SOUTHERN ILLINOIS METROPOLITAN PLANNING ORGANIZATION (SIMPO) SAFETY STUDY

Williamson and Jackson Counties, Illinois

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Introduction

This report explains the methods and recommendations for Southern Illinois Metropolitan Planning Organization (SIMPO) Safety Study. For this study, crash data from 2014 to 2018 were analyzed to identify the frequency (number of crashes per year), crash type (i.e. rear end, turning, angle, fixed object, etc.) and locations on state and local roadways. This study was conducted in coordination with the local input, knowledge and assistance from the SIMPO Technical Advisory Committee.

The first section of this report outlines the data sources used within the analysis, MPO-wide crash analysis and methodologies used in developing a priority ranking for high crash locations. The Appendix section of the report provides site specific analysis of the crash patterns and existing conditions at the priority locations. Safety countermeasures have been identified for each location, to provide low-cost, mid-cost and high-cost improvements that have the potential to mitigate the high crash patterns.

Study Area

The SIMPO study area includes Williamson County (Cambria, Colp, Crainville, Energy, Johnston City, Spillertown, Whiteash, and Unincorporated Williamson), Jackson County (Makanda, Murphysboro, and Unincorporated Jackson), Carbondale, Carterville, Marion, and Herrin. The study area is shown in **Figure 1.**

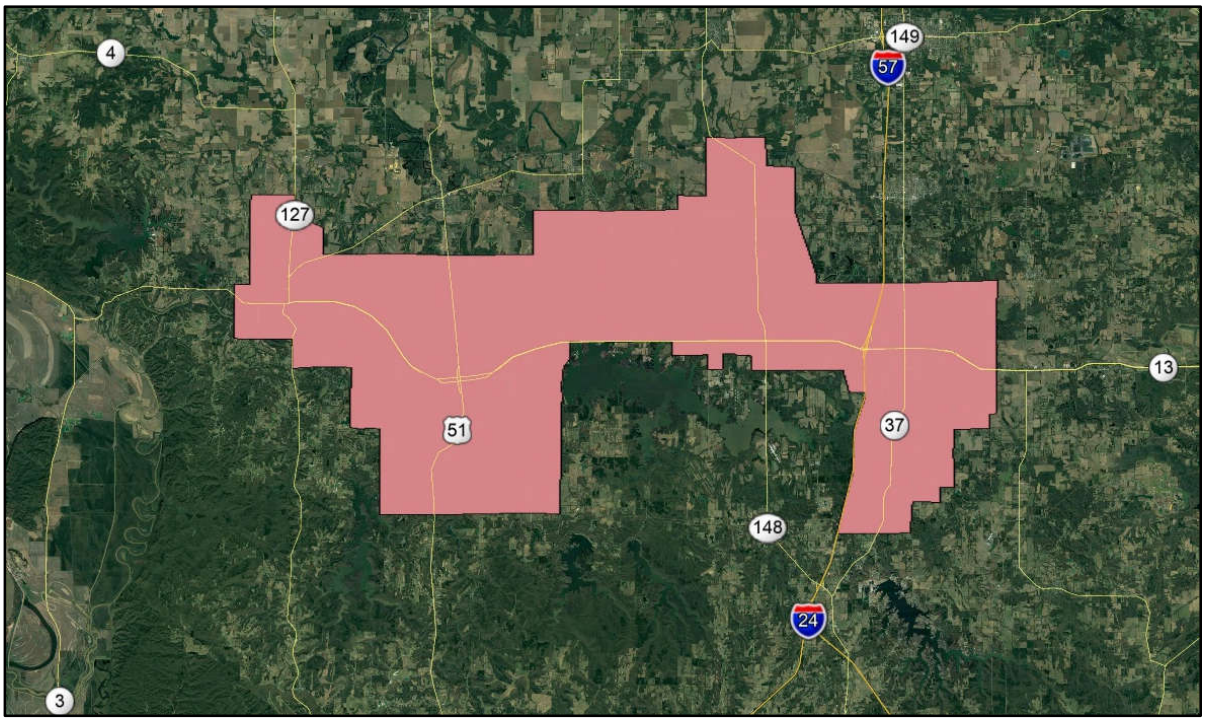


Figure 1: SIMPO Study Area

Crash Data

The crash data for the study was provided by SIMPO. All crash data was provided in a Geographic Information System (GIS) shapefile. The crash data were derived from the Illinois DOT crash database. The crash database is compiled every year from the local and state police crash records submitted to the Illinois Department of Transportation (IDOT) Division of Traffic Safety. The crash data files include information required to identify and analyze crash trends. Some of the categories provided include: crash ID, date and time of crash, route, severity of crash, number of injuries and fatalities, direction and maneuvers, road surface conditions, light conditions, weather, and type of collision.

One of the goals of the Federal Highway Administration and Illinois DOT is to address fatal and serious injury crashes. Crashes are categorized by injury severity, as K (Fatal), A, B or C injury or Property Damage Only (PDO). The definition of each of these severities is summarized below..

1. Fatal Crash: A motor vehicle crash (single or multiple) that results in the death of one or more persons.
2. Injury Crash: Any motor vehicle crash that results in one or more non-fatal injuries.
    a. A-Injury (Incapacitating Injury): Any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities he/she was capable of performing before the injury occurred. Type A crashes includes severe lacerations, broken limbs, skull or chest injuries, and abdominal injuries.
    b. B-Injury (Non-incapacitating Injury): Any injury other than a fatal or incapacitating injury, which is evident to observers at the scene of the crash. Includes lump on head, abrasions, bruises, minor lacerations.
    c. C-Injury (Possible Injury): Any injury reported or claimed which is not either of the above injuries. It includes momentary unconsciousness, claims of injuries not evident, limping, complaint of pain, nausea, and hysteria.
3. PDO: Property-damage only crash.

Roadway data were pulled from the Illinois Roadway Information System (IRIS) database. In addition to the physical location of the roadway provided in a GIS shapefile, IRIS data provide basic information such as functional classification and roadway ownership. Additional information such as roadway width, Average Daily Traffic (ADT) and condition rating may be provided but primarily on state-maintained roadways. This more detailed information was not available for the local roadways within the study area. The IRIS GIS shapefile also has roadways segmented based on logical roadway termini, such as intersections or changes in road classification. This segmentation was used as the basis for identification of high crash roadway segments.

Crash Analysis

The crashes recorded within the SIMPO study area were analyzed to identify locations with high crash frequencies. The crash data from January 1, 2014 to December 31, 2018 were summarized using a data tree to compare the local and state route crashes. The data tree identifies whether the collision occurred on a local and state roadway. Each box then categorizes the type of crash followed by the number of crashes, percent of crashes, and the breakdown of the severity of crashes (PDO/Injury/Fatal) with respect to that crash type. The data tree summarizing the SIMPO area crashes is shown in **Figure 2.**

As can be seen in the data tree, the most common crash type on the local roads is rear end (20%), followed by fixed object (17%), turning (17%), angle (16%), animal (10%), and parked motor vehicles (8%). Although, the most common crash type was rear end, the fixed object crashes consisted of more fatal crashes.

The most common crash type on state roads is rear end (31%), followed by turning (19%), animal (13%), angle (11%), sideswipe (10%) and fixed object (9%). Although, the most common crash type on the state system was rear ends, the angle, fixed object and turning crashes had more fatal crashes.

It should be noted that some crashes in the dataset had an unknown severity so those crashes were not included in the severity breakdown; therefore, the sum of the severity crashes may not equal the total crashes. Since the sum of unknown crashes is less than 0.1% of the total crashes, the difference in crash totals will not impact the results.

The crash data were also analyzed by the number of crashes by location (City/County) with respect to severity, see **Figure 3.** As shown in Figure 3, Carbondale has the most crashes with the Marion not far behind. The cities Marion and Carbondale have the highest frequencies of injury and overall crashes. Williamson County, Herrin, and Jackson County have similar crash totals.

The crash type was also compared to the location as shown in **Figure 4**. Intersection related crashes such as rear end, angle and turning crashes are highest in Carbondale and Marion, while animal crashes are highest on the county roads. This is generally consistent with expectation, since many of the county roads are rural in character compared to most of the city roads that are suburban/urban in character.

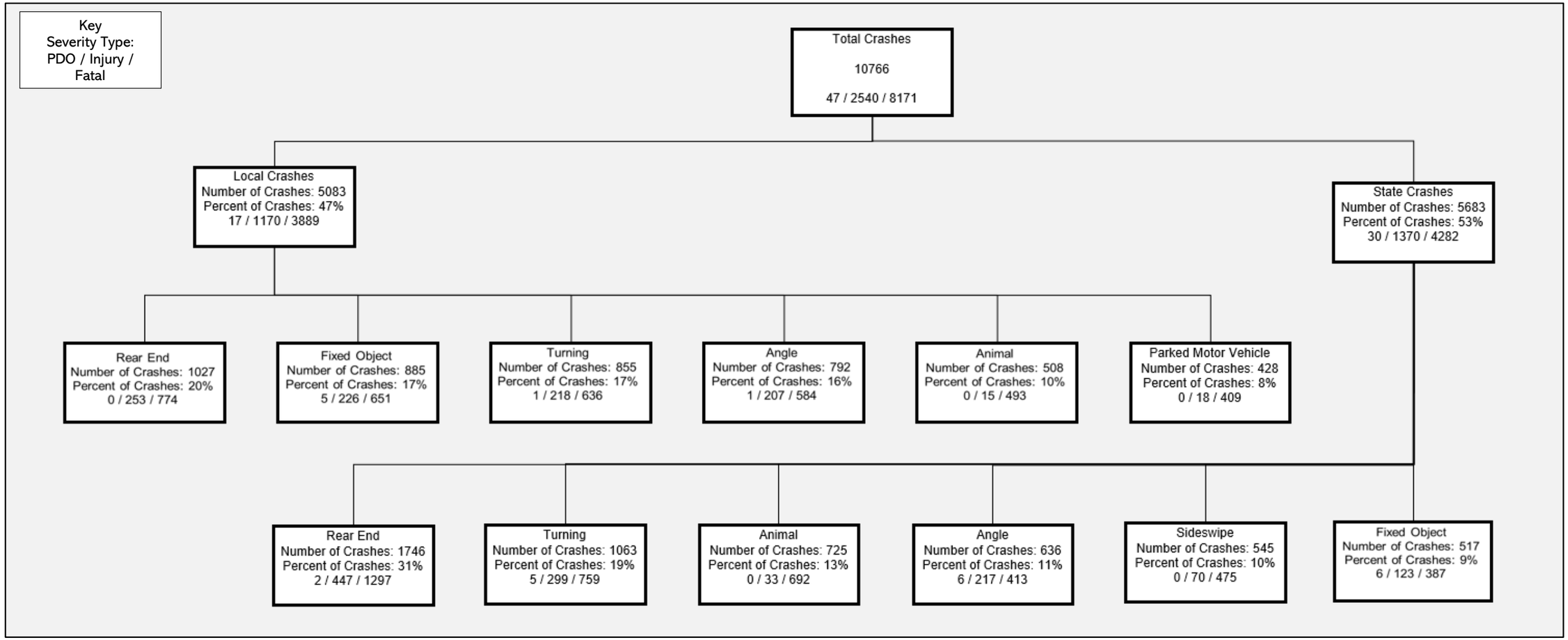


Figure 2: Data Tree Crash Analysis (2014-2018)

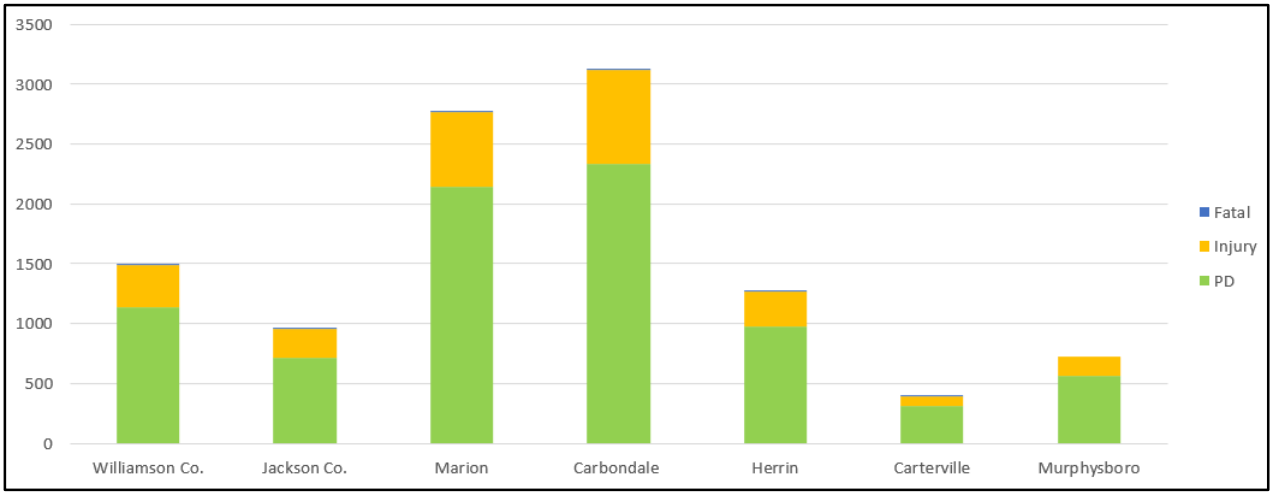


Figure 3: Crash Severity by Location (City or County)

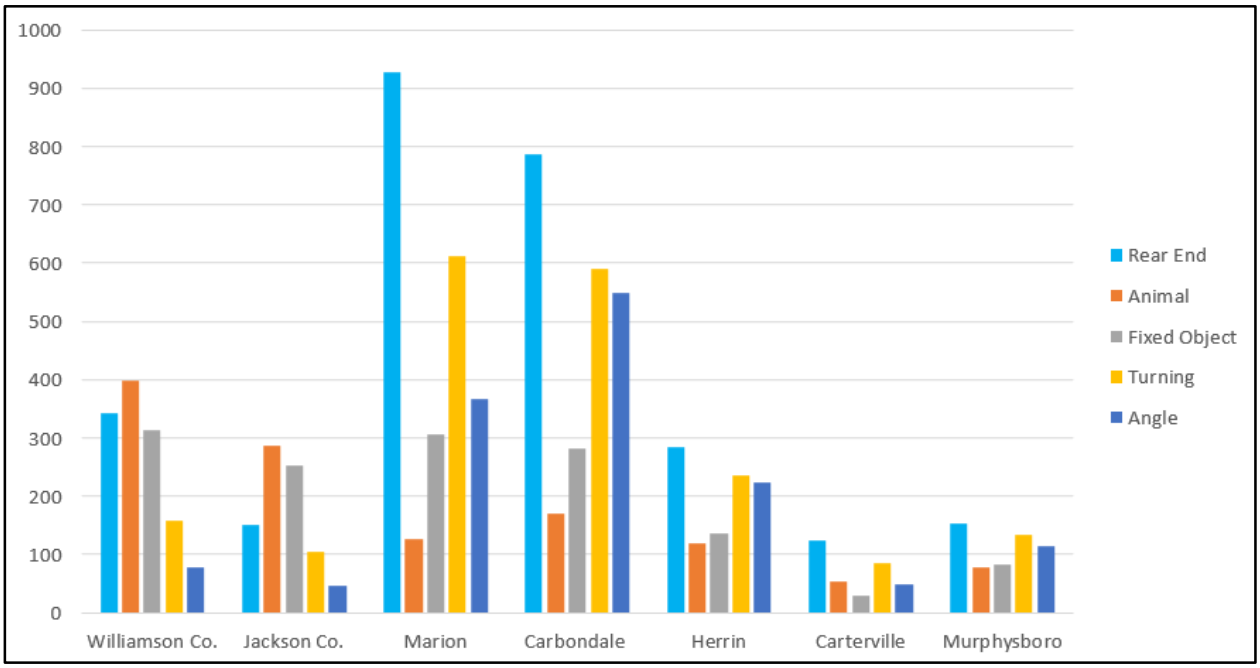


Figure 4: Crash Frequency and Type by Location

The crashes were also analyzed by type and time of day, shown in **Figure 5**. The three categories include lane departure (includes fixed object, overturned, head on or opposite direction sideswipe), intersection crashes (includes rear end, angle, and turning crashes) and animal crashes. In Figure 5, the intersection crashes have a small peak in the AM peak hour but the largest amount of crashes occur in the late afternoon/evening peak hour (3:00 – 6:00 PM). Lane departure crashes are relatively consistent throughout the day with small peaks in the PM peak hour and very early morning hours. Animal crashes are heaviest during the dark hours.

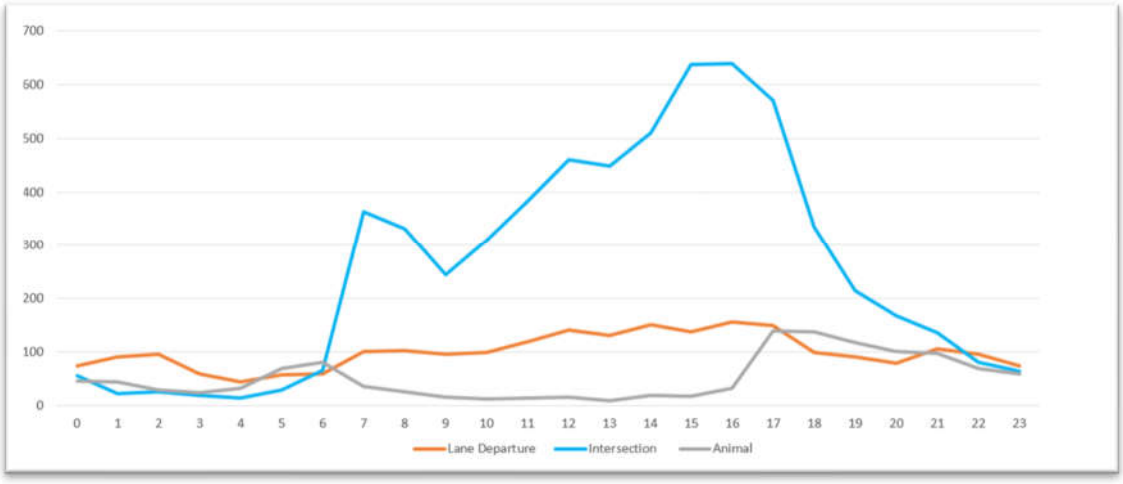


Figure 5: Crash Frequency and Type by Time of Day

Site Selection Methodology

A data driven approach was used to identify the priority locations for in-depth review and analysis to identify safety countermeasures. Two types of locations were considered in this process: roadway segments and intersections. Segments and intersections were further subcategorized into local segment/intersection or state segment/intersection for this study.

Roadway segments were based on the underlying GIS layer segmentation, which is based on logical termini of the roadway section, such as intersections, or changes in typical section, functional classification, etc. Lengths generally range from 0.5 miles to 1.5 miles in length. "Local Segments" are roadways that are owned/maintained by a local jurisdiction, while the "State Segments" are roadways that are owned/maintained by the IDOT.

If a crash occurs within 300 feet of approaching an intersection, it is considered an "intersection" crash. "Local intersections" are defined as intersections where all legs of the intersection are owned/maintained by a local jurisdiction. "State intersections" are defined as intersections that have at least one leg owned/maintained by IDOT.

Equivalent Property Damage Only (EPDO) Ranking

The Equivalent Property Damage Only (EPDO) method was used to rank each intersection and segment on the local system and on the state system. The EPDO ranking prioritizes the desire and ability to focus on areas that have higher crash severities as opposed to locations with high crash frequency but low severity. The EPDO assigns a weight based on the crash severity.

This analysis assumed a weight of 25 for fatal crashes, a weight of 10 for A Injury crashes, and a weight of one (1) for all other crashes (B injury, C injury and Property Damage Only). **Equation 1**

shows the calculation to determine the EPDO which was used on all state and locally maintained roadway segments and intersections. This methodology is consistent with the EPDO ranking used by the IDOT Highway Safety Improvement Program (HSIP)

$$EPDO = 25 * (\#\ Fatal) + 10 * (\#\ A\ Injury) + (\#\ B\ injury) + (\#C\ injury) + (\#\ PDO)$$

Equation 1: Equivalent Property Damage Only Crash Calculation

Once EPDO rankings were determined based on the 5-year crash data set from January 1, 2014 to December 31, 2018, sites were also reviewed to determine if they met the Illinois DOT HSIP eligibility requirements. HSIP eligibility generally includes at least one (1) fatal crash or two (2) Type A Injury crashes over a 5-year period.

Based on the EPDO ranking, a Top Local Segments List, Top Local Intersections List, as well as a Top State Segments List and Top State Intersections list was generated. Each of the top segments/intersections list included approximately 30 locations. An effort was made to include one location for each jurisdiction represented within the SIMPO area for the top segments/intersections lists. However, some of the smaller jurisdictions may not have locations that experience enough injury/fatal crashes to have a large enough EPDO value to be at the top of the segment/intersection lists.

In order to provide a complete preliminary list of locations based on the 5-years of crash data (2014-2018), the lists also included locations where safety improvements were already being implemented/planned, as well as the locations that did not include more than one A-Injury or fatal crash. Those locations were specifically noted in the lists.

CBB summarized the initial data driven approach and analysis to generate the top segment and intersection lists and presented the information to the SIMPO Technical Advisory Committee (TAC) on December 7, 2020. Areas of local concern were also identified by the committee for additional review. These locations and associated crashes were shown in **Table 1**. These locations were either on the top segment/intersection lists but not HSIP eligible during the years evaluated or areas of special concern from the public and/or local officials.

Table 1: Locations of Local Concern

Road Name	Total Crashes	Injuries	Fatalities	Jurisdiction	Comments
South Carbon and West Main St.	27	6	0	Marion	Local Concern; Not HSIP Eligible 2014-2018; Meets Using Years 2013-2017
Cardinal and Cambria	13	8	0	Williamson Co.	Local Concern; Not HSIP Eligible 2014-2018; Meets Using Years 2015-2019
Market and W. Deyoung St.	15	1	0	Marion	Local Concern; Offset north and south legs; Not HSIP Eligible 2014-2018 or other years;
Williamson County Pkwy & Walton Way	0	0	0	Williamson Co.	Local Concern; Very Wide T-Intersection; One leg free flow; Strange to navigate; Zero crashes reported

Final Priority List

Based on critical input from the TAC the Top Segments/Intersection lists were refined into the Top Priority List. Based on the crash data analyzed, the Top Priority list combined several segments and intersections that were adjacent to each other and considered these areas to be "corridors" which included both segments and intersections. These corridors were then analyzed in more detail to determine if safety improvements could be implemented to improve the safety of the corridor.

Table 2 shows the Top Priority Locations in Jackson County/Carbondale, while **Table 3** shows the Top Priority Locations in Williamson County/Marion and Herrin. These top locations were identified for in-depth crash analysis and field review. The combination of the crash analysis and field review was used to identify potential safety countermeasures. **Figure 7** graphically illustrates the location of the Top Priority locations.

A variety of safety countermeasures were suggested to provide a variety of cost options for the safety concern. Some solutions include: signing and striping, physical road improvements, shoulder improvements, speed management solutions, signal improvements, pedestrian/bike improvements/accommodations and roundabouts.

The attached **Appendices** include site-specific analysis and recommendations for each of the top priority locations.

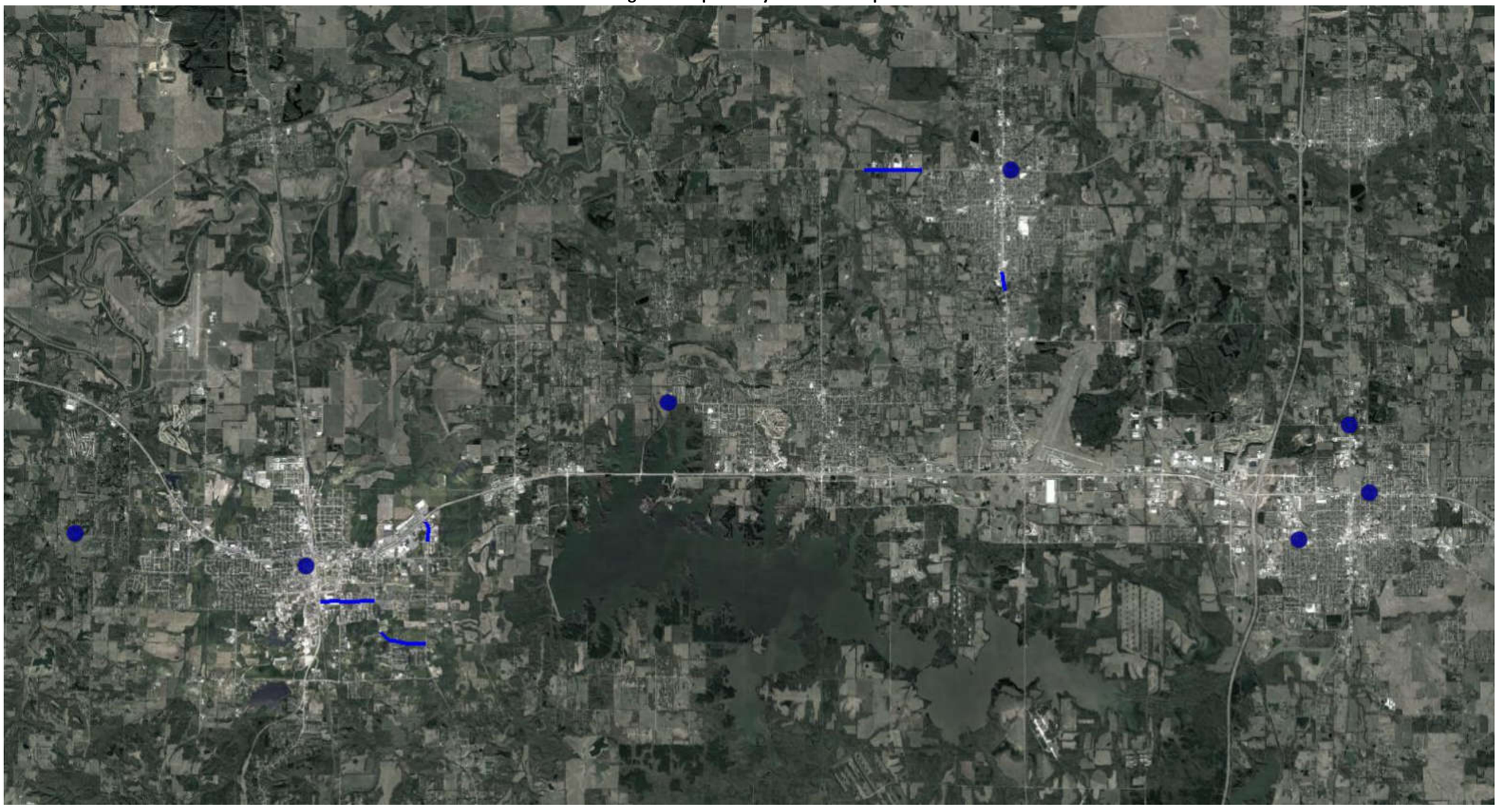
Table 2: Top Priority List - Carbondale/Jackson County

Road Name	From	To	Total Crashes	Total Injuries	A-Injuries	K (Fatal)	Jurisdiction	Township	General Comments	EPDO	Crash Comments
Old Hwy 13 & Country Club Rd			19	11	4	0	IDOT & Township or Road District	IDOT/Jackson Co	Ranked Critical on I-DOT Safety Tiers	55	Inj mostly Angle/turning RE (7 SB/EB; 2 NB/WB crashes; 4 EB LT); Sight Distance Concern-(No passing zone) Horz Curve to east ; vertical crest to west 50% Not-Daylight
West Walnut St. & N University Ave (US 51 & IL 13)			54	18	5	0	IDOT	Carbondale	Ranked Critical on I-DOT Safety Tiers	99	Signal; Inj (10 Angle & 4 Turning (EB & SB); 4 RE) 10AM - 8PM time
E Park Street	Brush Hill Road	Giant City Road	18	9	4	0	Township or Road District	Carbondale	Location of Concern (3-Alcohol crashes) Fatal crash in 2020 at 650 ft east of Warren drug impaired	53	Many Fixed object Crashes, curves, approx. 11' lanes, no shoulders, more crashes EB (downhill-Speed Data?), 60% dark crashes.
N Giant City Rd	E. Main Frontage Rd South	Sunny Acres	14	3	2	0	Municipality	Carbondale		32	Injury (Angle/Turns) at Kroger North Entrance-Sight Distance Concern (Trees) PDO=Sideswipe & Fixed Obj
N. Giant City Rd & E. Main Frontage Rd South			28	5	2	0	Municipality	Carbondale	Adjoins Giant City Segment (#6)	46	3-Way "Unconventional Stop" (SB Free) & Close to Signal Many SB TH & WB Crashes (Angle/Turns Major type) Sight Distance Concern-Vehicles queues for WB
N. Giant City Rd & E. Sunny Acres Rd			16	6	1	0	Municipality	Carbondale	Not HISP Eligible, Adjoins N. Giant City Seg (#6)	25	Many NB TH & WB Crashes (Angle/Turns Major type) Sight Distance Concern-Trees
E Grand Ave	Washington St.	west of Wall St	13	8	1	0	Municipality	Carbondale	Not HSIP Eligible	31	Major Type=Rear End & Bike/Ped Does City have Bike/Ped Volumes (estimate)?
E Grand Ave	E. Of Wall St	Lewis	12	2	2	0	Municipality	Carbondale		21	
East Grand Ave & South Wall St			38	13	2	0	Municipality	Carbondale	Intersection Priority #6 in Previous Study	56	Signal, curve in Rd west of signal; Lanes are reduced east of Wall. Crash Type=Tuning/Bike & Ped/Angle
East Grand Ave & S. Washington St.			14	2	2	0	Municipality/Other State Agency	Carbondale	Adjoins E Grand Segment (#8)	32	3-Way "Unconventional Stop" (SB Free) & Close to Signal Railroad crossing to west; Injury crashes=Angle &Bike Sight Distance Concern for WB(Queues from signal/RR)

Table 3: Top Priority List – Marion/Herrin/Williamson County

Road Name	From	To	Total Crashes	Total Injuries	A-Injuries	K (Fatal)	Jurisdiction	Township	General Comments	EPDO	Crash Comments
Park Ave (IL 148)	W. Clark Trail	W. Brewster Road	54	15	4	0	IDOT	Herrin	Ranked Critical on I-DOT Safety Tiers, Location of concern	90	Corridor Injury Crashes= 16 Turn, 8 Angle, 7 Rear End Segment (Side-streets/entrances) Injury Crashes = 7 Turn, 5 Angle, 3 Rear End
Park Ave (IL 148) and W. Clark Trail			45	11	1	0	IDOT	Herrin		54	Signal at Clark Trail; Inj Crashes= 5 Turn, 4 Rear End, 1 Angle
Park Ave (IL 148) and W. Brewster Road			23	6	1	0	IDOT	Herrin		32	At Brewster Inj Crashes= 4 Turn, 2 Angle
W. Herrin St	Elementary School	35th St	22	5	5	0	Municipality	Herrin	Segment Priority #4 in Previous Study (Adjoins 35th Street Int)	67	Rural/school area; Fatal (Alcohol & Motorcycle); Inj Crashes = 5 Rear End, 5 fixed, 3 turning, 2 head on, 2 Animal, 1 overturned, 1 sideswipe, 1 other School operations info (7 AM, 3PM & 7 PM crashes peak)
Herrin Colp Hwy & N 35th St			7	4	1	1	Municipality	Herrin	Adjoins Herrin Segment (#1)	40	
E. Herrin St & N. 13th St			20	5	1	1	Municipality	Herrin	Intersection Priority #4 in Previous Study	53	Urban area; All-Way Stop (Red Flasher) Inj Crashes=Turning & Angle Fatal=related to car chase
South Carbon St & West Main St			27	6	1	0	Municipality	Marion	Location of Concern; Not HSIP Eligible 2014-2018; Meets Using Years 2013-2017	36/44	Signal, Recent radius/signal timing improvement (year?) Injury crashes = 6 Rear Ends & 2 Bike; 1 turning (2013-2017)
N Market and W Deyoung St			12	1	1	0	Municipality	Marion	Location of Concern (Marion) Not HSIP Eligible	22	Side street stop; 1 injury=EB Rear end turning right (elderly); Request PDO crash reports;
Williamson Parkway/Walton Way and Joseph Cannon Way			0	0	0	0	Municipality	Marion	Location of Concern; Not HSIP Eligible 2014-2018	0	Zero Crashes reported
N Court St (IL 37)	Cedar Grove Road	Longstreet Road	26	5	0	1	IDOT	Williamson Co	Ranked Critical on I-DOT Safety Tiers	50	Rural; Segments = Animals/Rear end entrances, Many at dark, Fatal Ped (argument ran into rd.); 2 Rear End Injury (1B, 1C)
Court (IL 37) at Cedar Grove			13	5	0	0	IDOT	Williamson Co			Inj Crash = 8 Rear Ends = 7 B in, 1 C Inj Mostly NB, Sight Distance Concerns to north (crest); offset driveway on east side
Court (IL 37) at Longstreet			16	6	2	0	IDOT	Williamson Co		34	Inj Crashes = 4 Rear End, 1 turning, 3 Angle (direction mixed), Sight Distance Concerns (Dip to north) cut-thru via Deyoung/State large WB RT?
Cardinal Rd & Cambria Rd			13	8	2	0	County & Township or Road District	Williamson Co	Location of Concern; Not HSIP Eligible 2014-2018; Meets Using Years 2015-2019	32	Side-Street stop, High Speed roads; rural; No Turn lanes; Flashing LED on WB App. Sight distance concern to the south (curve), school east, Peak Hr. count? Inj Crashes= 7 Angle, 7 Turning, 1 Rear End

Figure 6: Top Priority Locations Map



SIMPO SAFETY STUDY

Appendix : Intersection of Old Illinois 13 at Country Club Road

prepared by:

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prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

The Intersection of Old Highway 13 and Country Club Road

Introduction

The Old Highway 13 and Country Club Road intersection is located within the city of Murphysboro in Jackson County. The intersection is an unsignalized intersection with stop signs on Country Club Road. **Figure 1** shows the location of the intersection.

Figure 1: Study Area

Existing Conditions

Figure 2 and **3** includes a plan view and a street view of the intersection. The intersection is at an acute angle as shown in **Figure 2**. This can be undesirable because it can restrict vehicular turning movement, increase the exposure time for vehicles, and restrict the crossroad sight distance. Both Old Highway 13 and Country Club Road have one lane in each direction. There are no sidewalks or crosswalks at the intersection or along the corridor.

Old Highway 13 is an alternative route for Highway 13 to get from Carbondale to Murphysboro. The intersection also provides access to some residential properties. The Midland Inn is in the southeast corner of the intersection and has access to Old Highway 13, about 180 feet east of the intersection and about 180 feet south of the intersection. Easterly Drive is about 160 feet west of the intersection on Old

Highway 13 and about 250 feet south of intersection on Country Club Road and provides access to a residential development in the southwest corner of the intersection. Old Highway 13 has a speed limit of 50 miles per hour (mph) and Country Club Road has a speed limit of 45 mph.

Figure 2: The Intersection of Old Highway 13 and Country Club Road (Plan View)

Figure 3: The Intersection of Old Highway 13 and Country Club Road (Street View-Looking North)

Safety Analysis

A total of **22 crashes** occurred at the study intersection from 2014 to 2018. The total number of crashes by year is shown in **Figure 4**. The total number of crashes is pretty consistent across the five years, except for 2016.

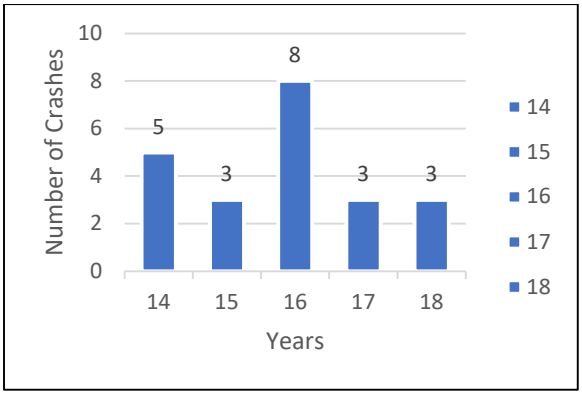


Figure 4: Frequency of Crashes by Year

Figure 5 shows the frequency of crashes by type. The majority of crashes are angle and turning crashes at 58 percent combined. 80 percent of the Angle/turning crashes involved **southbound** vehicles, many with **eastbound** vehicles.

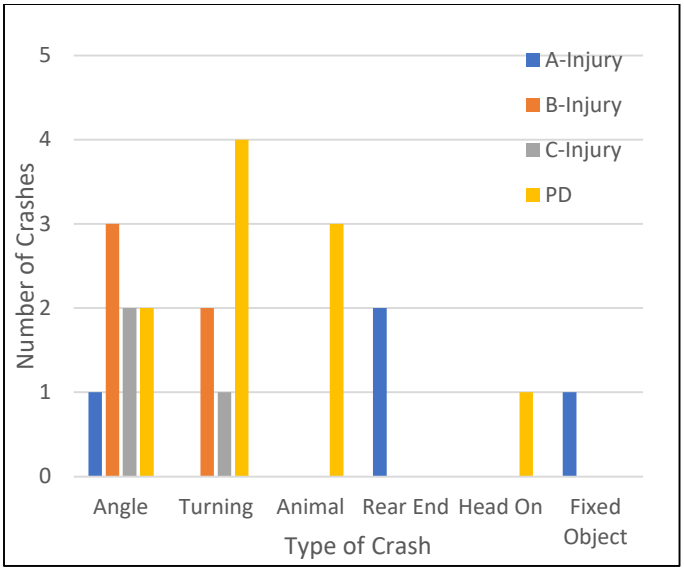


Figure 5: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 6**. 45 percent of the crashes were property damage only and 55% were injury. Two A-injuries were rear end crashes where vehicles were waiting to make a left-turn. Most turning injury crashes involved left vehicles.

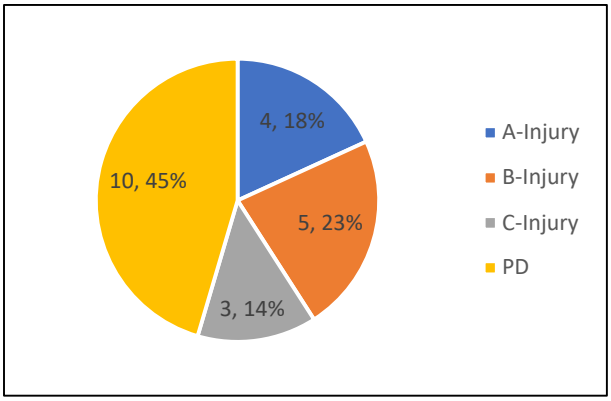


Figure 6: Frequency of Crashes by Severity

In **Figure 7,** the chart shows the frequency by direction and crash type. 50% of crashes occurred on the southbound approach and 18% of crashes occurred on the eastbound approach. 73% of the turning and angle crashes occurred on the southbound approach.

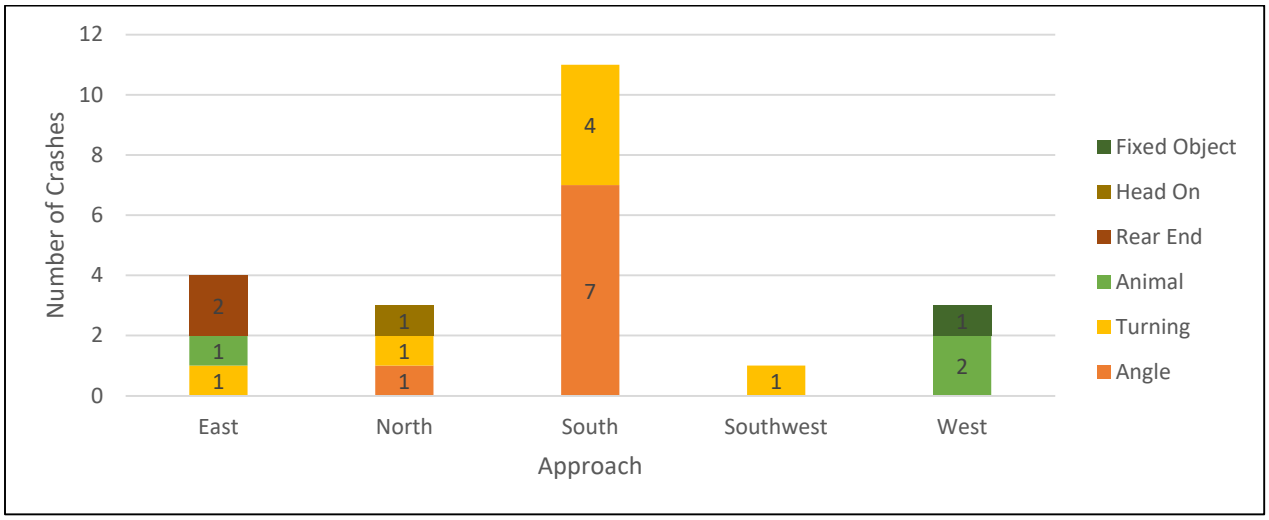


Figure 7: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 8** below. The crashes increase at 4pm and 8pm.

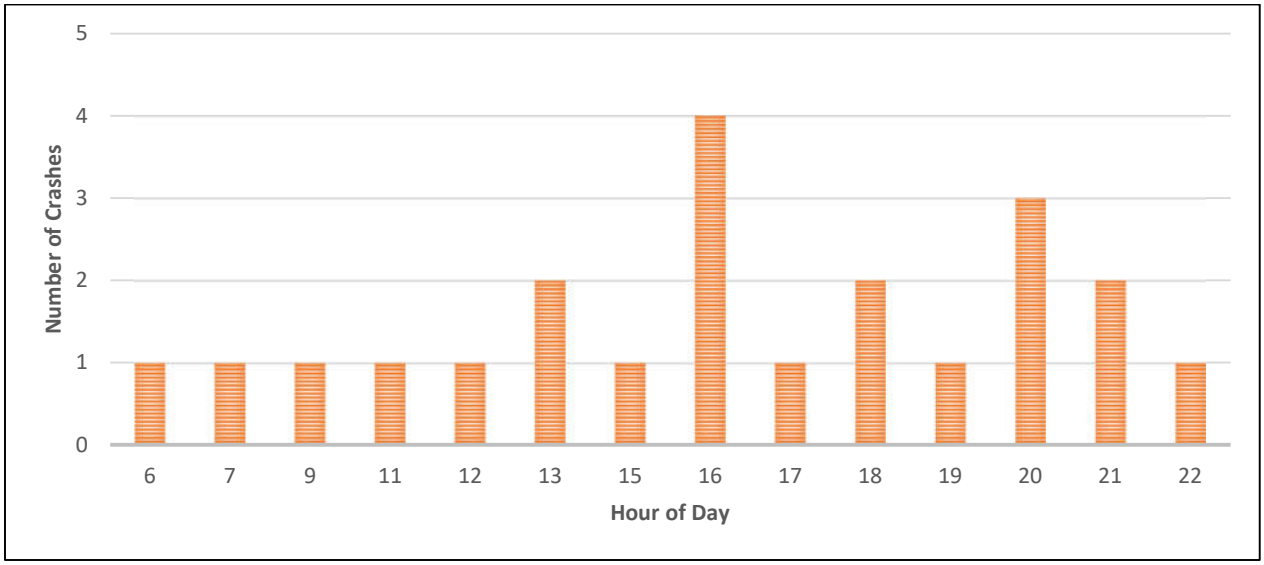


Figure 8: Frequency of Crashes by Hour

The frequency of weather crashes is shown in **Figure 9** below. 86% of crashes occurred on clear days.

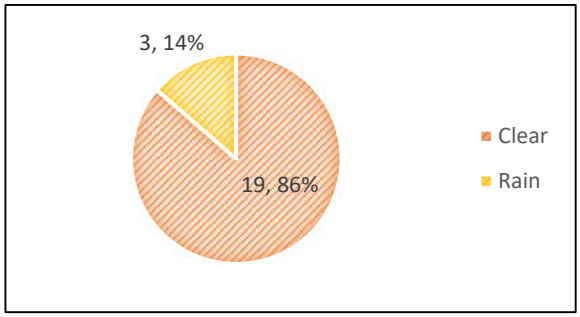


Figure 9: Frequency of Crashes by Weather

The frequency of crashes related to lighting conditions is shown in **Figure 10**. 64% of crashes occurred during daylight hours, with 36% of crashes occurring in dark hours.

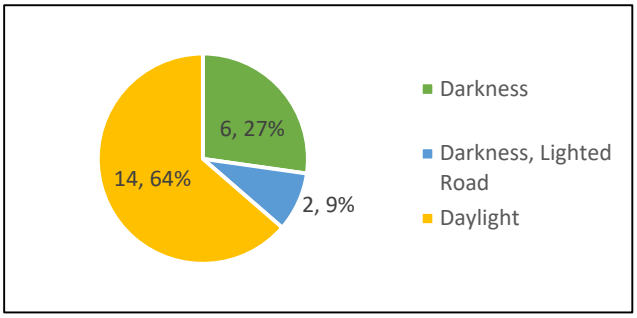


Figure 10: Frequency of Crashes by Lighting

The frequency of crashes related to the month is shown in **Figure 11** below. April, May, and November have four or five crashes compared to the rest of the year where crashes oscillate between zero and two crashes.

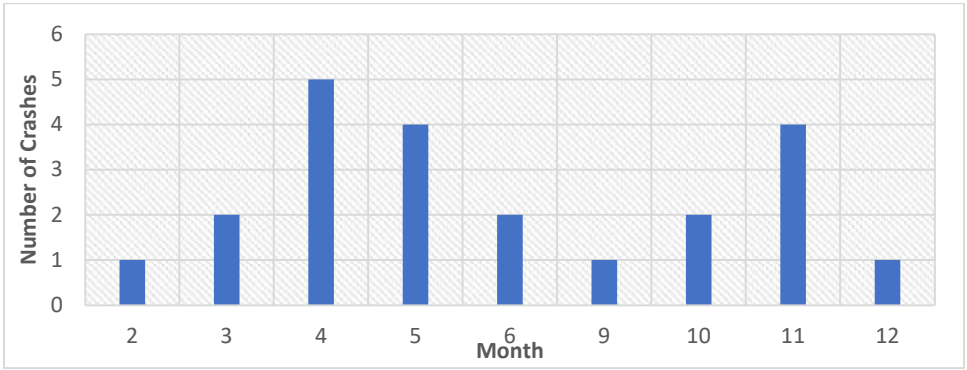


Figure 10: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures

Areas of Concern

Old Highway 13 and Country Club Road is a side-street stop intersection with Country Club Road required to stop. Old Highway 13 is a high-speed rural road with no turn lanes. The Country Club Road approaches have flared approaches to Old Highway 13. There is a yellow intersection warning sign with a flashing beacon for eastbound vehicles, approximately 900 feet west of the intersection. Most crashes are angle and turning crashes from the side-street. Of the 22 total crashes, there were four A-injury and five B-injury crashes, consisting of two rear ends, six angle, three turning, and one fixed object crash. Two of the severe crashes were eastbound left-turn vehicles that were rear ended while waiting to turn left.

