incapacitating	No injury/ unknown		
2013	1-Car	0	20	118	700	**838**	20.7%
	2-Car	1	35	381	2351	**2768**	68.2%
	3+ Cars	2	7	75	134	**218**	5.4%
	Bus	0	0	2	56	**58**	1.4%
	Cyclist	0	2	35	9	**46**	1.1%
	Moped/Motorcycle	1	10	50	16	**77**	1.9%
	Pedestrian	0	5	45	3	**53**	1.3%
	Total	**4**	**79**	**706**	**3269**	**4058**	100.0%
	Percent of Annual Total	0.1%	1.9%	17.4%	80.6%	100.0%	
2014	1-Car	3	27	115	737	**882**	21.2%
	2-Car	3	45	353	2325	**2726**	65.4%
	3+ Cars	0	9	81	159	**249**	6.0%
	Bus	0	0	12	82	**94**	2.3%
	Cyclist	0	8	40	8	**56**	1.3%
	Moped/Motorcycle	0	16	58	18	**92**	2.2%
	Pedestrian	2	12	48	6	**68**	1.6%
	Total	**8**	**117**	**707**	**3335**	**4167**	100.0%
	Percent of Annual Total	0.2%	2.8%	17.0%	80.0%	100.0%	
2015	1-Car	2	78	76	714	**870**	20.2%
	2-Car	3	187	268	2514	**2972**	68.9%
	3+ Cars	0	49	50	133	**232**	5.4%
	Bus	0	6	3	71	**80**	1.9%
	Cyclist	0	15	14	7	**36**	0.8%
	Moped/Motorcycle	3	24	14	12	**53**	1.2%
	Pedestrian	0	32	33	5	**70**	1.6%
	Total	**8**	**391**	**458**	**3456**	**4313**	100.0%
	Percent of Annual Total	0.2%	9.1%	10.6%	80.1%	100.0%	
3-Year	**Total**	**20**	**587**	**1871**	**10060**	**12538**	
	Percent of 3-Year Total	**0.2%**	**4.7%**	**14.9%**	**80.2%**	**100.0%**	

Figure 2 - Crash Type by Severity – Calendar Years 2013-2015



	1-Car	2-Car	3+ Cars	Bus	Moped/ Motorcycle	Bicycle	Pedestrian
Percent Fatal	0.2%	0.1%	0.3%	0.0%	1.8%	0.0%	1.0%
Percent Non-Fatal Injury	16.8%	15.0%	38.8%	9.9%	77.5%	82.6%	91.6%
Percent No Injury	83.1%	84.9%	60.9%	90.1%	20.7%	17.4%	7.3%

Figure 3 - Crash Type – Calendar Years 2013-2015



Time of Crashes

This section summarizes the number of crashes by hour and day. Law enforcement agencies and emergency responders can use these data relating to the timing of crashes for planning purposes. Additionally, decision makers may use this information in an attempt to reduce peak crash times.

On weekdays, the number of crashes typically peaked in conjunction with the morning rush hour, 7:00 AM to 9:00 AM, and then increased gradually throughout the day until peaking again in conjunction with the evening rush hour, 4:00 PM to 6:00 PM (**Figure 4**). There was an additional peak at noon around the lunch hour. The late afternoon was the most likely time for a crash to occur, with more than one per hour.

The hourly distribution of weekend crashes exhibits a predictable pattern. Crashes in the late evening and early morning are apparently more common during the weekend, and rush hour peaks were not as prevalent as on weekdays. During the Calendar Year 2013-2015 study period, a greater number of crashes occurred on Fridays than on any other day and the fewest crashes occurred on Sundays (**Figure 5**).