The main concern is reducing the turning and angle related crashes.

Less than optimal sight distance is a concern at this intersection with vegetation along the road and the vertical dip to the west of the intersection. It is our understanding that IDOT did a safety improvement at this location in the 90's and the intersection does meet sight distance policy.

Countermeasures

Even though the sight distance meets IDOT policy, any potential improvements to sight distance by trimming/removing vegetation should be considered, see **Figure 10.**

Figure 10: Sight Distance SB to EB (Google Earth - Northbound looking to the west)

A low-cost safety improvement could be improving the radius and minimizing the intersection skew. Improved radii can help vehicles make a smoother turn. Improving the skew at an intersection can make it easier for drivers to look over their shoulders as they turn or to check both directions for oncoming traffic.

Another low-cost safety countermeasure could be providing a second stop sign on the left-side of the road, parallel to the existing stop sign to, essentially, double up on stop signs to increase the visibility of the intersection. Larger stop signs can also be installed to make the stop more visible to drivers. Furthermore, transverse rumble strips can be installed as a different means of warning drivers of the upcoming intersection. Although these countermeasures have proven to reduce crashes, they are most effective where the motorist are not seeing the stop signs, which does not appear to be the case at this location.

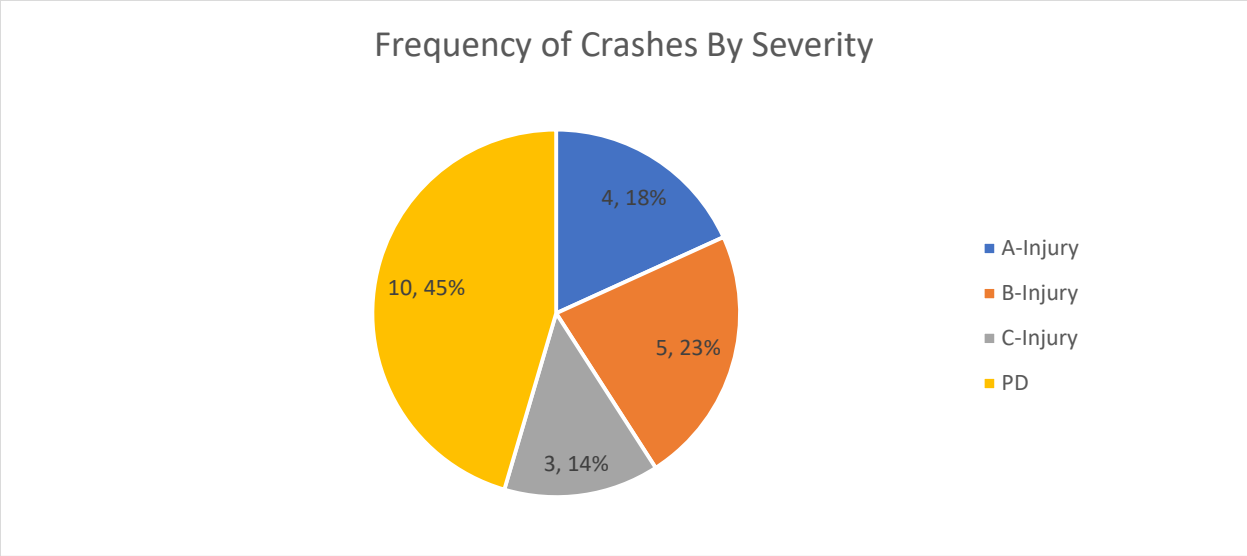
Although an intersection warning sign with flashing beacon is already provided, crashes are still occurring. An improved alternate to the static flashing beacon would be to install an Intersection Conflict Warning System (ICWS) or "Vehicles Entering When Flashing" (VEWF) system, so that vehicles on the mainline are made aware of when vehicles could be crossing the road from the side-street. These dynamic systems warn mainline traffic of possible side-street conflicts at nearby intersections. These systems consist of post mounted signs and flashers on the mainline and vehicle detection (loops) on the cross streets. When a vehicle is detected on the side-street, the flashers activate along the mainline to alert drivers along the mainline that there is a vehicle on the side-street.

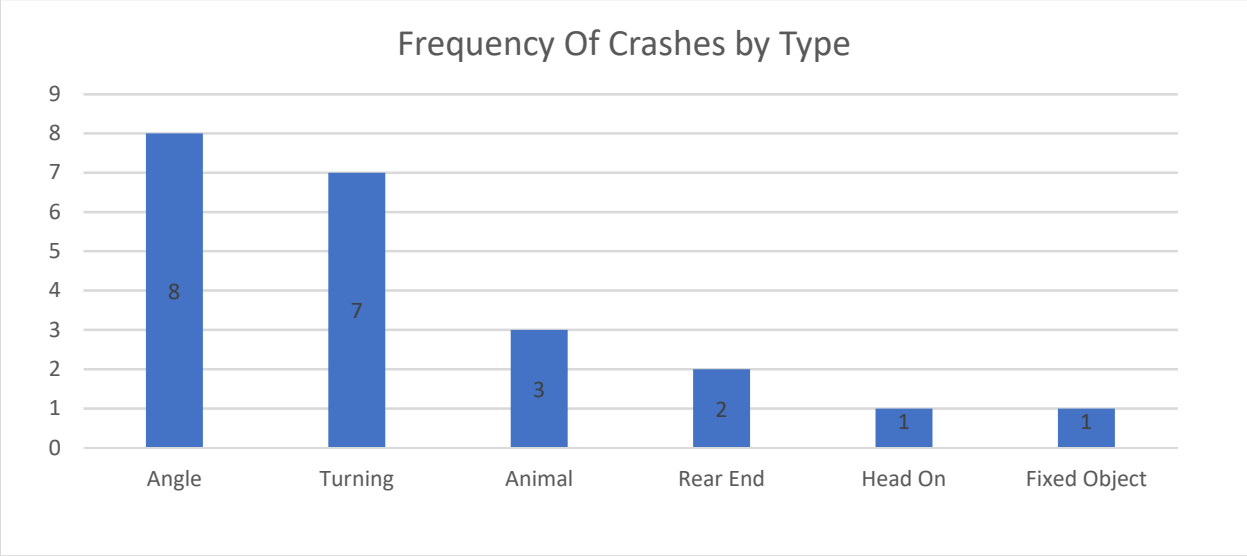
Since 36% of the total crashes occur at night, improving the intersection lighting may also help decrease crashes.

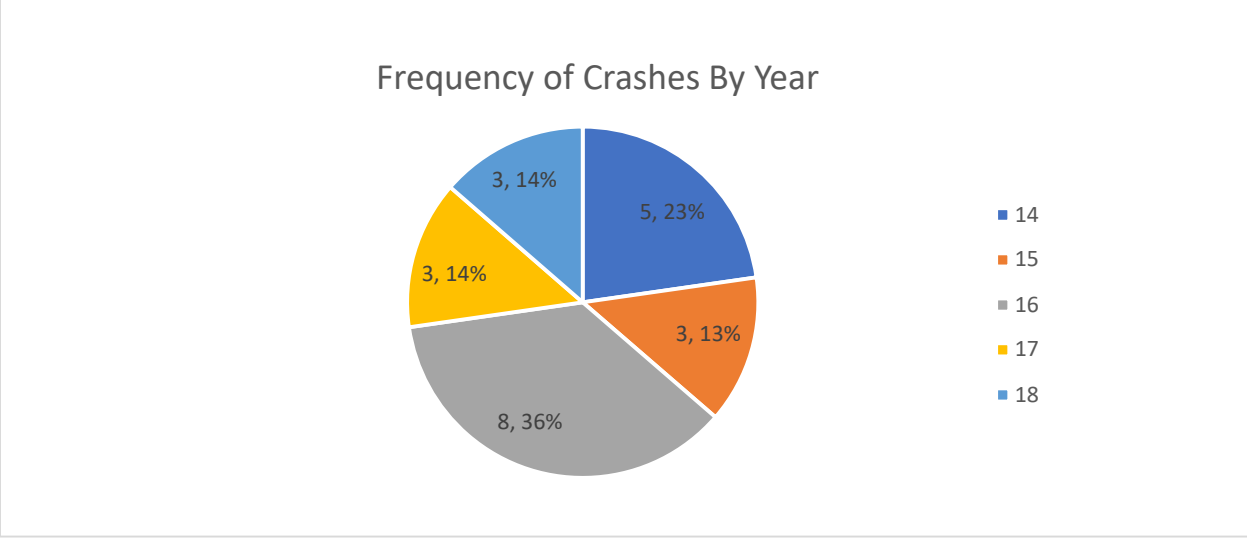
A more costly safety improvement would be to construct mainline left-turn lanes along Old Highway 13. The turn lanes would take left-turning traffic out of the paths of through-moving vehicles and reduce rear end crashes due to unexpected stops. It should be noted that the length of the left-turns lanes and tapers could extend a long distance due to the high speed of Old Highway 13.

Another higher cost option would be to consider a roundabout at the intersection. The roundabout would reduce the turning and angle crashes and reduce the overall severity of crashes that occur at the intersection but would have impacts to property near the intersection.

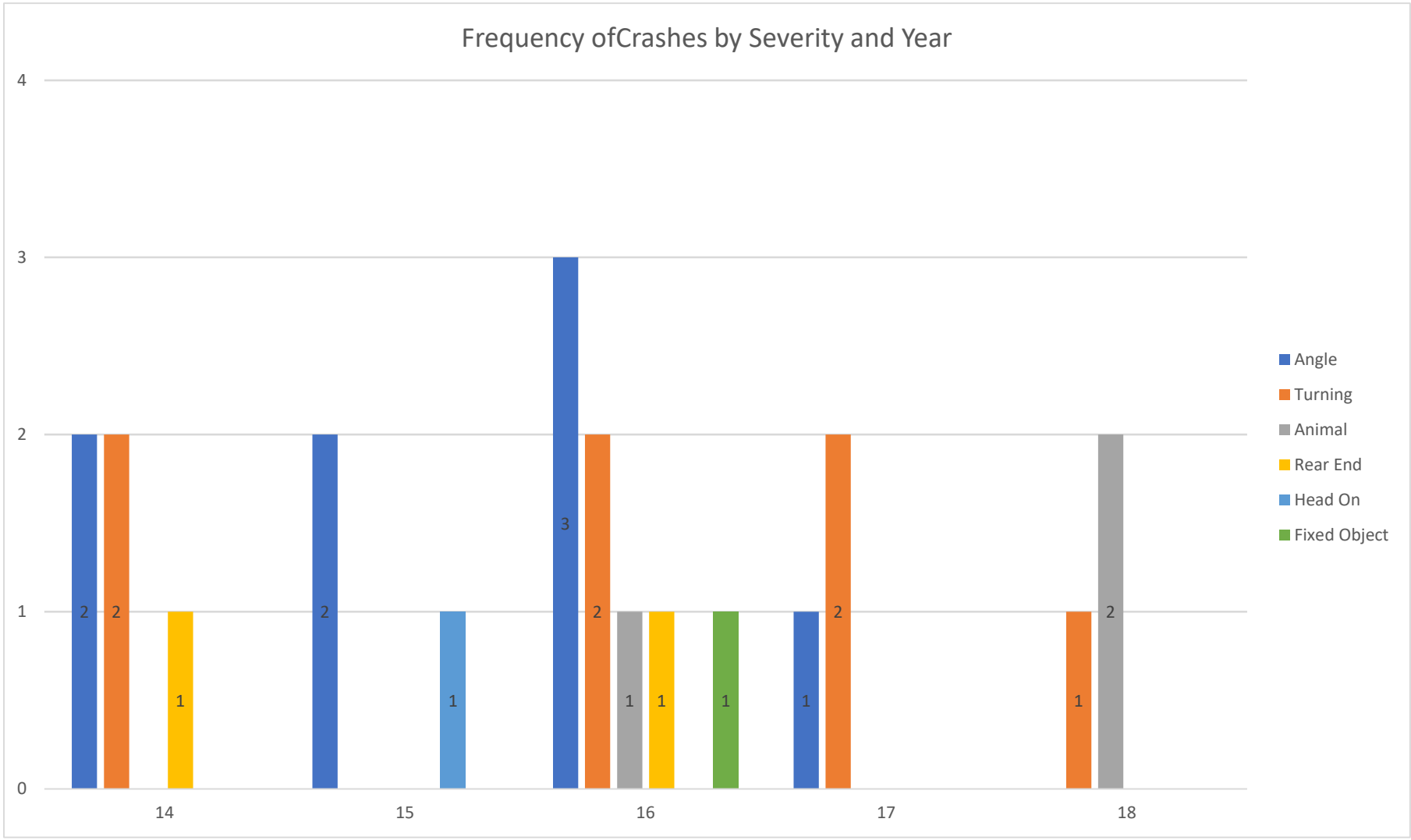
Intersection of Old Highway 13 and Country Club Road (2014-2018)







Intersection of Old Highway 13 and Country Club Road (2014-2018)



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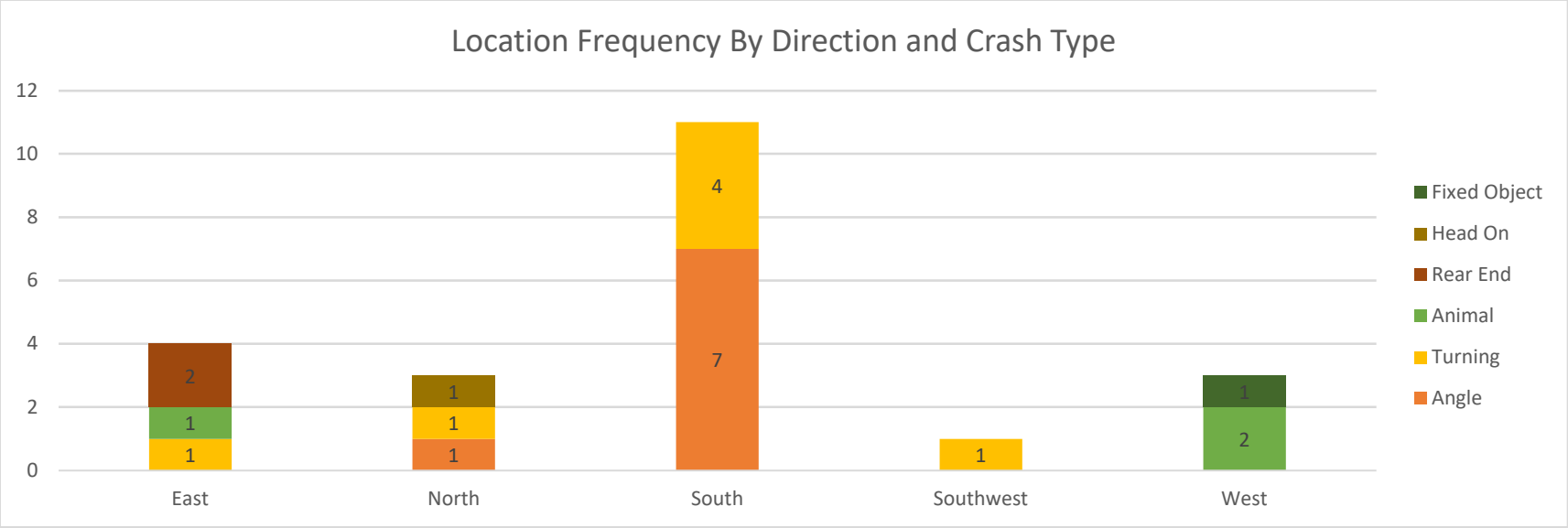

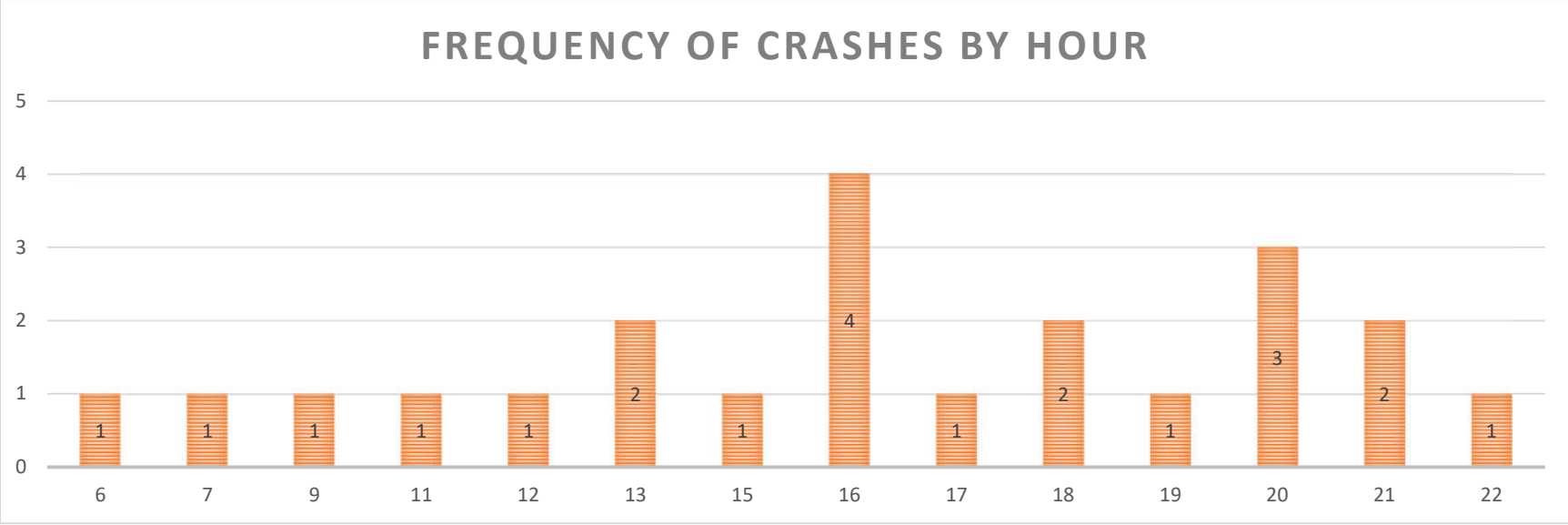

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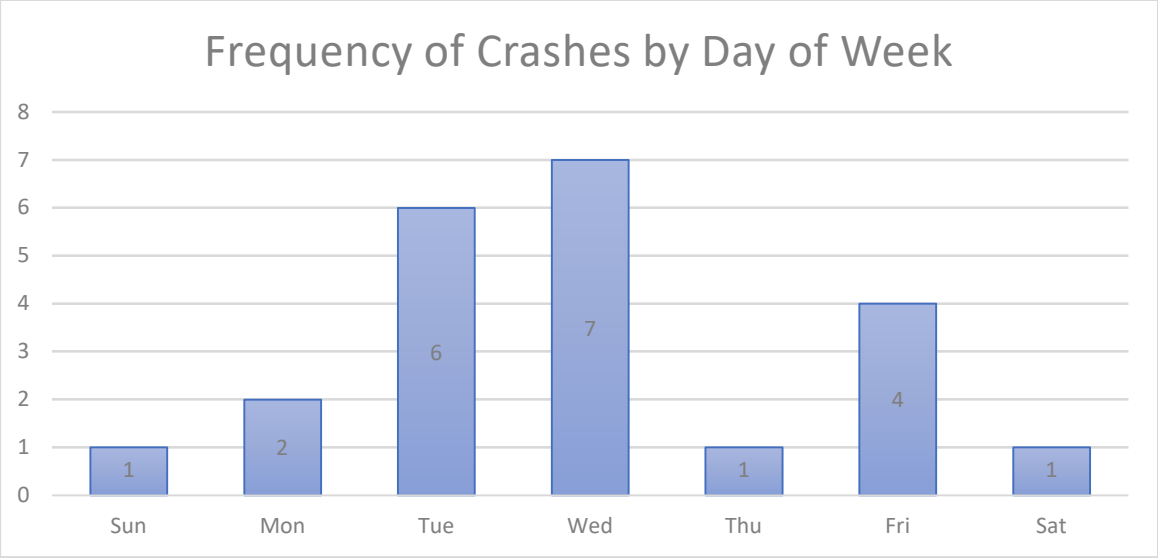

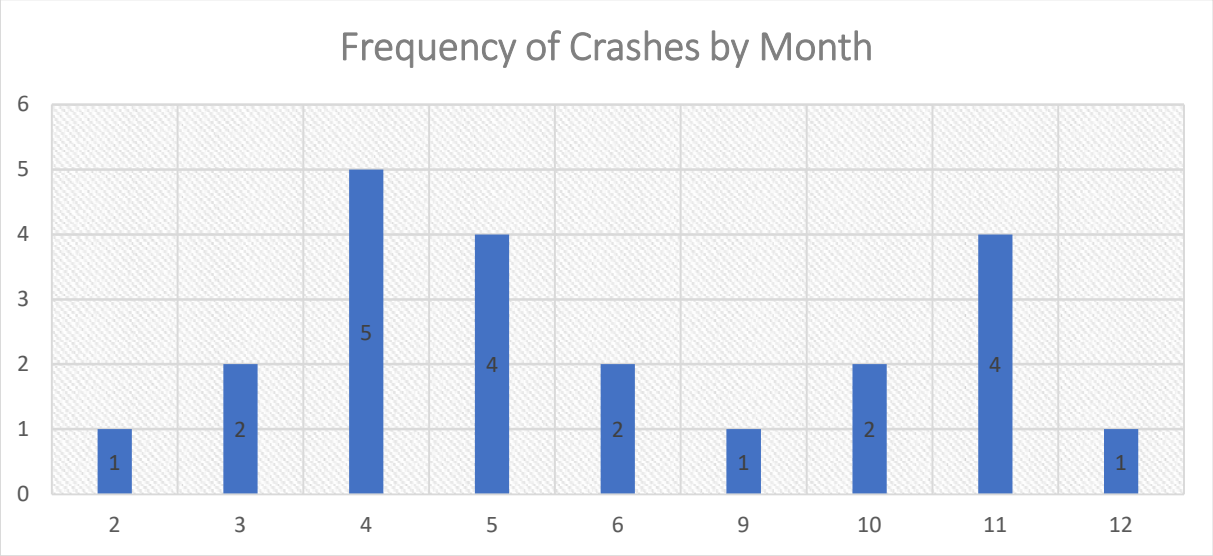

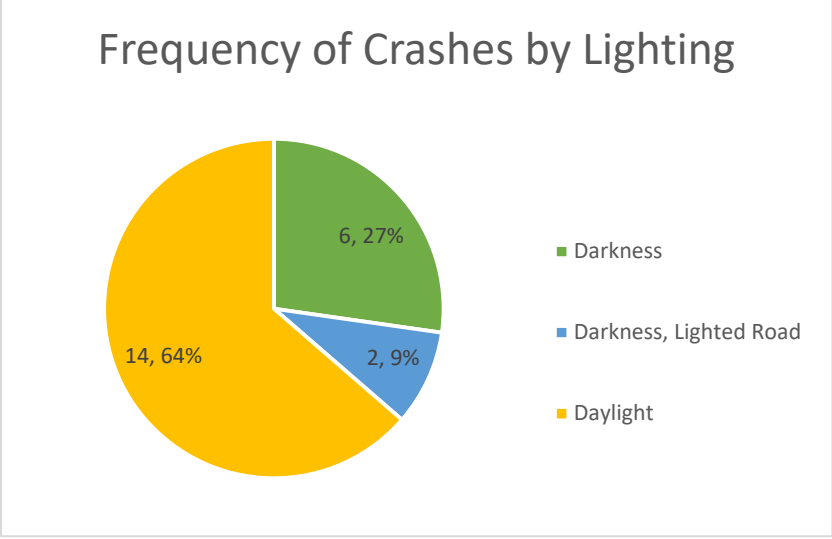

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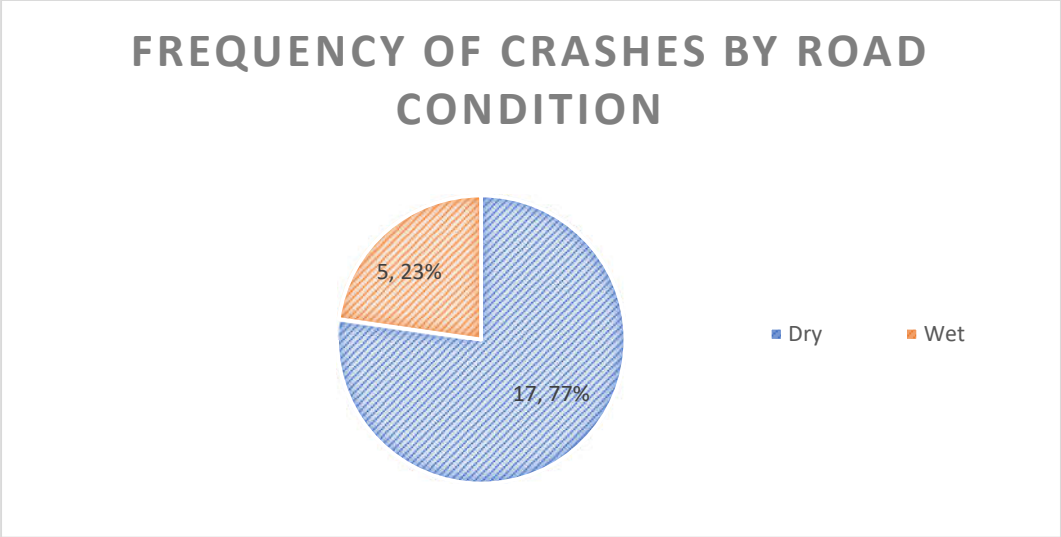
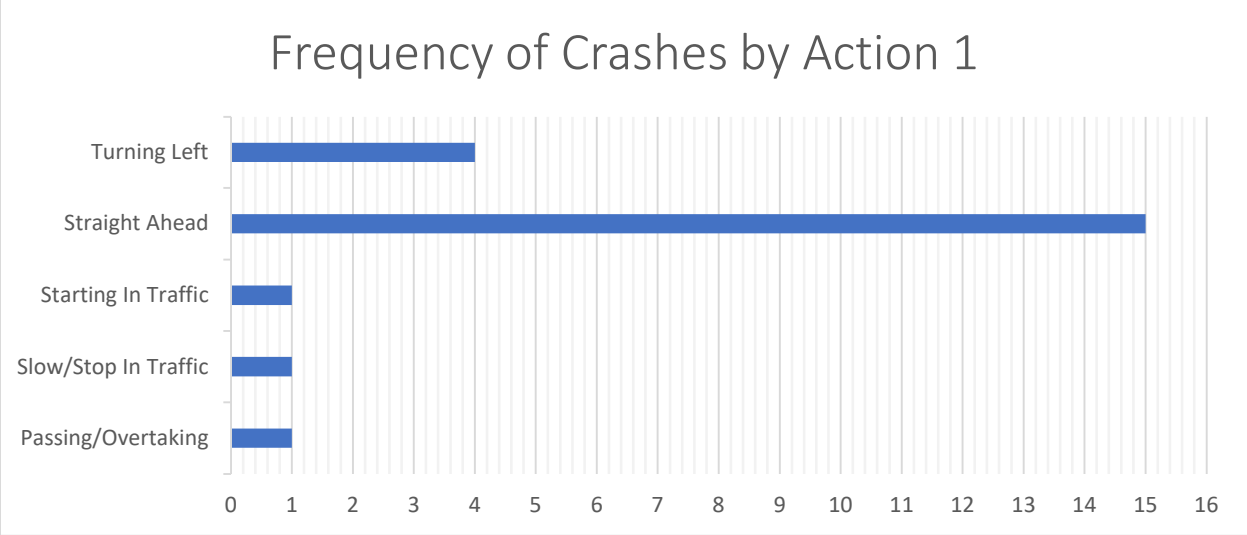
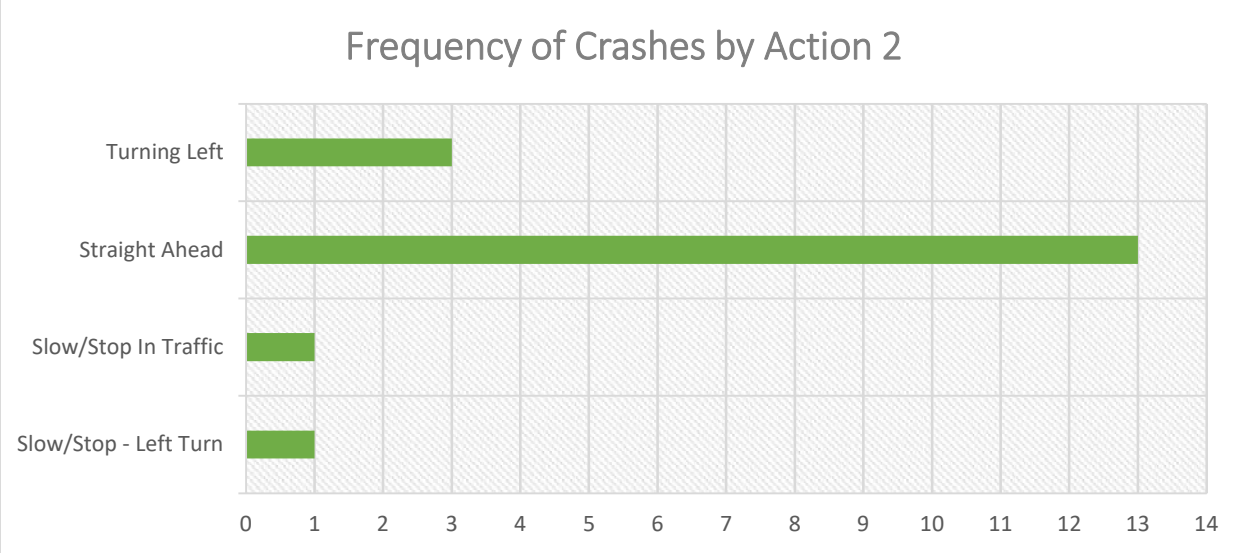


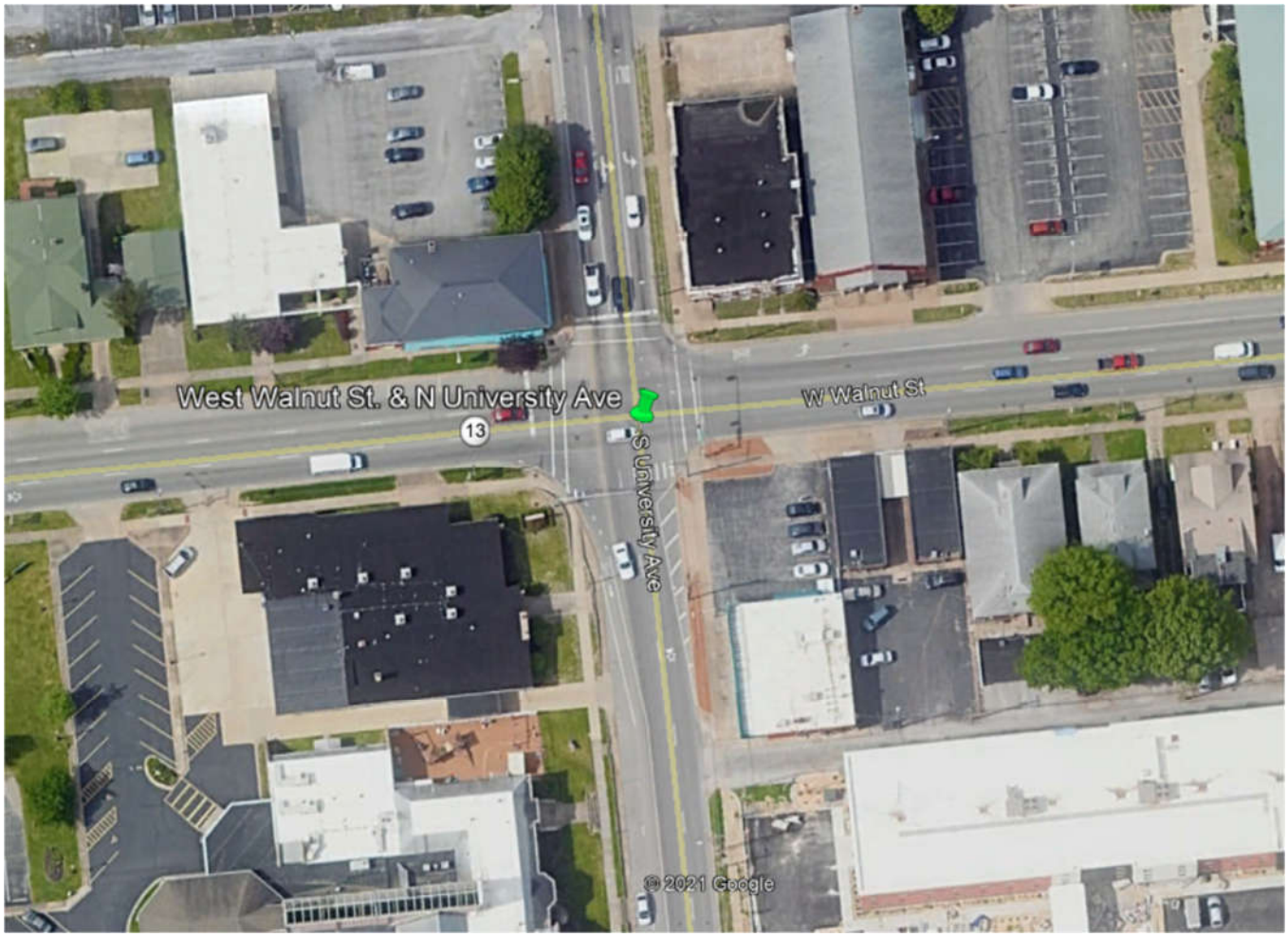




CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE
201400057885	14	5	28	11	Wed	2	2	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Truck Single Unit	East	Straight Ahead	Intersection	C-Injury
201400209963	14	4	9	20	Wed	2	0	0	Turning	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Passenger	South	Turning Left	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD
201400225111	14	4	21	17	Mon	2	2	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	B-Injury
201400288805	14	9	30	15	Tue	2	2	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	A-Injury
201400416955	14	11	2	18	Sun	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Unincorporated	Normal	SUV	South	Slow/Stop In Traffic	Intersection	Normal	Passenger	North	Turning Left	Intersection	PD
201501107840	15	6	3	13	Wed	3	2	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	South	Straight Ahead	Intersection	Normal	SUV	East	Straight Ahead	Intersection	C-Injury
201501259830	15	3	18	20	Wed	2	0	0	Head On	Clear	Darkness	Wet	Stop Sign/Flasher	Unincorporated	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Slow/Stop - Left Turn	On Pavement (Roadway)	PD
201501262938	15	11	27	19	Fri	2	2	0	Angle	Rain	Darkness	Wet	No Controls	Unincorporated	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Truck Single Unit	East	Straight Ahead	Intersection	B-Injury
201601069577	16	3	11	13	Fri	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Van/Mini-Van	South	Straight Ahead	Intersection	Normal	Pickup	East	Straight Ahead	Intersection	PD
201601082296	16	4	7	16	Thu	2	0	0	Turning	Rain	Daylight	Wet	Stop Sign/Flasher	Unincorporated	Normal	Passenger	North	Turning Left	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD
201601089382	16	4	19	7	Tue	2	4	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	North	Straight Ahead	Intersection	Normal	Passenger	West	Straight Ahead	Intersection	A-Injury
201601089383	16	4	18	12	Mon	1	1	0	Fixed Object	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Pickup	West	Straight Ahead	Off Pavement - Right						A-Injury
201601120584	16	5	27	6	Fri	2	1	0	Turning	Rain	Daylight	Wet	No Controls	Unincorporated	Normal	Passenger	East	Passing/Overtaking	On Pavement (Roadway)	Normal	Pickup	East	Turning Left	On Pavement (Roadway)	B-Injury
201601238730	16	10	11	16	Tue	3	3	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Van/Mini-Van	East	Straight Ahead	Intersection	Normal	Passenger	East	Slow/Stop In Traffic	Intersection	A-Injury
201601289879	16	11	30	9	Wed	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	SUV	South	Starting In Traffic	Intersection	Normal	Passenger	East	Straight Ahead	Intersection	PD
201601326177	16	12	28	22	Wed	1	0	0	Animal	Clear	Darkness, Lighted Road	Wet	No Controls	Unincorporated	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)						PD
201701110188	17	5	2	20	Tue	2	0	0	Turning	Clear	Darkness	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Passenger	North	Turning Left	Intersection	PD
201701146311	17	6	10	16	Sat	2	4	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Murphysboro	Normal	Van/Mini-Van	South	Turning Left	On Pavement (Roadway)	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	B-Injury
201701268269	17	10	13	21	Fri	2	1	0	Angle	Clear	Darkness	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	B-Injury
201801062197	18	2	20	18	Tue	1	0	0	Animal	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)						PD
201801160583	18	5	15	16	Tue	2	1	0	Turning	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Pickup	Southwest	Turning Left	On Pavement (Roadway)	Normal	Motorcycle	East	Straight Ahead	On Pavement (Roadway)	C-Injury
201801346585	18	11	7	21	Wed	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)						PD

SIMPO SAFETY STUDY

Appendix : Intersection of West Walnut Street (IL 13) at University Avenue (US 51)



prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

The Intersection of University Avenue and Walnut Street

Introduction

The intersection of University Avenue and Walnut Street is located in Carbondale and within Jackson County. The intersection is signalized with overhead traffic signals. **Figure 1** shows the location of the intersection.

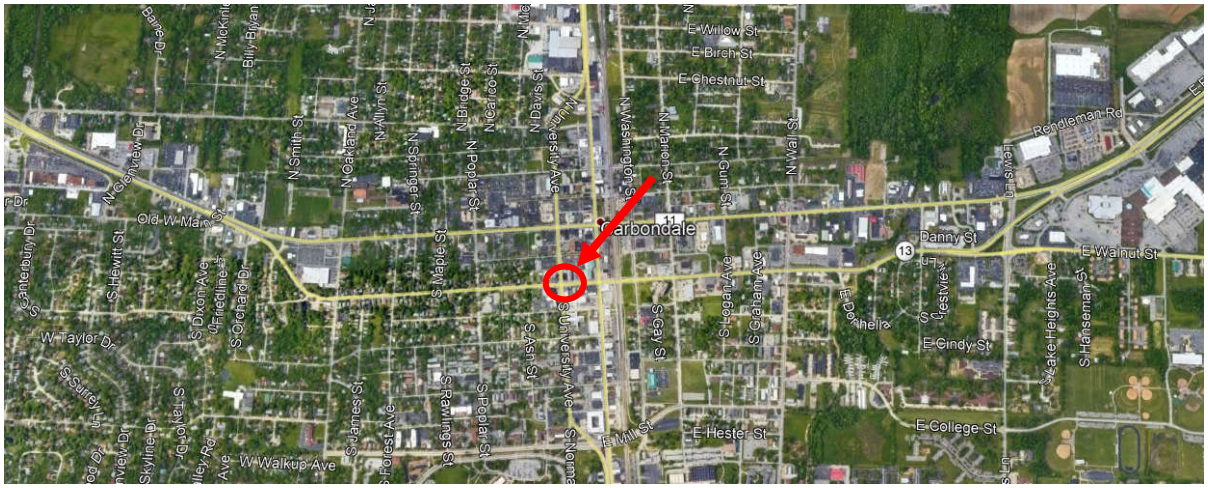


Figure 1: Study Area

Existing Conditions

University Avenue is a one-way road southbound and Walnut Street is a one-way road eastbound. The intersection only has two overhead mounted signals because the traffic is only traveling in two directions. The two roads intersect at a 90-degree angle as shown in the plan view in **Figure 2**.

North of the intersection, University Avenue has three 10-foot lanes (one left-turn lane, one shared through/left-turn lane and a through lane) and reduces to two 12-foot lanes on the south side of the intersection. A bike lane is striped on the west side of the corridor. South of the intersection, there is also a painted lane channelizer and lane shift so that vehicles in the left-turn lanes do not continue south.

West of the intersection, Walnut Street has three lanes and a parking lane on the north side of the road. East of the intersection, Walnut Street has four lanes with one of the lanes striped as a left-turn only lane from the next signal to the east.

The adjacent land use consists of commercial properties with many access driveways near the intersection. The building in the northwest corner limits sight distance for southbound and eastbound vehicles approaching the intersection. Also located about 680 feet east of the intersection are railroad tracks parallel to University Avenue. There are sidewalks along both corridors and crossings are provided across each leg of the intersection, as shown in the street view in **Figure 3**.

The southbound approach of University Avenue also has overhead lane assignment signs in advance of the intersection so that vehicles are aware of the lane configuration. **Figure 4** shows the advanced overhead signage, approximately 190 north of the intersection.

Figure 2: The Intersection of University Avenue and Walnut Street (Plan View)

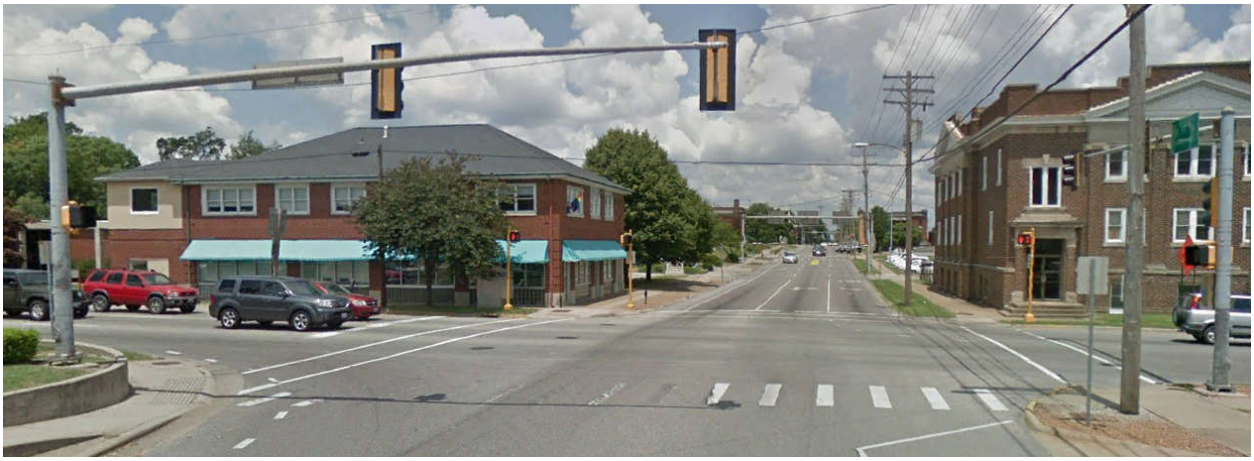


Figure 3: The Intersection of University Avenue and Walnut Street (Street View-Looking North)

Figure 4: Southbound on University Avenue North of the Intersection (Looking South)

Safety Analysis

A total of 54 crashes occurred in the study area from 2014 to 2018. The frequency of crashes by year is shown in **Figure 5**. On average, there are 10.8 crashes per year. 2015 has the highest number of crashes at 16 crashes.

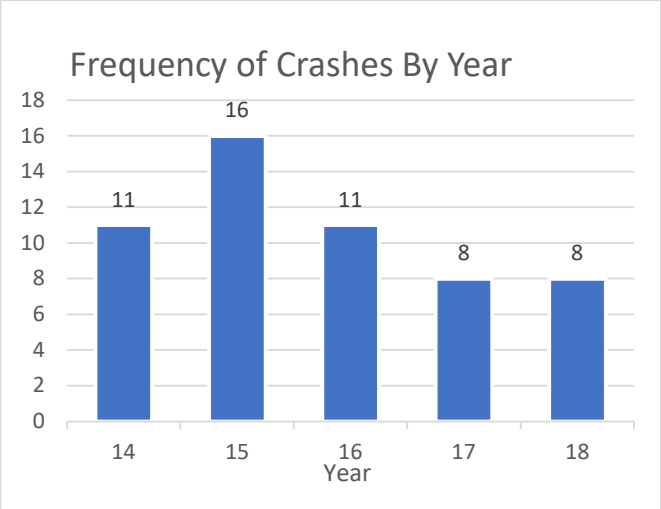


Figure 5: Frequency of Crashes by Year

In **Figure 6**, it shows the frequency of crashes by type. The majority of crashes are turning and angle crashes at 70 percent combined. Then rear ends account for about 24 percent.

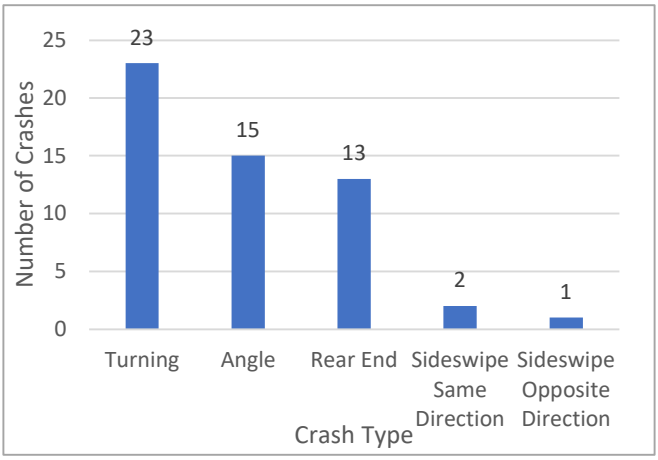


Figure 6: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 7**. The majority of crashes are property damage only at 67 percent. A-injury crashes consist of four angles and one turning. B-injury crashes consist of four angles and one turning. C-injury crashes consist of four rear end, two angles and two turning.

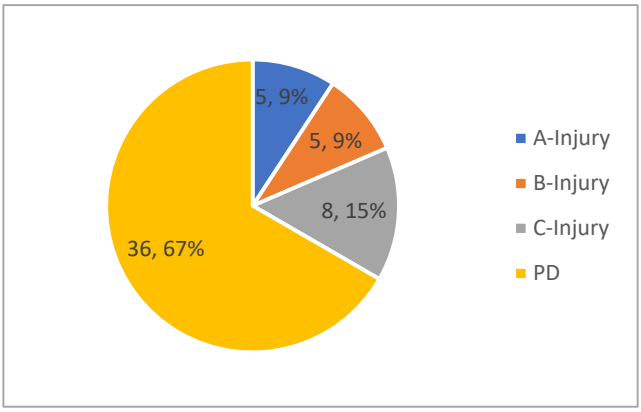


Figure 7: Frequency of Crashes by Severity

In **Figure 8**, the chart shows the frequency by direction and crash type. Most crashes occurred with southbound and eastbound vehicles, which is consistent with two one-way roads.

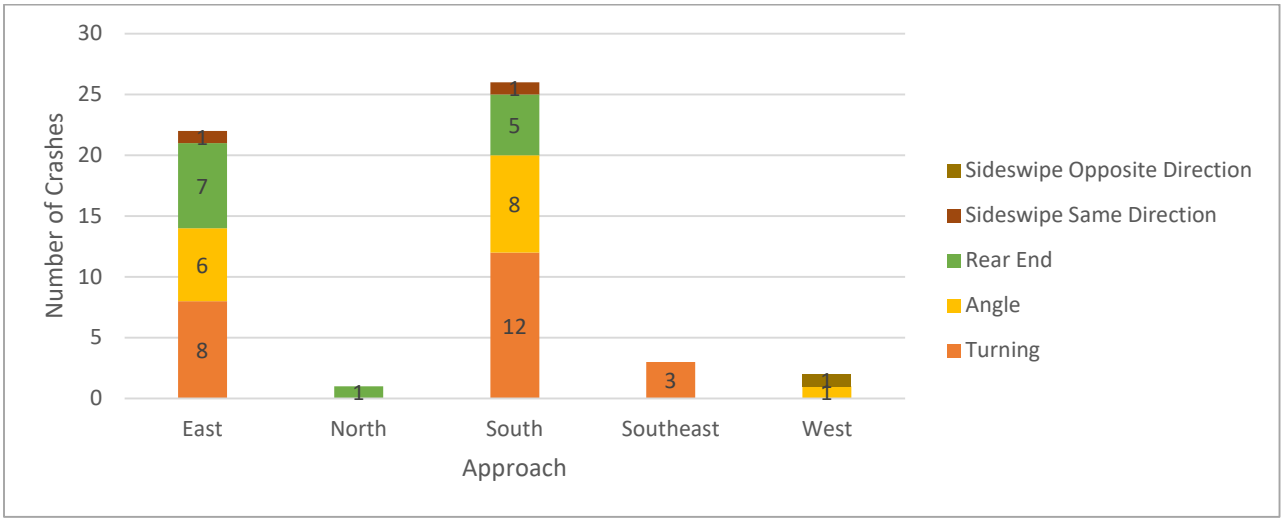


Figure 8: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 9** below. The crashes are heaviest from 10 AM to 8 PM.

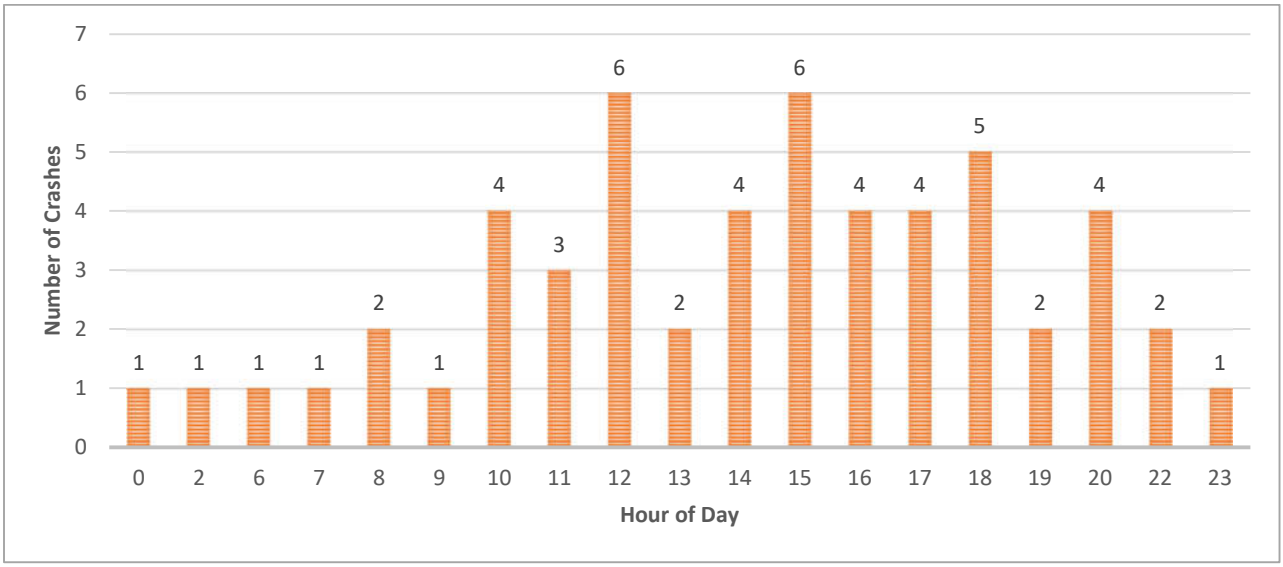


Figure 9: Frequency of Crashes by Hour

The frequency of weather crashes is shown in **Figure 10**, below. The majority of crashes occurred on clear days (87%).

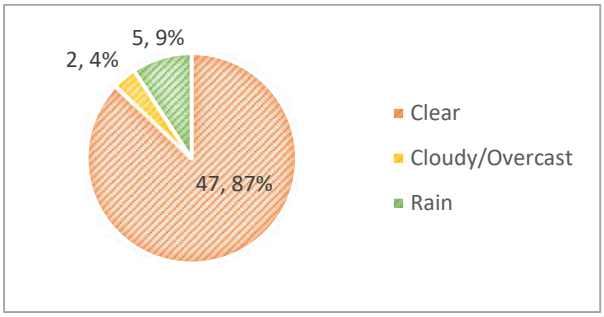


Figure 10: Frequency of Crashes by Weather

The frequency of crashes related to lighting conditions is shown in **Figure 11**. The majority of crashes occurred during daylight (72%).

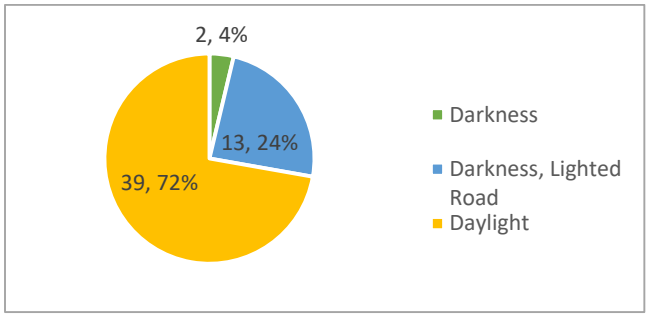


Figure 11: Frequency of Crashes by Lighting

The frequency of crashes related to the Month is shown in **Figure 12**. May and August are the two months with the highest number of crashes, eight and nine crashes respectively.

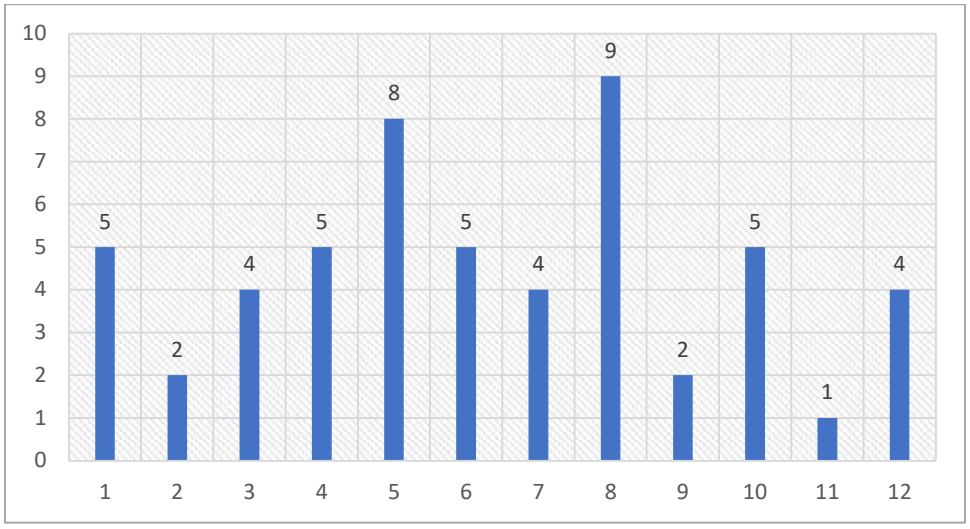


Figure 12: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures

Areas of Concern

University Avenue and Walnut Street is a signalized intersection where two one-way roads intersect. South of the intersection, there is a shift in alignment and a bike lane on the west side of the road. The two southbound lanes serve four lanes to the east and vehicles being in the correct lane is a concern due to the angle and turning crash history. Further, there is limited sight distance for the southbound and eastbound legs due to the building in the northwest corner.

80% of the A- and B- injury crashes are turning or angle crashes. In total, turning and angle crashes combined make up 70% of crashes, followed by 24% of rear end crashes.

Discussions with the local agencies indicate that motorist frequently make left-turns on red and with the intersection in the downtown area pedestrians frequently use the intersection and could be at risk. Additionally, since the two southbound left-turn lanes feed into four eastbound lanes east of the intersection and lane changes occur when vehicles are completing the left-turn, especially if oriented to driveways in close proximity to the intersection.

Countermeasures

Implementing systemic signing and visibility improvements at the signalized intersection could help with guiding vehicles to the correct lane. This means replacing all signal heads possibly with arrows indications to further provide direction for lanes, replacing pedestrian heads with pedestrian countdown timers with push button activation and signs, installing reflective back plates on all primary signal heads, restriping stop lines, striping crosswalks, installing advance warning signs, installing overhead signs, and installing curb ramps. High visibility striping could be considered for stop bars, lane lines, and left-turn skip stripes. Signal timing could be checked and the yellow and all-red times could be adjusted, if needed.

Since the building in the northwest corner restricts sight distance and to reduce turning and angle crashes, it is recommended to install a No Turn on Red (MUTCD R10-11) signs for the southbound approach so that vehicles do not strike pedestrians.

Further, Turning Vehicles Yield to Pedestrians (MUTCD R10-15L) could be added to the far side of the intersection on the mast arm for the southbound approach to remind left-turning motorists to look and yield to pedestrians crossing at the intersection.

Although lane assignment signs are provided overhead prior to the intersection, providing some lane control signs on the signal mast arms (MUTCD R3-5, MUTCD R3-6, MUTCD R3-5a) to reinforce the lane assignment could help to minimize vehicles being in the incorrect lane in the southbound direction.

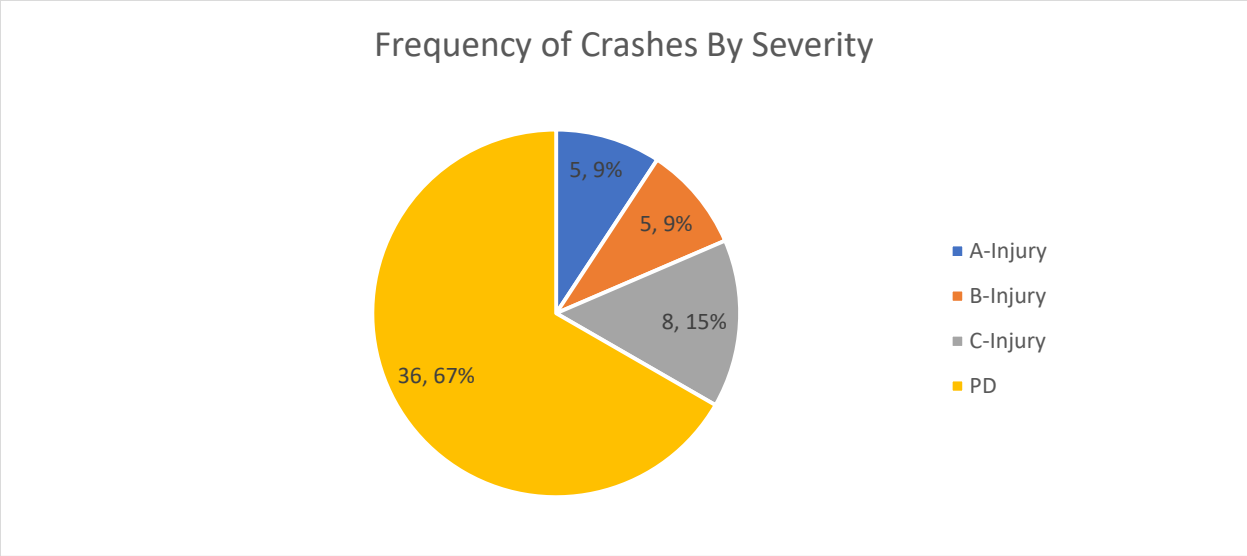
R3-5 R3-6 R3-5a

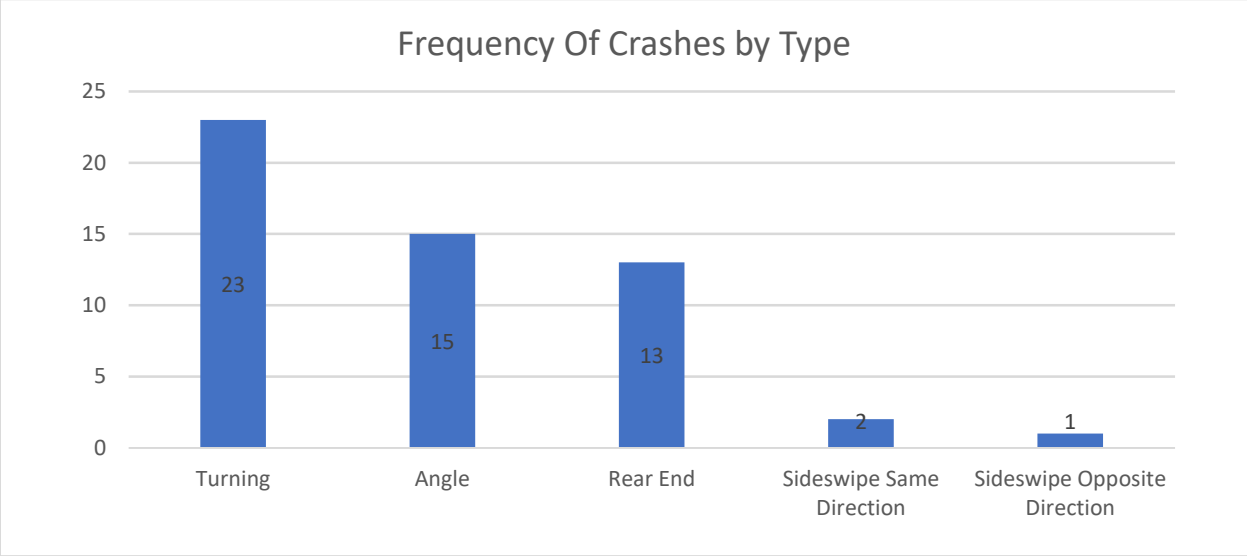
Speed management could be considered to help reduce the severity of crashes. For example, speed feedback signs can be installed along Walnut, west of University, in an attempt to slow vehicles down when entering the downtown area. Installing dynamic signal warning flashers to provide drivers with advance notice of the phase change could also help to reduce red light running, abrupt stops at an intersection, and angle crashes.

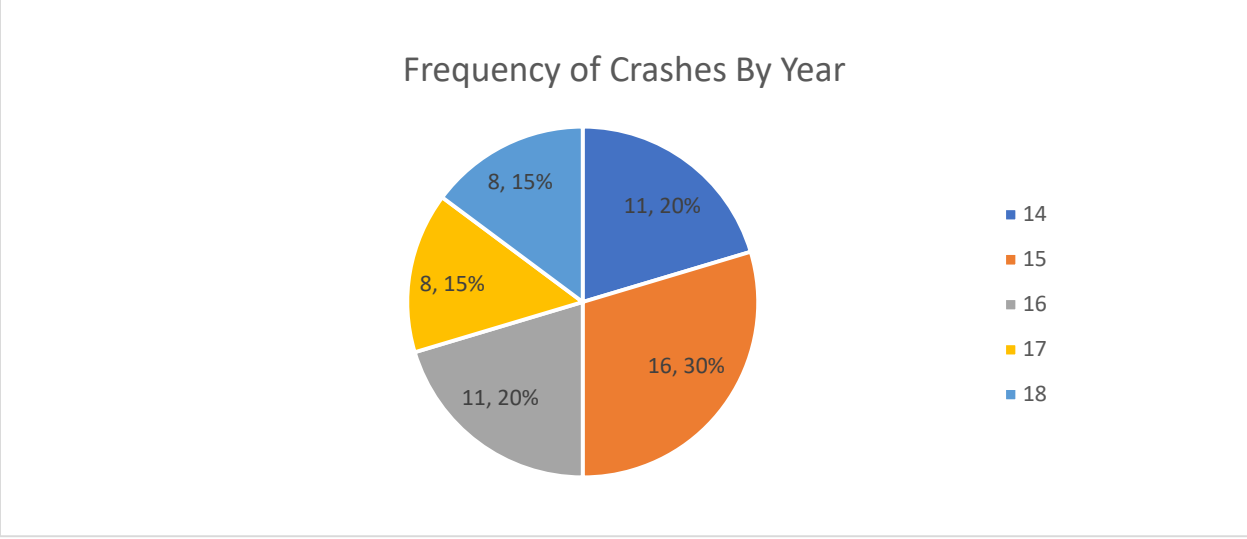
A more costly improvement would be to construct a raised intersection or raised crosswalk, which would slow vehicle speeds and create a safer place for pedestrians to cross.

Although commonly used in horizontal curves where vehicles leave the road, high friction surface treatment could be considered to reduce rear end crashes by stopping vehicles faster, but likely is not warranted with the 9% wet weather crash history.

Intersection of University Avenue and Walnut Street (2014-2018)







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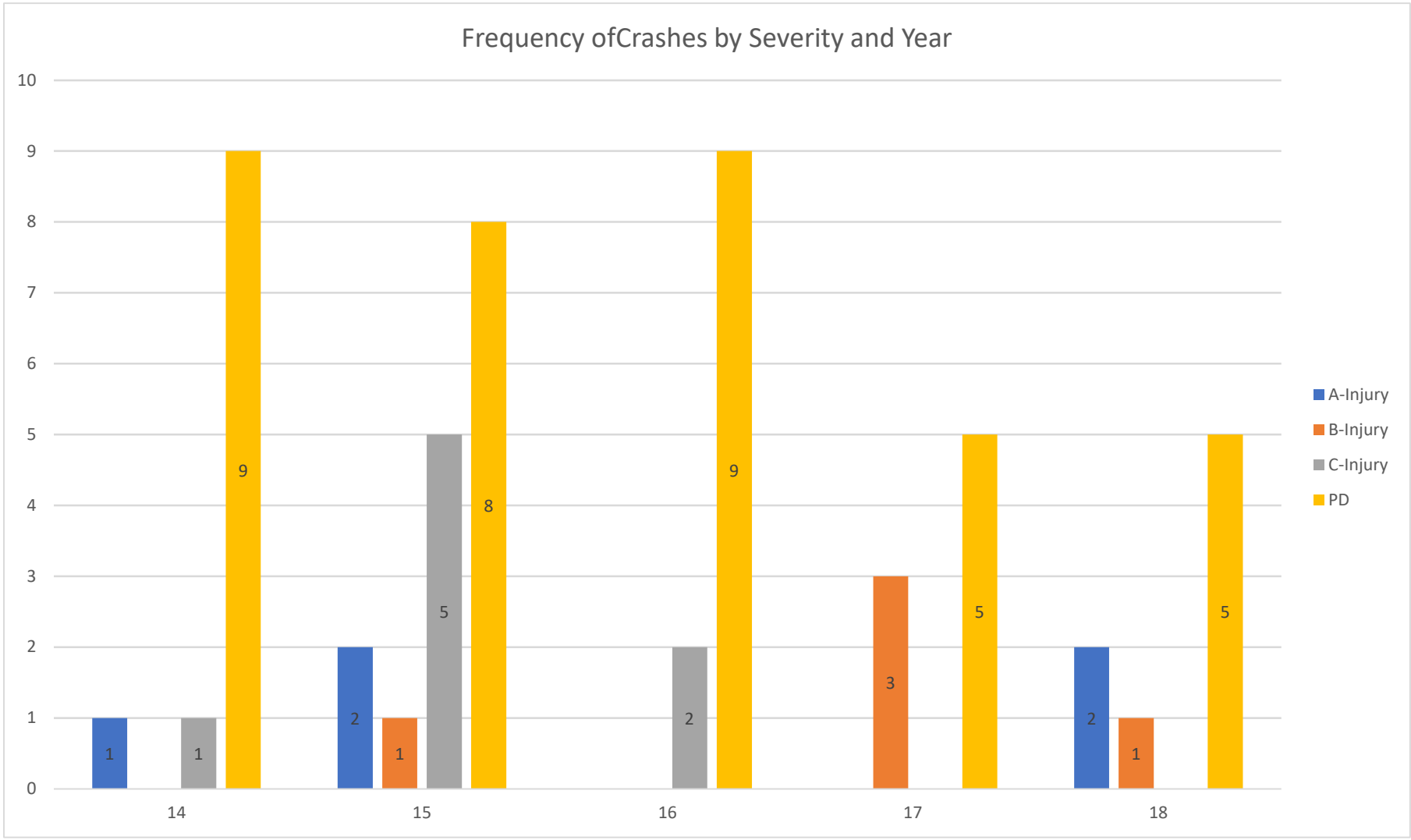

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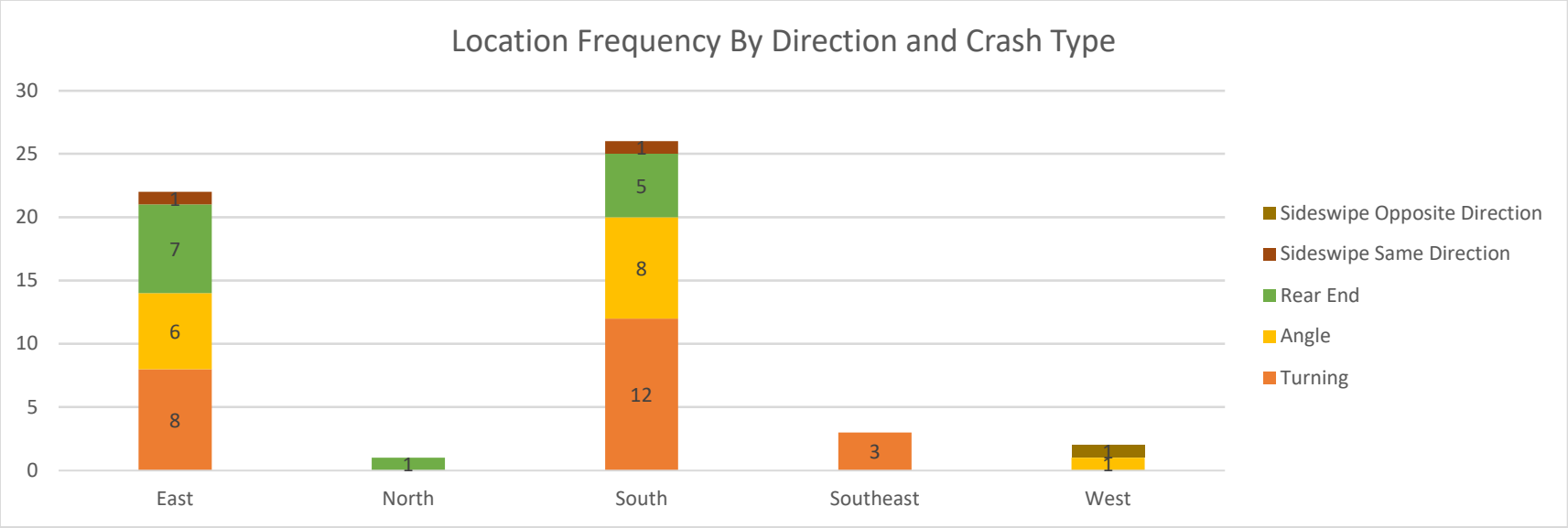
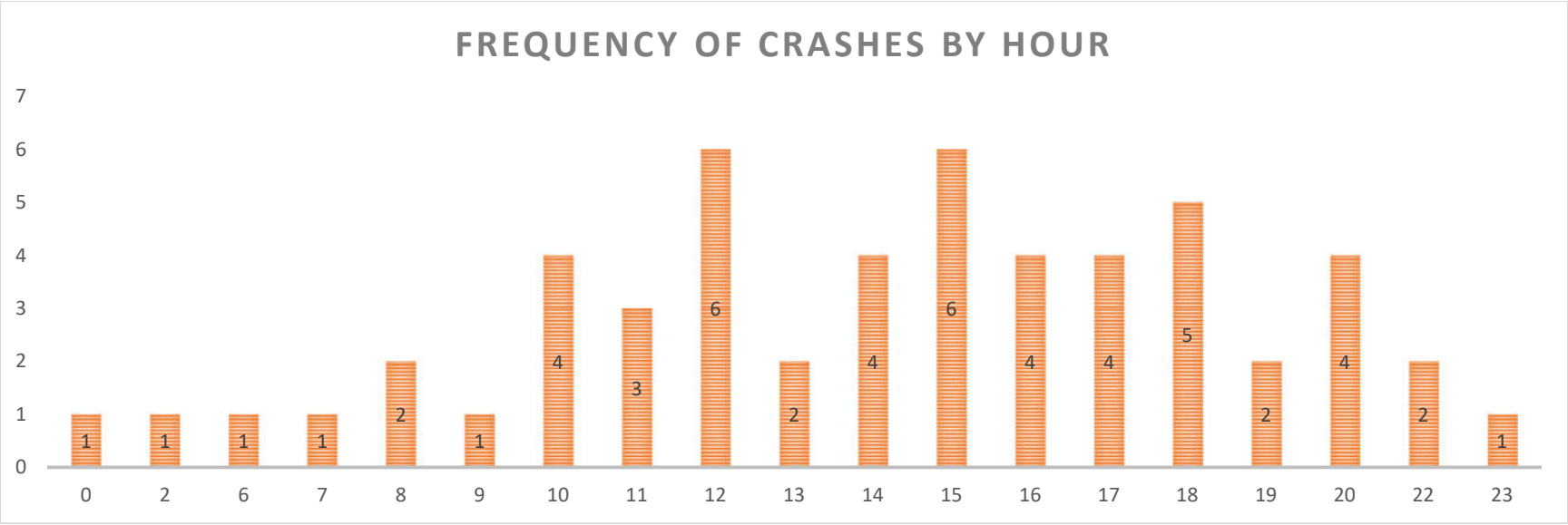
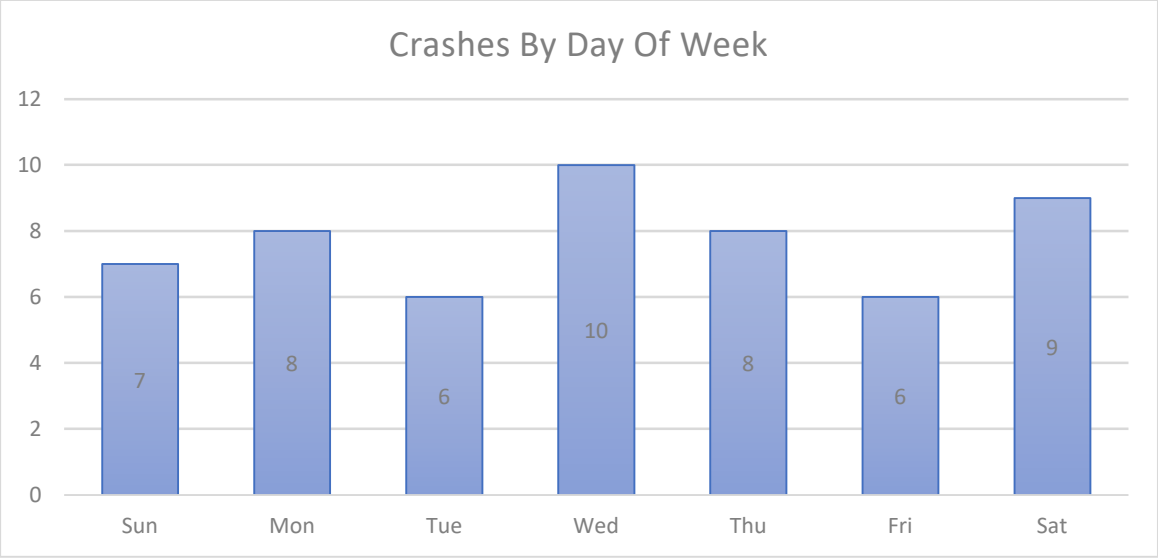
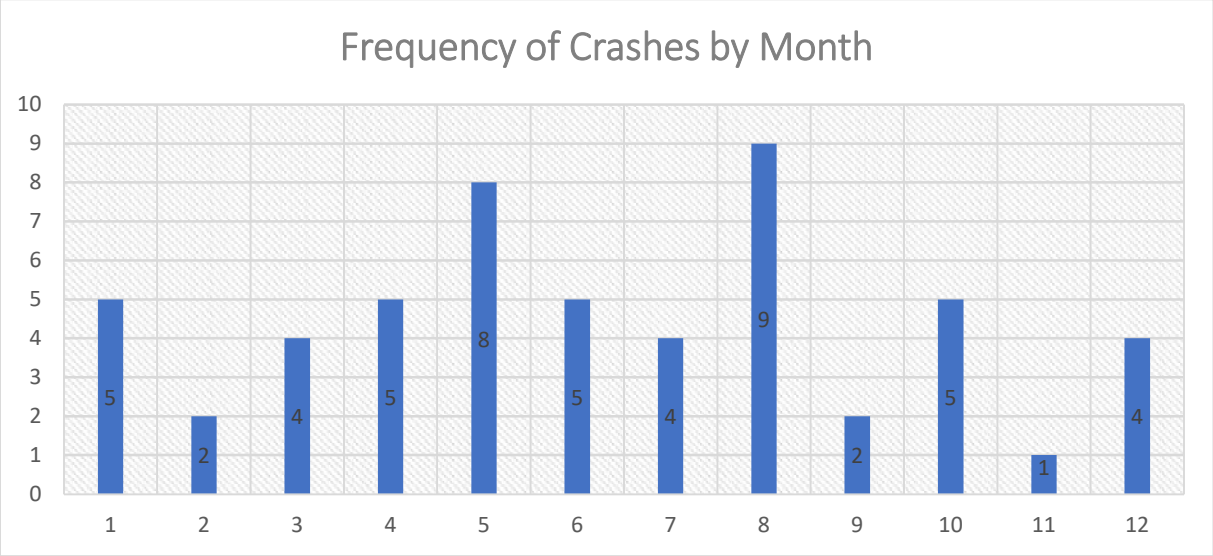
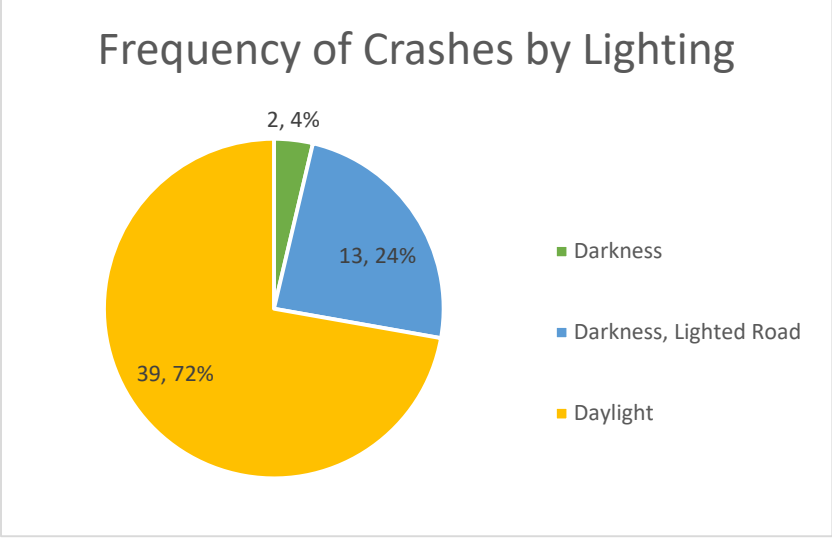




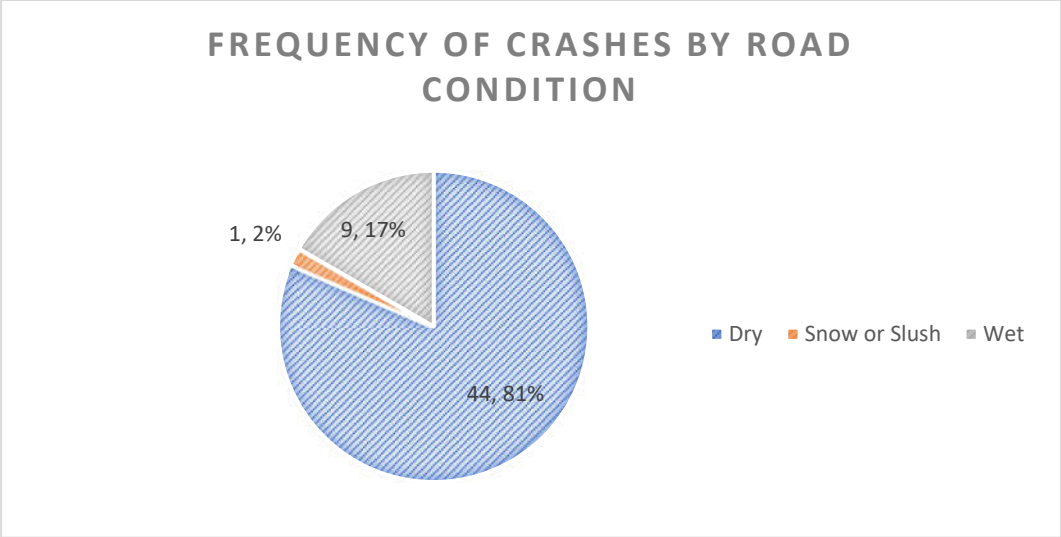
Intersection of University Avenue and Walnut Street (2014-2018)

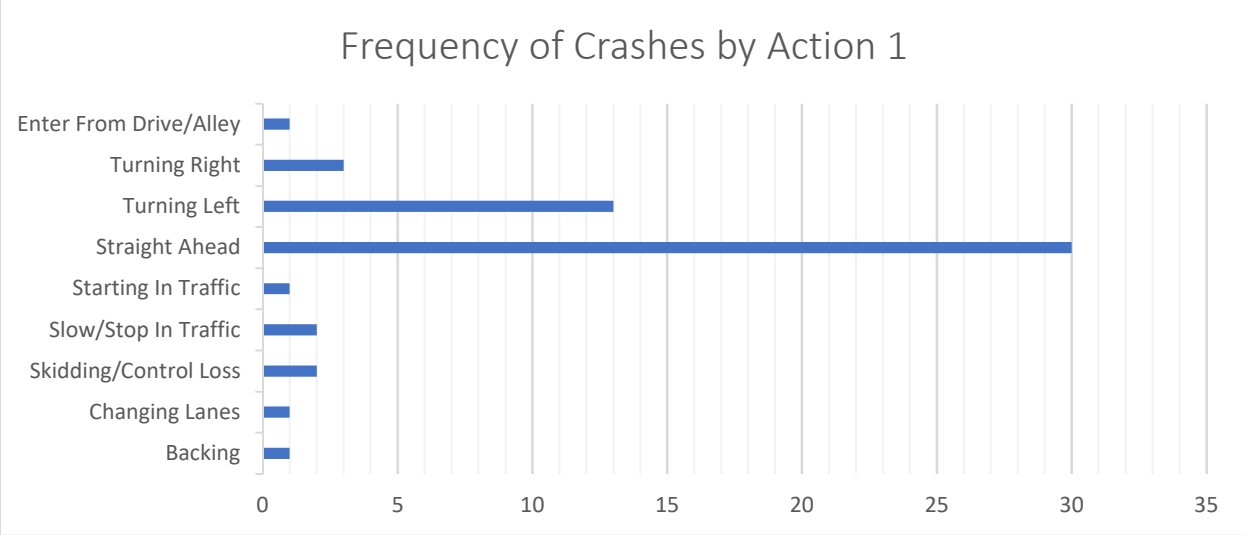


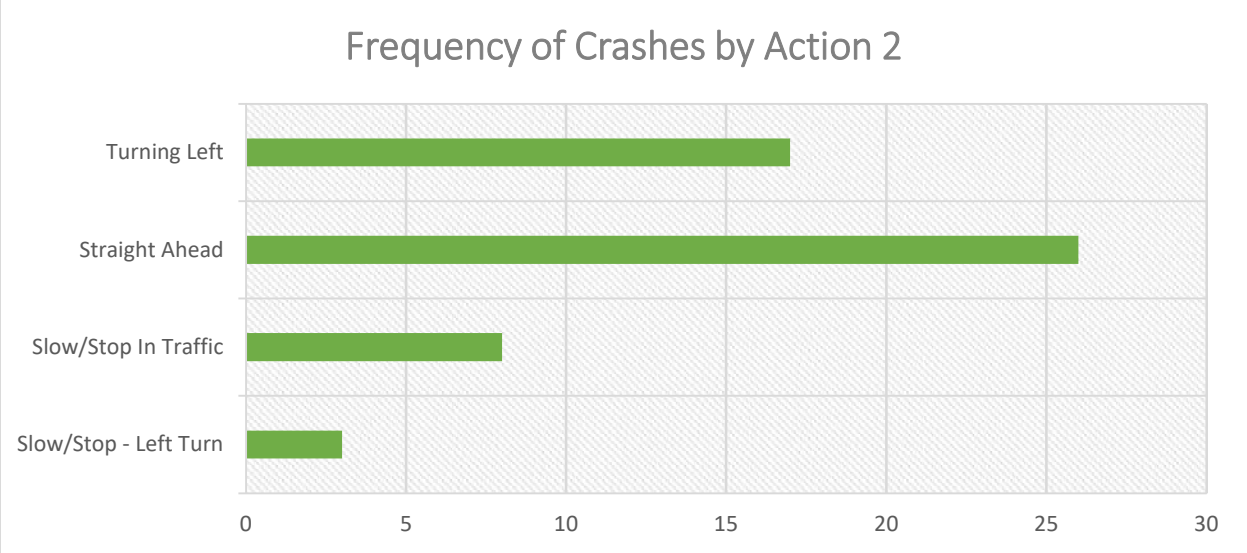




Intersection of University Avenue and Walnut Street (2014-2018)







CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE
201400073376	14	1	11	15	Sat	2	1	0	Angle	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	A-Injury
201400110848	14	2	13	18	Thu	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	Southeast	Turning Left	On Pavement (Roadway)	PD
201400201121	14	4	3	9	Thu	2	0	0	Turning	Rain	Daylight	Wet	Traffic Signal	Carbondale	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Passenger	South	Turning Left	Intersection	PD
201400203225	14	4	4	15	Fri	2	1	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	South	Straight Ahead	Intersection	Normal	SUV	Southeast	Turning Left	Intersection	C-Injury
201400248160	14	5	9	23	Fri	2	0	0	Angle	Cloudy/Overcast	Darkness	Wet	Traffic Signal	Carbondale	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD
201400302750	14	7	2	17	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Carbondale	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201400305536	14	7	15	11	Tue	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	SUV	Southeast	Turning Left	On Pavement (Roadway)	Normal	Passenger	Southeast	Turning Left	On Pavement (Roadway)	PD
201400315441	14	8	6	14	Wed	2	0	0	Turning	Clear	Daylight	Dry	Lane Use Marking	Carbondale	Normal	SUV	Southeast	Turning Left	Intersection	Normal	SUV	Southeast	Turning Left	Intersection	PD
201400318305	14	8	12	2	Tue	2	0	0	Turning	Clear	Darkness, Lighted Road	Wet	Traffic Signal	Carbondale	Normal	Passenger	South	Turning Left	Intersection	Normal	Van/Mini-Van	South	Turning Left	Intersection	PD
201400392421	14	9	28	18	Sun	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Van/Mini-Van	South	Turning Left	Intersection	Normal	Passenger	South	Turning Left	Intersection	PD
201400420929	14	11	12	11	Wed	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Pickup	South	Straight Ahead	Intersection	Normal	Pickup	Southeast	Turning Left	Intersection	PD
201501146471	15	6	10	15	Wed	2	1	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Tractor With Semi-Trailer	East	Turning Left	Intersection	Emotional	SUV	East	Turning Left	Intersection	B-Injury
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201501209809	15	1	28	16	Wed	2	1	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Carbondale	Emotional	Passenger	North	Backing	Intersection	Other	Passenger	North	Slow/Stop - Left Turn	Intersection	C-Injury
201501255167	15	3	12	12	Thu	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Pickup	East	Turning Left	Intersection	Normal	Pickup	East	Turning Left	Intersection	PD
201501328785	15	5	31	8	Sun	2	5	0	Angle	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	A-Injury
201501329976	15	5	14	16	Thu	2	1	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	South	Slow/Stop In Traffic	On Pavement (Roadway)	C-Injury
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201501368832	15	6	13	20	Sat	2	0	0	Turning	Clear	Darkness	Dry	Traffic Signal	Carbondale	Normal	Van/Mini-Van	South	Straight Ahead	Intersection	Normal	Passenger	South	Turning Left	Intersection	PD
201501369338	15	6	30	18	Tue	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	SUV	South	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD
201501400568	15	8	2	7	Sun	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD
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201501493047	15	12	10	12	Thu	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Van/Mini-Van	South	Turning Left	Intersection	Normal	Van/Mini-Van	East	Straight Ahead	Intersection	PD
201501493864	15	12	11	14	Fri	2	0	0	Sideswipe Same Direction	Clear	Daylight	Wet	Traffic Signal	Carbondale	Normal	Passenger	East	Straight Ahead	Intersection	Normal	Passenger	East	Straight Ahead	Intersection	PD
201601315196	16	1	19	18	Tue	2	0	0	Angle	Clear	Darkness, Lighted Road	Snow or Slush	Traffic Signal	Carbondale	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Pickup	East	Straight Ahead	Intersection	PD
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201601389246	16	5	20	18	Fri	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	East	Skidding/Control Loss	On Pavement (Roadway)	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	PD
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201601475925	16	10	22	19	Sat	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Traffic Signal	Carbondale	Normal	Passenger	East	Turning Right	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD
201601504332	16	12	23	17	Fri	2	0	0	Sideswipe Same Direction	Rain	Darkness, Lighted Road	Wet	Traffic Signal	Carbondale	Normal	SUV	South	Straight Ahead	Intersection	Normal	SUV	South	Straight Ahead	Intersection	PD
201701171438	17	5	15	22	Mon	2	0	0	Angle	Clear	Darkness, Lighted Road	Dry	Traffic Signal	Carbondale	Normal	Tractor With Semi-Trailer	West	Straight Ahead	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD
201701387899	17	3	14	15	Tue	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Slow/Stop - Left Turn	On Pavement (Roadway)	PD
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201801443825	18	5	27	14	Sun	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	East	Turning Left	Intersection	Normal	Pickup	East	Straight Ahead	Intersection	PD
201801450368	18	6	25	17	Mon	2	1	0	Turning	Clear	Daylight	Dry	Traffic Signal	Carbondale	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	A-Injury
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201801475218	18	10	3	16	Wed	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Carbondale	Other/Unknown	Passenger	East	Straight Ahead	Intersection	Normal	Pickup	East	Slow/Stop In Traffic	Intersection	PD

SIMPO SAFETY STUDY

Appendix : Park Street

Brush Hill Road to Giant City

prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

Park Street-Brush Hill Road to Giant City Road

Introduction

The segment location is Park Street from Brush Hill Road to Giant City Road. The segment is about 0.71 miles long.

Figure 1: Study Area

Existing Conditions

Park Street is located in Carbondale, in Jackson County. The corridor and connecting roads provide a connection to residential properties along the segment and in the area. The corridor is in an undeveloped area. The segment includes two lanes, one 11-foot lane in each direction. There is a speed limit of 30 miles per hour (mph). There are no sidewalks along the corridor or crosswalks in the study area. There is a reverse curve located to the east of the intersection of Park Street and Warren Road. The Carbondale Township Fire Department is just west of the study area.

Figure 2: Reverse Curve

Safety Analysis

The frequency of crashes by year is shown in **Figure 3**. There are **13 total crashes** on the corridor between 2014 to 2018. The year 2017 had the most crashes at four compared to the 2.6 crash per year average.

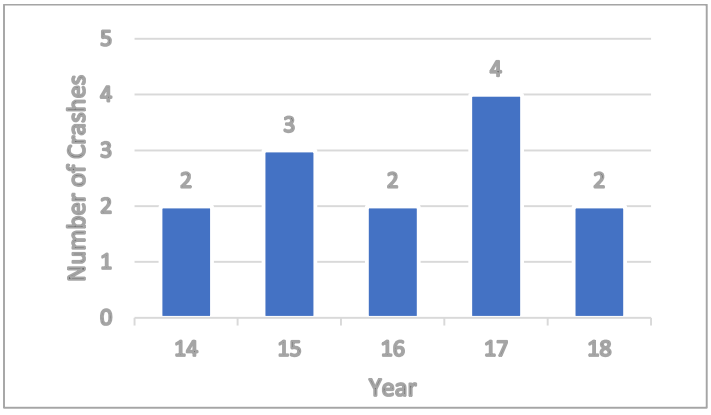


Figure 3: Frequency of Crashes by Year

The distribution of crashes by type is shown in **Figure 4**. The majority of crashes on the segment are fixed object crashes at 69 percent. Four of the fixed object crashes involved a driver was alcohol or drug impaired.

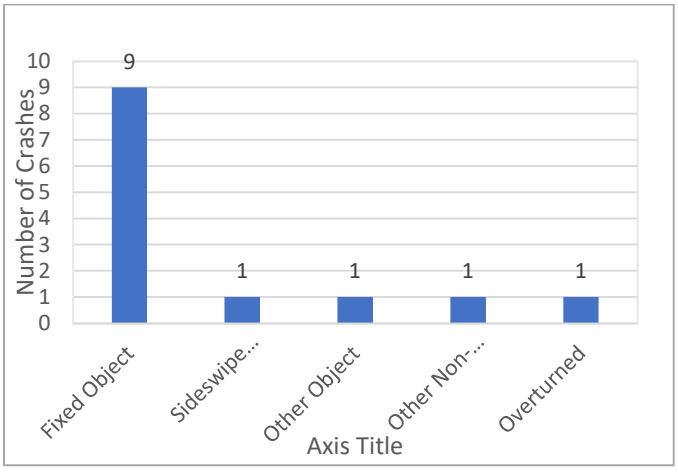


Figure 4: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 5**. 47 percent of the crashes were property damage only and 53 percent were injury. A-injury crashes consisted of two fixed object crashes and one sideswipe same direction crash.