Figure 4 - Crashes by Time of Day – Calendar Years 2013-2015

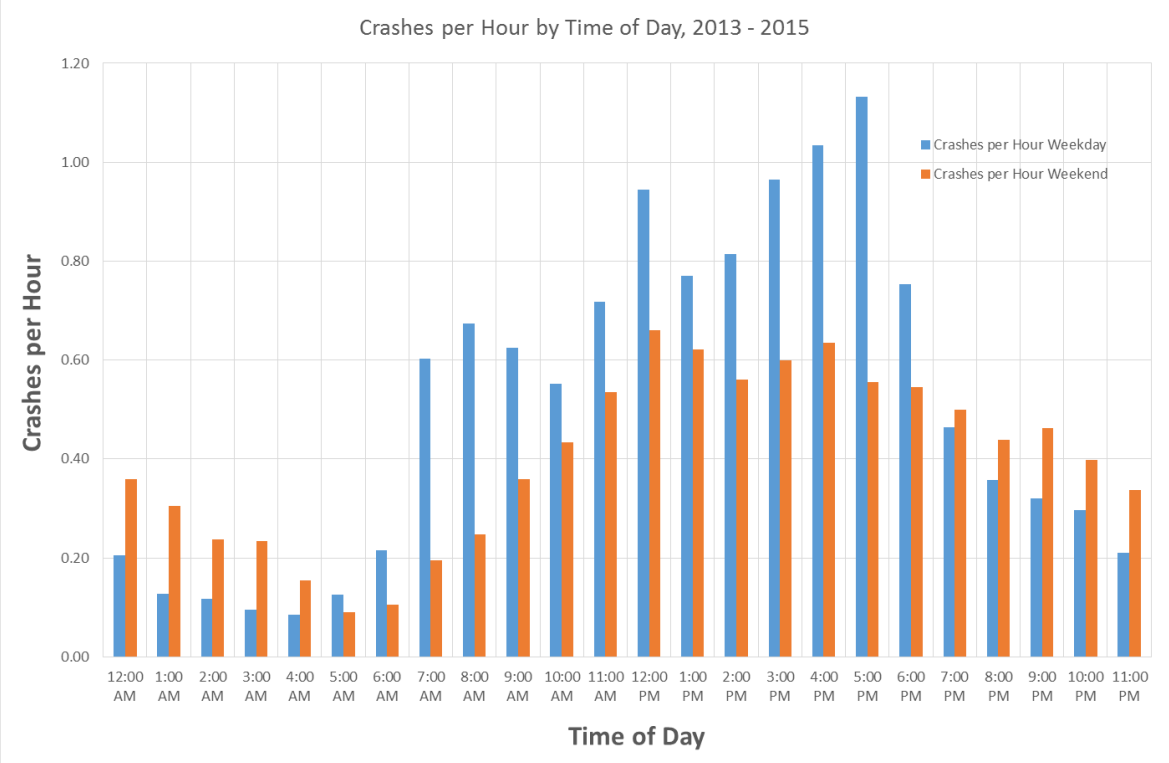
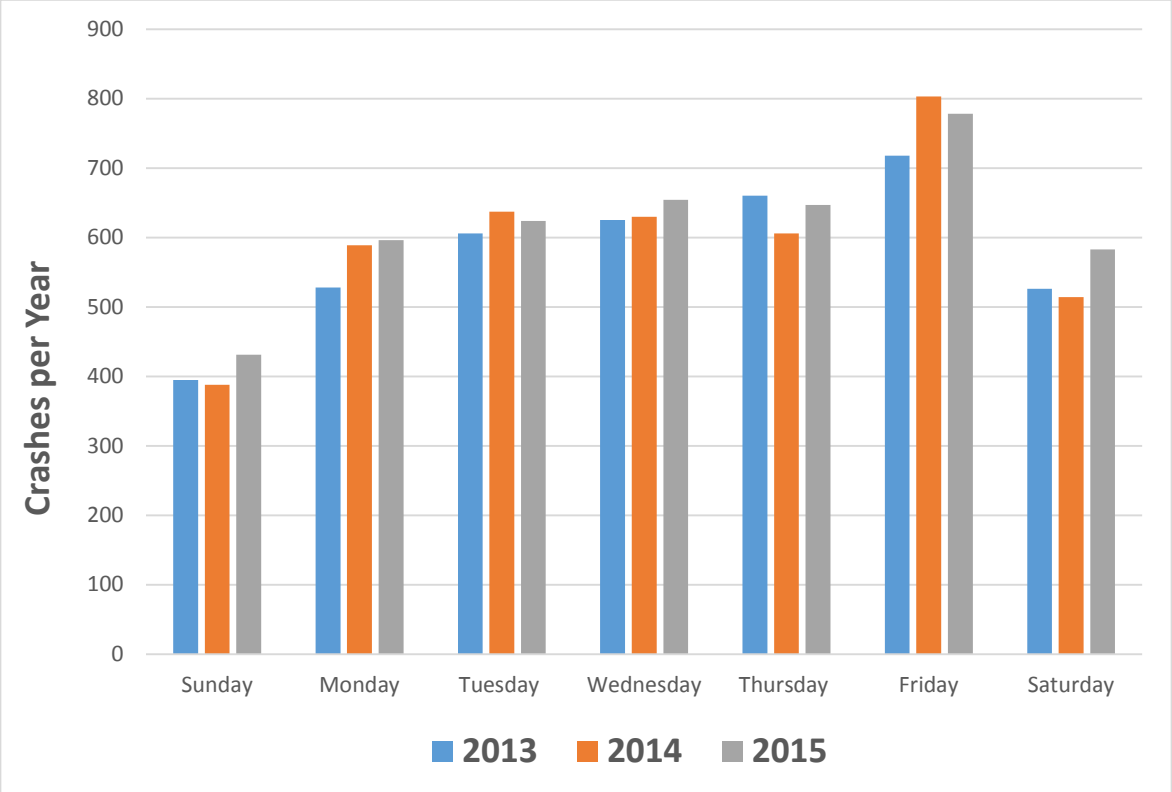


Figure 5 - Crashes by Day of Week – Calendar Years 2013-2015



Crash Locations

This section addresses the spatial distribution of crashes in Monroe County highlighting locations of high crash frequency, crash rates, and crash severity **(Table 3)**. This identification process used a stepwise approach: (1) ranking the sum total of all C.Y. 2013-2015 all Monroe County intersection crash locations into the "Top 50 Crash Locations," (2) adjusting these crash locations with traffic volume data thereby deriving three-year crash rates, and (3) a derivation of intersection severity rates.

The methodology used in this report does not identify locations which have a higher than expected (i.e. statistically significant) crash totals, crash rates, or severity indices. Future crash reports should therefore consider a comparative analysis of intersections with similar operating characteristics. The BMCMPO staff shall additionally explore a network solution for calculating crash rates at lower crash frequency locations.

Table 3 - Top 50 Crash Locations by Crash Total – Calendar Years 2013-2015

Crash Total Rank	Intersection	Juris-diction	Year			Total
			2013	2014	2015	
1	SR 37 & 3rd Street	INDOT	25	28	36	89
2	SR 46 & Pete Ellis Drive	INDOT	32	27	27	86
3	SR 37 & Bloomfield Road	INDOT	26	33	25	84
4	SR 45 & Gillham Drive	INDOT	28	34	20	82
5	SR 45/46 Bypass & 10th Street	INDOT	26	22	30	78
6	SR 46 & 3rd Street	INDOT	23	20	26	69
7	SR 45 & S Liberty Drive	INDOT	16	22	27	65
8	SR 45/46 Bypass & College Ave/Walnut St	INDOT	16	24	24	64
9	SR 46 & Kingston Drive	INDOT	13	20	31	64
10	SR 45 & Curry Pike/Leonard Springs Road	INDOT	17	25	19	61
10	SR 37 & Tapp Road	INDOT	17	20	19	60
11	SR 45/46 Bypass & Kinser Pike	INDOT	15	23	22	56
12	SR 48 & Curry Pike	INDOT	15	22	18	55
13	Walnut Street Pike & Winslow Road	COB	20	18	14	52
14	SR 45 & Pete Ellis Drive/Range Road	INDOT	17	18	17	52
15	3rd St & Swain Avenue	COB	23	14	14	51
15	SR 48 & Gates Drive	INDOT	15	24	12	51
16	10th St & Union Street	COB	13	15	20	47
16	Grimes Ln & Walnut Street	COB	12	17	18	48
17	2nd St & College Avenue	COB	20	16	9	46
18	3rd St & Jordan Avenue	COB	17	14	15	45
19	17th St & Jordan Avenue	COB	15	13	16	45
20	SR 48 & Liberty Drive	INDOT	13	13	19	44
20	College Ave & Kirkwood Avenue	COB	19	16	8	43
21	3rd St & Fess Avenue	COB	10	10	23	43
22	3rd St & Walnut Street	COB	14	17	11	42
22	Dunn St & Kirkwood Avenue	COB	13	13	16	42

Table 3 - Top 50 Crash Locations by Crash Total – Calendar Years 2013-2015 (Continued)

Crash Total Rank	Intersection	Juris-diction	Year 2013	2014	2015	Total
23	2nd St & Patterson St	COB	13	13	15	41
23	3rd St & College Avenue	COB	18	14	8	40
24	4th Street & Walnut Street	COB	16	6	17	39
25	7th Street & Walnut Street	COB	12	14	10	39
26	Kirkwood Ave & Walnut Street	COB	14	14	11	36
26	SR 45/46 Bypass & 17th Street	INDOT	7	17	12	38
27	10th Street & College Avenue	COB	12	11	15	36
28	3rd Street & Indiana Avenue	COB	15	12	9	36
28	2nd Street & Rogers Street	COB	9	14	13	36
28	Rhorer Road & Walnut Street Pike	MC	7	18	11	35
28	Curry Pike & Vernal Pike	MC	9	16	10	36
28	SR 46 & Centennial Drive	INDOT	8	12	14	35
29	3rd St & Dunn Street	COB	12	12	9	34
29	9th Street & College Avenue	COB	9	11	13	33
30	7th Street & College Avenue	COB	9	15	11	33
31	SR 46 & Smith Road	INDOT	11	11	10	32
31	SR 45/46 Bypass & Dunn St	INDOT	13	11	7	32
	17th Street and Walnut Street	COB	10	14	8	32
32	Walnut St & Country Club Dr/Winslow Rd	COB	13	10	9	32
	10th Street & N Sunrise Drive	COB	7	8	15	31
32	10th Street & Woodlawn Avenue	COB	17	8	7	31
32	3rd Street & Washington Street	COB	9	12	10	31
33	17th Street & Kinser Pike/Madison Street	COB	9	9	13	30
33	SR 46 & Union Valley Road	INDOT	14	7	9	30