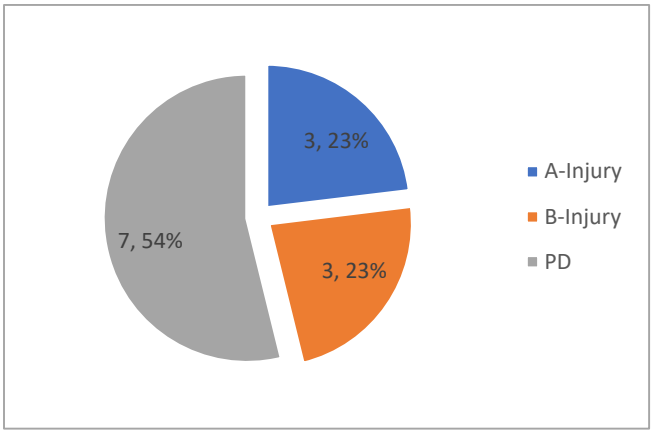


Figure 5: Frequency of Crashes by Severity

In **Figure 6**, the chart shows the frequency by direction and crash type. 65 percent of crashes were in the eastbound direction.

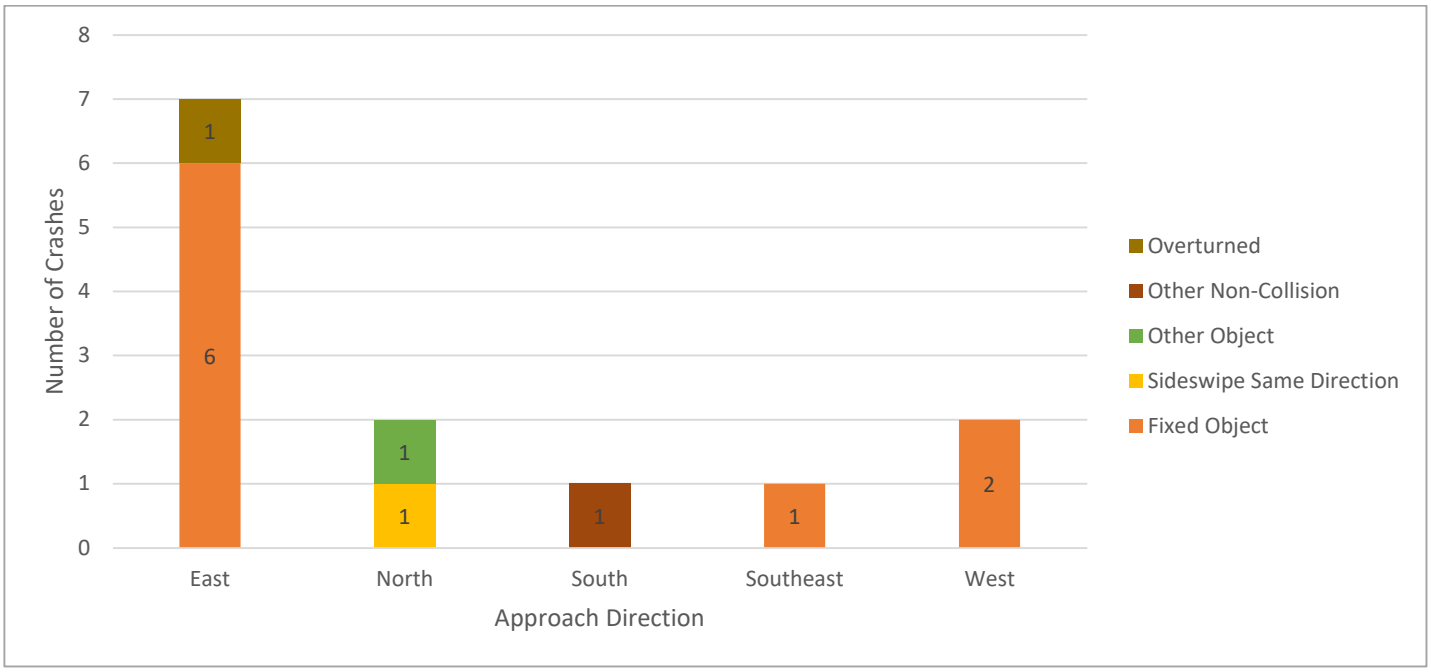


Figure 6: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 8**, below. The crashes increase at 12 midnight to 1am.

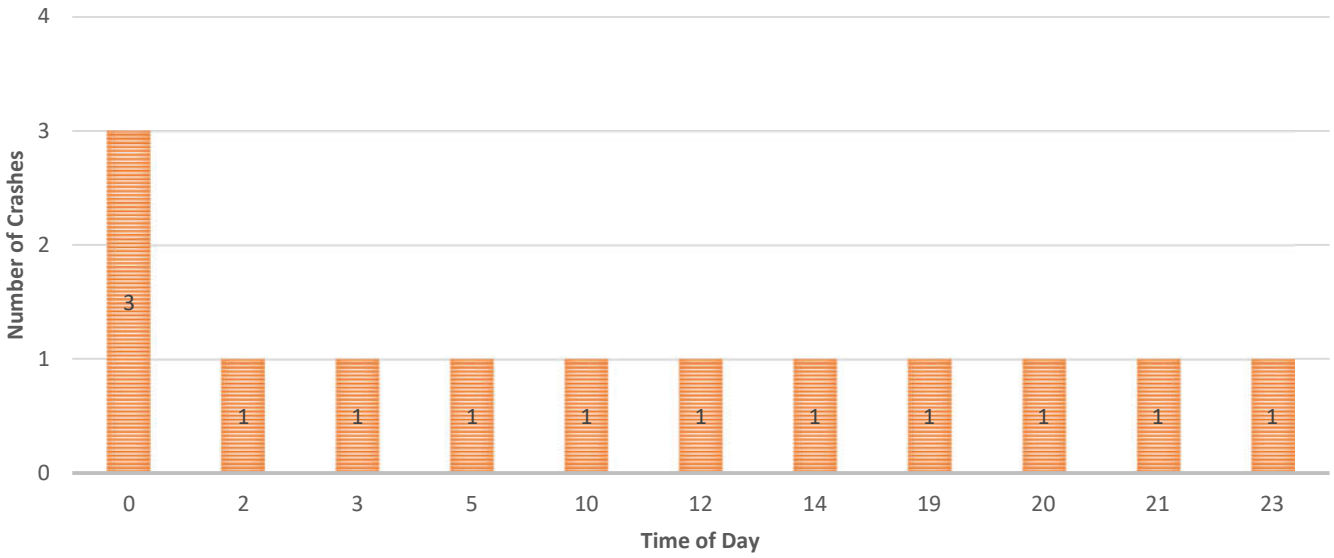


Figure 8: Frequency of Crashes by Hour

The frequency of weather crashes is shown in **Figure 9** below. The majority of crashes occurred on clear days (77%).

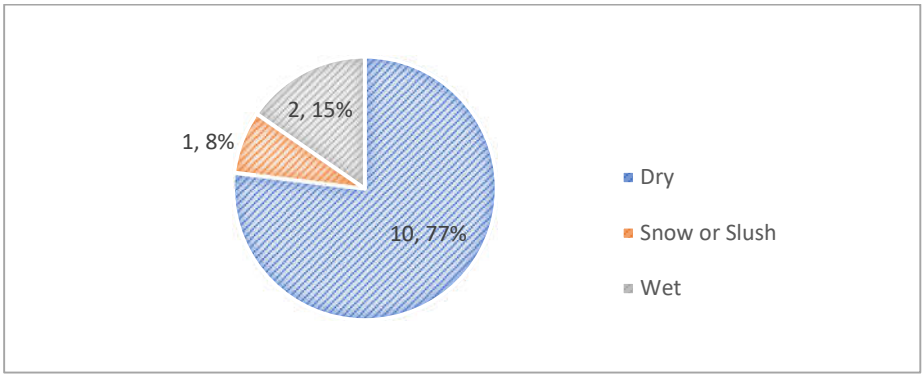


Figure 9: Frequency of Crashes by Road Condition

The frequency of crashes related to lighting conditions is shown in **Figure 10** below. Only 31% of crashes occurred during the dawn/day, with **69% non-daylight crashes**.

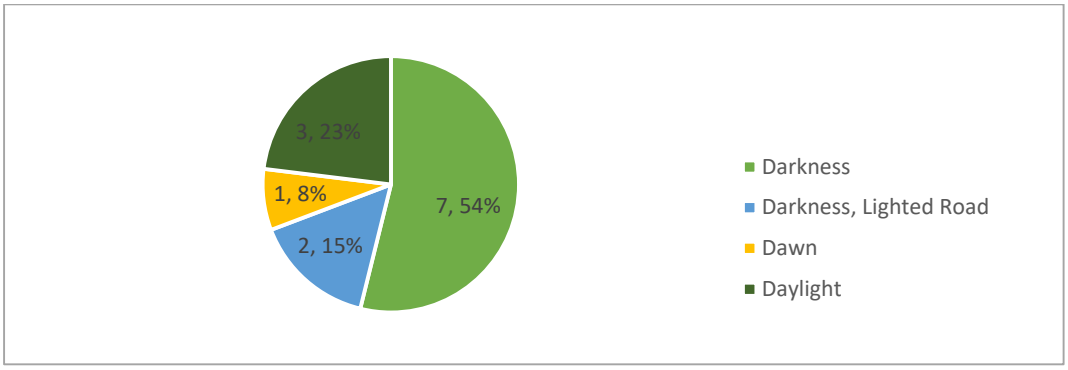


Figure 10: Frequency of Crashes by Lighting

The frequency of crashes related to Month is shown in **Figure 11** below.

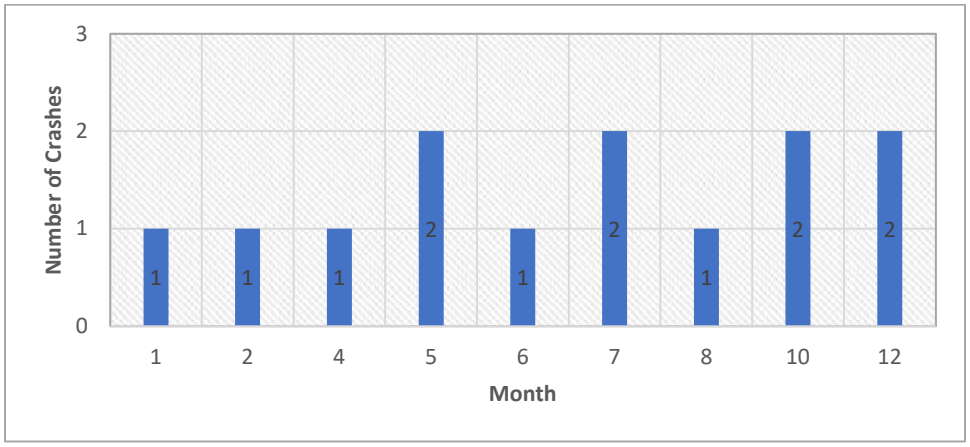


Figure 11: Frequency of Crashes by Month

Areas of Concern and Possible Countermeasures

Areas of Concern

Park Street, between Brush Hill and Giant City Road, is a two-lane road segment. The road is curvy and has a downgrade from the west to the east. In addition, there is less than optimal sight distance approaching Brush Hill Road. In the five-year period, there were 13 total crashes, nine of which were fixed objects. There were three A-injury and three B-injury crashes, three of which were fixed object crashes.

Based on the crash data, it appears that motorists are not seeing the relatively minor curves and leaving the roadway. The dark conditions and the and the downhill grade (speed) also play a factor in the safety conditions.

Countermeasures

To address vehicles leaving the roadway, there are several safety countermeasures that can be considered. First are the curves; improving the curve warning signs and/or providing chevron signs in the curves to better warn drivers of upcoming curves and to keep vehicles from veering off the road. The chevrons should be installed with retroreflective sheeting while the curve warning signs should be installed with fluorescent sheeting. The improved signs will better warn drivers at night or in dark conditions when it is more challenging to see the upcoming curves. In order to make the sign assemblies extra visible at night, reflective posts strips are recommended to make signs and roadside objects more visible to drivers.

The vertical curve near Brush Hill Road can also cause sight distance issues. It is recommended to install a “Hill Blocks View” warning sign (MUTCD W7-6) and advisory plaque to warn westbound drivers of the condition near Brush Hill Road.

A large percentage of crashes are eastbound and “downhill”, therefore increased speed is a concern. A speed feedback sign to show the speed of motorist traveling eastbound at a strategic location could help motorists realize the speed at which they are traveling at and the need to decrease vehicle speed accordingly. A speed feedback sign between Brush Hill Road and Warren Road is recommended to show the speeds of eastbound vehicles.

Improving the lighting along the roadway to reduce fixed object at nighttime crashes could be considered but could also add more fixed objects along the side of the road.

Finally, a more costly option is to widen shoulders to provide additional recovery area for vehicles if they do leave the roadway. Rumble strips could also be considered to warn drivers when they are about to leave the roadway and to give drivers a chance to correct their vehicle path before running off the road. However, the residential area should also be contemplated when considering rumples, as the noise may be a nuisance to the residents that live in the area.

Figure 12 shows a concept for the shoulder widening, chevron signs on a curve, a speed feedback sign for eastbound vehicles and a “Hill Blocks View” sign for westbound vehicles.

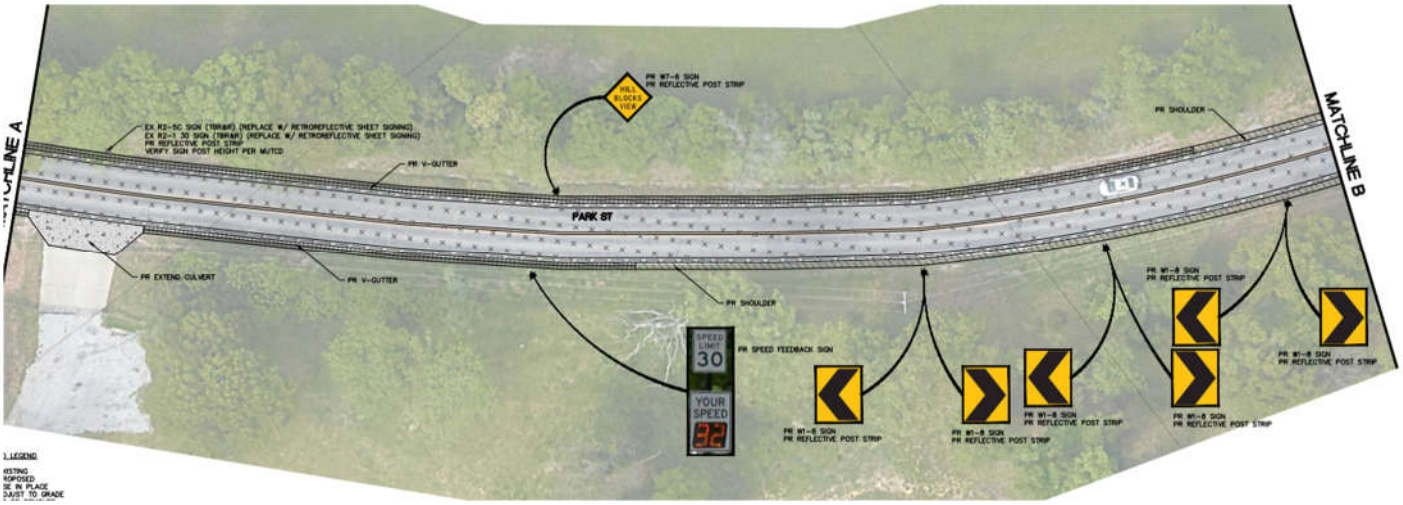
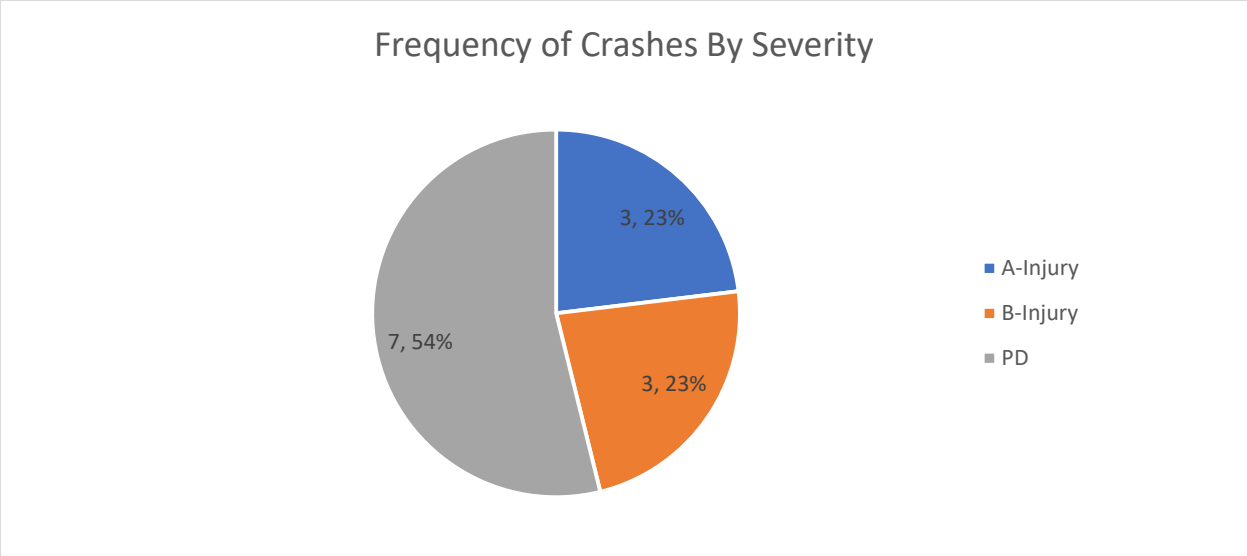
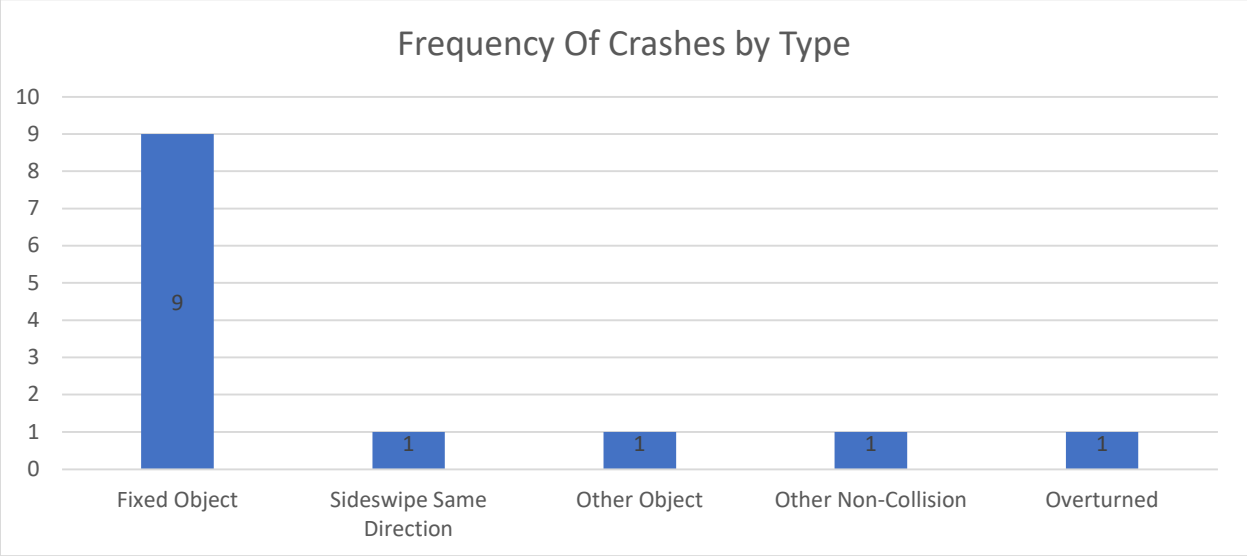
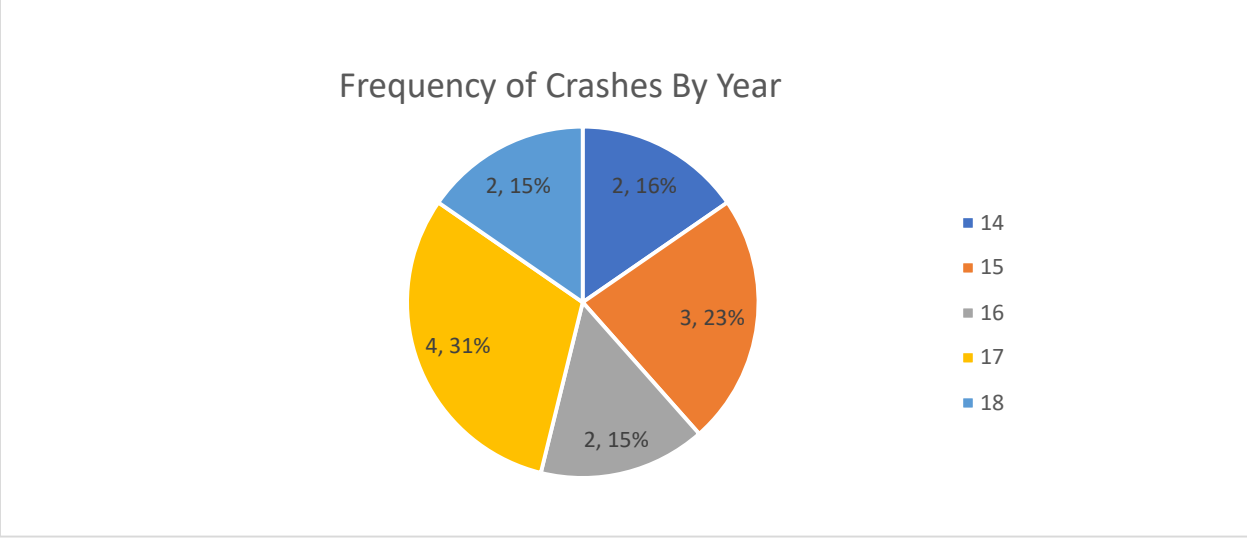


Figure 12: Concept illustrating several safety countermeasures, east of Brush Hill Road

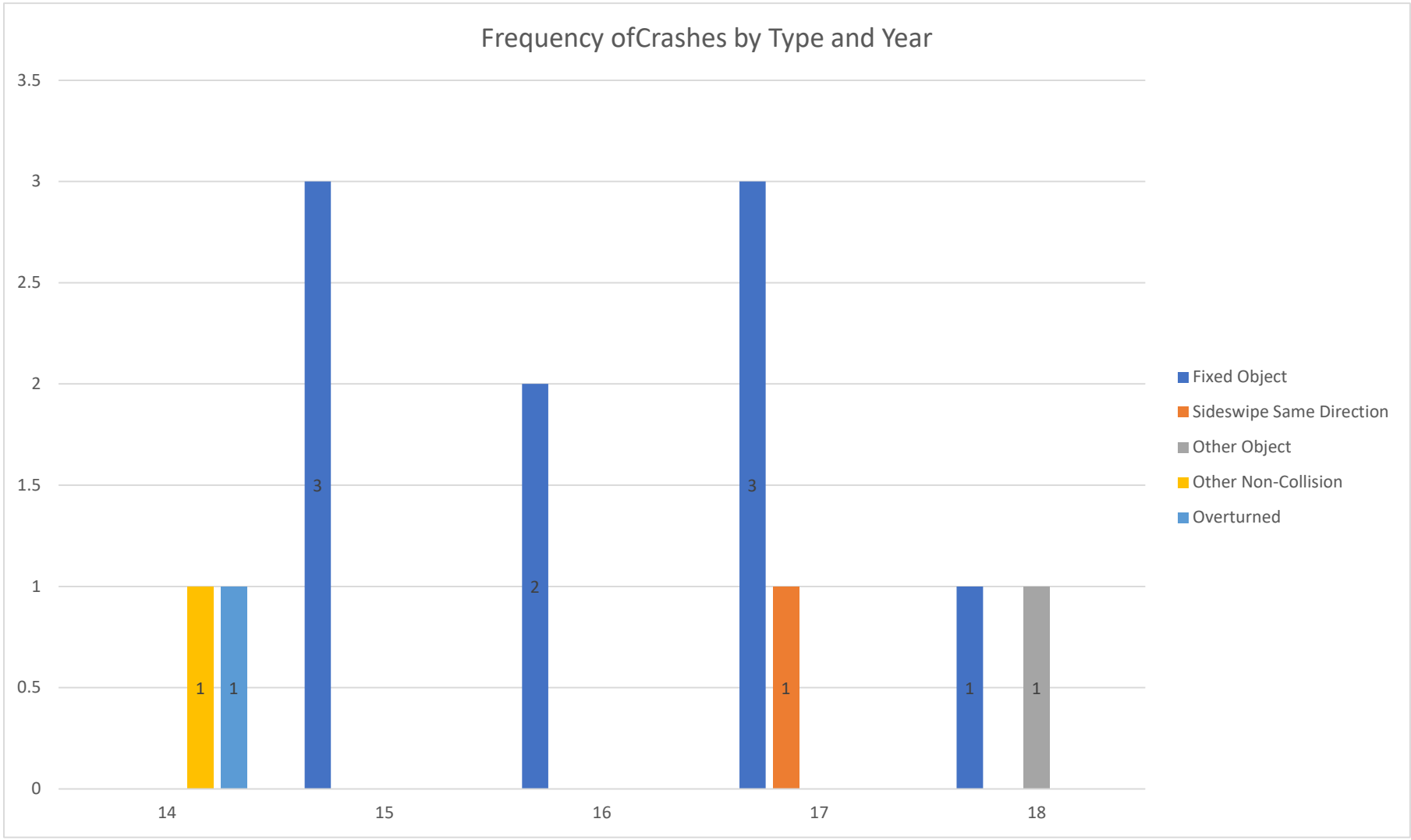
Segment of Park Street - Brush Hill Road to Giant City Road (2014-2018)







Segment of Park Street - Brush Hill Road to Giant City Road (2014-2018)



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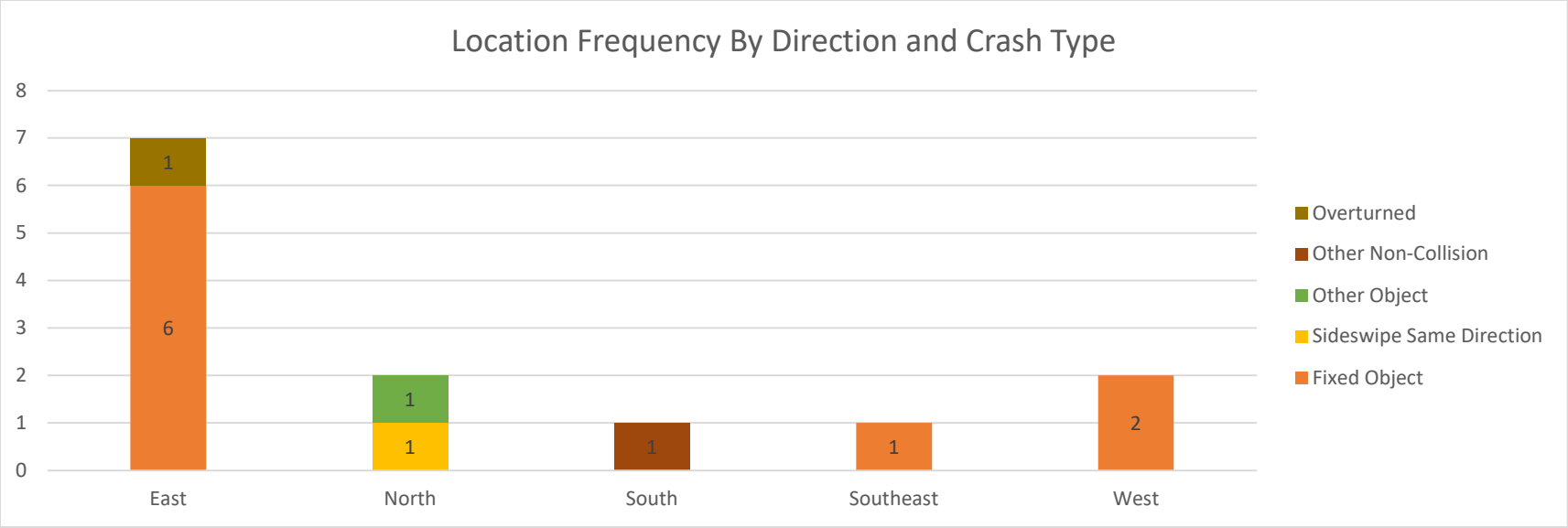

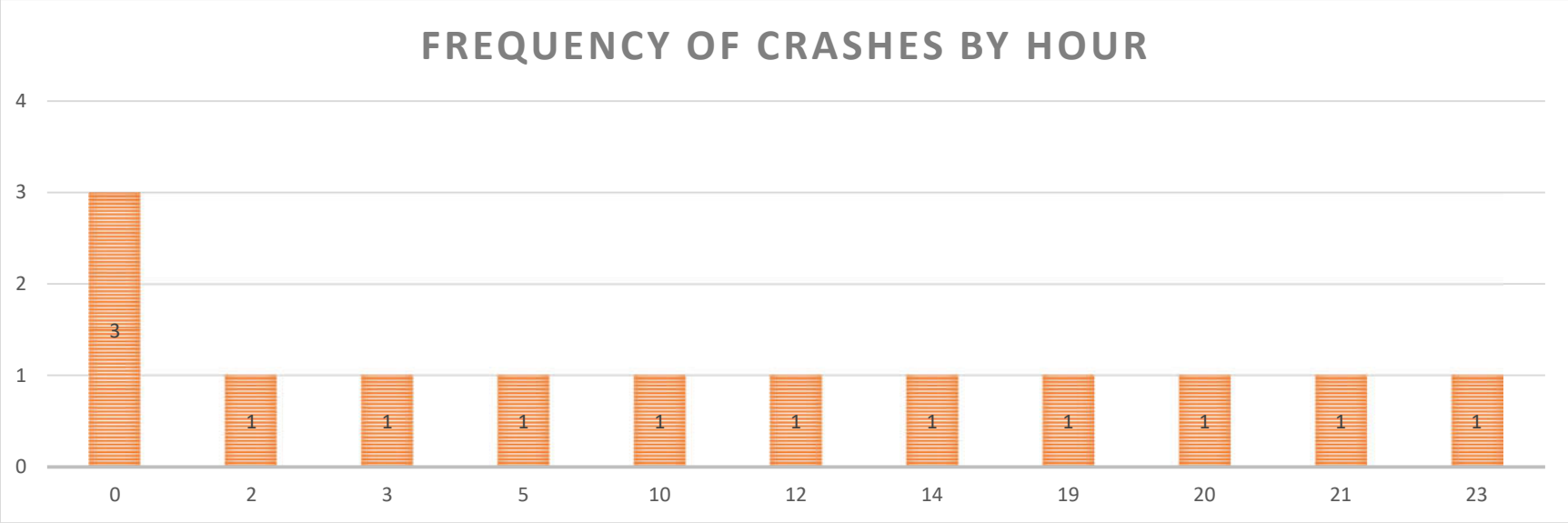

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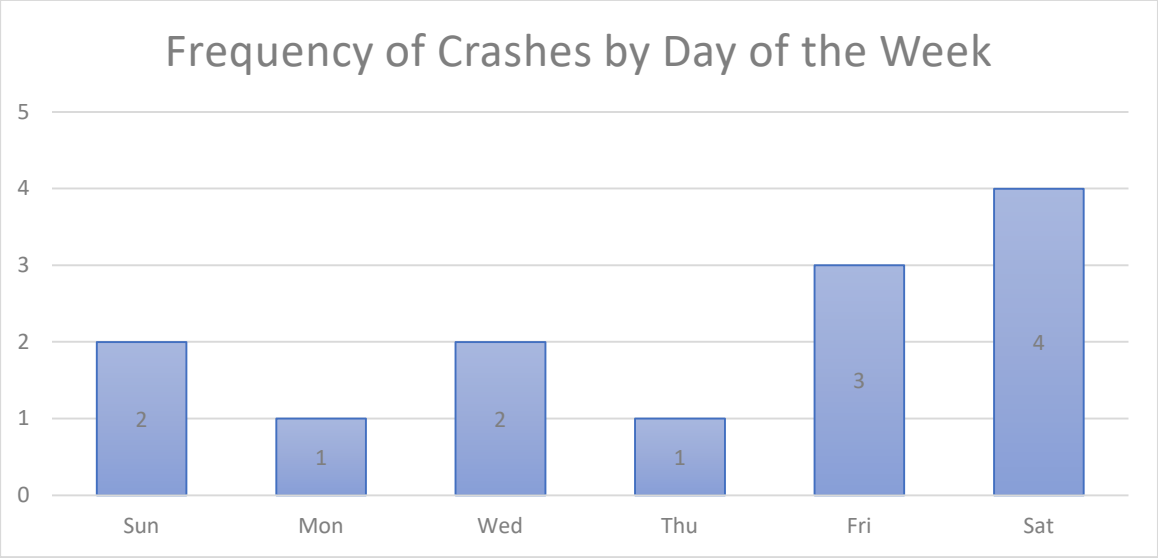
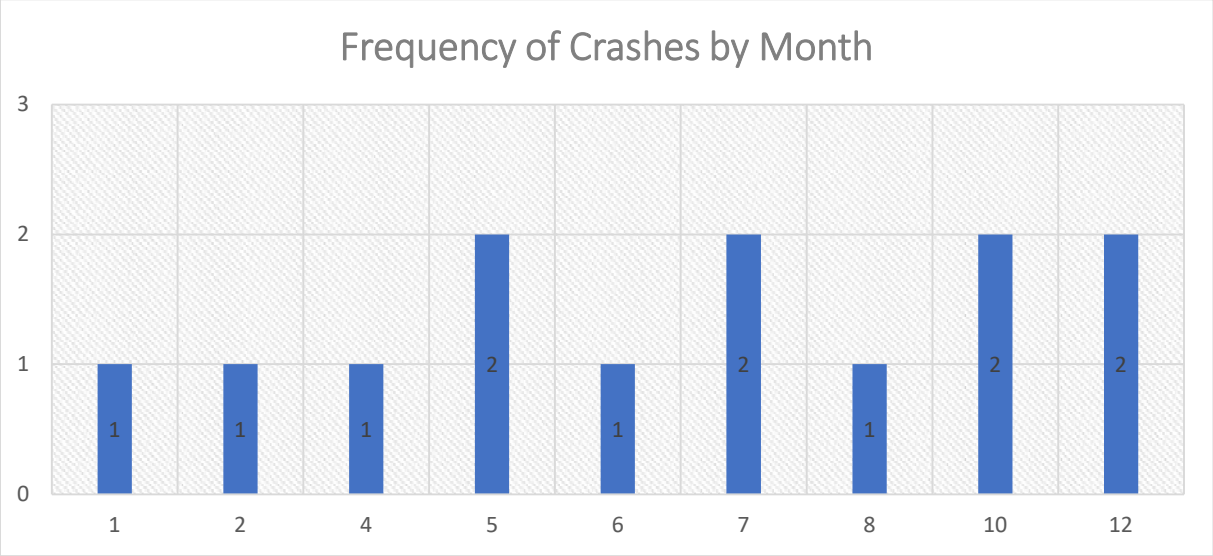
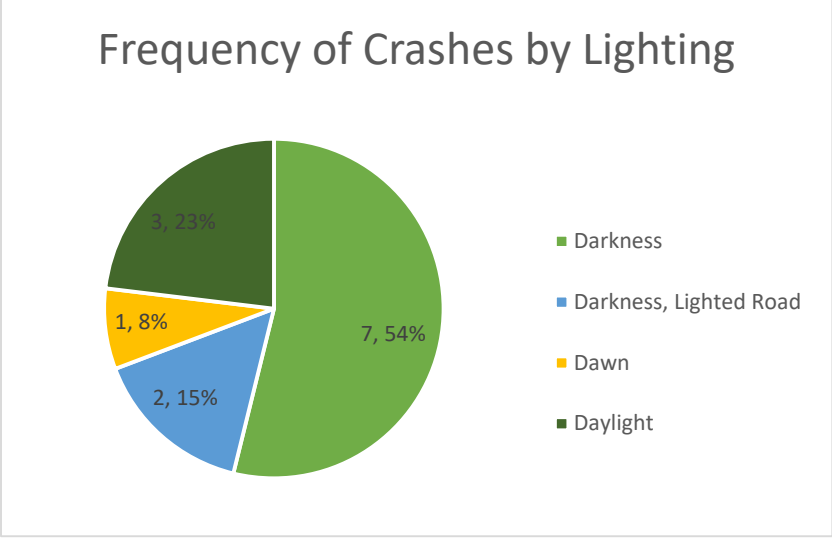
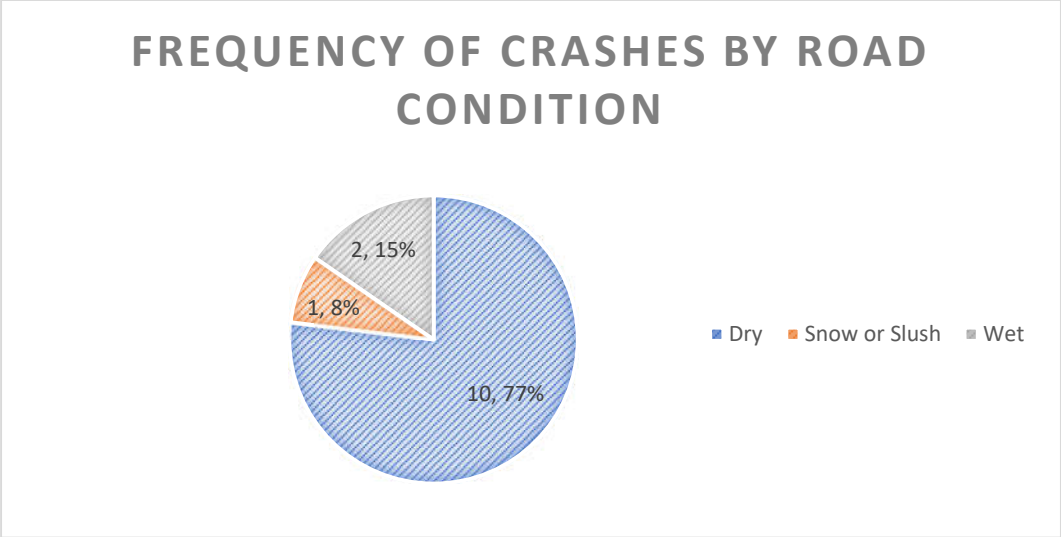
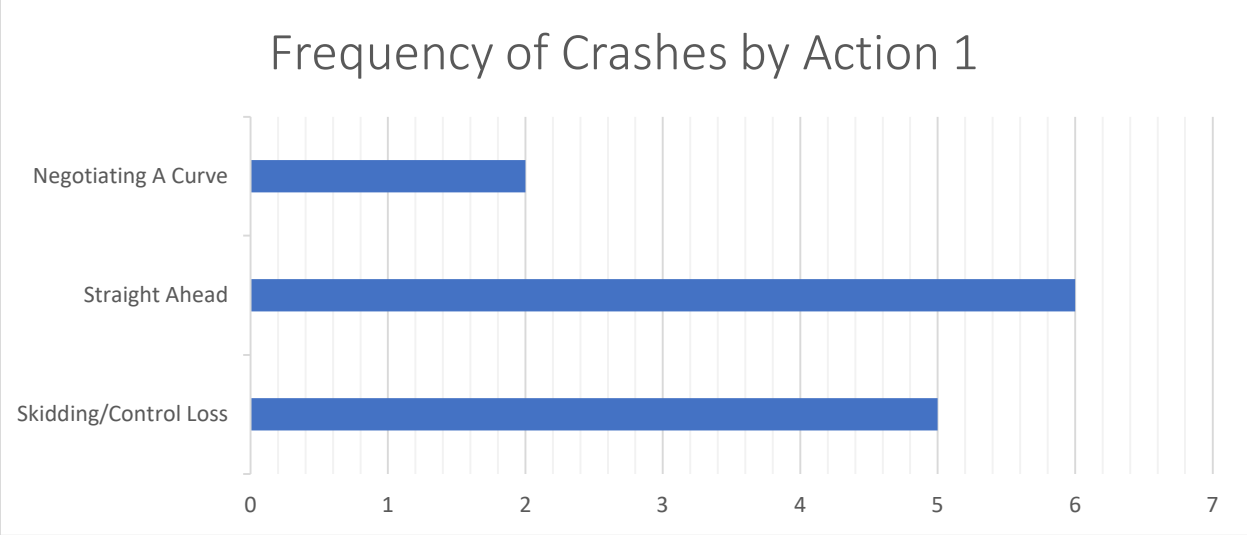


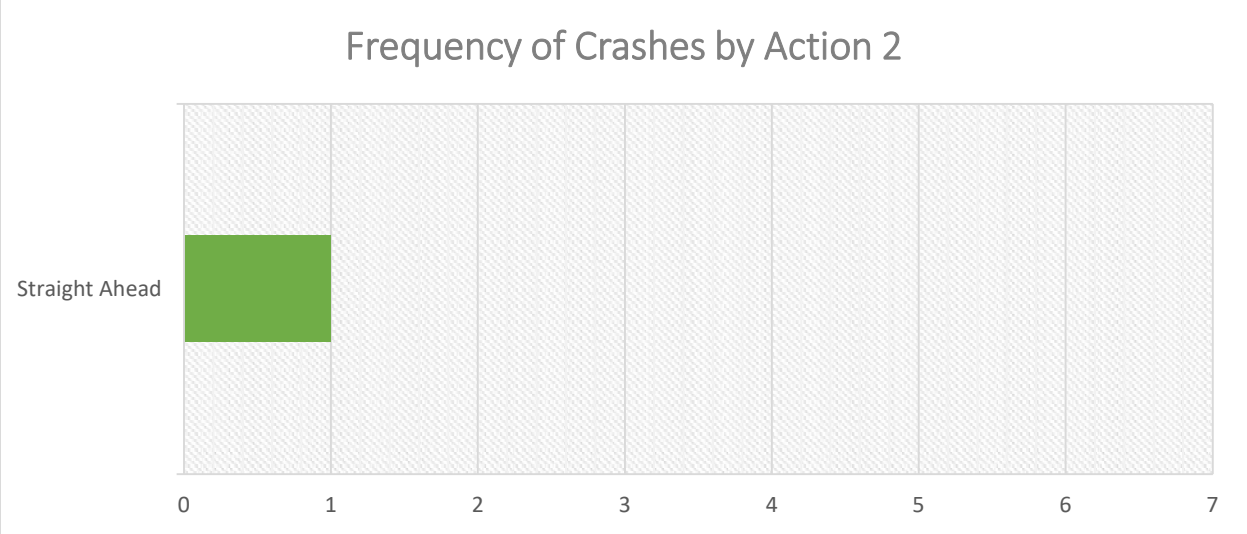




Segment of Park Street - Brush Hill Road to Giant City Road (2014-2018)







CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE
201400299357	14	10	25	19	Sat	1	2	0	Overturned	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Motorcycle (Over 150cc)	East	Skidding/Control Loss	Off Pavement - Right						B-Injury
201400317471	14	8	10	2	Sun	1	0	0	Other Non-Collision	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Motorcycle (Over 150cc)	South	Straight Ahead	Off Pavement - Right						PD
201501154301	15	7	25	12	Sat	1	1	0	Fixed Object	Clear	Daylight	Dry	No Controls	Unincorporated	Alcohol Impaired	Pickup	East	Skidding/Control Loss	Off Pavement - Right						A-Injury
201501228585	15	2	18	0	Wed	1	0	0	Fixed Object	Snow	Darkness, Lighted Road	Snow or Slush	No Controls	Unincorporated	Normal	Passenger	Southeast	Skidding/Control Loss	Off Pavement - Right						PD
201501270818	15	12	4	0	Fri	1	0	0	Fixed Object	Clear	Darkness	Dry	Lane Use Marking	Unincorporated	Had Been Drinking	Passenger	East	Negotiating A Curve	Off Pavement - Left						PD
201601099213	16	4	28	23	Thu	1	0	0	Fixed Object	Clear	Darkness	Dry	No Controls	Unincorporated	Alcohol Impaired	Pickup	East	Straight Ahead	Off Pavement - Right						PD
201601387281	16	5	7	0	Sat	1	0	0	Fixed Object	Clear	Darkness, Lighted Road	Dry	No Controls	Carbondale	Drug Impaired	Passenger	West	Skidding/Control Loss	Off Pavement - Left						PD
201701178193	17	7	14	3	Fri	2	1	0	Sideswipe Same Direction	Rain	Darkness	Wet	Stop Sign/Flasher	Unincorporated	Had Been Drinking	SUV	North	Skidding/Control Loss	Off Pavement - Right	Other/Unknown	Passenger	North	Straight Ahead	On Pavement (Roadway)	A-Injury
201701357998	17	12	29	14	Fri	1	0	0	Fixed Object	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	East	Negotiating A Curve	Off Pavement - Right						PD
201701363171	17	1	4	20	Wed	1	1	0	Fixed Object	Clear	Darkness	Dry	No Controls	Unincorporated	Removed By EMS	Passenger	East	Straight Ahead	Off Pavement - Right						A-Injury
201701418831	17	5	13	5	Sat	1	1	0	Fixed Object	Clear	Dawn	Dry	No Controls	Carbondale	Alcohol Impaired	SUV	East	Straight Ahead	Off Pavement - Left						B-Injury
201801168910	18	6	4	21	Mon	1	1	0	Other Object	Clear	Darkness	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	North	Straight Ahead	Intersection						B-Injury
201801317046	18	10	14	10	Sun	1	0	0	Fixed Object	Cloudy/Overcast	Daylight	Wet	No Controls	Unincorporated	Normal	Passenger	West	Straight Ahead	Off Pavement - Right						PD

SIMPO SAFETY STUDY

Appendix : North Giant City Road Corridor

East Main Frontage Road to Sunny Acres

prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

Giant City Road Corridor – East Main Frontage Road South to Sunny Acres Road

Introduction

The corridor includes the Giant City Road segment from East Main Frontage Road South to Sunny Acres Road, as well as the intersection of Giant City Road and East Main Frontage Road South and the intersection of Giant City Road and Sunny Acres Road. The segment is about .30 miles long. **Figure 1** shows the study area and includes the markers of the two intersections mentioned above.