Table 4 - Top 50 Crash Locations by Crash Rate – Calendar Years 2013-2015

Crash Rate Rank	Crash Frequency Rank	Intersection	3-Year Total	Juris-diction	Crash Rate
1	5	SR 45 & Gillham Drive	84	INDOT	5.00
2	39	Kirkwood Avenue & Dunn Street	42	COB	3.78
3	20	3rd Street & Swain Avenue	55	COB	3.71
4	20	3rd Street & Fess Avenue	58	COB	3.51
5	4	SR 46 & Pete Ellis Drive	89	INDOT	3.18
6	18	Walnut Street Pike & Winslow Road	56	COB	2.96
7	6	SR 46 & S Kingston Drive	64	INDOT	2.94
8	1	SR 37 & 3rd Street	112	INDOT	2.73
9	16	10th Street & Union Street	51	COB	2.56
10	3	SR 37 & Bloomfield Road	86	INDOT	2.45
11	24	17th Street & Jordan Avenue	45	COB	2.35
12	2	SR 45/46 Bypass & 10th Street	82	INDOT	2.27
13	48	3rd Street & Dunn Street	38	COB	2.18
14	43	3rd Street & Woodlawn Avenue	37	COB	2.15
15	48	10th Street & Sunrise Drive	30	COB	2.09
16	24	10th Street & College Avenue	38	COB	2.05
17	37	3rd Street & Highland Avenue	30	COB	1.95
18	31	Rhorer Road & Walnut Street Pike	32	MC	1.92
19	22	4th Street & S Walnut Street	43	COB	1.91
20	37	14th Street & Walnut Street	30	COB	1.90
21	8	SR 37 & Vernal Pike	90	INDOT	1.88
22	14	SR 45 & Pete Ellis Drive/Range Road	52	INDOT	1.86
23	6	SR 46 & 3rd Street	78	INDOT	1.84
24	9	SR 45 & Liberty Drive	69	INDOT	1.81
25	35	Kirkwood Avenue & College Avenue	44	COB	1.73

Table 4 - Top 50 Crash Locations by Crash Rate – Calendar Years 2013-2015 (Continued)

Crash Rate Rank	Crash Frequency Rank	Intersection	3-Year Total	Juris-diction	Crash Rate
26	43	7th Street & Walnut Street	39	COB	1.63
27	26	2nd Street & College Avenue	46	COB	1.62
28	43	10th Street & Woodlawn Avenue	32	COB	1.60
29	22	Kirkwood Avenue & Walnut Street	36	COB	1.55
30	14	SR 37 & Tapp Road	73	INDOT	1.53
31	11	SR 45/46 Bypass & College Ave/Walnut St	65	INDOT	1.53
32	26	3rd Street & Jordan Avenue	40	COB	1.51
33	31	2nd Street & Patterson Drive	42	COB	1.51
34	10	SR 45/46 Bypass & Kinser Pike	60	IN	1.50
35	48	2nd Street & Rogers Street	40	COB	1.39
36	39	3rd Street & Washington Street	31	COB	1.39
37	31	7th Street & College Avenue	33	COB	1.37
38	43	8th Street & College Avenue	26	COB	1.36
39	13	SR 48 & Curry Pike	55	INDOT	1.32
40	16	SR 48 & Gates Drive	53	INDOT	1.28
41	11	SR 45 & Curry Pike/Leonard Springs Rd	52	INDOT	1.21
42	18	3rd St & College Avenue	41	COB	1.21
43	26	SR 48 & Liberty Drive	45	INDOT	1.15
44	39	SR 45/46 Bypass & 17th Street	36	INDOT	1.11
45	39	Kirkwood Avenue & Rogers Street	30	COB	1.10
46	30	Grimes Lane & Walnut Street	49	COB	1.08
47	48	10th Street & Jordan Avenue	30	COB	1.04
48	36	SR 46 & Smith Road	27	INDOT	0.98
49	43	SR 46 & Smith Pike	35	INDOT	0.90
50	31	Walnut St & Country Club Dr/Winslow Rd	30	COB	0.83

Table 5 - Top 50 Crash Locations by Crash Severity – Calendar Years 2012-2014

Severity Rank	Intersection	Juris-diction	Fatal	Injury	Property Damage	Severity Number
1	SR 37 & 3rd Street	INDOT	0	32	84	186
2	SR 37 & Bloomfield Road	INDOT	0	27	67	148
3	SR 46 & Kingston Drive	INDOT	0	26	57	135
4	SR 37 & Vernal Pike	INDOT	0	23	51	135
5	SR 45/46 Bypass & 10th Street	INDOT	0	14	83	131
6	SR 46 & Pete Ellis Drive	INDOT	0	18	69	123
7	SR 46 & 3rd Street	INDOT	0	15	68	113
8	SR 45/46 Bypass & Kinser Pike	INDOT	1	20	35	107
9	SR 45 & Gillham Drive	INDOT	1	4	80	104
10	SR 45 & Liberty Drive	INDOT	0	12	55	97
10	SR 48 & Curry Pike	INDOT	0	17	37	97
10	Walnut Street Pike & Winslow Road	COB	0	16	34	97
13	SR 45/46 Bypass & College Ave/Walnut St.	INDOT	0	19	36	96
14	4th Street & Walnut Street	COB	0	17	29	89
15	SR 45 & Curry Pike/ Leonard Springs Rd	INDOT	0	14	41	86
16	SR 45 & Pete Ellis Drive/ Range Road	INDOT	0	14	39	84
17	3rd Street & College Avenue	COB	0	16	34	82
18	SR 37 & Tapp Road	INDOT	0	14	39	81
19	2nd Street & Patterson Drive	COB	0	17	22	79
20	3rd Street & Jordan Avenue	COB	0	14	29	71
21	SR 48 & Gates Drive	INDOT	0	9	43	70
22	Grimes Lane & Walnut Street	COB	0	13	27	69
23	3rd Street & Fess Avenue	COB	0	10	38	68
24	10th Street & Union Street	COB	0	6	46	67
25	SR 48 & Liberty Drive	INDOT	0	10	33	66
25	SR 46 & Smith Road	INDOT	0	13	24	66
27	3rd Street & Swain Avenue	COB	0	8	40	64
27	Rhorer Road & Walnut Street Pike	MC	0	11	28	64
29	Kirkwood Avenue & Dunn Street	COB	0	11	24	63
30	7th Street & College Avenue	COB	0	10	29	62
31	10th Street & Jordan Avenue	COB	0	14	19	61
32	2nd Street & College Avenue	COB	0	8	35	59
32	Kirkwood Avenue & College Avenue	COB	0	9	29	59
34	SR 45/46 Bypass & 17th Street	INDOT	0	10	25	58

Table 5 - Top 50 Crash Locations by Crash Severity – Calendar Years 2012-2014 (Continued)

Severity Rank	Intersection	Juris-diction	Fatal	Injury	Property Damage	Severity Number
35	3rd Street & Walnut Street	COB	0	6	36	57
36	10th Street & College Avenue	COB	0	6	38	56
36	17th Street & Jordan Avenue	COB	0	6	38	56
36	3rd Street & Highland Avenue	COB	0	10	26	56
39	Walnut St & Country Club Dr/Winslow Rd	COB	0	8	31	55
39	3rd Street & Washington Street	COB	0	10	25	55
41	Kirkwood Ave & Walnut Street	COB	0	4	42	54
42	3rd Street & Woodlawn Avenue	COB	0	8	26	53
43	8th Street & College Avenue	COB	0	7	27	51
44	14th Street & Walnut Street	COB	0	7	29	50
44	10th Street & Woodlawn Avenue	COB	0	8	26	50
46	7th Street & Walnut Street	COB	0	6	28	46
47	Kirkwood Avenue & Rogers Street	COB	0	4	31	43
48	2nd Street & Rogers Street	COB	0	4	29	41
48	10th Street & Sunrise Drive	COB	0	4	29	41
50	3rd Street & Dunn Street	COB	0	3	30	39
51	SR 46 & Smith Pike	INDOT	0	2	32	38

Crash Factors

This section summarizes the primary crash factors from 2013 to 2015. An understanding of these causes informs infrastructure investments, enforcement activities, and educational efforts. Traffic law enforcement and road design can address unsafe speeds, while guardrail, rumble strips, or safety education can mitigate the tendency of motorists to drive off the road. Similarly, enforcement and education could reduce the number of crashes attributable to alcohol potentially leading to a decrease of weekend/late night hit and run crashes.