Figure 1: Study Area

Existing Conditions

Giant City Road is located in Carbondale, Illinois within Jackson County. The corridor is in a developed area and provides access to several commercial/retail uses along the segment. The Giant City Road segment is generally a five-lane section which includes two lanes in each direction and one center lane. The entire corridor includes a curb and gutter and has a speed limit of 40 miles per hour (mph). Sidewalks are provided along both sides of the road with no marked crossing across Giant City Road. There is one crosswalk marked across the west at the intersection of Giant City Road and East Main Frontage Road South.

East Main Frontage Road South provides access to many stores and restaurants as well as the University Mall. The intersection of Giant City Road and East Main Frontage Road South is an unconventional three-way stop intersection with all movements stopping except for southbound traffic.

The East Main Frontage Road South intersection is only approximately 250 feet (centerline to centerline) south of the signalized intersection with Illinois 13. North of East Main Frontage Road South, Giant City Road widens out to provide four northbound lanes that serve the approach to Illinois 13. The frontage

roads approach to Giant City Road has "Cross Traffic From Left/Right Does Not Stop" as supplemental signs to the stop signs. The intersection of Giant City Road and East Main Frontage Road South is shown in **Figure 2.**

Figure 2: Intersection of Giant City Road and East Main Frontage Road South

The intersection at Giant City Road and Sunny Acres is a conventional side-street stop intersection with traffic on Sunny Acres Road required to stop at the approach to Giant City Road. Sunny Acres Road provides access to stores and restaurants along the corridor including the Southern Illinois Healthcare Enterprises. Carbondale Community High School is about .35 miles south of the intersection of Giant City Road and Sunny Acres. The intersection at Giant City Road and Sunny Acres Road is shown in **Figure 3.**

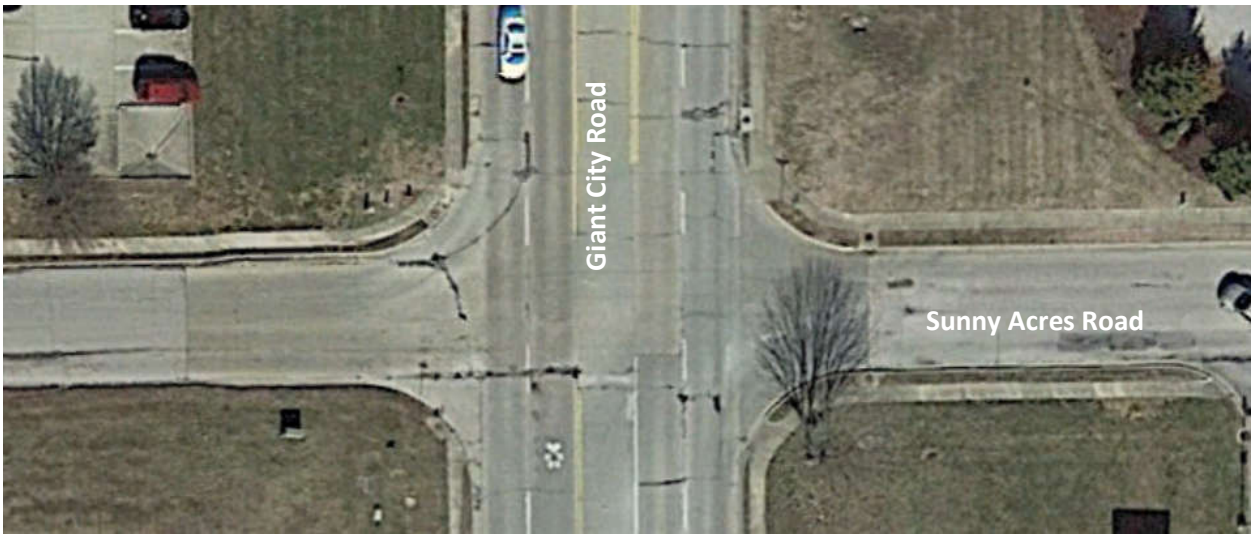


Figure 3: Intersection of Giant City Road and Sunny Acres Road

Safety Analysis

A total of 63 crashes occurred along the study corridor from 2014 to 2018. **Figure 4** shows the crash frequency by years. The crash average is 12.6 crashes per year. There is a significant spike in crashes in 2017 with 21 crashes.

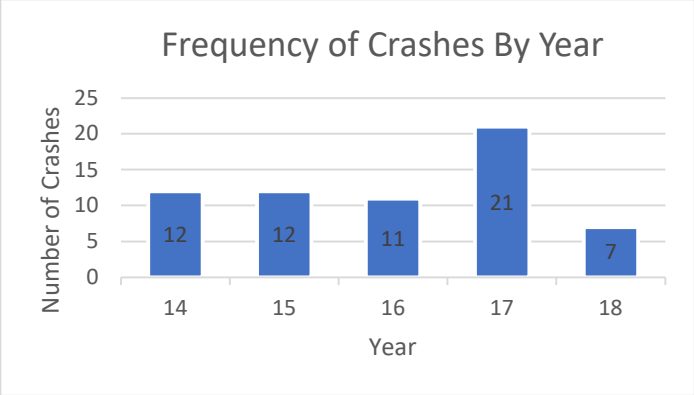


Figure 4: Frequency of Crashes by Year

The frequency of crashes by type is shown in **Figure 5.** The majority of crash types are angle and turning crashes. About 70 percent of crashes in the study corridor are at the intersections. Most of the intersection crashes are angle and turning crashes. The types of crashes on the segment are more diverse. The most common crash type on the segment are sideswipes at 42 percent.

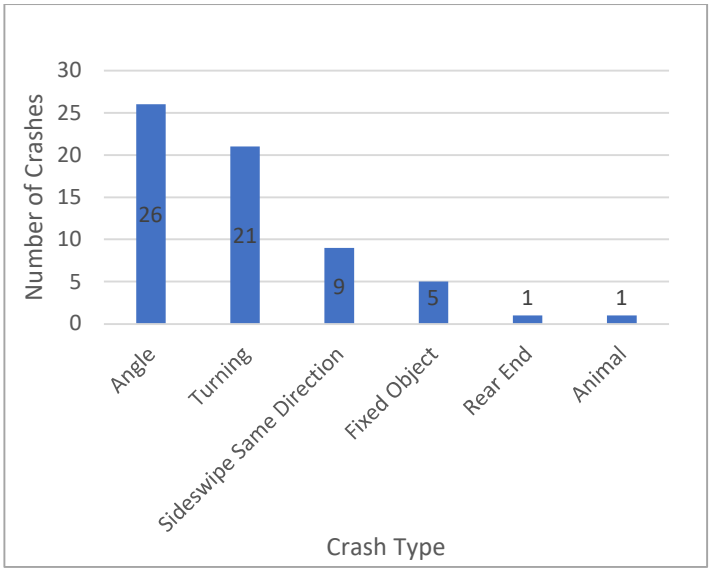


Figure 5: Frequency of Crashes by Type

Figure 6 shows frequency of crashes by severity in the study area. The majority of the crashes are only property damage at 78 percent. There were no fatal crashes on the corridor. The five A-Injury crashes were all angle crashes. About 79 percent of the injury crashes happened at one of the intersections mentioned above.

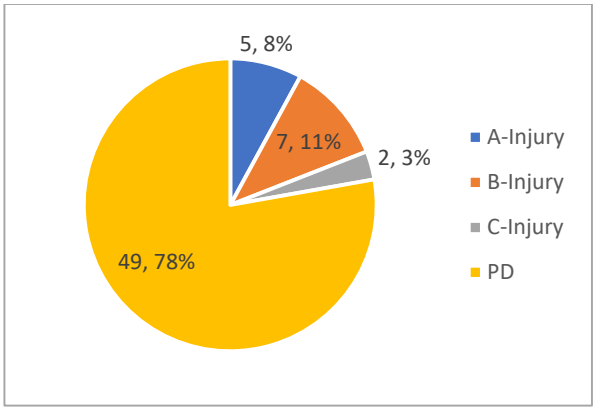


Figure 6: Frequency of Crashes by Severity

The location frequency by direction and crash type is shown in **Figure 7**. The majority of crashes involve westbound vehicles at 38 percent. There are 19 angle crashes with westbound vehicles and 5 angle crashes with eastbound vehicles. Turning crashes are about evenly distributed in each direction.

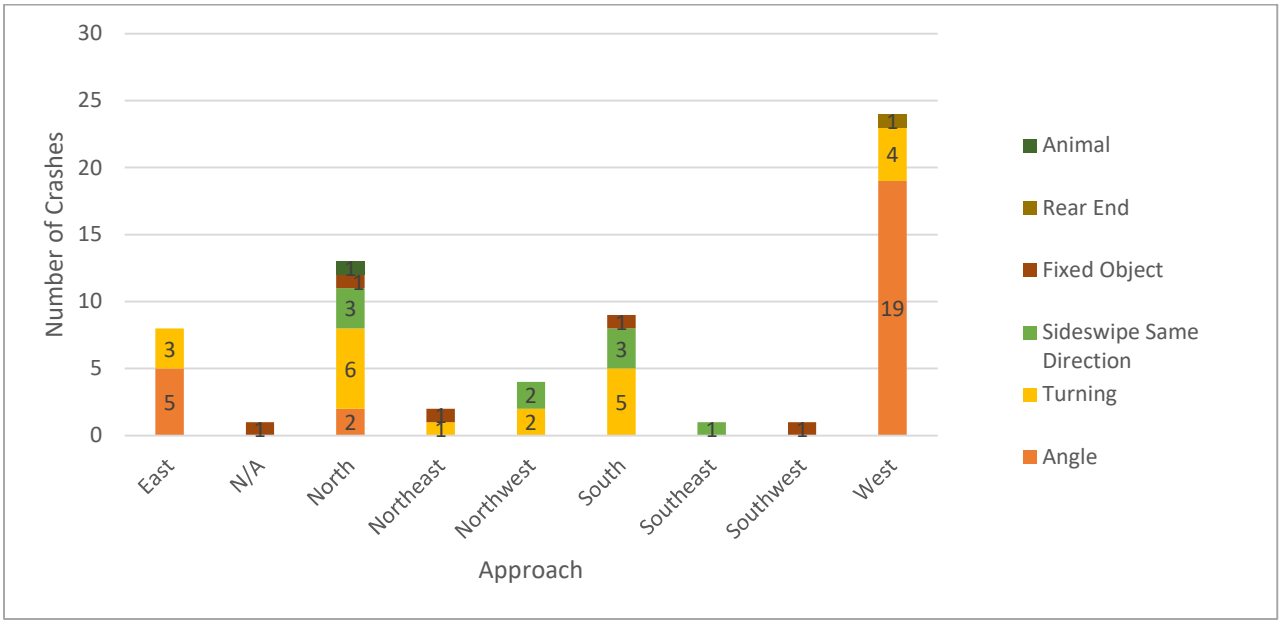


Figure 7: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour chart shows that crashes peak in the afternoon and start to decrease after the evening peak hour. The chart can be seen in **Figure 8**.

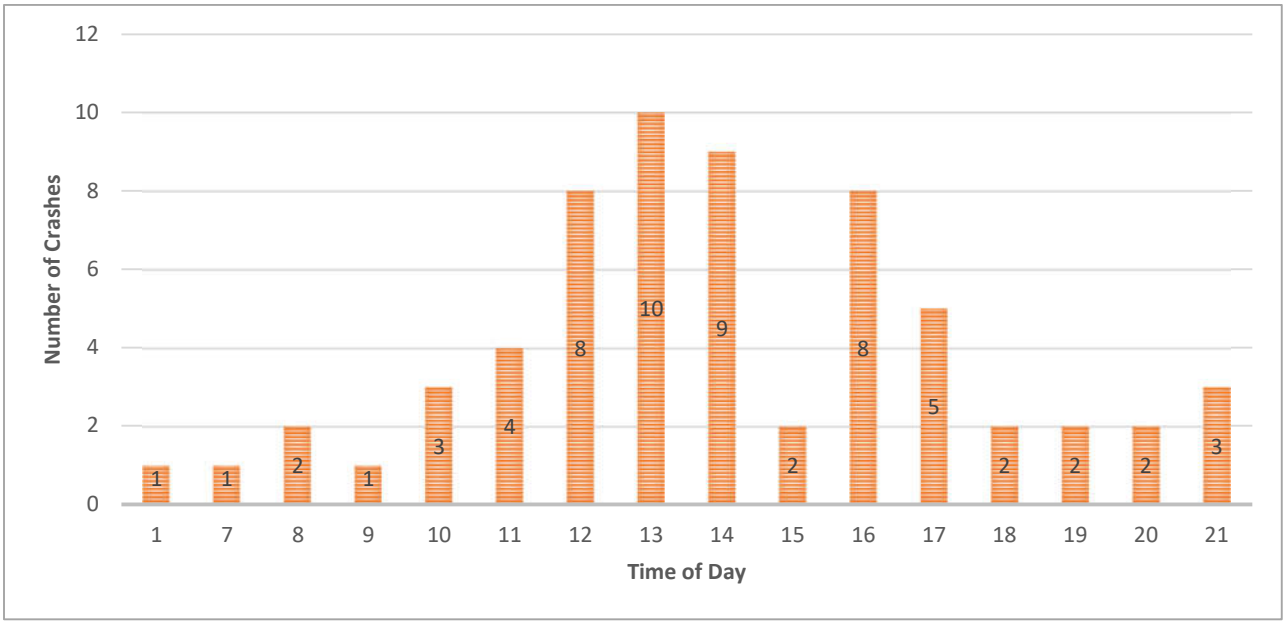


Figure 8: Frequency of Crashes by Hour

The weather condition is shown in **Figure 9**. The majority of crashes occurred on clear days (79%)

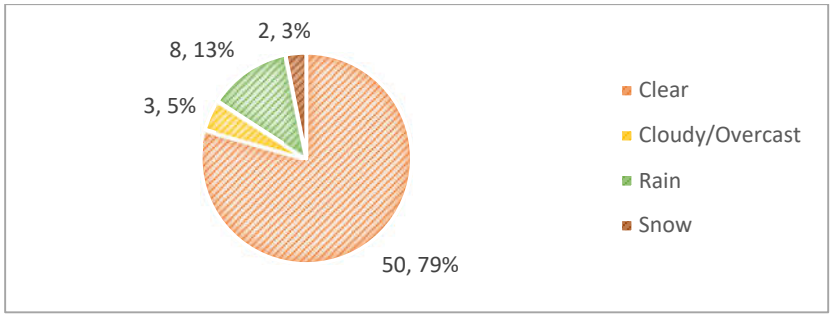


Figure 9: Frequency of Crashes by Weather

The lighting condition is shown in **Figure 10**. The majority of crashes occurred during daylight hours (78%)

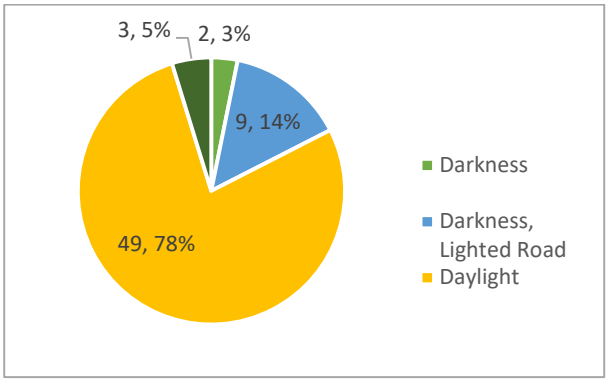


Figure 10: Frequency of Crashes by Lighting

The crash frequency by month is shown in **Figure 11.** A spike in crashes occurred in April (4) and August (8).

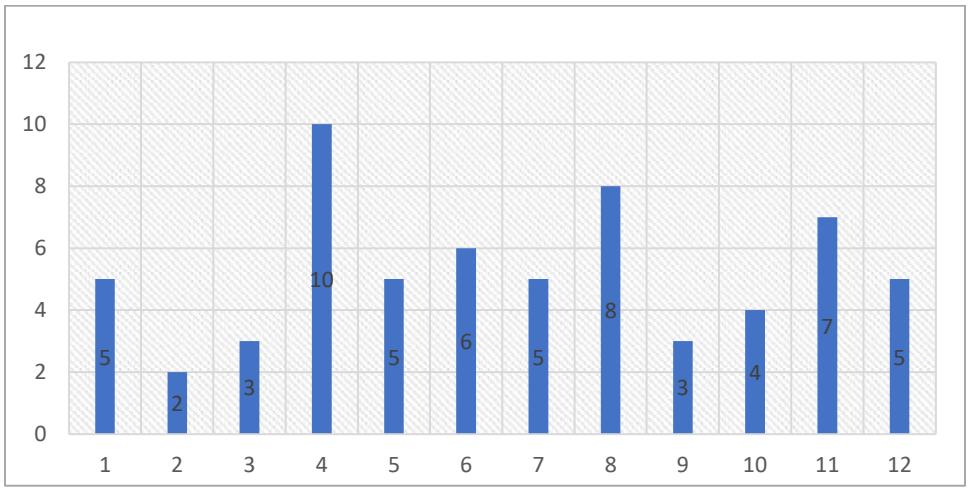


Figure 11: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures – East Main Frontage Road South and Giant City Road Intersection

Areas of Concern

The East Main Frontage Road South is less than 200 feet from IL 13 and the queues from the signal impact the East Main Frontage Road South intersection. The intersection is currently controlled by an unconventional three-way stop with southbound N. Giant City Road "free flow" and all other approaches stop-controlled.

28 out of the 63 total crashes on the corridor occurred at the intersection of Giant City Road and East Main Frontage Road South. Most crashes involved vehicles from the side street and 20 of the crashes involved a southbound vehicle on Giant City Road. There were 14 angle crashes with four resulting in injuries, and 13 were turning crashes resulting in one injury. Some crash reports specify the queue from the signal impacts visibility for the westbound through and left-turns at the intersection. The crash data indicates that the westbound vehicle was involved in nearly half of the intersection crashes.

Countermeasures

The signing and striping could be refreshed at the intersection to improve marking and signing visibility. Skip dashes could be added to the northbound left-turn to clarify the left-turn lane is for turning onto the East Main Frontage Road South and not the left turn lane at Illinois 13.

Consideration could be given to adding a second northbound stop sign in the middle of the road with a 4-foot wide median. Consideration could also be given to installing flashing LED stop signs, but the flashing LED stop signs are installed to make the stop signs more noticeable to drivers where vehicles missing the stop signs. Unfortunately, it appears that motorists do see the stop signs, but the queuing and impacts for the Illinois 13 intersection are more of an issue.

In order to reduce the angle and turning crashes, restricting left-turns from the side-street is recommended. Should turns be restricted at this location, alternative access routes should be available. Restrictions could be accomplished in many different levels with varying degrees of effectiveness and safety benefits. For example, side-street turns could be restricted by signage, pavement markings, and/or enforcement, but the compliance maybe poor. One option is to restrict side street lefts at certain times of the day by posting signs and enforcing the signs. Typically, turns would be prohibited when there are long queues and delays, i.e. the peak hours.

The following summarize options for physically restricting access starting with the least intrusive and progressing to most intrusive. Again, alternative routes should be available when restricting turns.

Option 1 - "partial pork chop" island on the east leg of the intersection to physically limit the ability to make westbound left-turns. A redline drawing over the aerial is shown in **Figure 12**.

Option 2 - Full "pork chop" islands on both side-street legs, see **Figure 13**.

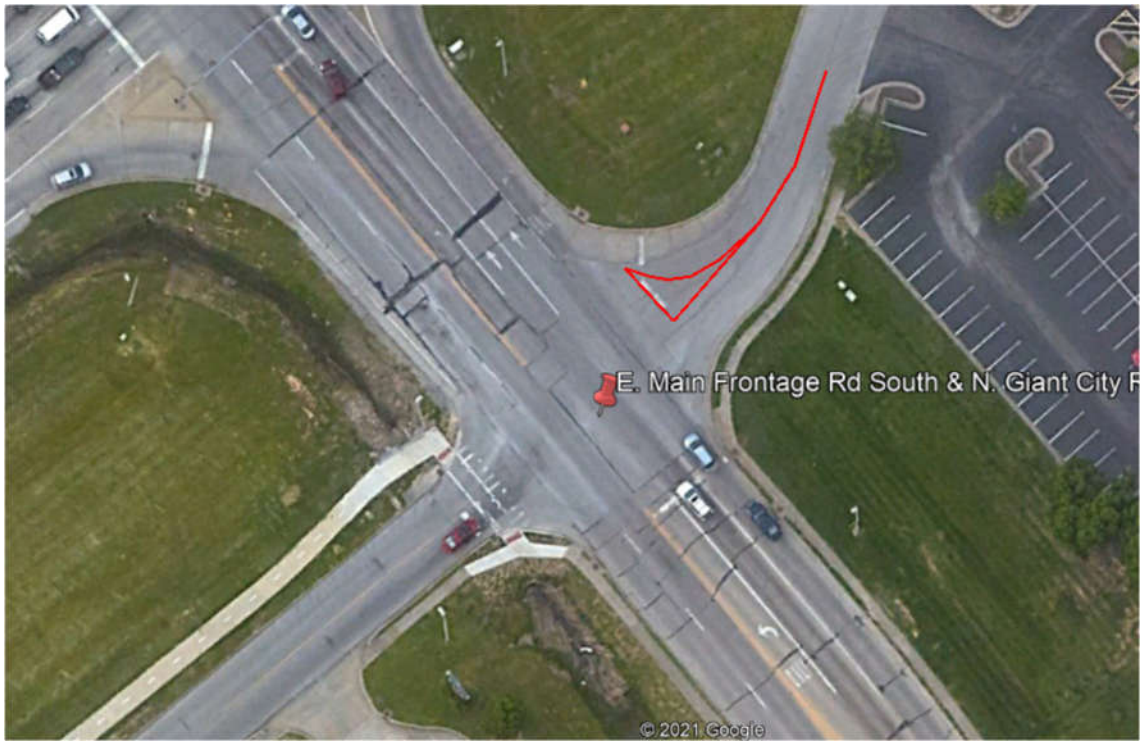


Figure 12: Example of Westbound Left-Turn Restriction with Partial "Porkchop Island"

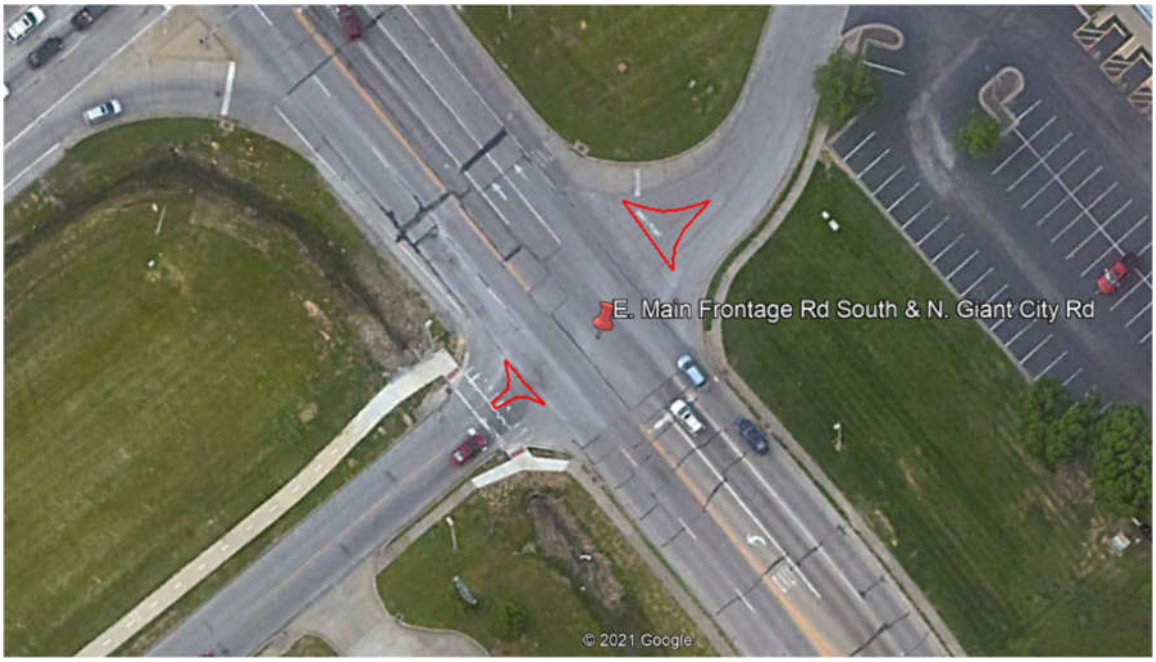


Figure 13: Example of "Porkchop Islands" on Frontage Road

Option 3 - Restrict all left-turns at the intersection with a center median on N. Giant City Road, see **Figure 14**.

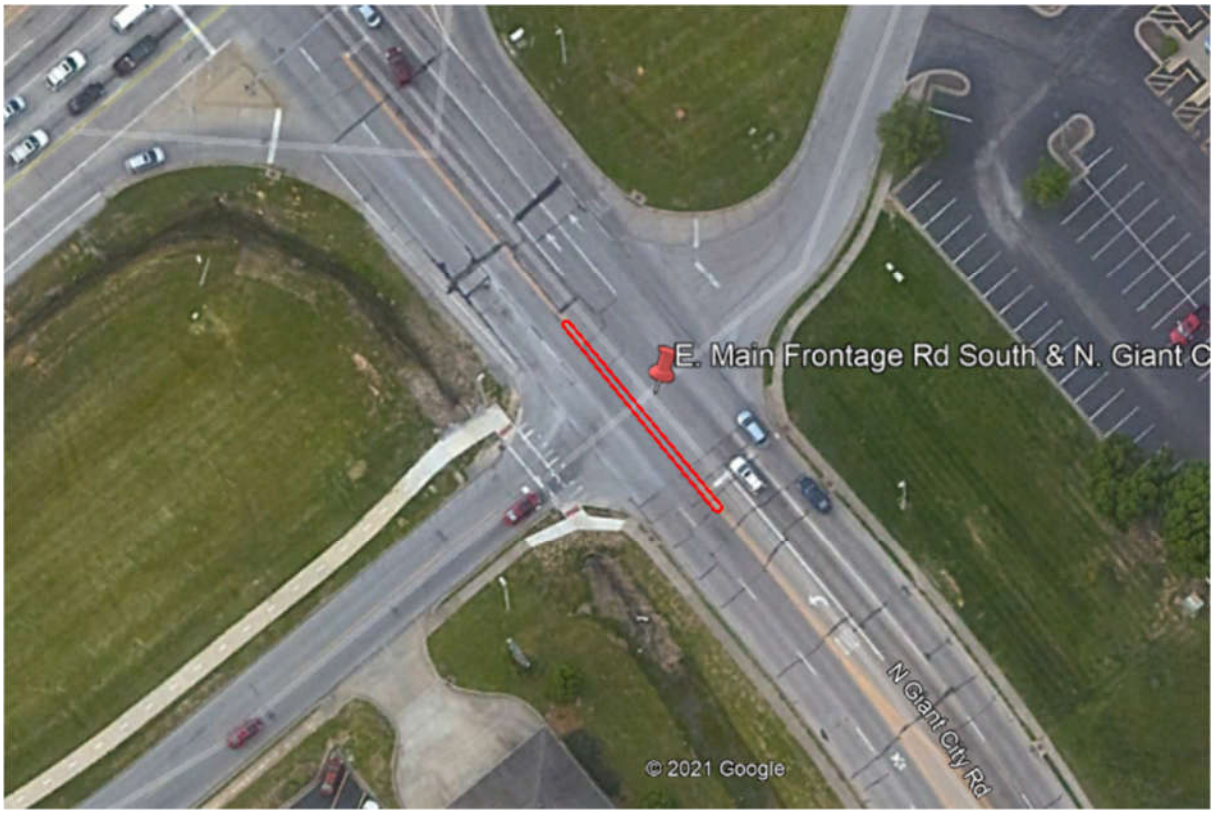


Figure 14: Example of Center Medians to restrict Frontage Access to Right-in/Right-out

On a larger scale, a roundabout could be evaluated at the intersection. Though, the roundabout requires a large footprint and will have operational impacts to the adjacent signal at IL 13 that would need to be addressed. FHWA recommends an inscribed circle diameter range of 105' to 250' for a two-lane roundabout.[1] **Figure 15** shows a 115 foot radius (230' diameter) circle, which represents the typical footprint that would likely be impacted by a two-lane roundabout.

[1] https://www.fhwa.dot.gov/publications/research/safety/00067/000676.pdf

Figure 15: Potential Footprint of Roundabout (230' diameter)

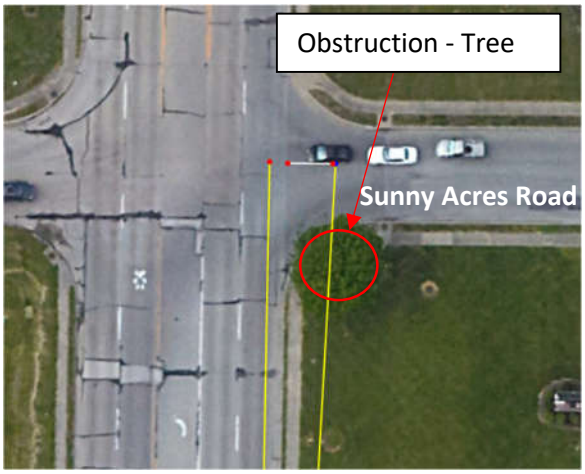
Areas of Concern and Possible Countermeasures – Giant City Rd and Sunny Acres Road Intersection

Areas of Concern

N. Giant City Road and E. Sunny Acres Road is a side-street stop intersection. There were 16 crashes that occurred at the intersection with the most common crashes consisting of angle and turning crashes. One A-Injury was reported as an angle crash involving a westbound vehicle and a northbound vehicle. A large majority of the angle/turning crashes involved eastbound or westbound vehicles. The landscaping along N. Giant City Road appears to create sight distance issues with trees offset only a short distance from the edge of the roadway and in the corner of the intersection.

Countermeasures

It is recommended that sight distance be improved by removing obstructions from the intersection sight triangle. Also consider implementing an annual vegetation maintenance program and/or revising landscaping requirements for future developments along Giant City Road to minimize landscaping in the sight triangle. AASHTO recommends 565 feet of intersection sight distance for left-turns on the side street for 45 mph design speed of major road and five-lane cross-section. Additionally, stop bars can be provided on both side street stop approaches for a visual cue for vehicles to stop.



Areas of Concern and Possible Countermeasures – Segment of Giant City Road between East Main Frontage Road South and Sunny Acres Rd

Areas of Concern

There were 19 of the 63 total crashes along East Main Frontage Road South that occurred between Sunny Acres Road and Giant City Road. Of the 19 crashes, eight were sideswipe, all of which were property-damage-only crashes, four were angle crashes, three were turning, and three were fixed object crashes. Two of the angle crashes were A-injuries. Many of the angle and turning crashes were entrance related.

Countermeasures

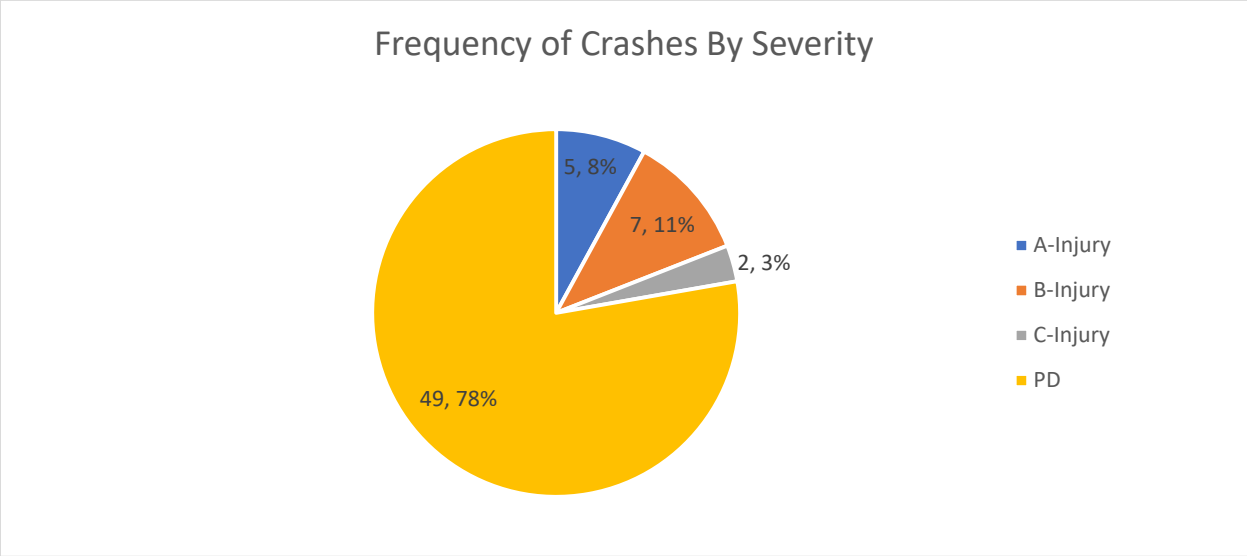
Again, less than optimal sight distance appears to continue along the corridor and impact driveways. To reduce angle/rear end crashes, remove obstructions from sight triangles at/near driveways. Annual vegetation maintenance and revising landscaping requirements for future developments to minimize landscaping in the sight triangle should be considered. AASHTO recommends 565 feet of intersection sight

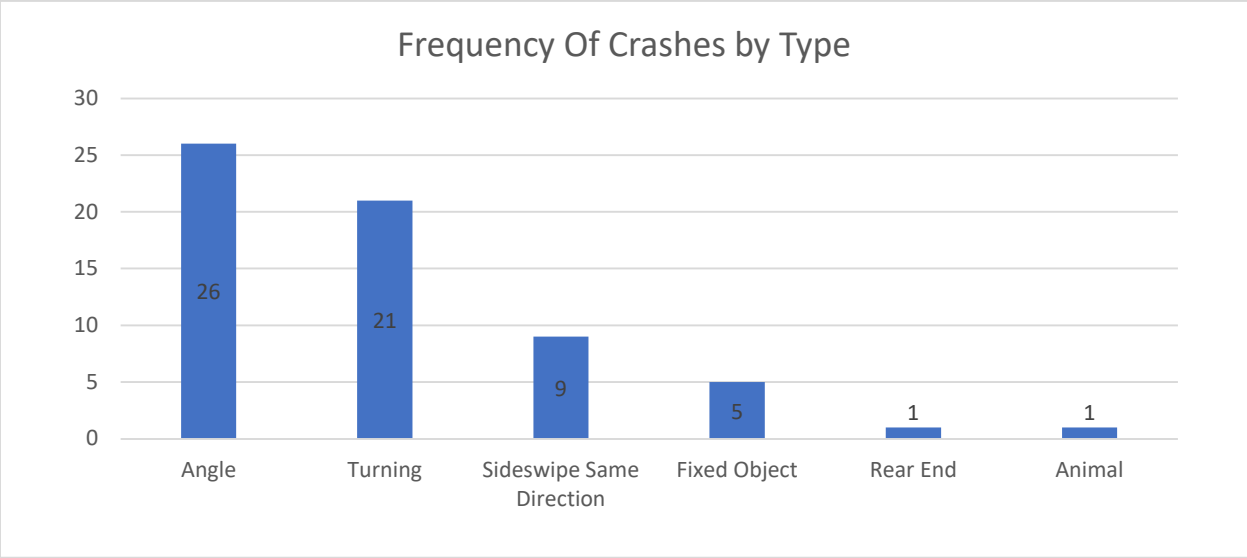
distance for left-turns from a side-street onto the side street for 45 mph design speed of the major road and a five-lane cross-section.

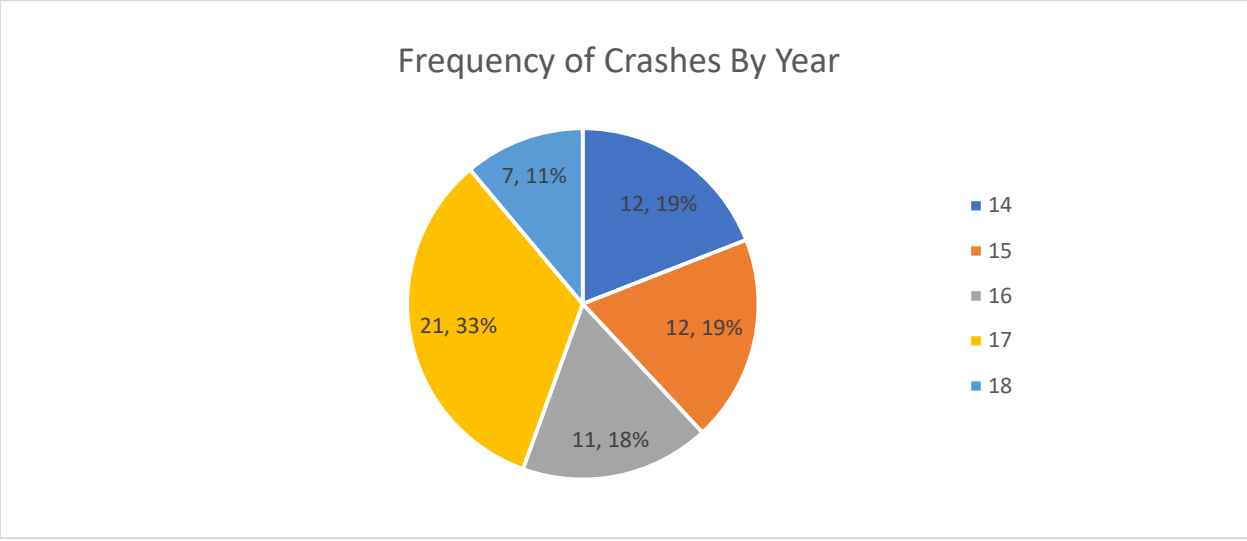
Reflective strips can be installed on posts and sign assemblies to make signs and roadside hazards more apparent to drivers.

Long term consideration could be given to providing a raised median along the road, but alternative access should be considered and aligned to consideration raised medians. Edna Court is offset from the Kroger North entrance.

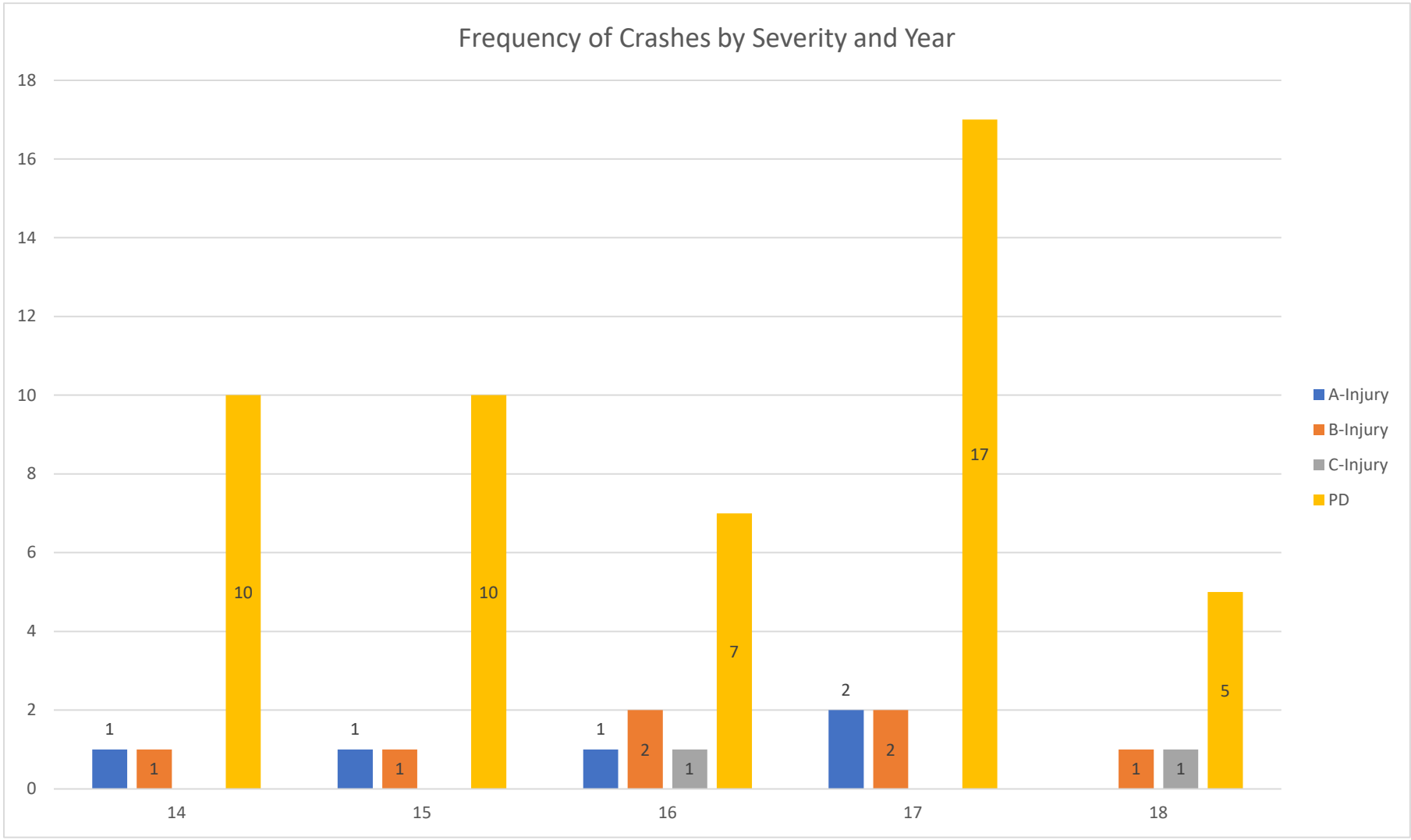
Giant City Road Corridor Crashes – East Main Frontage Road South to Sunny Acres Road (2014-2018)



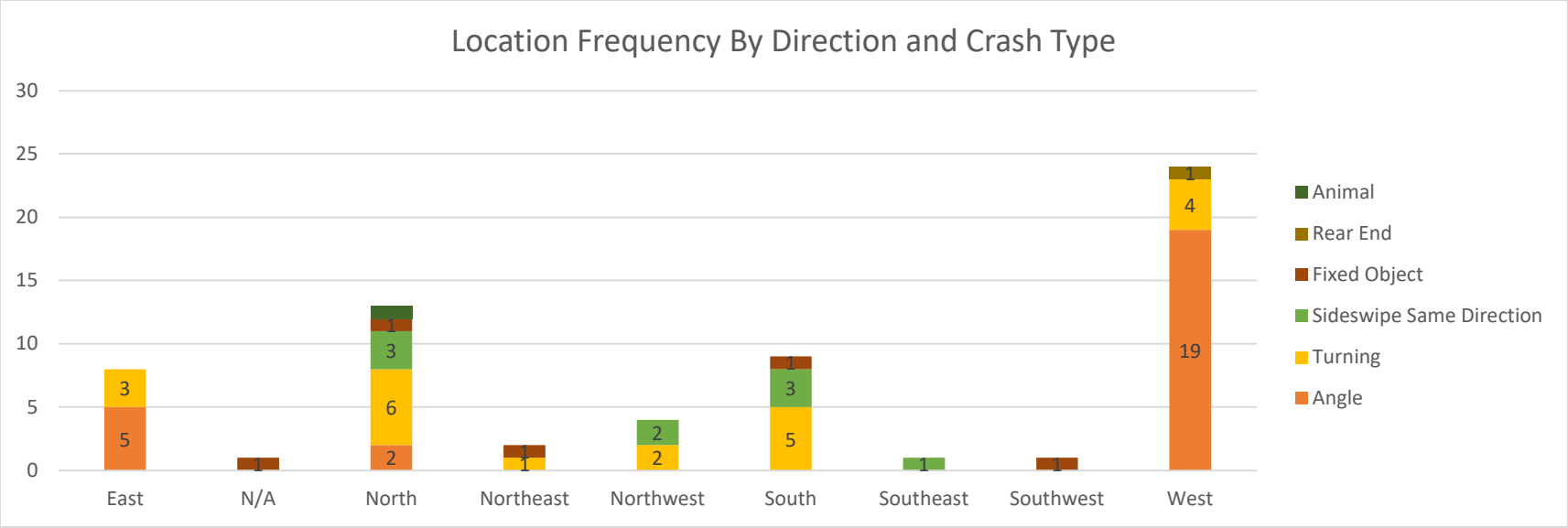


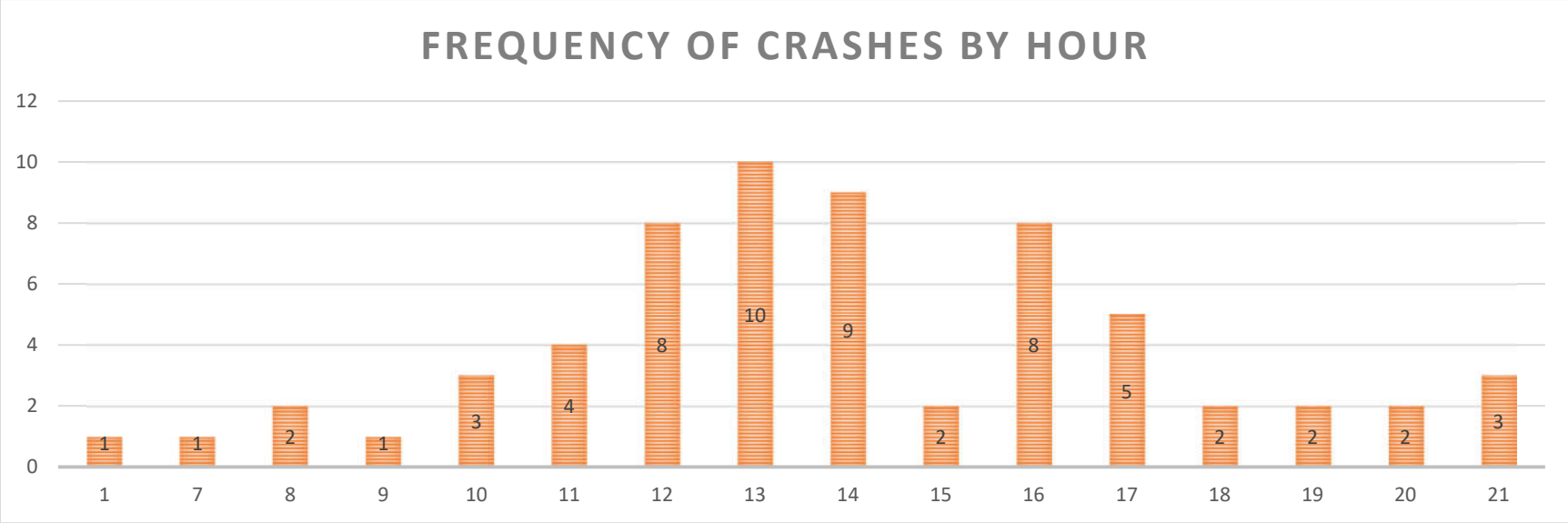


Giant City Road Corridor Crashes – East Main Frontage Road South to Sunny Acres Road (2014-2018)