Table 6 illustrates the Top 10 Primary Crash Factors for 2013-2015 by Severity. Failure to Yield Right-of-Way was once again the most common cause of crashes, contributing to nearly 2,300 crashes from 2013 to 2015. Following Too Closely and Unsafe Backing were additional significant crash factors. While failing to yield right of way was the most frequent crash cause, running off the road to the right was more dangerous based on the percentage of crashes that resulted in fatality or incapacitating injury. **Table 6a** shows the Top 10 Primary Crash Factors for 2013-2015 ranked in order of percent of incapacitating injury resulting from the crash. Of the most during the time period, which resulted in five (5) fatal crashes and the highest percentage of incapacitating injury.

The frequency of crashes ranked by primary factor provides information about which crashes happen most often. The percentage comparison reveals which primary factors for crashes have previously resulted in injury and which are less likely to result in injury. For example, unsafe backing ranked third as a primary factor in a crash, but comparing likelihood of injury, 98% of crashes from unsafe backing result in no injury.

Table 6 - Top 10 Primary Crash Factors by Severity – Calendar Years 2013-2015

Rank	Primary Factor	Severity				Total
		Fatal	Incapacitating Injury	Non-Incapacitating Injury	Prop. Damage/ Unknown	
1	Failure to Yield Right-of-Way	1	153	469	1,651	**2,274**
2	Following Too Closely	0	87	450	1,604	**2,141**
3	Unsafe Backing	0	4	22	1,439	**1,465**
4	Ran Off Road – Right	5	87	178	759	**1,029**
5	Other (Driver) – Explain in Narrative	2	23	86	732	**843**
6	Speed Too Fast (Weather)	0	20	66	467	**553**
7	Animal/Object in Roadway	0	5	29	473	**507**
8	Disregard Signal/Sign	1	37	141	315	**494**
9	Improper Turning	0	16	31	430	**477**
10	Unsafe Lane Movement	0	10	39	392	**441**

Table 6a - Top 10 Primary Crash Factors by Severity Percentages – Calendar Years 2013-2015

Rank	Primary Factor	Severity				Total
		% Fatality	% Incapacity Injury	% Non-Incapacitating Injury	% Property Damage	
1	Failure to Yield	0.04%	6.7%	21%	73%	**2,274**
2	Following too Closely	0.00%	4.1%	21%	75%	**2,141**
3	Unsafe Backing	0.00%	0.3%	2%	98%	**1,465**
4	Ran Off Road-Right	0.49%	8.5%	17%	74%	**1,029**
5	Explain in Narrative	0.24%	2.7%	10%	87%	**843**
6	Too fast for Weather Conditions	0.00%	3.6%	12%	84%	**553**
7	Animal/Object in Roadway	0.00%	1.0%	6%	93%	**507**
8	Disregard Signal/Regulatory Sign	0.20%	7.5%	29%	64%	**494**
9	Improper Turning	0.00%	3.4%	6%	90%	**477**
10	Unsafe Lane Movement	0.00%	2.3%	9%	89%	**441**

Fatalities

This section provides a focused examination of motor vehicle fatalities in Monroe County from Calendar Year 2013 to 2015. As with previous sections, the material presented here can be useful for enforcement, education, and decision-making.

In 2015 there were eight crash fatalities in Monroe County (Table 6). Of these, three resulted from crashes involving a moped or motorcycle, three resulted from crashes involving two cars, and two resulted from crashes involving one car. Over the period from 2013 to 2015, the average annual number of fatalities per 100,000 residents was 4.9 for Monroe County. This figure is well below the U.S. average of 10.92 fatalities per 100,000 people for 2015.[1] While the average number of fatalities in Monroe County is lower than the national average, the national average might not represent the best comparison. The U.S. fares much worse than many other developed nations in terms of traffic safety. The United Kingdom and Sweden average 2.9 and 2.8 traffic deaths per 100,000 people, respectively[2].

An investigation of the causal factors leading to fatal crashes shows that veering left of the centerline and running off the road to the right are the most common cause of crashes leading to a fatality (Table 7).

Table 7 - Fatalities by Crash Type – Calendar Years 2013-2015

Year	Crash Type						Total	Fatalities per 100,000 Population
	One Car	Two Cars	Three Cars or More	Moped or Motorcycle	Bicycle	Pedestrian		
2013	0	1	2	1	0	0	**4**	**2.8**
2014	4	3	0	0	0	2	**9**	**6.3**
2015	2	3	0	3	0	0	**8**	**5.5**
Total	**6**	**7**	**2**	**4**	**0**	**2**	**21**	**4.9**

Table 8 - Fatal Crash Primary Factors – Calendar Years 2013-2015

Rank	Primary Factor	Fatal Injury	% of Total
1	Left Of Center	6	30%
2	Ran Off Road Right	5	25%
3	Unsafe Speed	2	10%
4	Other (Driver) - Explain In Narrative	2	10%
5	Pedestrian Action	2	10%
6	Failure To Yield Right Of Way	1	5%
7	Disregard Signal/Regulatory Signage	1	5%
8	Obstruction Not Marked	1	5%
	Total	**20**	**100%**

Fatal Crash Locations

This section summarizes the locations for crashes with identified fatalities. A total of twenty (20) recorded fatal crash locations resulted in a total of twenty-one (21) fatalities during the Calendar 2013-2015 study period. Table 8 identifies the locations of Calendar Year 2013-2015 fatal crashes. Location information will aid transportation planners and engineers to identify problematic locations. Fatalities are a major factor in determining HSIP funding eligibility.