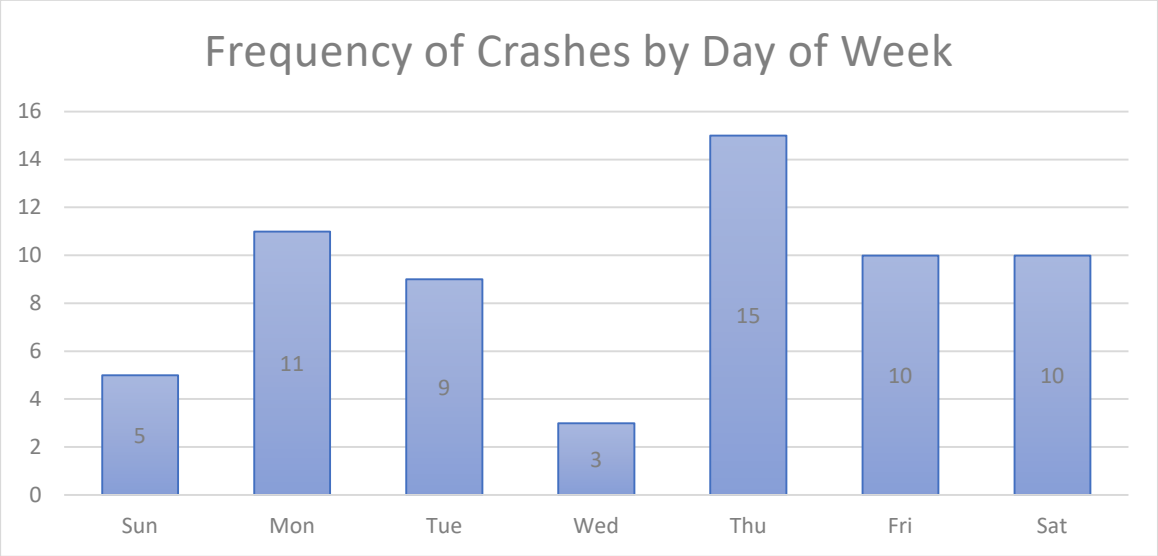


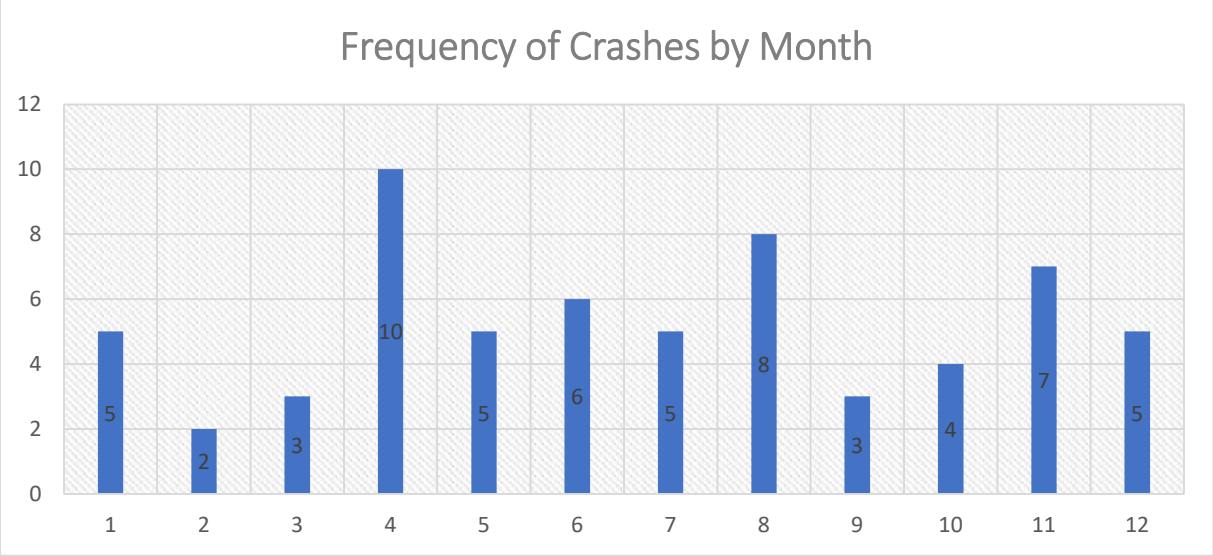
Giant City Road Corridor Crashes – East Main Frontage Road South to Sunny Acres Road (2014-2018)

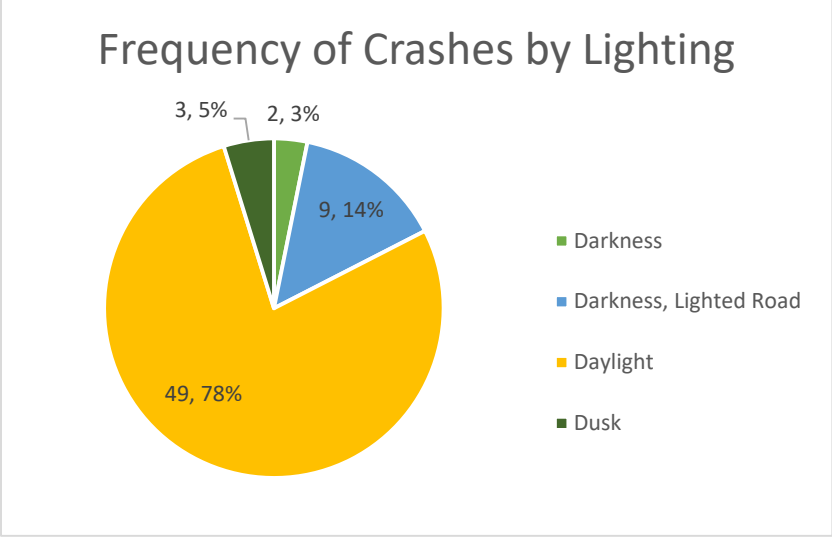




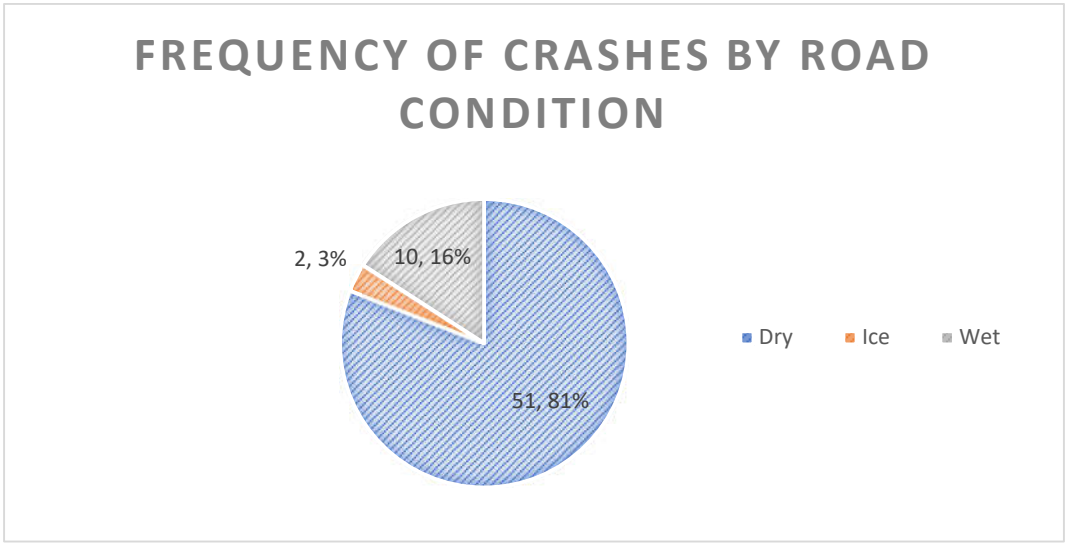
Giant City Road Corridor Crashes – East Main Frontage Road South to Sunny Acres Road (2014-2018)

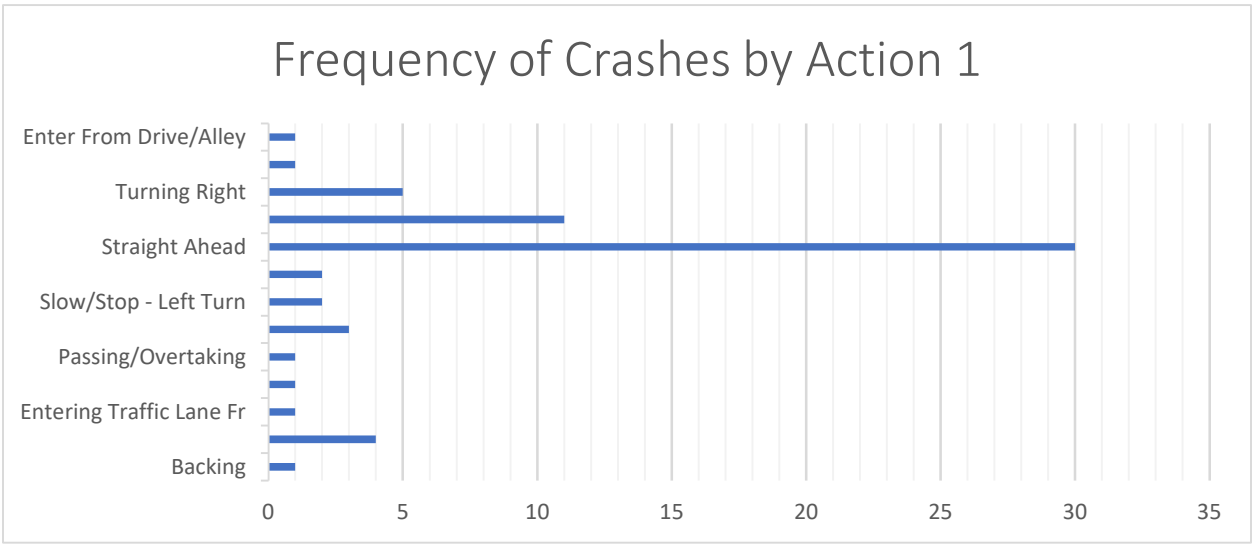


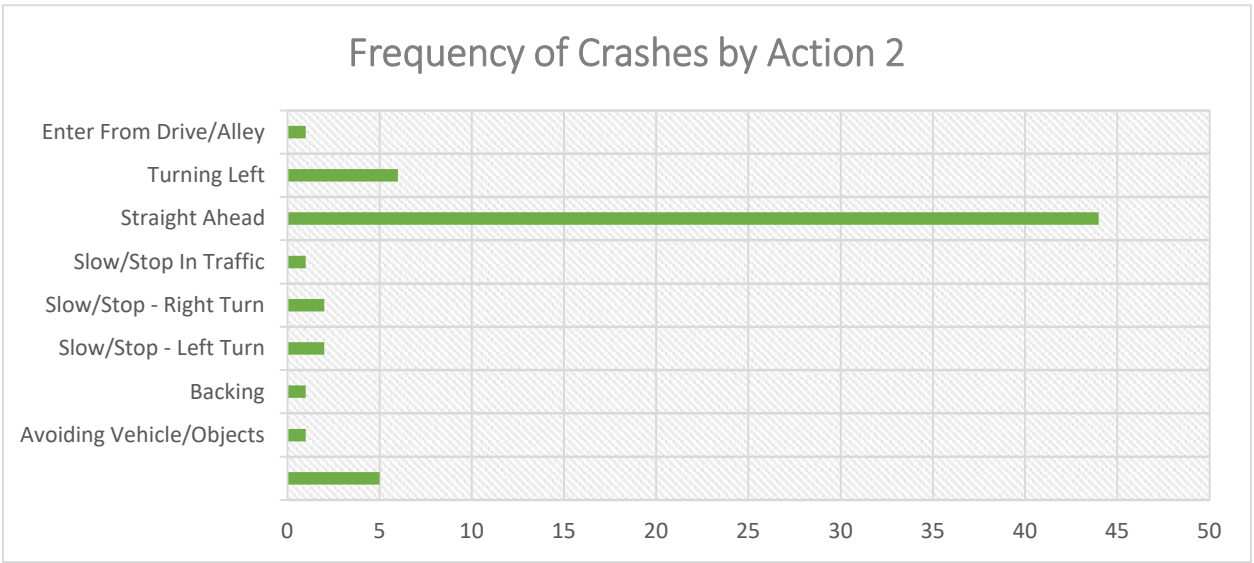




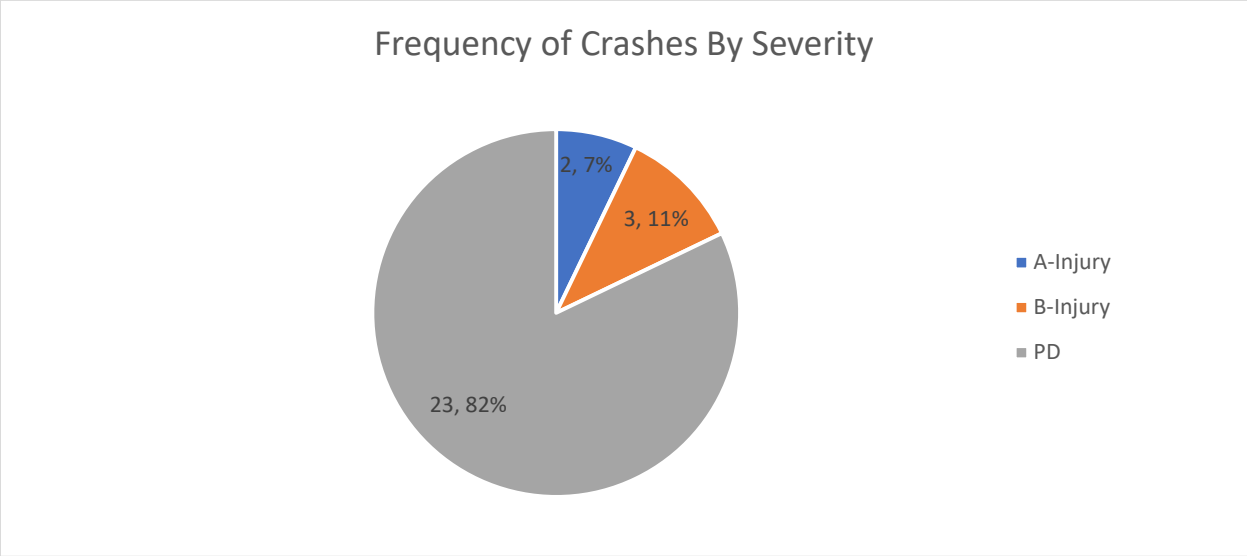
Giant City Road Corridor Crashes – East Main Frontage Road South to Sunny Acres Road (2014-2018)

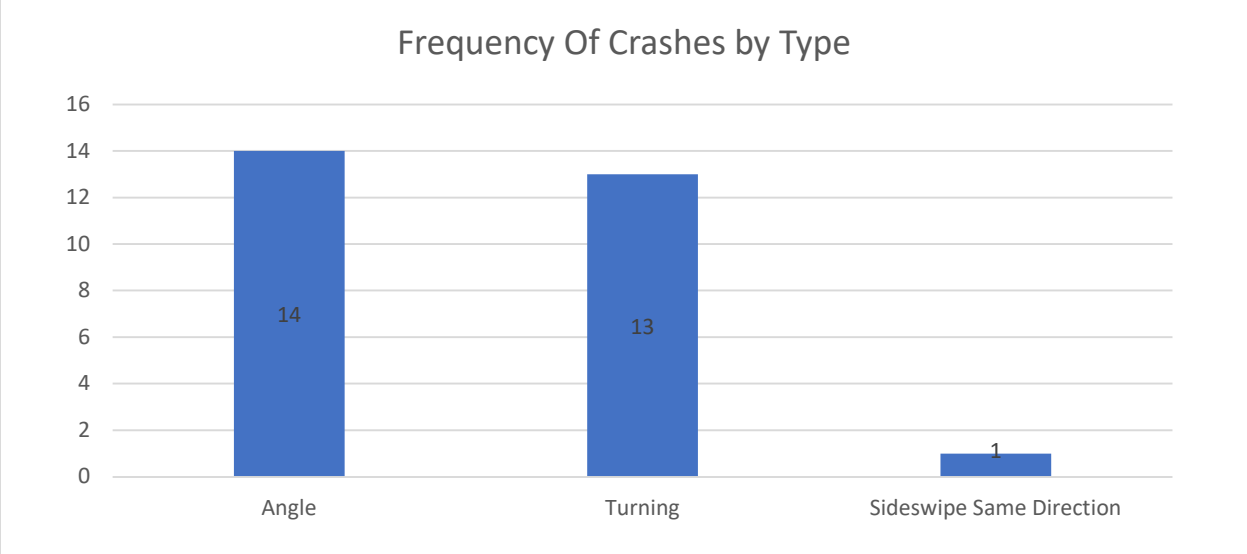


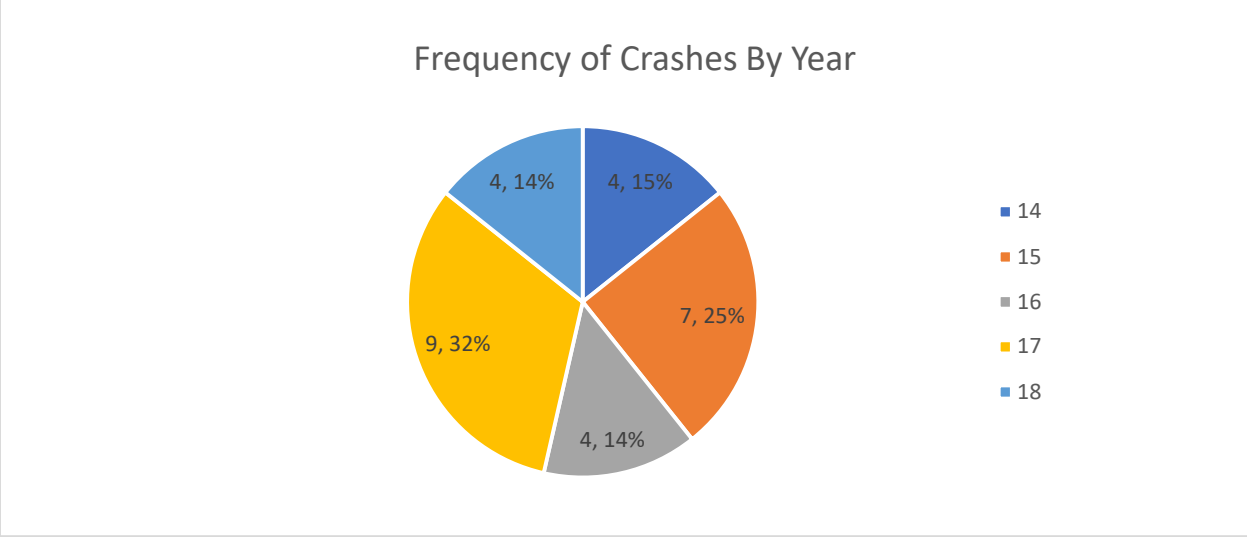




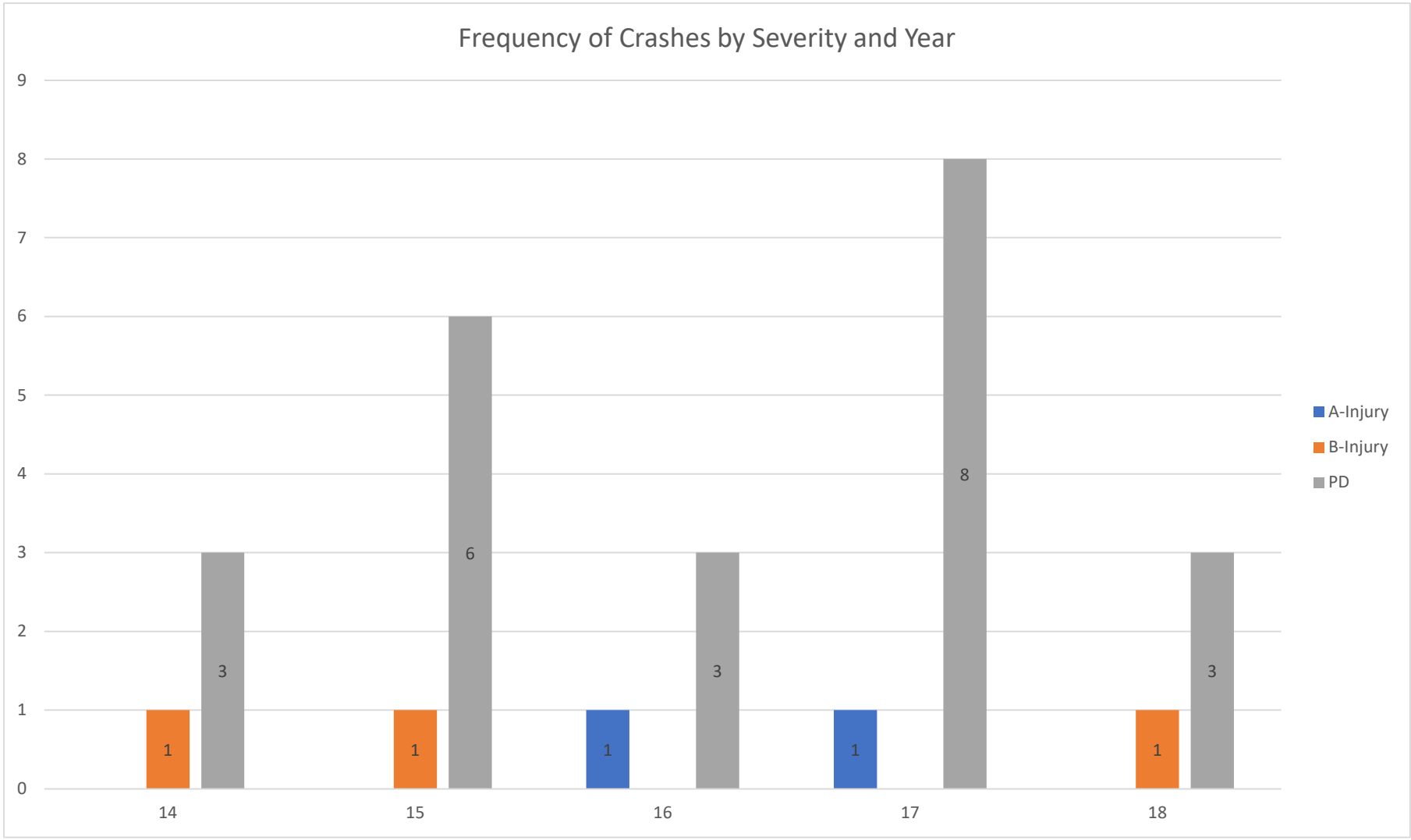
Intersection of East Main Frontage Road South and Giant City Road (2014-2018)



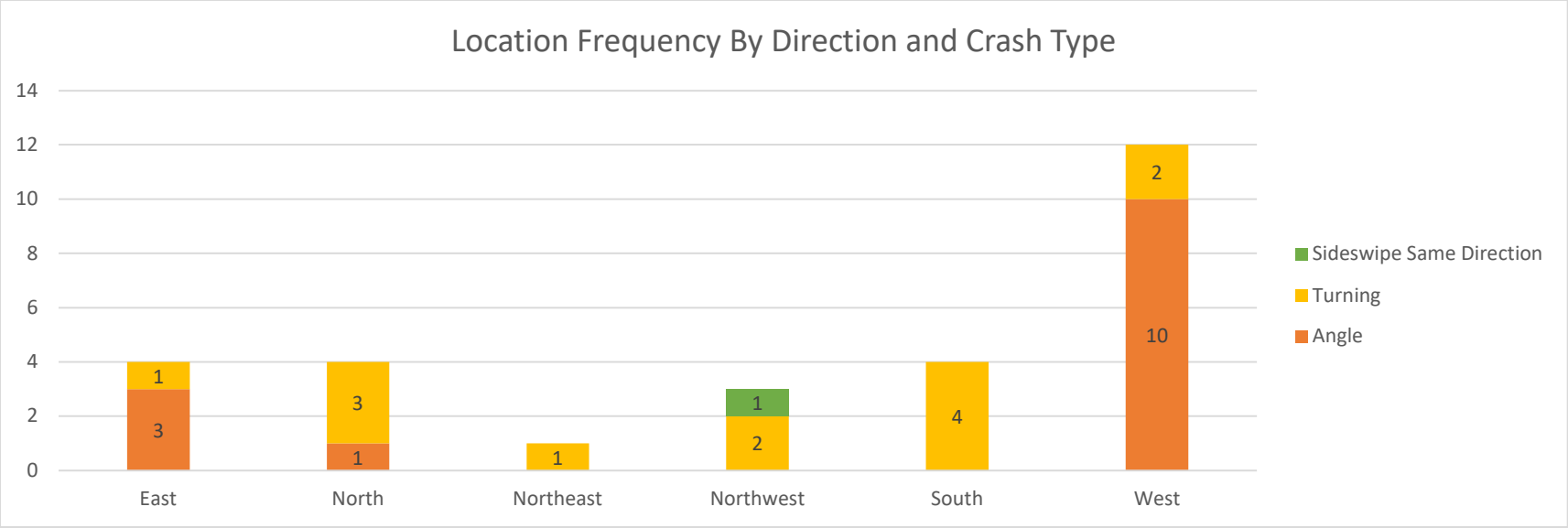


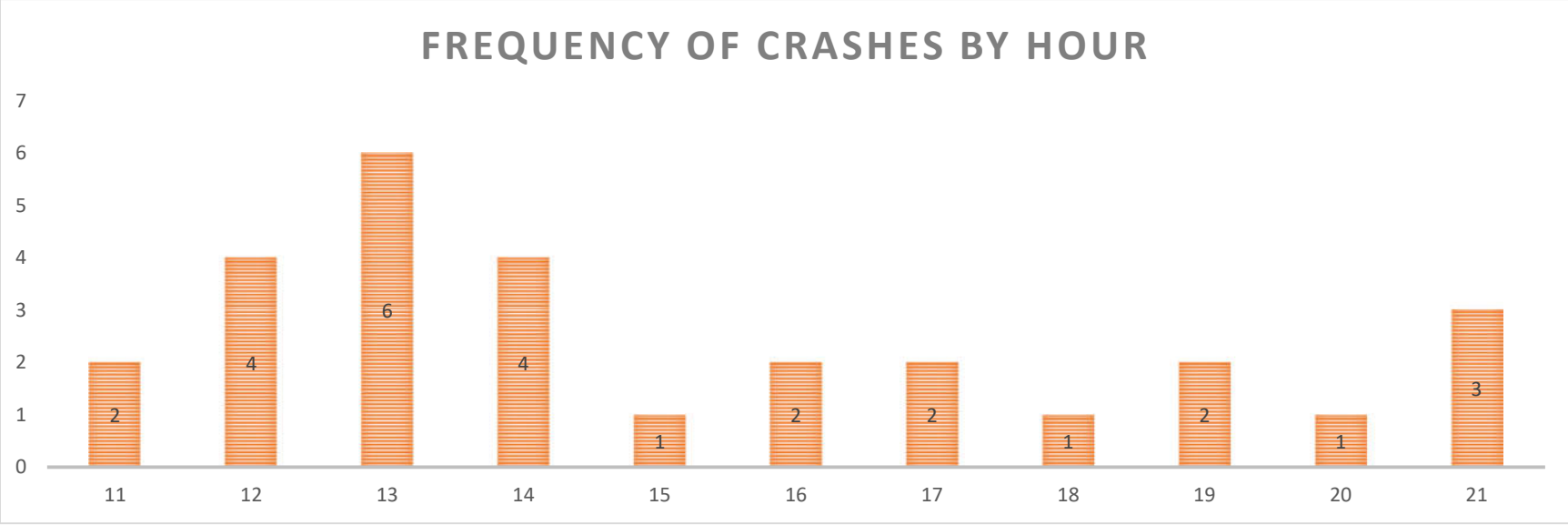


Intersection of East Main Frontage Road South and Giant City Road (2014-2018)

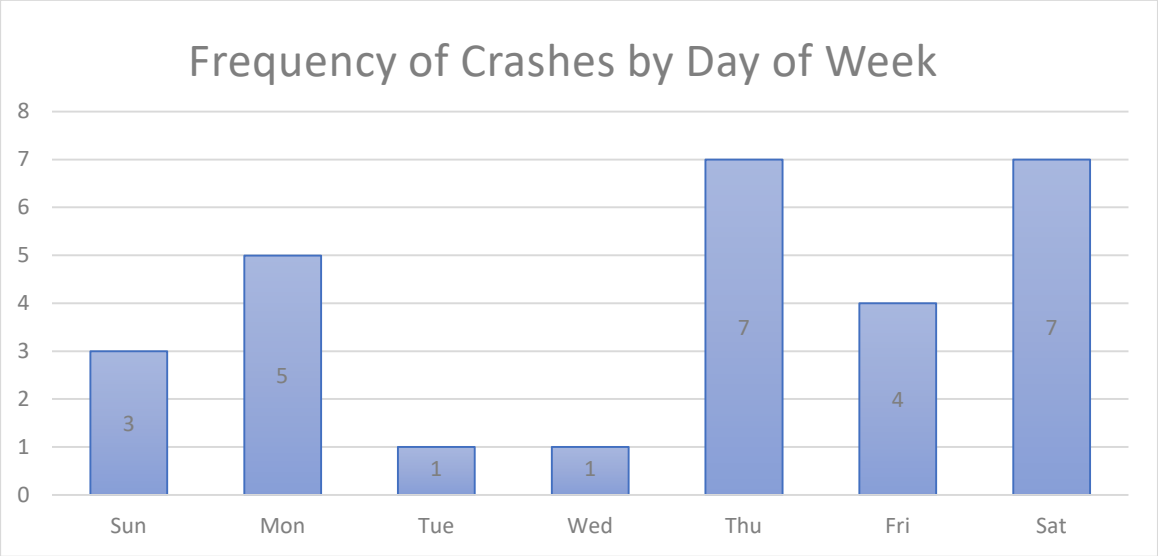


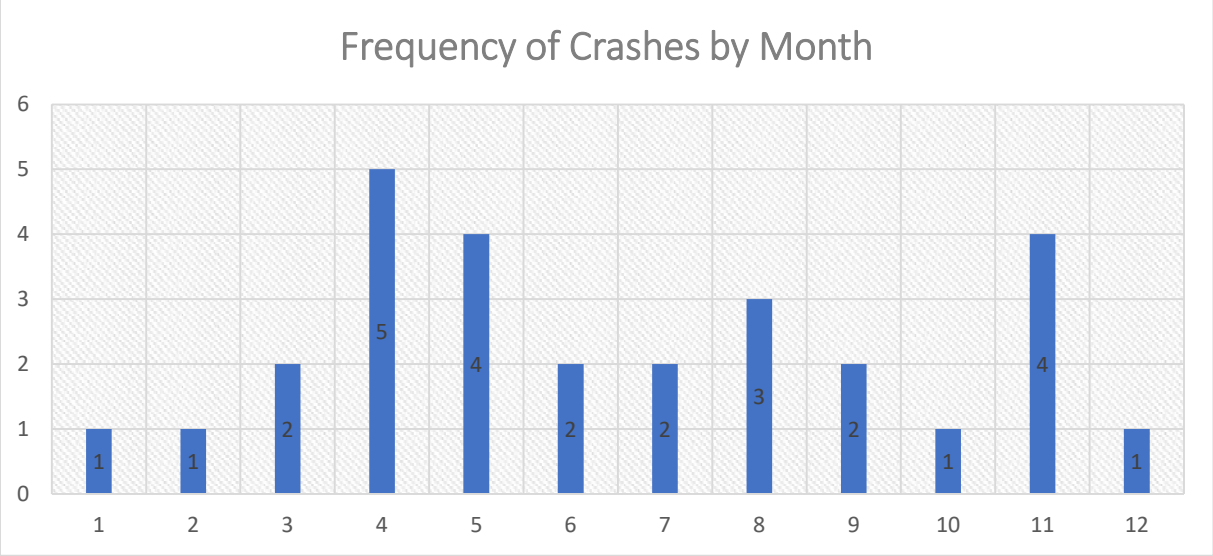
Intersection of East Main Frontage Road South and Giant City Road (2014-2018)

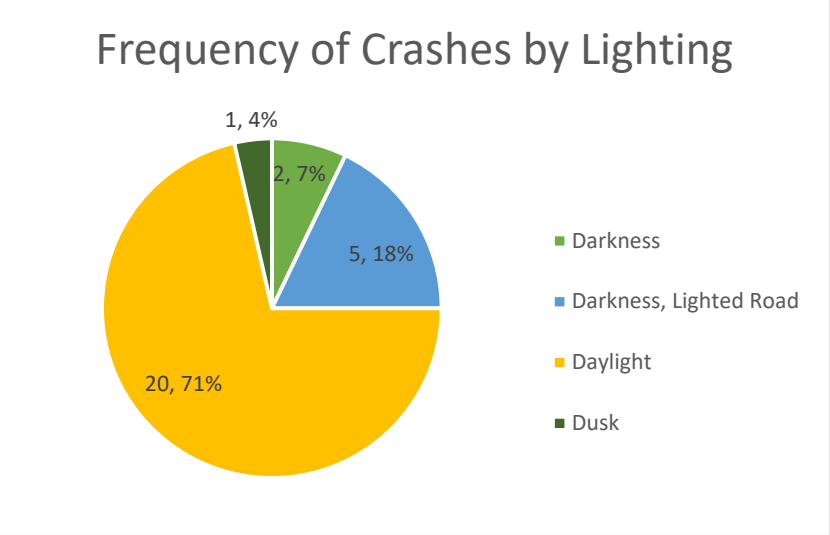




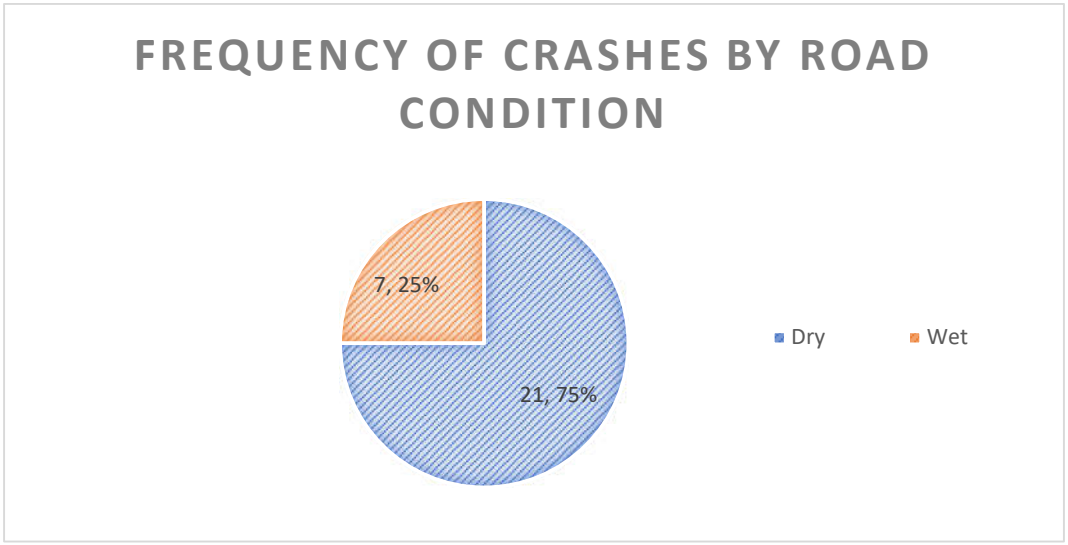
Intersection of East Main Frontage Road South and Giant City Road (2014-2018)

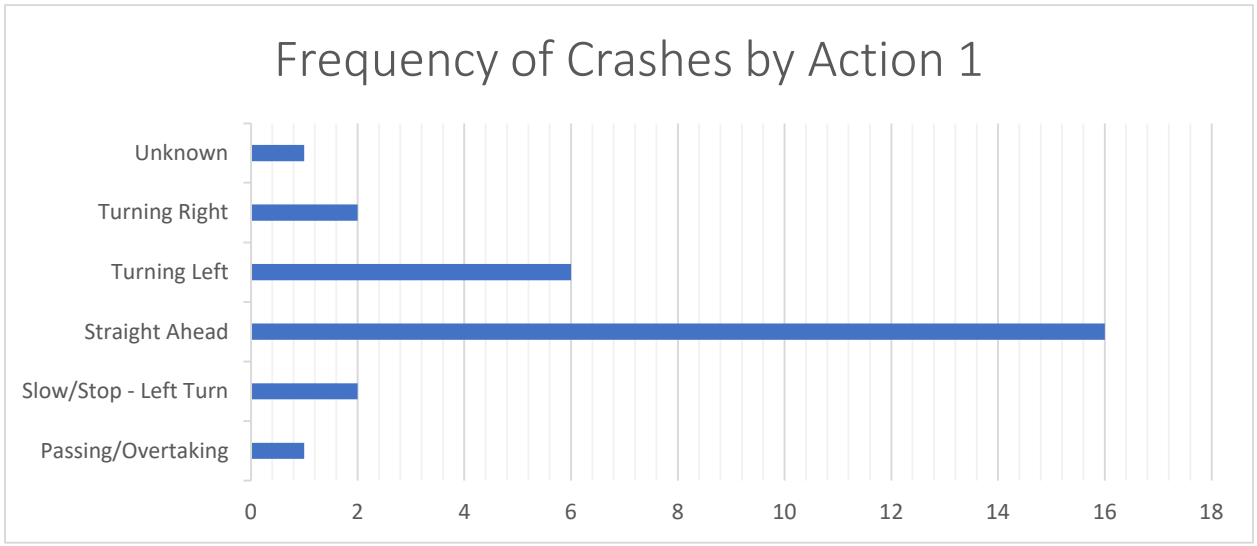


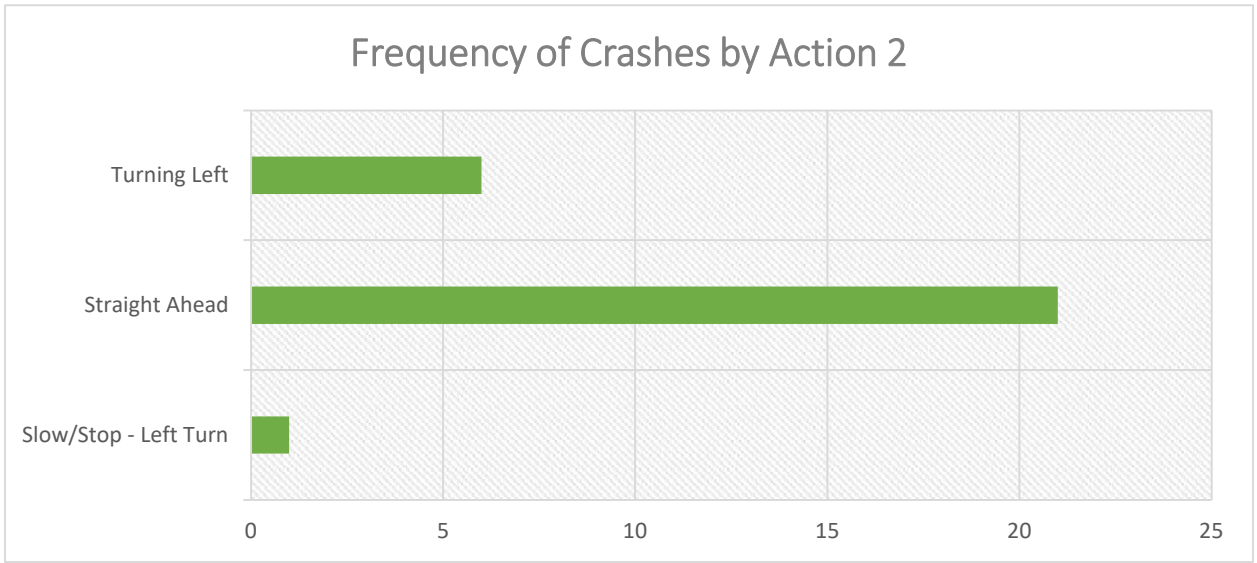




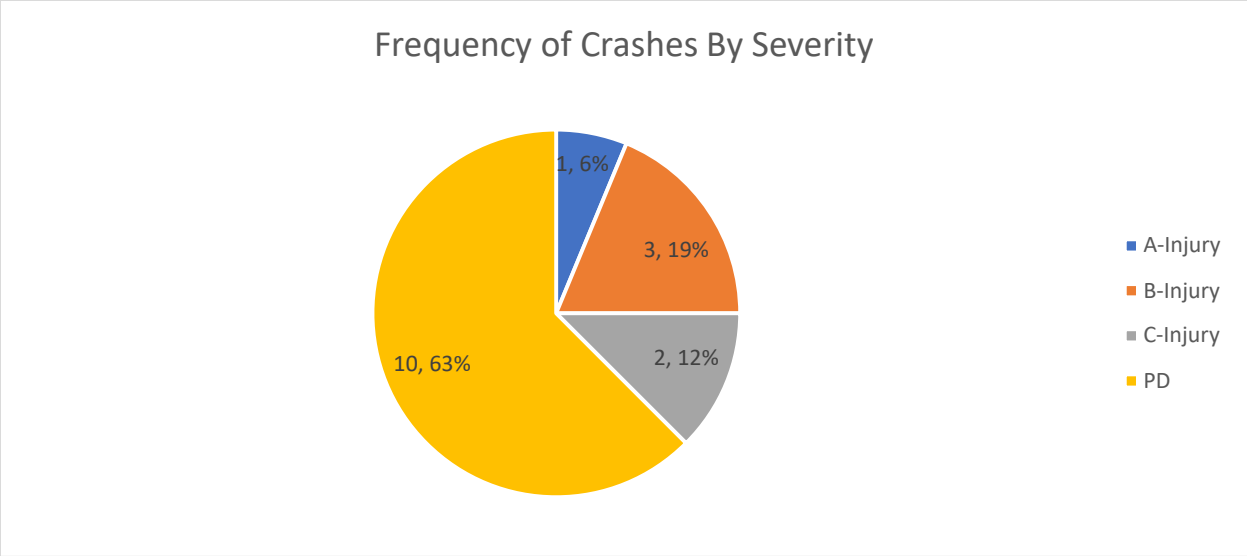
Intersection of East Main Frontage Road South and Giant City Road (2014-2018)

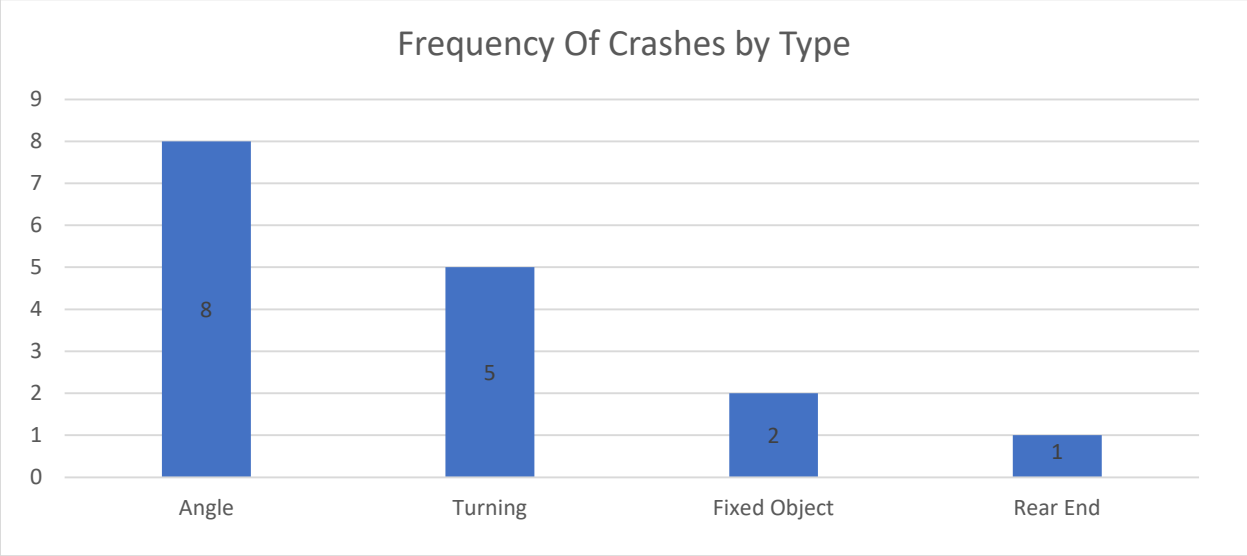


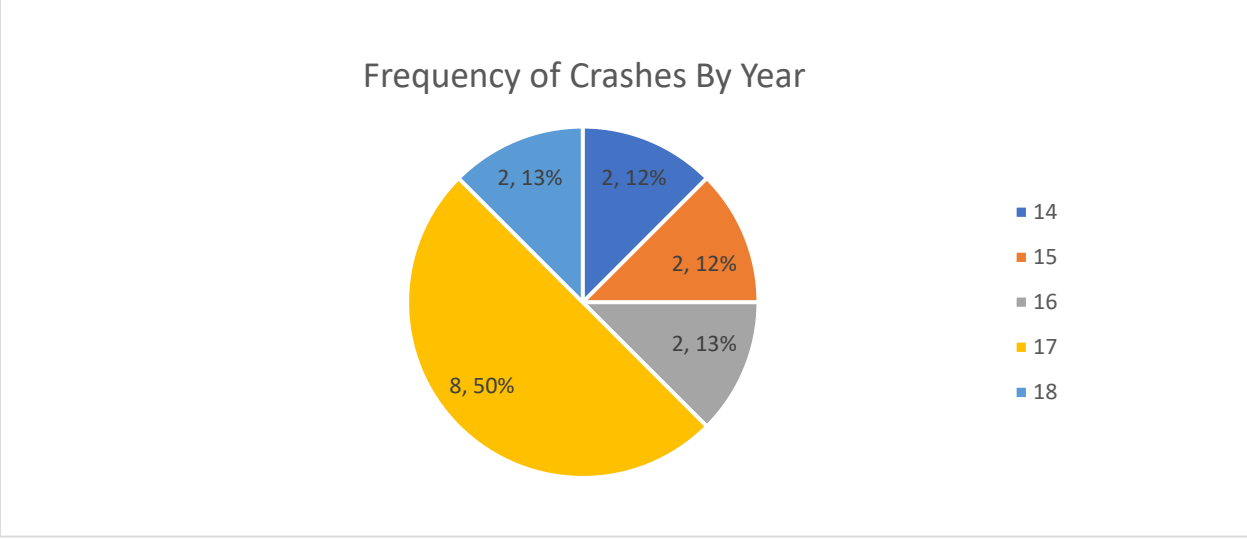




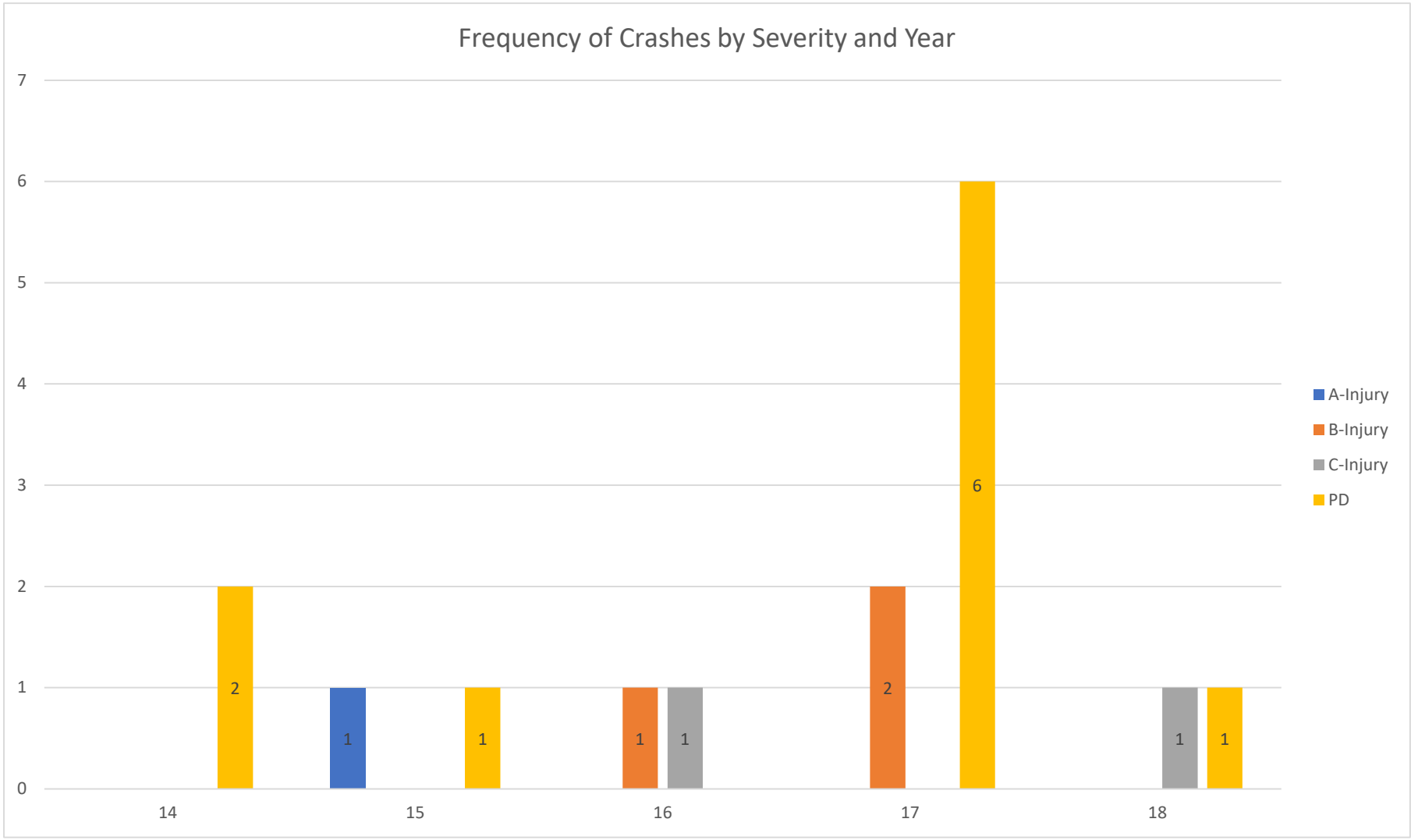
Intersection of Giant City Road and Sunny Acres Road (2014-2018)







Intersection of Giant City Road and Sunny Acres Road (2014-2018)



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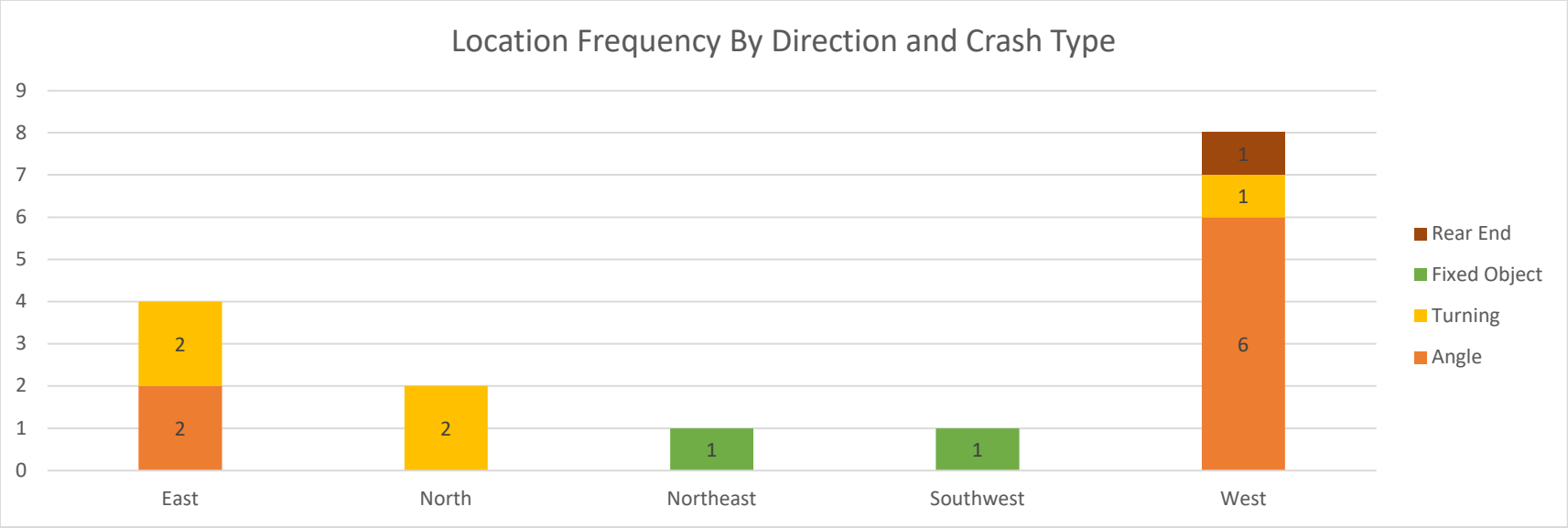

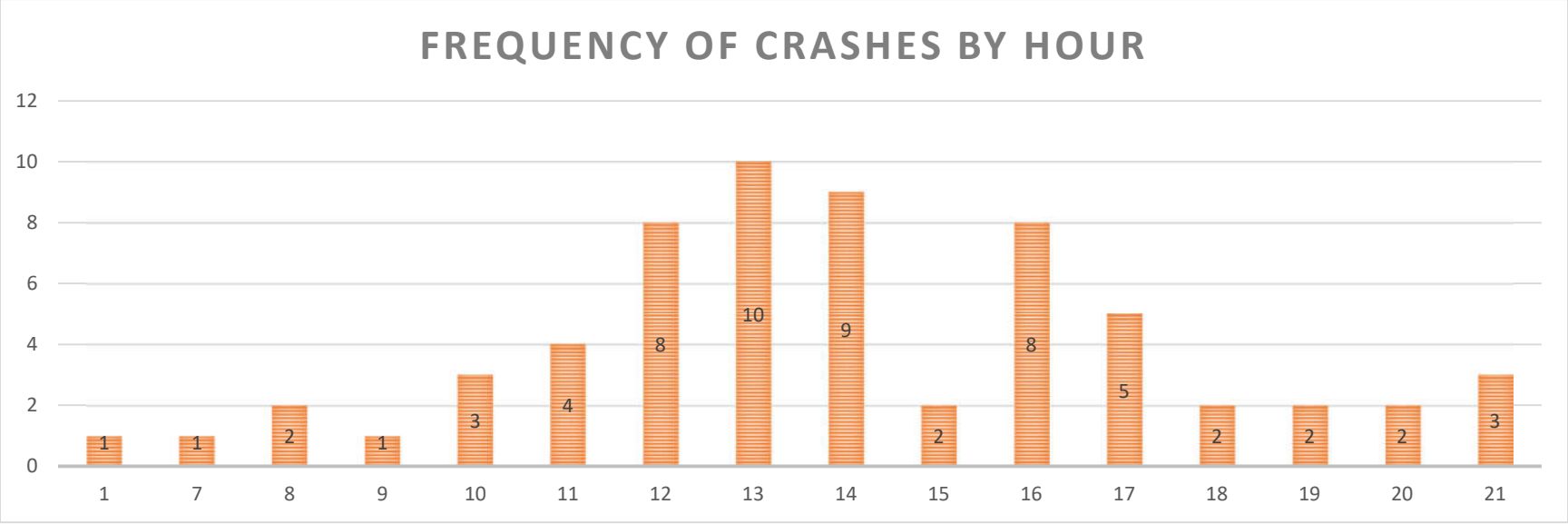

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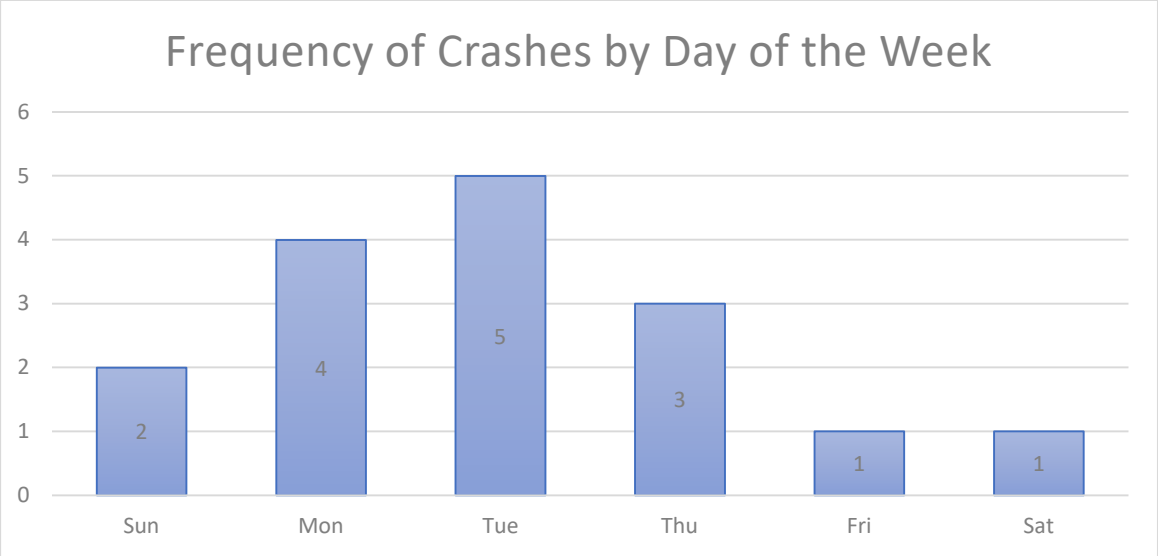
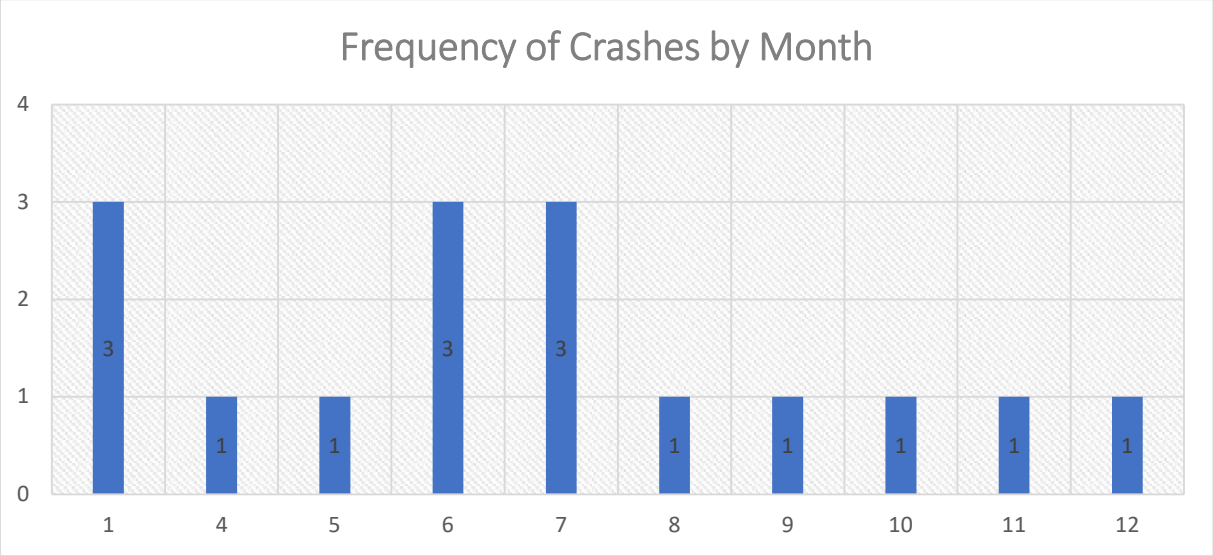
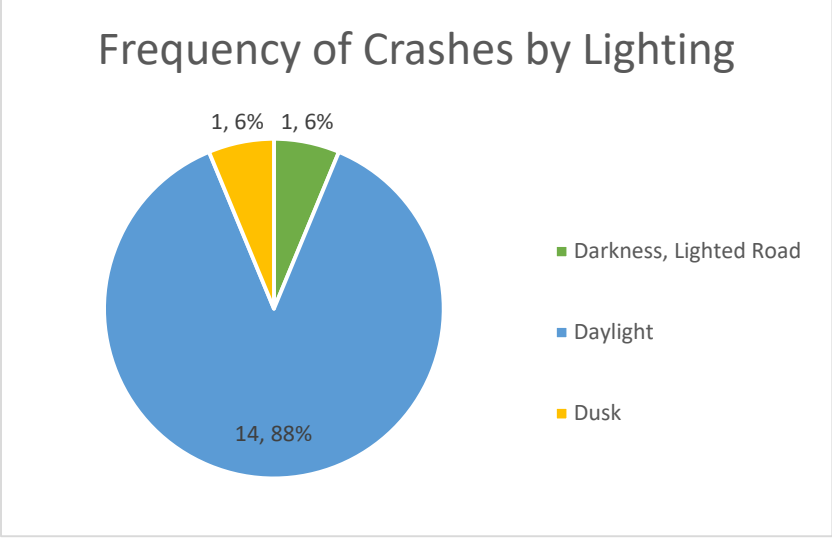
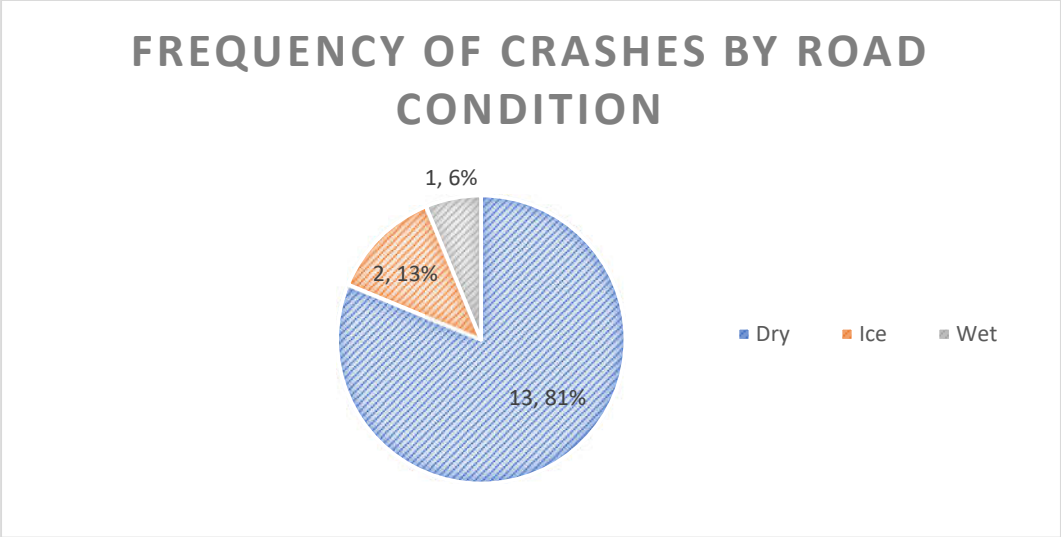
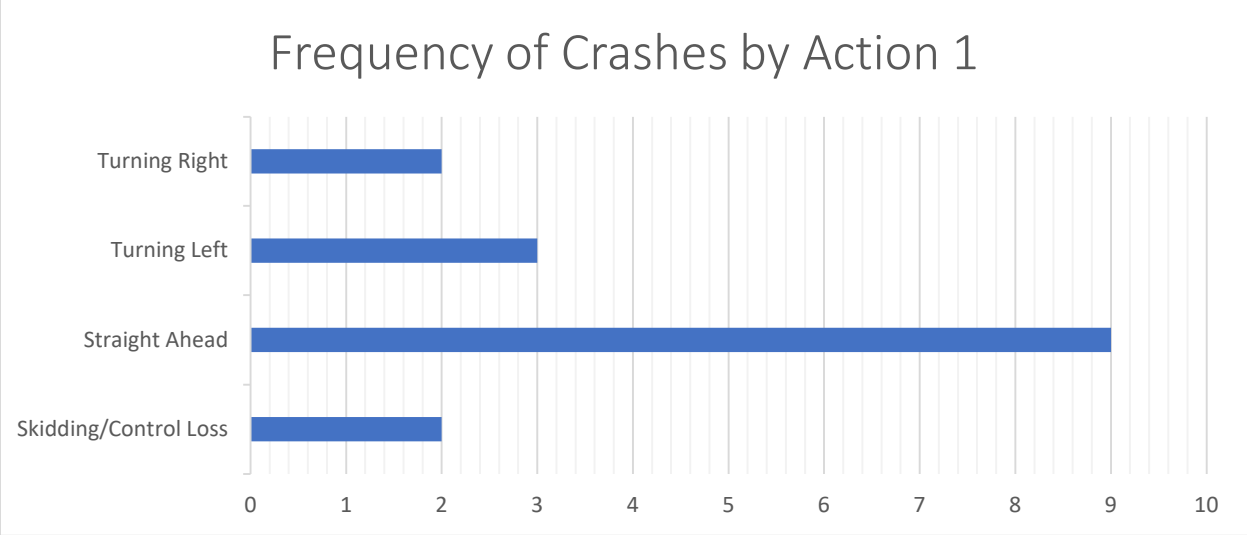


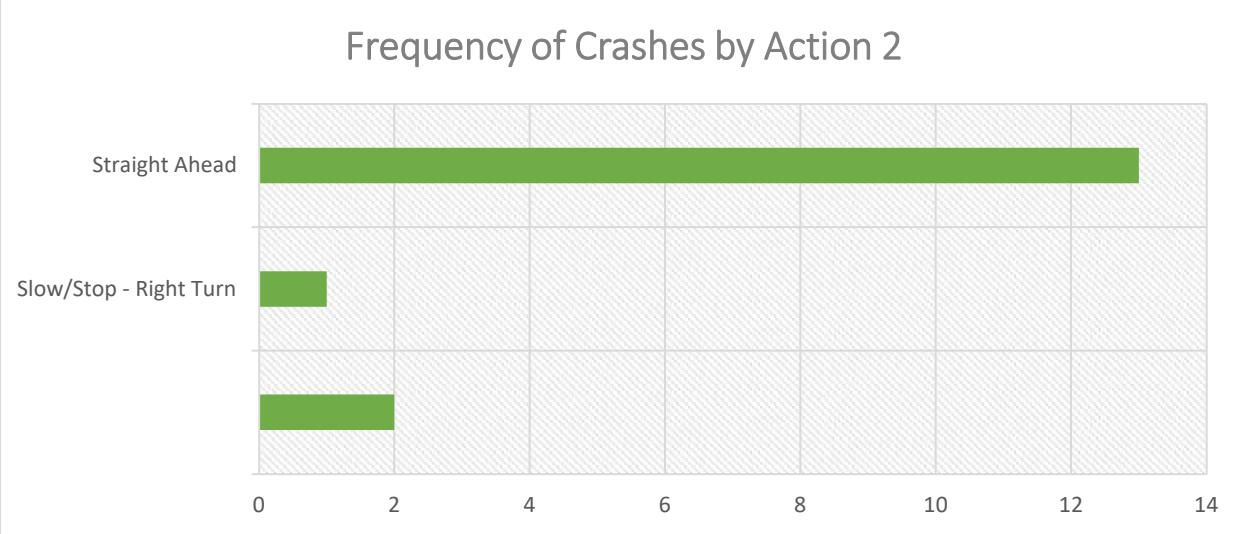




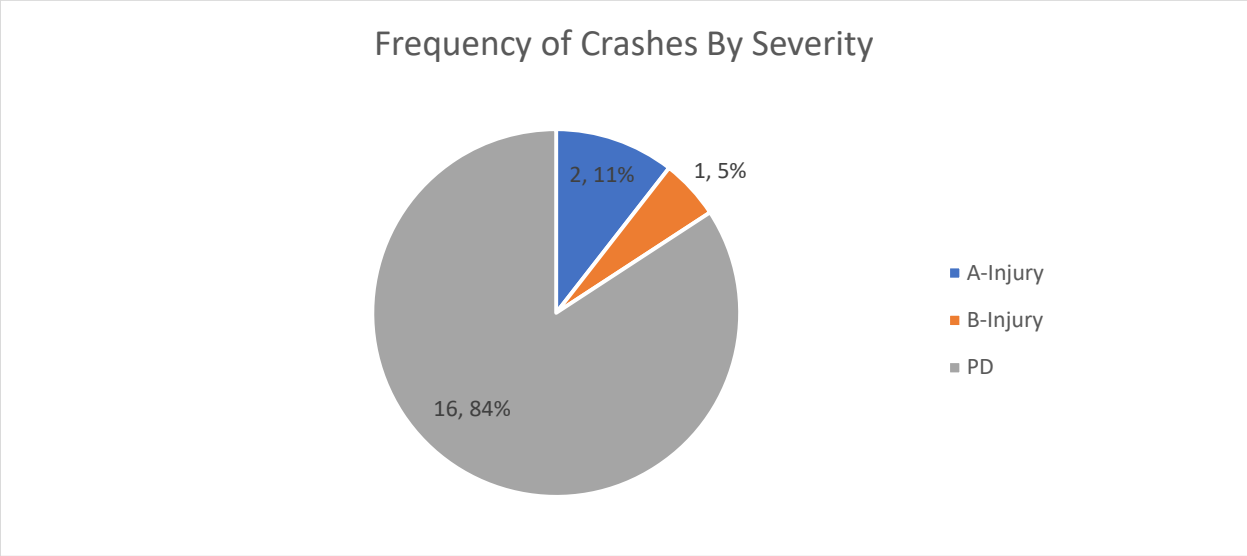
Intersection of Giant City Road and Sunny Acres Road (2014-2018)

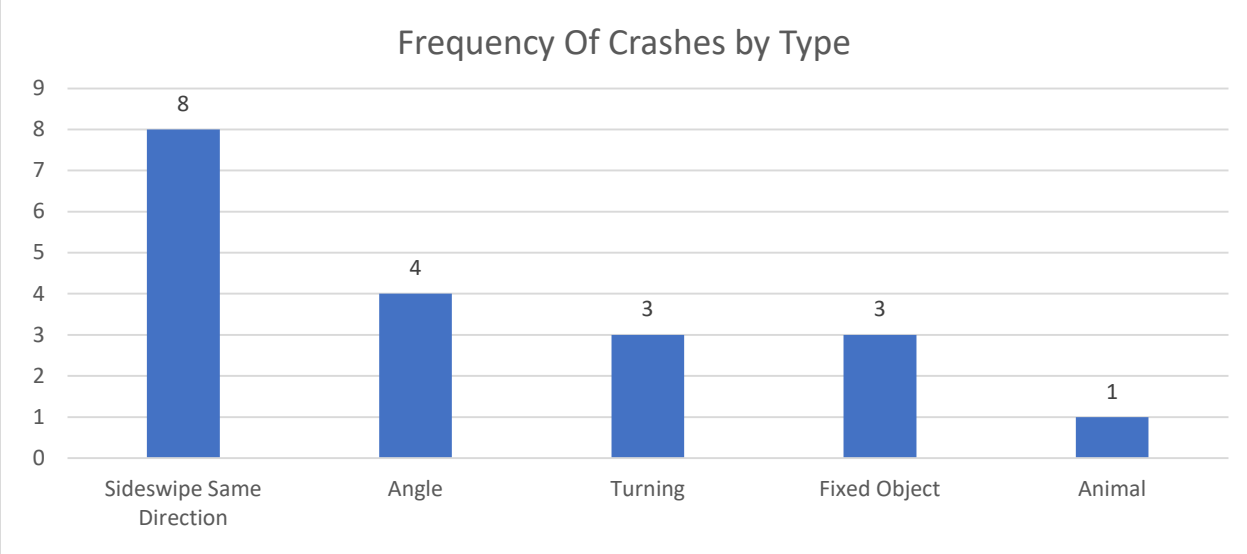


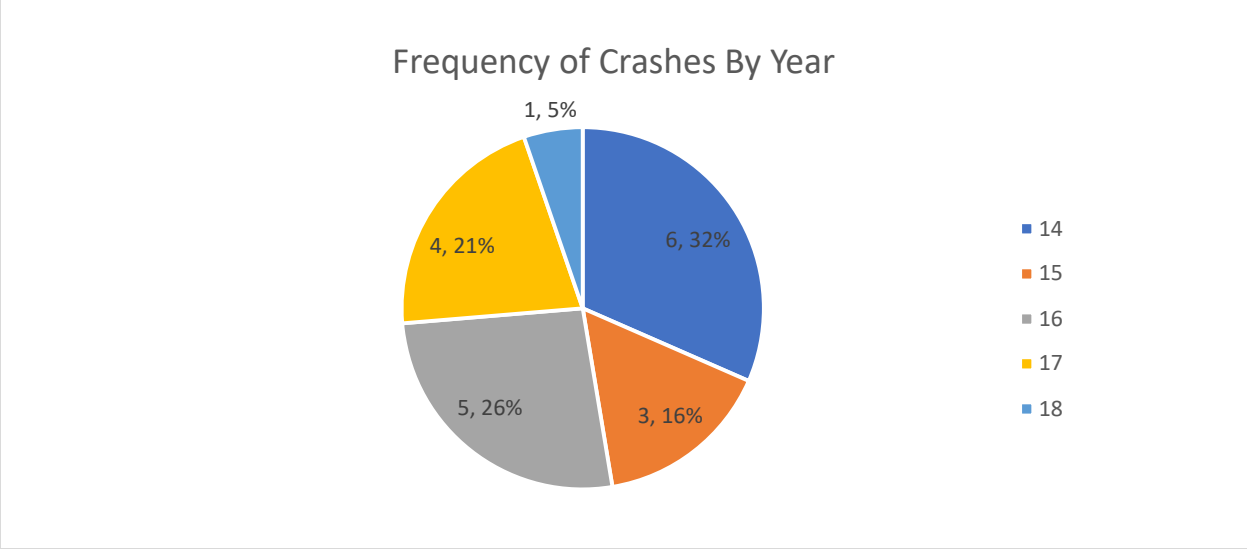




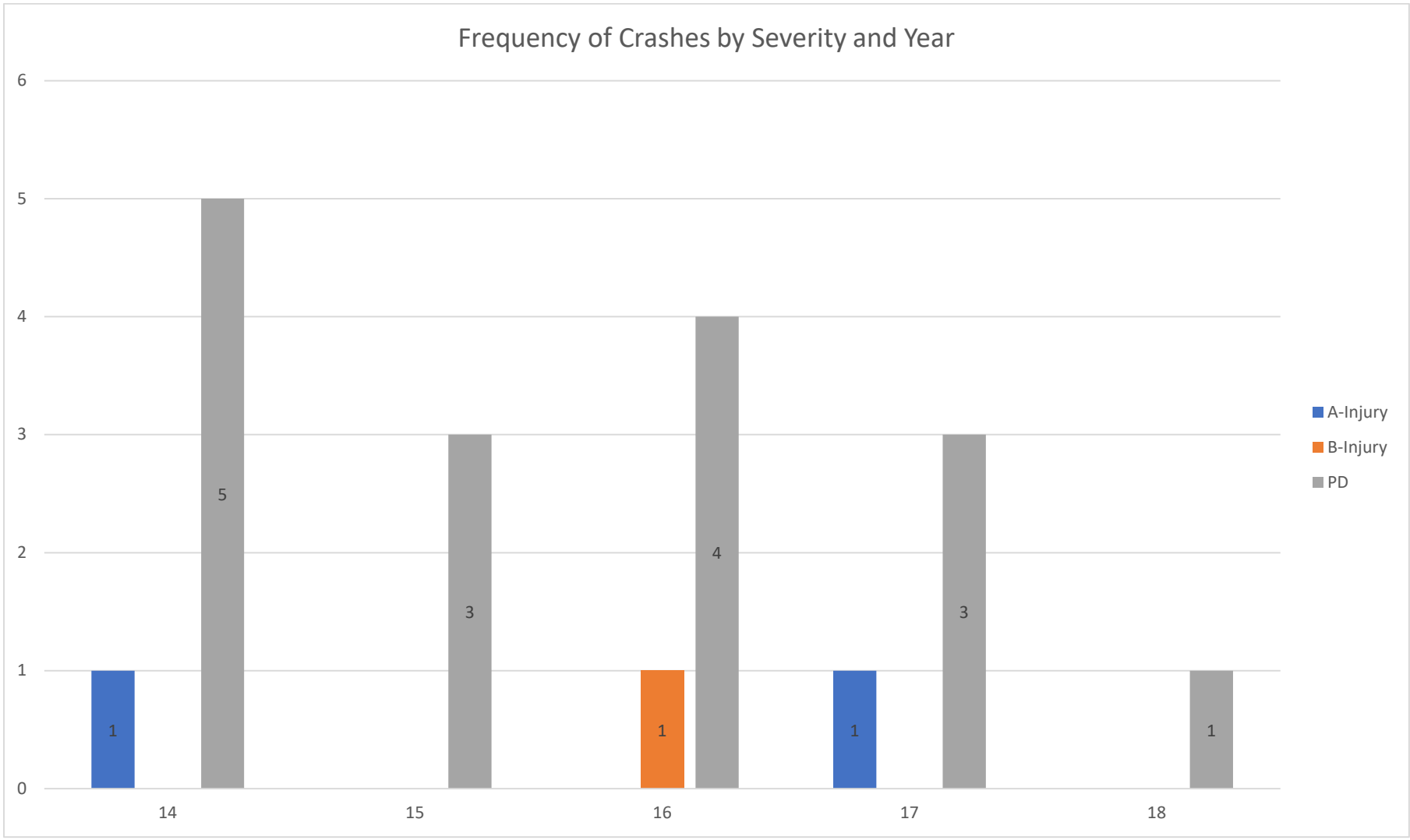
Segment Crashes along Giant City Road between East Main Frontage Road South to Sunny Acres (2014-2018)



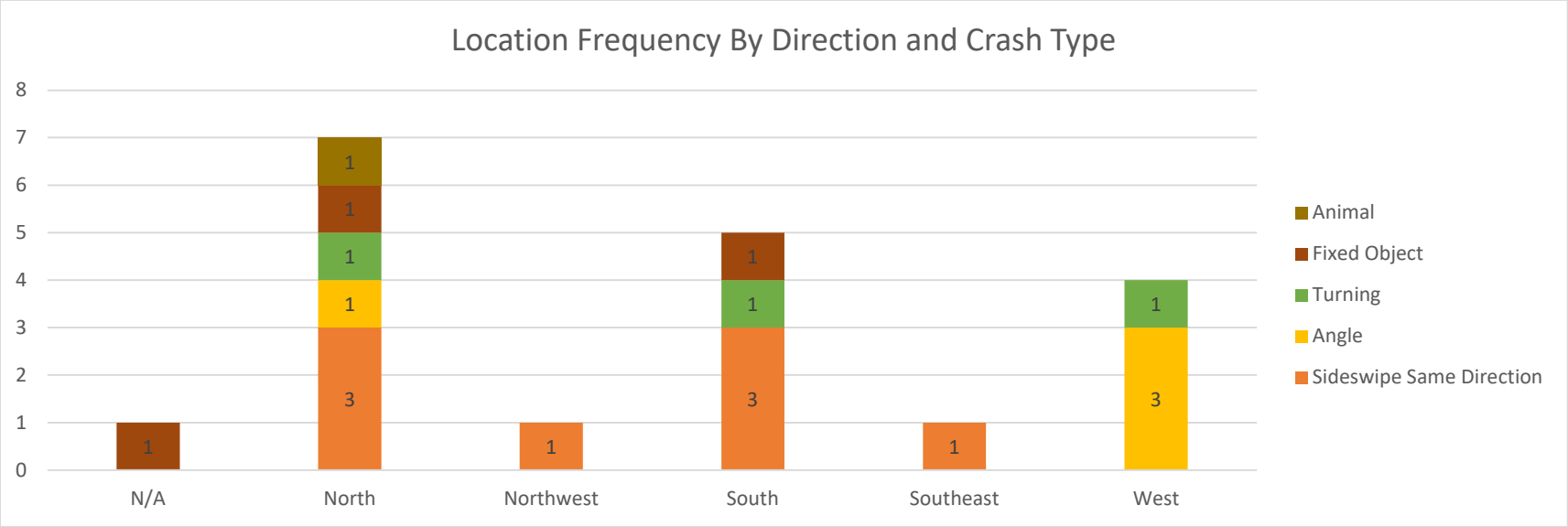


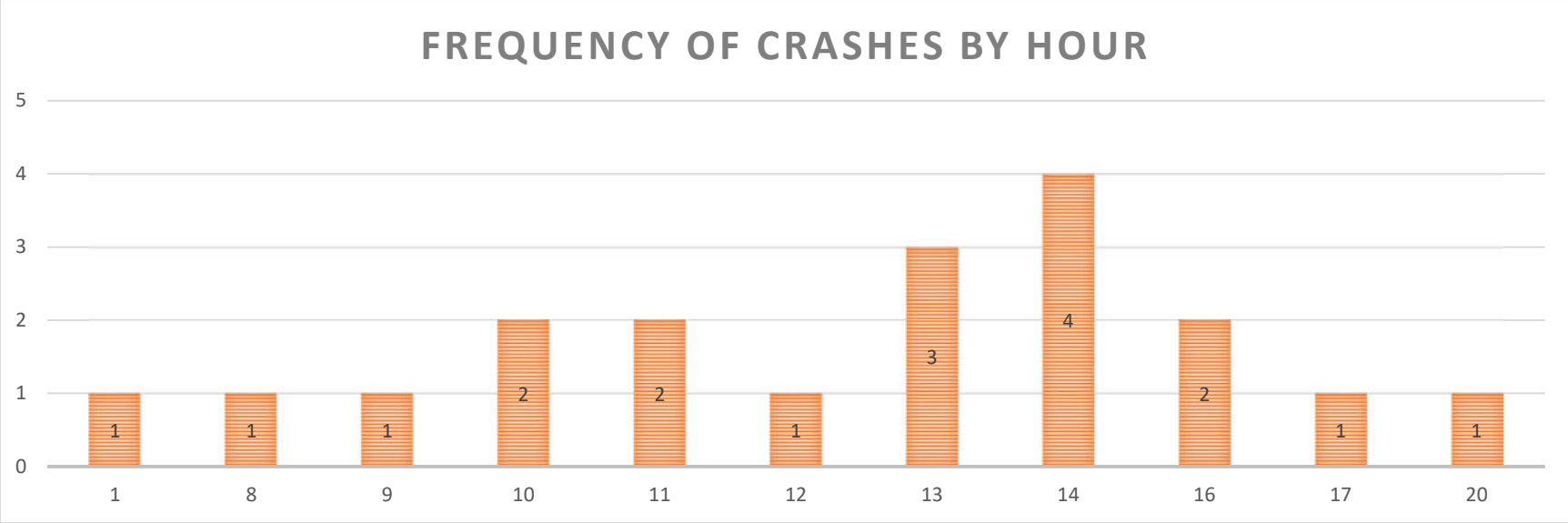


Segment Crashes along Giant City Road between East Main Frontage Road South to Sunny Acres (2014-2018)

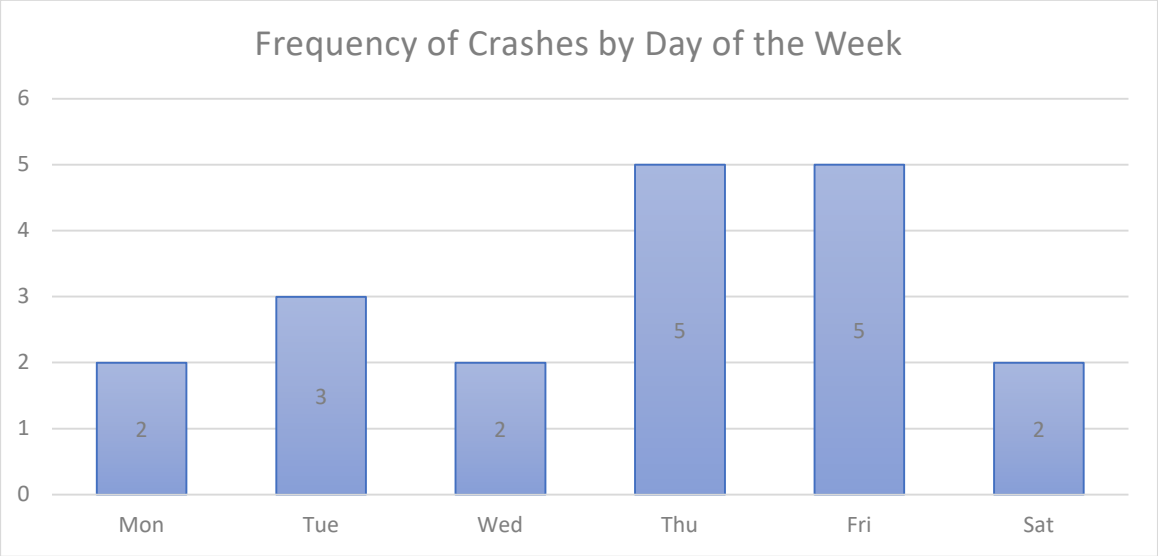


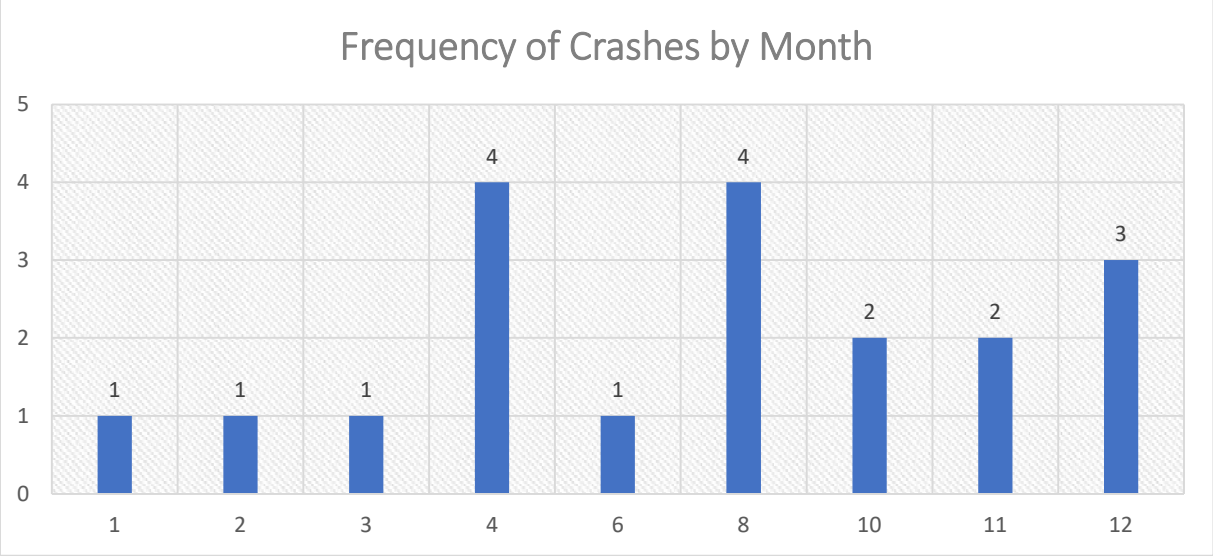
Segment Crashes along Giant City Road between East Main Frontage Road South to Sunny Acres (2014-2018)

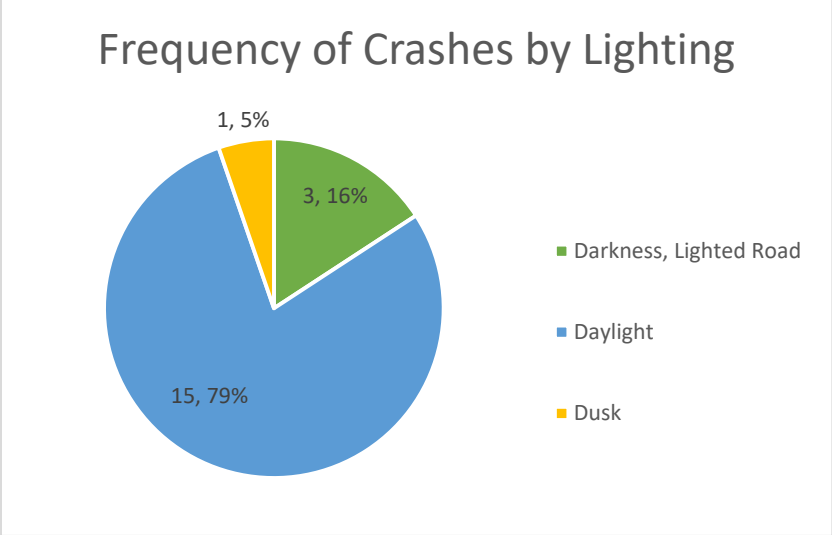




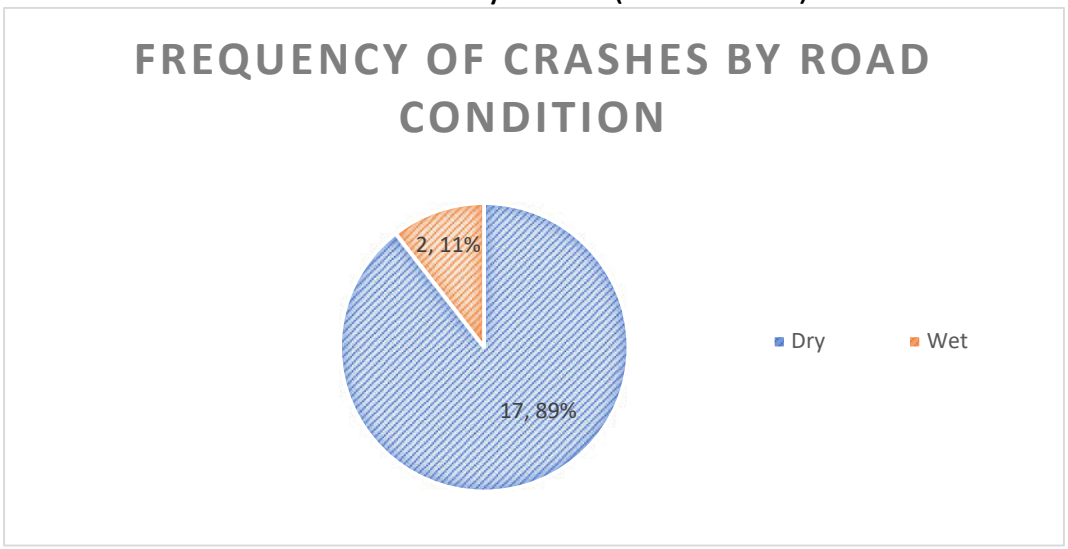
Segment Crashes along Giant City Road between East Main Frontage Road South to Sunny Acres (2014-2018)

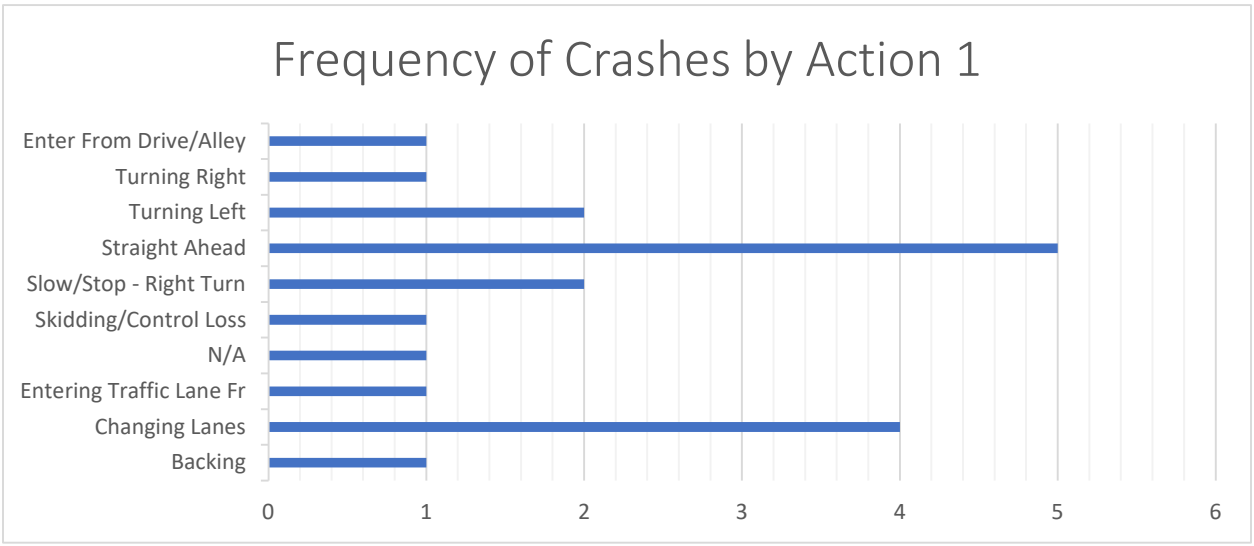


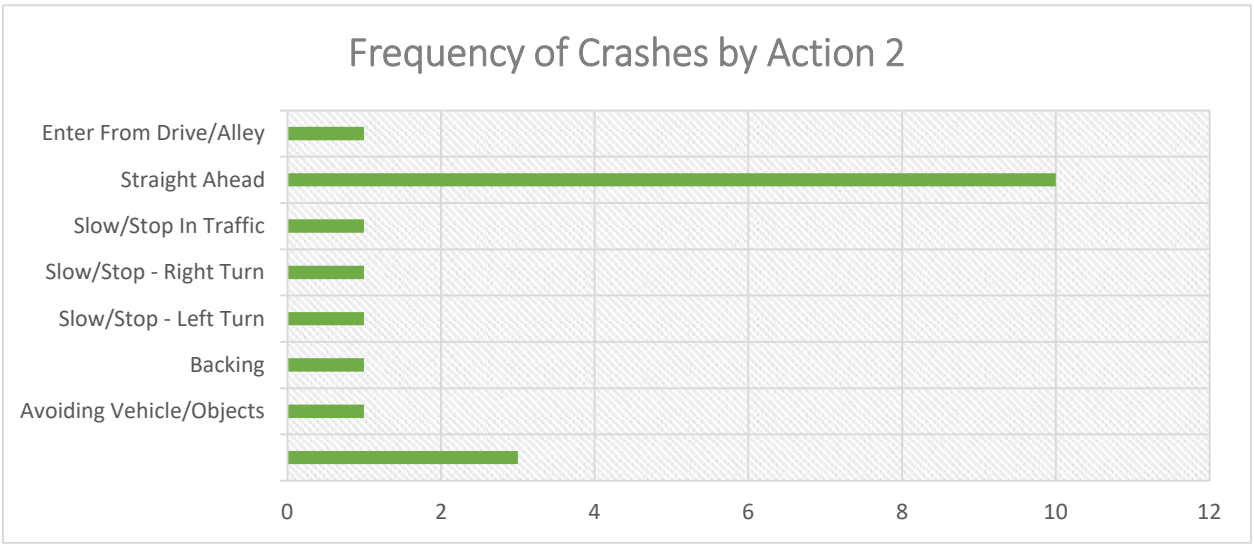




Segment Crashes along Giant City Road between East Main Frontage Road South to Sunny Acres (2014-2018)