Table 9 - Fatal Crash Locations by Type – Calendar Years 2013-2015

Location	Juris-diction	Total Deaths	Number of Crashes				
			One Car	Two Cars	Three or More Cars	Moped or Motorcycle	Pedestrian
Fairfax Rd and Schacht Rd	MC	1	0	0	0	1	0
Leonard Springs Rd and Duncan Rd	MC	1	1	0	0	0	0
Moon Rd, from Sand College Rd to County Line	MC	2	1	0	0	0	0
Old SR 46, from SR 46 to N Brummetts Creek Rd	IN	1	0	1	0	0	0
SR 37 and SR 45	IN	1	0	0	0	1	0
SR 37 and Ingram Rd	IN	1	1	0	0	0	0
SR 37 and Victor Pike	IN	1	0	0	0	1	0
SR 446 and Pine Grove Rd	IN	1	0	1	0	0	0
SR 45	IN	1	0	1	0	0	0
SR 45 and Gillham Rd	IN	1	0	1	0	0	0
SR 45 from S Breeden Rd to Burch/Stanford Rd	IN	1	0	0	1	0	0
SR 45/46 and Kinser Pike	IN	1	0	0	1	0	0
SR 46 and N 5th St	IN	1	0	0	0	0	1
SR 45/46 and Arlington Rd	IN	1	1	0	0	0	0
SR 46 and W Flatwoods Rd	IN	1	0	1	0	0	0
SR 46 from Flatwoods Rd to Chafin Chapel Rd	IN	1	0	1	0	0	0
SR 48 and Kirby Rd	IN	1	0	1	0	0	0
SR 48 from Vernal Pike to SR 43	IN	1	0	0	0	1	0
Beasley Dr and Curry Pike	MC	1	0	0	0	0	1
Howard Rd and Starnes Rd	MC	1	1	0	0	0	0
Total		**20**	**5**	**7**	**2**	**4**	**2**

Bicycle and Pedestrian Crashes

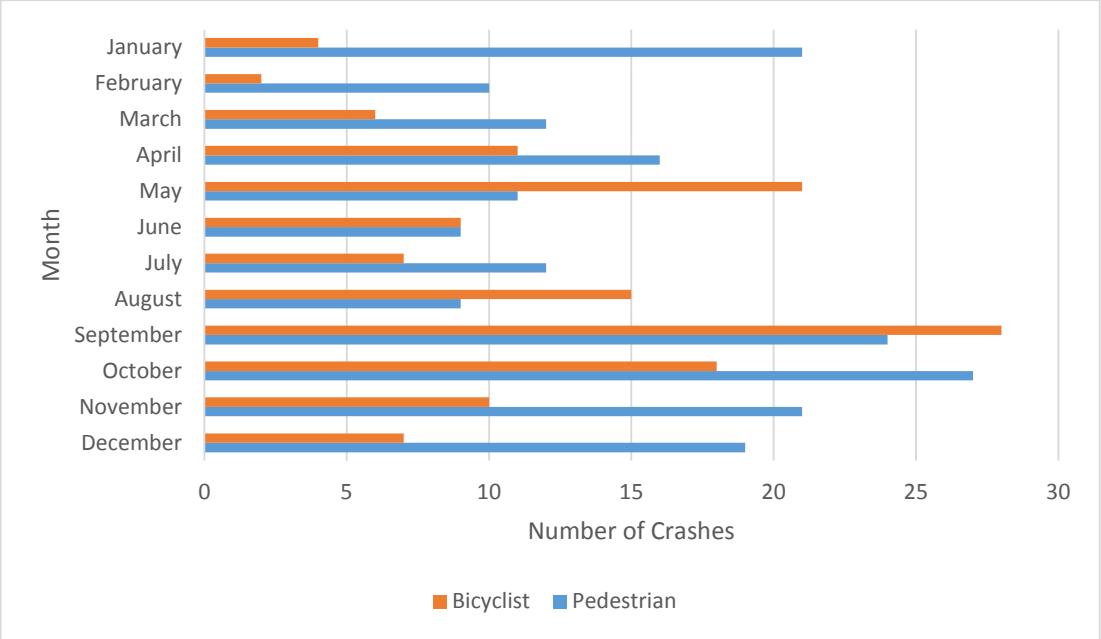
This section documents bicycle and pedestrian crashes in Monroe County from 2013 to 2015. Bicycle and pedestrian crashes within the City of Bloomington and Monroe County represent a planning priority given a high number of non-motorized trips within the urbanized area. Data from the 2013 American Community Survey indicates that 5.1% of commuters in Bloomington use a bicycle as their primary mode of transportation, while 14.7% walk for multiple trip purposes. The combined walking and biking commute rate ranks 7th among U.S. cities with a population of greater than 65,000 people. However, as described in this report, individuals using these modes of transportation are particularly vulnerable to injury.

Crashes involving cyclists and pedestrians more often result in injury when compared with motor vehicle crashes. Therefore there is a priority need to reduce the frequency and severity of these crashes. Figure 6 shows that the frequency of pedestrian and bicycle crashes varies by mode. Pedestrian crashes had peaks in January and October whereas crashes involving a bicyclist had peaks in May and September. Local agencies should therefore use this knowledge to emphasize enforcement and education strategies during these predictable seasonal peak months.

Table 10 - Top Bicycle and Pedestrian Crash Locations – Calendar Years 2013-2015

Rank	Intersection	Jurisdiction	Crash type		Total Ped + Bike
			Pedestrian	Bicycle	
1	7th Street & Jordan Avenue	COB	3	5	8
2	2nd Street & Walnut Street	COB	2	3	5
2	3rd Street & Jordan Avenue	COB	3	2	5
2	Dunn Street & Kirkwood Avenue	COB	4	1	5
3	3rd Street & Woodlawn Avenue	COB	3	1	4
3	SR 46 (3rd St) & N Clarizz Blvd	IN	2	2	4
3	Kirkwood Avenue & College Avenue	COB	4	0	4
3	Kirkwood Avenue & Walnut Street	COB	2	2	4
3	6th Street & Morton Street	COB	2	2	4
3	7th Street & Walnut Street	COB	3	1	4
3	17th Street & Indiana Avenue	COB	2	2	4

Figure 6 - Bicycle and Pedestrian Crashes by Month – Calendar Years 2013-2015



Conclusion

This C.Y. 2013-2015 Crash Report highlights trends relating to motor vehicle, bicycle and pedestrian crashes in Monroe County. The information contained within this Crash Report represents an informational guide for transportation/traffic engineering decision-making ultimately leading to a safer and healthier transportation system for Monroe County and the Bloomington-Monroe County Metropolitan Planning Organization.

Several problem areas noted in this and past BMCMPO Crash Reports were improved upon or are in the process of being addressed, such as at many locations along the SR 37/I-69 construction corridor. Improvements at the intersection of Atwater Avenue and Henderson Street completed in 2011 resulted in a 54% reduction in crash frequency at that location, compared to the period from 2008 to 2010. Evaluation of past and future crash data at these and other locations will further aid in implementing appropriate and effective mitigation strategies to reduce and avoid future crashes.

This Crash Report identifies locations that may require further study to see if safety issues warrant capital improvement investments. Intersections along SR 37, SR 45, and SR 45/46 Bypass corridors continue with problematic issues given traffic volumes and correlated crash frequency. State and local transportation officials, engineers, and staff are coordinating information thereby targeted locations with warranted safety improvements due to jurisdictional boundaries at these locations.

Data and analysis and other attributes included within the report (e.g. bus, moped, motorcycle, fatalities, causes, locations, severity of crashes), provide additional information for identifying trends and/or areas of concern. Information regarding seasonal spikes in bicycle and pedestrian crashes can serve as a foundation for education and enforcement strategies. Future versions of this Crash Report may consider a more detailed analysis of hit and run locations and alcohol-related factors. An improved understanding of these factors would help the community to better focus its efforts on reducing serious traffic injuries and their subsequent impact on the BMCMPO planning area.

Future reports should consider comparing local jurisdiction intersections and/or roadway corridors with similar operating characteristics in order to help identify locations which have a higher than expected crash total, crash rate, or severity index. Additionally, a method to calculate a crash rate for every intersection in the network warrants exploration. These additional levels of analyses will further aid transportation planners, engineers, and officials in effectively identifying hazardous locations and securing funding for operational modifications.

This Crash Report represents a continuous step toward improving safety on local BMCMPO area roadways by identifying problematic locations. Transportation planners, engineers, and local officials together will use this information to determine locations that need attention, and seek funding for necessary operational improvements, physical modifications or other means (enforcement, education) warranted to improve overall BMCMPO transportation system safety.