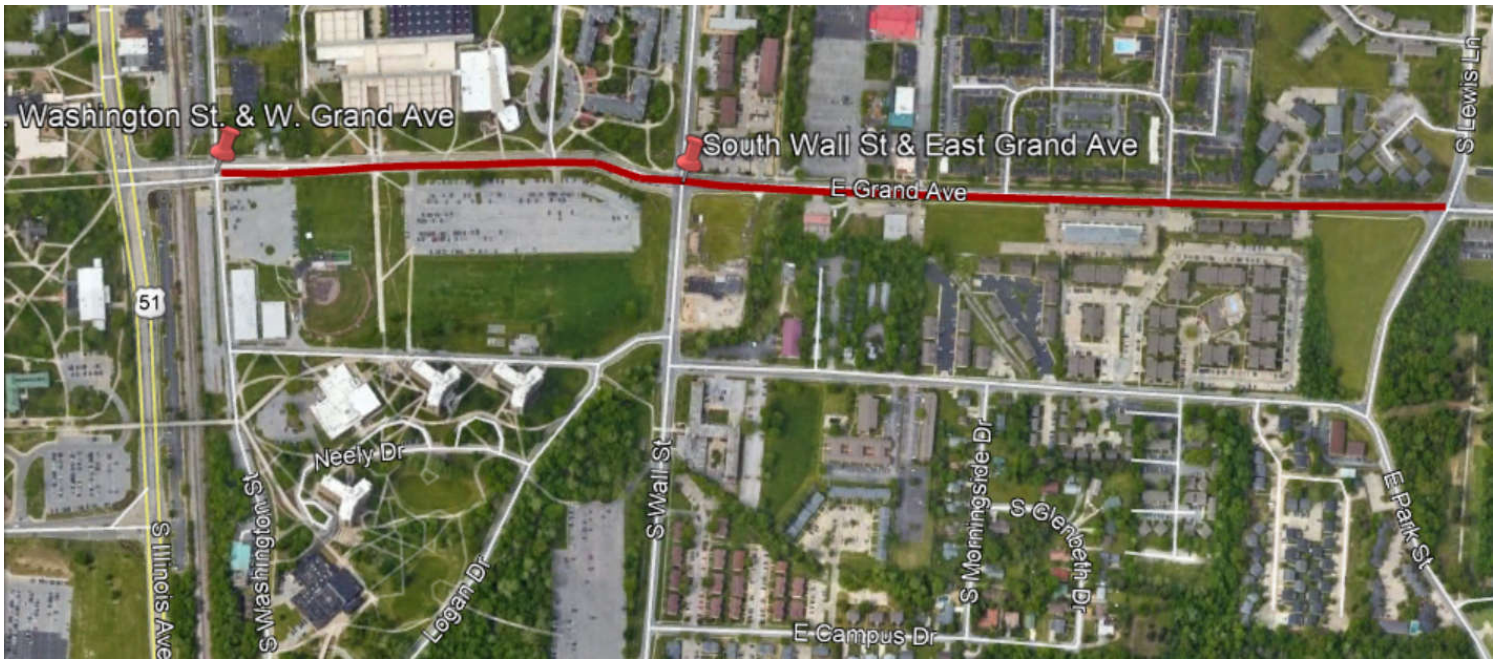


CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE	Intersection_Name
20140028111	14	2	28	13	Fri	2	1	0	Angle	Clear	Daylight	Wet	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	B-Injury	E. Main Frontage Rd South & N. Giant City Rd
20140040958	14	10	13	16	Mon	3	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	A-Injury	Segment
20140021041	14	4	9	20	Wed	1	0	0	Animal	Clear	Darkness, Lighted Road	Dry	No Controls	Carbondale	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)						PD	Segment
20140089991	14	4	17	14	Thu	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Tractor With Semi-Trailer	Northwest	Enter From Drive/Alley	Other	Normal	Passenger	West	Enter From Drive/Alley	Other	PD	Segment
20140015940	14	3	12	14	Wed	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	South	Slow/Stop - Right Turn	On Pavement (Roadway)	Normal	Passenger	South	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	Segment
20140030592	14	6	27	11	Fri	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Carbondale	Normal	Passenger	North	Backing	On Pavement (Roadway)	Normal	Passenger	North	Backing	On Pavement (Roadway)	PD	Segment
20140012831	14	8	2	13	Sat	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	South	Turning Left	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
20140023982	14	5	3	13	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20140030718	14	7	26	12	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	N. Giant City Rd & E. Sunny Acres Rd
20140020351	14	4	3	16	Thu	2	0	0	Turning	Rain	Daylight	Wet	Stop Sign/Flasher	Carbondale	Normal	Passenger	North	Straight Ahead	Intersection	Normal	Passenger	East	Turning Left	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20140023462	14	4	29	12	Tue	2	0	0	Turning	Clear	Daylight	Dry	Lane Use Marking	Carbondale	Normal	Passenger	East	Turning Left	Intersection	Normal	SUV	North	Straight Ahead	Intersection	PD	N. Giant City Rd & E. Sunny Acres Rd
20140026882	14	5	31	19	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	Northeast	Turning Left	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20150133706	15	5	1	16	Fri	2	3	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Van/Mini-Van	West	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	A-Injury	N. Giant City Rd & E. Sunny Acres Rd
20150133995	15	7	4	21	Sat	2	4	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	E. Main Frontage Rd South & N. Giant City Rd
20150149724	15	10	2	14	Fri	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Slow/Stop - Right Turn	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
20150143965	15	11	17	11	Tue	1	0	0	Fixed Object	Clear	Daylight	Dry	No Controls	Carbondale	N/A	N/A	N/A	N/A	N/A	Normal	SUV	North	Avoiding Vehicle/Objects	Off Pavement - Right	PD	Segment
20150148749	15	12	12	13	Sat	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Carbondale	Normal	Passenger	South	Changing Lanes	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
20150124836	15	3	5	16	Thu	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20150129979	15	5	14	11	Thu	3	0	0	Angle	Rain	Daylight	Wet	Stop Sign/Flasher	Carbondale	Normal	Passenger	East	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20150135247	15	6	2	14	Tue	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	N. Giant City Rd & E. Sunny Acres Rd
20150142698	15	11	1	13	Sun	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20150149083	15	11	14	14	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20150128361	15	10	12	12	Sun	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Turning Left	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20150133910	15	6	8	14	Mon	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	East	Turning Left	Intersection	Normal	Motorcycle (Over 150cc)	South	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20160146027S	16	9	1	13	Thu	2	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Pickup	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	A-Injury	E. Main Frontage Rd South & N. Giant City Rd
20160140457Z	16	6	7	12	Tue	2	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Pickup	West	Straight Ahead	Intersection	Normal	Pickup	South	Straight Ahead	Intersection	B-Injury	N. Giant City Rd & E. Sunny Acres Rd
20160150362I	16	12	13	17	Tue	2	1	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Carbondale	Normal	SUV	North	Turning Right	Intersection	Normal	SUV	North	Straight Ahead	Intersection	C-Injury	N. Giant City Rd & E. Sunny Acres Rd
20160138207A	16	4	28	1	Thu	1	1	0	Fixed Object	Rain	Darkness, Lighted Road	Wet	Stop Sign/Flasher	Carbondale	Alcohol Impaired	Passenger	North	Skidding/Control Loss	Off Pavement - Right						B-Injury	Segment
20160134755Z	16	2	25	10	Thu	2	0	0	Sideswipe Same Direction	Cloudy/Overcast	Daylight	Dry	No Controls	Carbondale	Normal	Passenger	North	Changing Lanes	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
20160143899G	16	8	12	9	Fri	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Lane Use Marking	Carbondale	Normal	Unknown	North	Changing Lanes	On Pavement (Roadway)	Normal	Truck Single Unit	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Segment
20160144356G	16	8	18	14	Thu	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Lane Use Marking	Carbondale	Normal	Passenger	South	Changing Lanes	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
20160150433S	16	12	23	10	Fri	2	0	0	Turning	Cloudy/Overcast	Daylight	Dry	No Controls	Carbondale	Normal	SUV	West	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
20160144159G	16	8	4	14	Thu	3	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20160135589G	16	3	19	19	Sat	2	0	0	Turning	Clear	Dusk	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	Northwest	Turning Left	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20160138076A	16	4	24	13	Sun	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	North	Turning Left	On Pavement (Roadway)	Normal	Van/Mini-Van	South	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20170139076S	17	4	17	11	Mon	3	2	0	Angle	Rain	Daylight	Wet	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	Intersection	Normal	Van/Mini-Van	South	Straight Ahead	Intersection	A-Injury	E. Main Frontage Rd South & N. Giant City Rd
20170143499G	17	6	19	16	Mon	2	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Tractor Without Semi-Trailer	West	Straight Ahead	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	B-Injury	N. Giant City Rd & E. Sunny Acres Rd
20170146637Z	17	9	28	16	Thu	2	2	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	B-Injury	N. Giant City Rd & E. Sunny Acres Rd
20170138922S	17	4	4	12	Tue	2	2	0	Angle	Clear	Daylight	Dry	No Controls	Carbondale	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Slow/Stop - Right Turn	On Pavement (Roadway)	A-Injury	Segment
20170170823	17	1	23	13	Mon	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Pickup	West	Straight Ahead	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
20170145146J	17	8	8	8	Tue	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Carbondale	Normal	SUV	Southeast	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	Southeast	Straight Ahead	On Pavement (Roadway)	PD	Segment
20170148141J	17	11	30	16	Thu	2	0	0	Turning	Clear	Dusk	Dry	Other	Carbondale	Normal	Pickup	North	Turning Right	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
20170148148	17	1	16	16	Mon	2	0	0	Angle	Rain	Dusk	Wet	Stop Sign/Flasher	Carbondale	Normal	Passenger	East	Straight Ahead	Intersection	Normal	SUV	South	Straight Ahead	Intersection	PD	N. Giant City Rd & E. Sunny Acres Rd
20170139951Z	17	4	7	12	Fri	2	0	0	Angle	Clear	Daylight	Dry	No Controls	Carbondale	Normal	Passenger	West	Straight Ahead	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20170145679F	17	8	26	14	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20170142994	17	12	7	17	Sat	2	0	0	Angle	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20170163563	17	1	5	7	Thu	1	0	0	Fixed Object	Snow	Daylight	Ice	No Controls	Carbondale	Normal	Passenger	Southwest	Skidding/Control Loss	On Pavement (Roadway)						PD	N. Giant City Rd & E. Sunny Acres Rd
20170163568	17	1	5	8	Thu	1	0	0	Fixed Object	Snow	Daylight	Ice	No Controls	Carbondale	Normal	Passenger	Northeast	Skidding/Control Loss	On Pavement (Roadway)						PD	N. Giant City Rd & E. Sunny Acres Rd
20170144955	17	7	31	18	Mon	2	0	0	Rear End	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Slow/Stop - Right Turn	On Pavement (Roadway)	PD	N. Giant City Rd & E. Sunny Acres Rd
20170142423	17	5	25	21	Thu	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Carbondale	Other/Unknown	Pickup	South	Unknown	On Pavement (Roadway)	Normal	Passenger	South	Turning Left	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20170143890	17	7	3	15	Mon	2	0	0	Turning	Rain	Daylight	Wet	Stop Sign/Flasher	Carbondale	Normal	Passenger	Northeast	Turning Left	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20170145350G	17	8	15	12	Tue	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Pickup	Northwest	Turning Left	Intersection	Normal	SUV	Northeast	Turning Left	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20170145523S	17	8	21	15	Mon	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	North	Turning Right	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	N. Giant City Rd & E. Sunny Acres Rd
20170147446O	17	11	1	21	Wed	2	0	0	Turning	Rain	Darkness, Lighted Road	Wet	No Controls	Carbondale	Normal	Passenger	South	Passing/Overtaking	On Pavement (Roadway)	Normal	Passenger	South	Turning Left	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20170147850B	17	11	17	18	Fri	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Carbondale	Normal	SUV	South	Turning Right	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20170478941	17	11	19	13	Sun	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	SUV	West	Turning Left	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	N. Giant City Rd & E. Sunny Acres Rd
20180473144	18	9	30	20	Sun	2	1	0	Angle	Clear	Darkness	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	East	Slow/Stop - Left Turn	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	B-Injury	E. Main Frontage Rd South & N. Giant City Rd
20180145368	18	7	8	17	Sun	2	1	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	SUV	East	Turning Left	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	C-Injury	N. Giant City Rd & E. Sunny Acres Rd
20180492886	18	12	14	17	Fri	1	0	0	Fixed Object	Rain	Darkness, Lighted Road	Wet	No Controls	Carbondale	Normal	Passenger	South	Straight Ahead	Off Pavement - Right						PD	Segment
20180145151I	18	6	30	12	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	SUV	West	Straight Ahead	Intersection	Normal	Van/Mini-Van	South	Straight Ahead	Intersection	PD	E. Main Frontage Rd South & N. Giant City Rd
20180476905	18	10	16	10	Tue	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	N. Giant City Rd & E. Sunny Acres Rd
20180474993	18	10	8	13	Mon	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Stop Sign/Flasher	Carbondale	Other/Unknown	Passenger	Northwest	Slow/Stop - Left Turn	On Pavement (Roadway)	Normal	Van/Mini-Van	Northwest	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd
20180410637	18	1	8	17	Mon	2	0	0	Turning	Cloudy/Overcast	Darkness	Wet	No Controls	Carbondale	Normal	Passenger	West	Turning Right	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	E. Main Frontage Rd South & N. Giant City Rd

SIMPO SAFETY STUDY

Appendix : Grand Avenue Corridor

Washington Street to Lewis Street



prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

Grand Avenue Corridor - Washington Street to Lewis Street

Introduction

The study corridor includes Grand Avenue, from Washington Street to Lewis Street, including the Intersection of Grand Avenue and Washington Street and the Intersection of Grand Avenue and South Wall Street. The segment is about 0.82 miles long. **Figure 1** shows the study area and includes markers at the two intersections mentioned above.

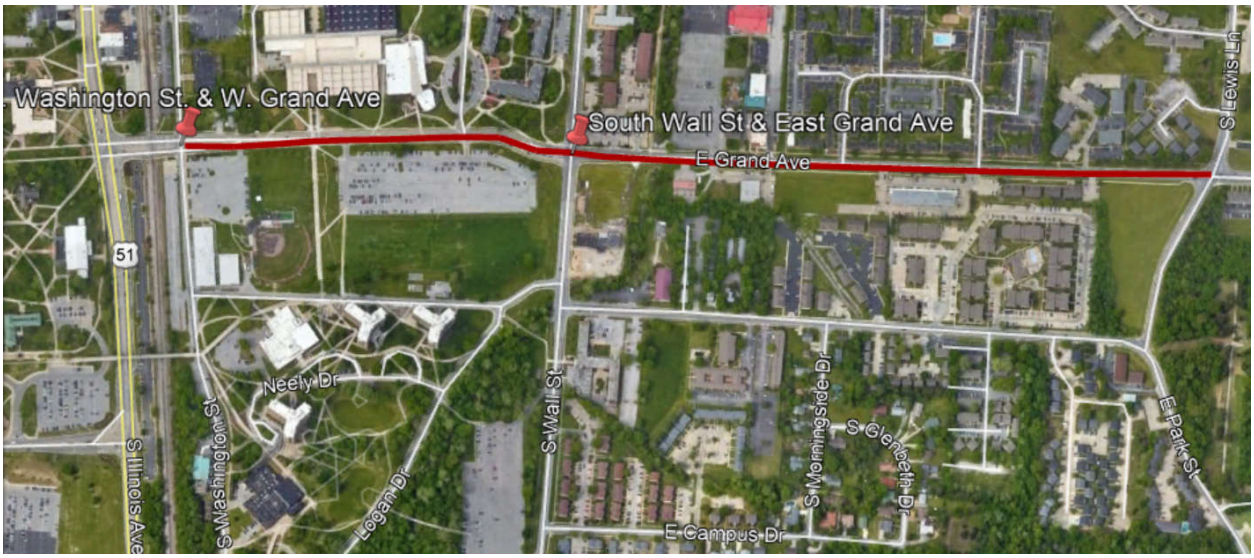


Figure 1: Study Area

Existing Conditions

Grand Avenue is located in Carbondale, Illinois in Jackson County. This corridor provides a connection between US Route 51 and Giant City Road. The corridor is in a developed area and provides access to part of the Southern Illinois University Carbondale campus. The segment from Lewis Street to South Wall Street includes three lanes, one 11-foot lane in each direction and a 10-foot center turn lane. From South Wall Street to Washington Street, the corridor expands to four 12-foot lanes, two lanes going in each direction. The entire corridor includes a curb and gutter system and has a speed limit of 30 miles per hour (mph).

Several of the buildings along the corridor are apartments and housing for college students attending the university. Pedestrians can use the sidewalks that are along the corridor and have access to crossing the roadway at two different locations. The two locations provide marked pedestrian facilities to cross Grand Avenue. One crossing is at the intersection of Grand Avenue and South Wall Street, in **Figure 2,** and the other crossing is at a rectangle rapid flashing beacon (RRFB), in **Figure 3,** located about 550 feet east of the intersection of Grand Avenue and Washington Street and in front of the Southern Illinois University (SIU) Student Recreation Center.

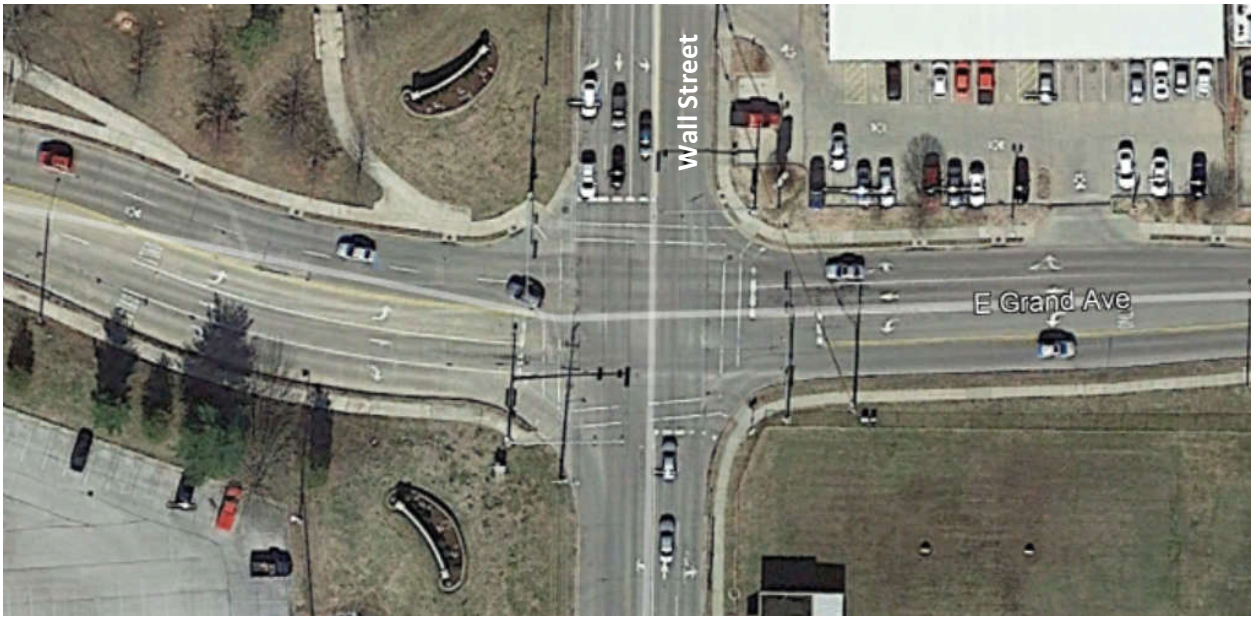


Figure 2: Intersection of Grand Avenue and South Wall Street

Figure 3: RRFB to SIU Student Recreation Center

The intersection of Grand Avenue and South Wall Street is signalized and provides pedestrian accommodations including push buttons and crosswalks across all legs. The area surrounding this intersection includes student housing and a plaza with shops and restaurants, on the north. In the southwest corner of the intersection, there is a parking lot for the university.

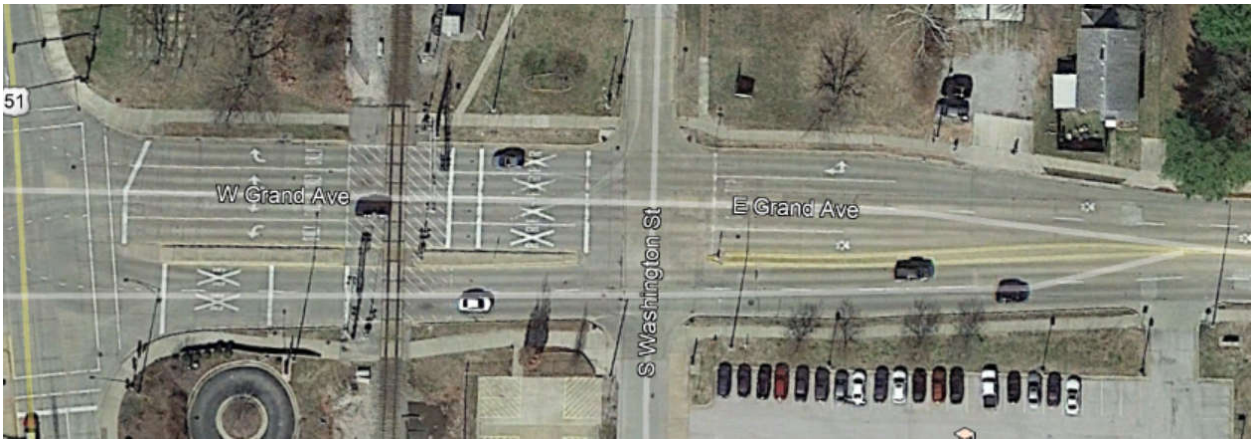


Figure 4: Intersection of Grand Avenue and Washington Street

The intersection of Grand Avenue and Washington Street, shown in **Figure 4**, is unsignalized with southbound Washington Street and eastbound Grand Avenue required to stop. The intersection does not have any marked pedestrian crossings. Washington Street is limited to one-way southbound at this intersection. Westbound Grand Avenue has a second stop sign in the middle of the road (in between the eastbound and westbound lanes) to reenforce the need to stop at the intersection. There is a parking lot south of the intersection for Southern Illinois University's Charlotte West Stadium. About 100 feet to the west of the intersection, there is a railroad crossing. Additionally, there is another intersection with South Illinois Avenue (US 51) about 290 feet west of the intersection, as shown in **Figure 4** above.

The last intersection located on this corridor is the intersection of Grand Avenue and Lewis Lane which is located on the east end of the study area. This intersection did not make the priority list and is not an intersection of concern. There is an elementary school northeast of this intersection and a middle school further down the corridor. Even though both schools are not included in the study area, the Grand Avenue and Lewis Lane intersection is worth noting because of potential impacts on traffic in the study area.

Safety Analysis

A total of **112 crashes** occurred in the study corridor in 2014 to 2018. The frequency of crashes by year is shown in **Figure 5**. The crash trend is relatively consistent across the five years with 2016 having the highest number of crashes at 35.

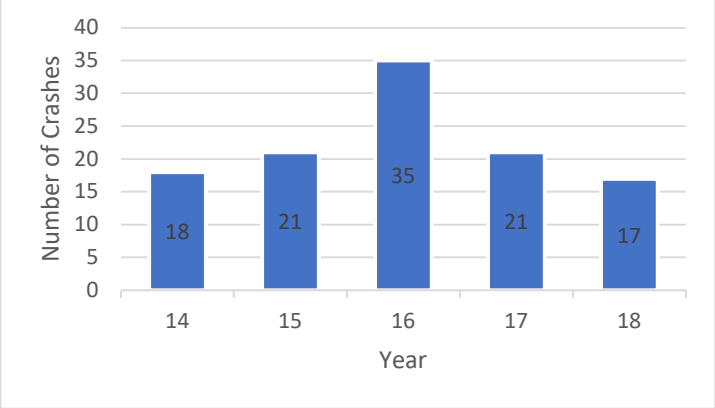


Figure 5: Frequency of Crashes by Year

Figure 6 shows the frequency of crashes by type. The majority of crashes are rear ends and turning crashes at 53 percent combined. Half the crashes are at the intersections in the study area and half are along the corridor. There are 10 pedalcyclist crashes and 5 pedestrian crashes. All bicycle and pedestrian crashes resulted in A-Injury, B-Injury, or C-Injury crashes. As mentioned above, the SIU Student Recreation Center and student housing for the university are located along the corridor. This land use adds more pedestrian and bicyclist movements along the corridor.

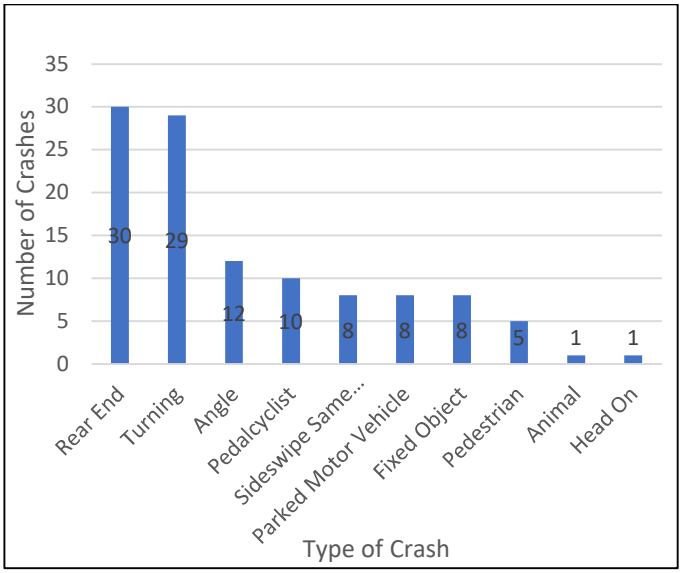


Figure 6: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 7**. The majority of crashes are property damage only at 71 percent. There are no fatal crashes on the corridor. Nearly half for the injury crashes along the corridor are bicycle or pedestrian related (15 of 32). It should be noted that the RRFB was installed in 2017. The crash data includes one pedalcyclist crash in 2017 as well as one pedalcyclist and one pedestrian crash in 2018.

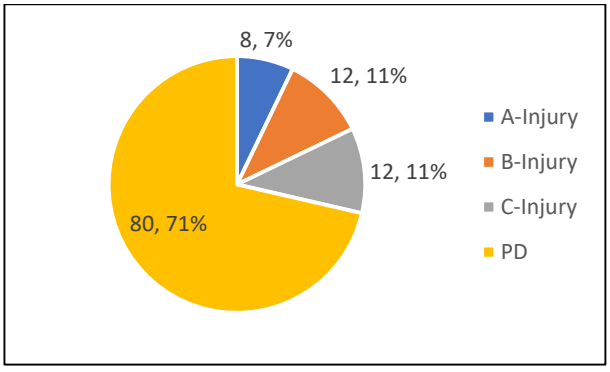


Figure 7: Frequency of Crashes by Severity

Figure 8 shows the frequency by direction and crash type. 29 percent of the crashes occurred on the eastbound approach and 29 percent of the crashes occurred on the westbound approach. The 18 of the 30 rear end crashes occurred on the east side of the intersection.

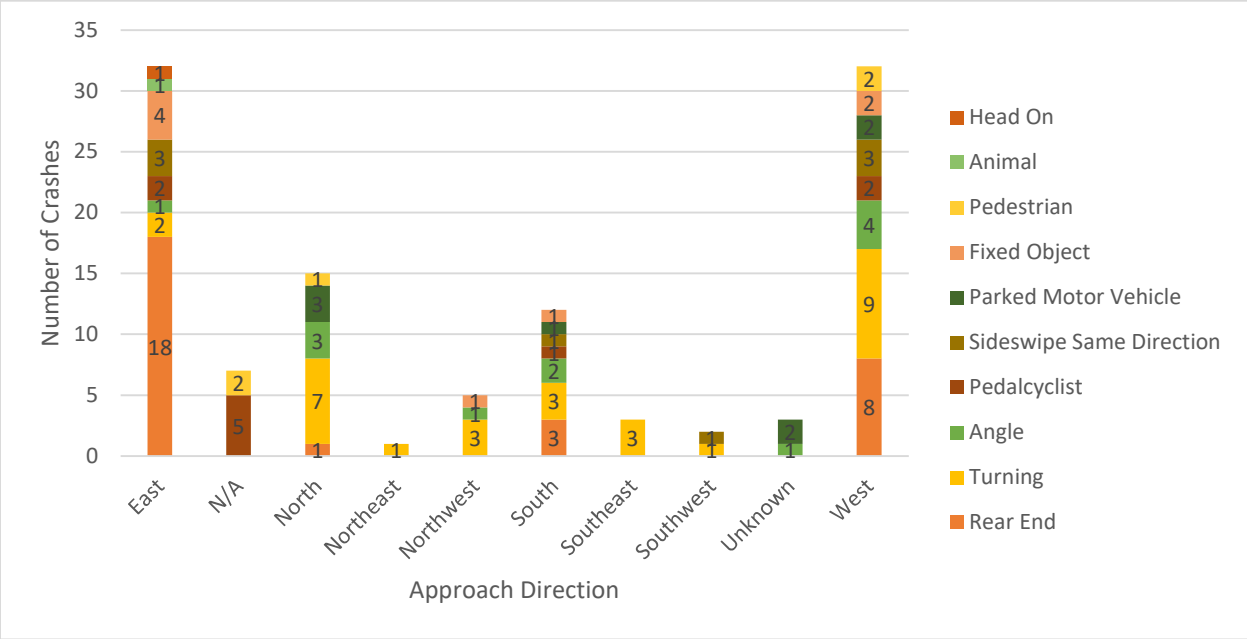


Figure 8: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 9**, below. The crashes increase in the afternoon and evening peaks with a spike at 9pm. The crashes are the lowest in the morning hours between 3am and 7am. The hours are consistent with travel patterns around universities.

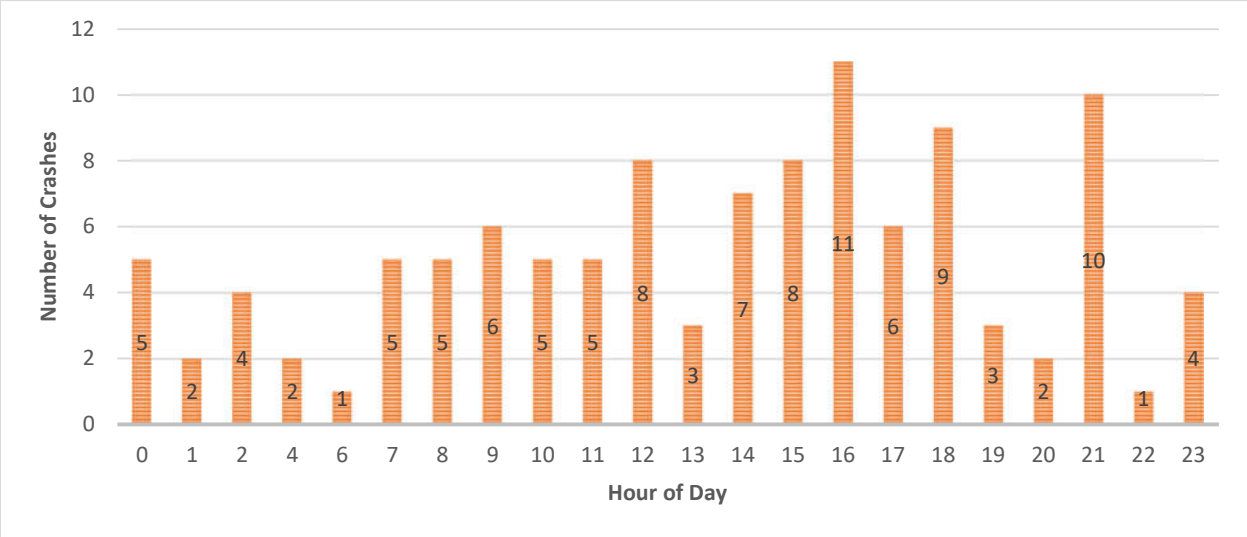


Figure 9: Frequency of Crashes by Hour

The weather condition is shown in **Figure 10**. The majority of crashes occurred on clear days (75%).

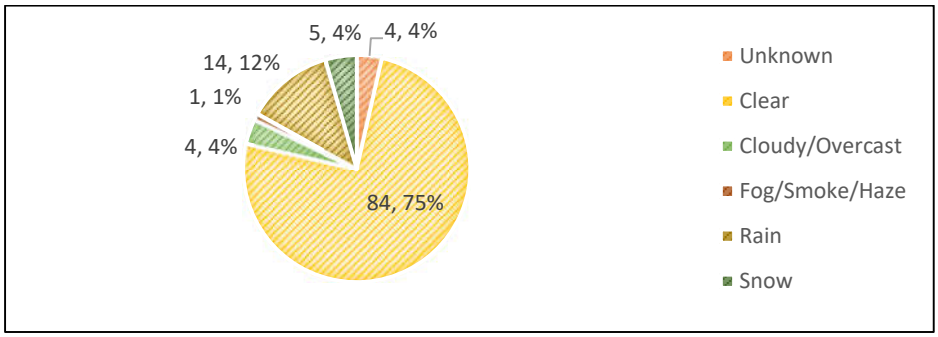


Figure 10: Frequency of Crashes by Weather

The lighting condition is shown in **Figure 11**. 64 percent of crashes occurred during daylight hours.

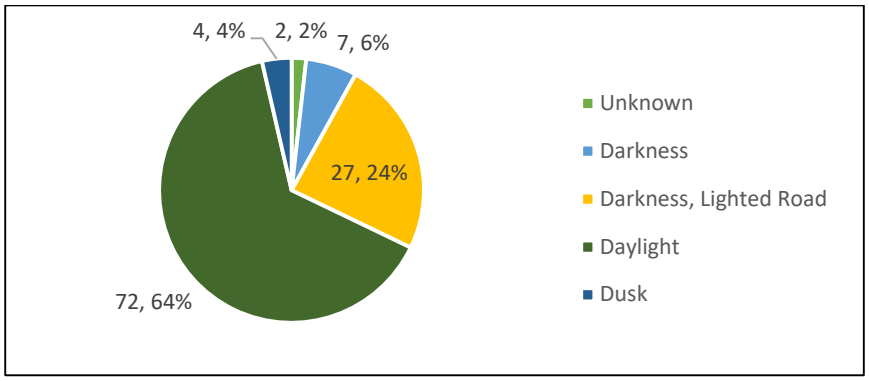


Figure 11: Frequency of Crashes by Lighting

The crash frequency by month is shown in **Figure 12.** The months with the fewest crashes are January (1) and June (6).

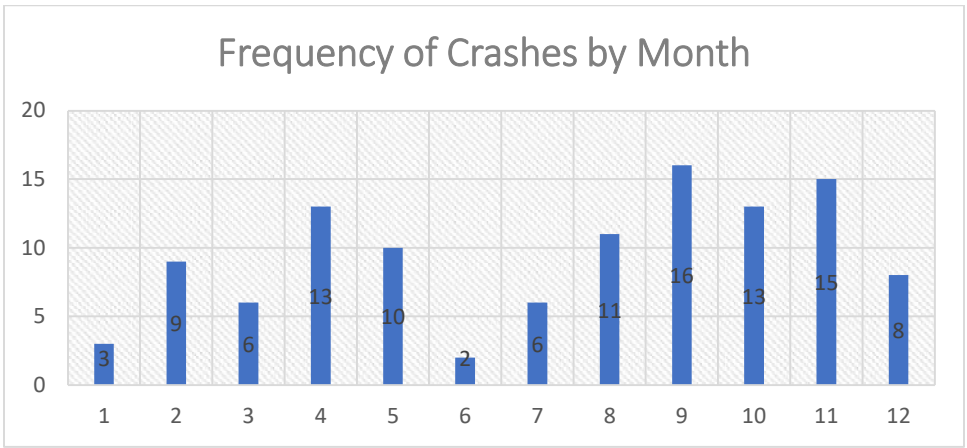


Figure 12: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures – Grand Avenue Segments

Areas of Concern

Grand Avenue, between Washington Street and Lewis Street, has 61 total crashes in the five-year period. There were four A-injuries of different crash types: rear end, fixed object, bike, and pedestrian. The eight B-injuries consisted of six bike crashes, one angle, and one pedestrian crash. Overall, the most common crash type is rear end, followed by parked, turning, fixed object, and bike crashes. The most common injury crash is crashes with bikes.

Countermeasures

To help address the rear end and fixed object crashes, speed management could be considered. One countermeasure would be to install speed feedback signs to slow vehicles down. Another alternative is to consider lane narrowing and/or a road diet.

To better accommodate bikes and pedestrians, a 10-foot shared use path could be constructed along Grand Avenue. The path would separate bikes and pedestrians from vehicles. In 2017 an RRFB was installed along Grand Avenue near the Student Center. An RRFB awareness campaign could also be initiated to improve awareness compliance from vehicles as well as pedestrians for the RRFB. Speed tables could also be used to raise crosswalk(s) and slow vehicles down, making Grand Avenue more bike/pedestrian friendly.

Finally, lighting along the corridor could also be improved to reduce crashes and improve the visibility of pedestrians, bicycles, and fixed objects.

Considering the three potential safety concerns noted together (speed management, bike/pedestrian safety and lighting), it appears that Grand Avenue could be a good candidate for a road diet with bicycle/pedestrian facilities . A road diet could repurpose the current four lane cross-section by re-striping to a narrower three lane cross-section with improved pedestrian/bike facilities. **Figure 13** illustrates a basic before and after cross-section.

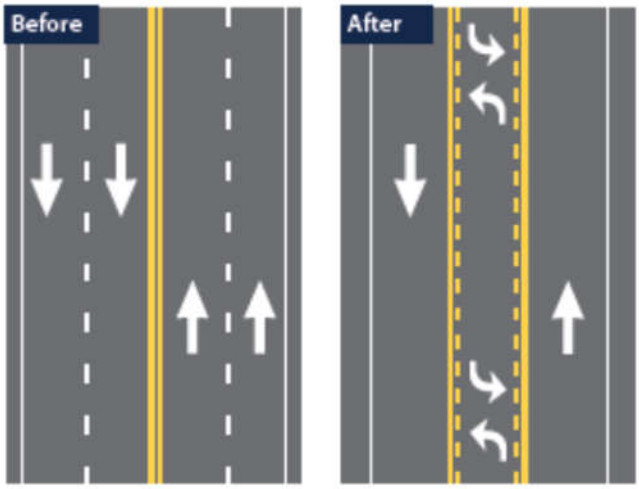


Figure 13: Example of "Road Diet" Cross Section from FHWA [1]

From a safety perspective, a road diet would provide a separate left-turn lane which would likely reduce rear end collisions and could also provide improved pedestrian/bike accommodations to reduce the high amount of bike crashes. Improved lighting could also be considered at the same time.

In order to determine if a road diet is the correct alternative for the area, a larger study is recommended to verify that a road diet is the proper solution and feasible. The larger study should consider more than just the safety aspect considered herein. Many items should be investigated in more detail including: traffic volumes, pedestrian/bike volumes, shuttle routes and stop locations, influence of special events at the nearby fields, etc. Due to the proximity to the University, their input and cooperation will be critical in the study.

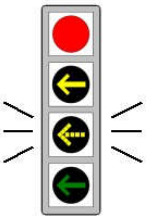
Areas of Concern & Possible Countermeasures – S. Wall Street and Grand Avenue (Signalized Intersection)

Areas of Concern

S. Wall Street and Grand Avenue is a signalized intersection. Wall Street is a four-lane road on the west side of the intersection and a three-lane road on the east side of the intersection. 37 crashes occurred at S. Wall Street and Grand Avenue intersection in the five-year period with most crashes occurring with vehicles on the side street. Of the total crashes, 49% were turning, 27% were rear end, 16% were pedestrian or bicycle crashes. The biggest concern is to reduce rear end and turning crashes.

[1] https://safety.fhwa.dot.gov/road_diets/resources/fhwasa16033-flyer.pdf

Countermeasures



To reduce angle and turning crashes, flashing yellow arrows could be installed on the left-turn signal heads to better convey the left-turn driver needs to yield to oncoming vehicles. A more restrictive measure would be to implement protected-only left-turn phasing to minimize interaction between left-turning vehicles and through vehicles on the opposite approach. The impacts to capacity and operations should also be evaluated before implementation of protected-only left-turn phasing so that the change does not create long queues, which could negatively impact safety.

Reflective back plates can also be installed on the primary signal heads at the intersection to bring attention to the signal. The less than optimal visibility of the signal when traveling eastbound (due to the curve in the road west of Wall Street) could be improved by clearing the sight triangle, adding a supplementary signal head(s) or providing active advanced warning signs for when the signal is going to turn to red, such as be prepared to stop flashers.

To address bike and pedestrian crash reduction, improved pedestrian accommodations could be considered at Grand Avenue and S. Wall Street. Right-turn on red restrictions could be implemented at the intersection along with proper enforcement to minimize conflicts between vehicles and pedestrians. Pedestrian countdown heads could be installed and a leading pedestrian interval could be implemented to help reduce pedestrian crashes.

An additional option would be to consider specific bike accommodations, signals, and controls to establish a more prominent bike presence.

Lastly a raised intersection could be considered to make bikes and pedestrians more apparent and to slow vehicles.

A more costly option to address the crash concerns is to construct a roundabout at S. Wall Street and Grand Avenue intersection. A roundabout could include separated bike and pedestrian facilities. The impacts to capacity, operations, special events and nearby property should also be considered before implementation.

Areas of Concern & Possible Countermeasures – S. Wall Street and Washington Street Intersection

Areas of Concern

Washington Street is less than 250 feet away from US 51 (Illinois Avenue) and the queues from the signal and railroad may impact the Washington Street intersection by restricting sight distance for the southbound approach. The intersection is currently controlled by an unconventional 3-way stop with

eastbound Grand Avenue free-flowing and all other approaches stop-controlled. The railroad crossing mentioned is between Washington and Illinois Avenue and has lights and gates. Washington is a one-way street heading southbound on the south side. However, southbound vehicles on the north leg are still negatively impacted by westbound queues from the signal and restricting the visibility of the free-flowing eastbound vehicles.

The two most common types of crashes are turning and angle crashes followed by sideswipe, rear end and fixed object. The two A-injuries consisted of an angle crash and a bike crash. The other 12 crashes were property-damage-only crashes. The southbound left or through conflicting with the eastbound throughs are the biggest areas of concern.

Countermeasures

To mitigate bike crashes, improved bike and pedestrian markings along the east and west directions could be considered. The one bike related injury crash was a northbound bike crossing from the south side of the intersection to the north. The road diet mentioned in the segments section could also help to reduce the number of lanes and slow vehicle speeds.

To address the southbound left-turn and through crash concerns, flashing LED stop signs for southbound Washington Street could be installed to help reduce angle and turning crashes.

Restricting through and left-turns for the southbound approach with signing, pavement markings, and/or enforcement would also help mitigate turning and angle crashes. A "porkchop island" on the southbound approach could be used to physically restrict through and left-turning vehicles, see **Figure 14**.

Figure 14: Example of "Porkchop Island" on Washington Avenue

Another option would be to physically restrict all left-turns with a raised center median on N. Grand Avenue, see **Figure 15**. In this case, alternative routes for left-turns would need to be provided.

Figure 15: Example of Median to restrict Washington to Right-in/Right-out

One final option to restrict turning and through movements from the southbound approach would be to convert Washington Street to a one-way, northbound street to the north of Grand, see **Figure 16**. MUTCD compliant one-way/do not enter signage and possibly pavement marking would need to be considered.

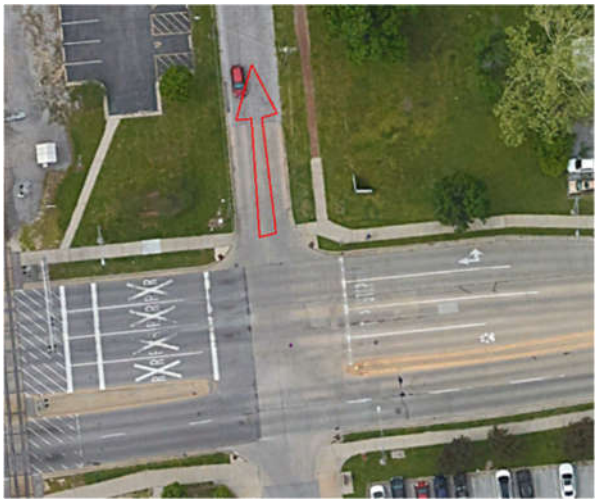
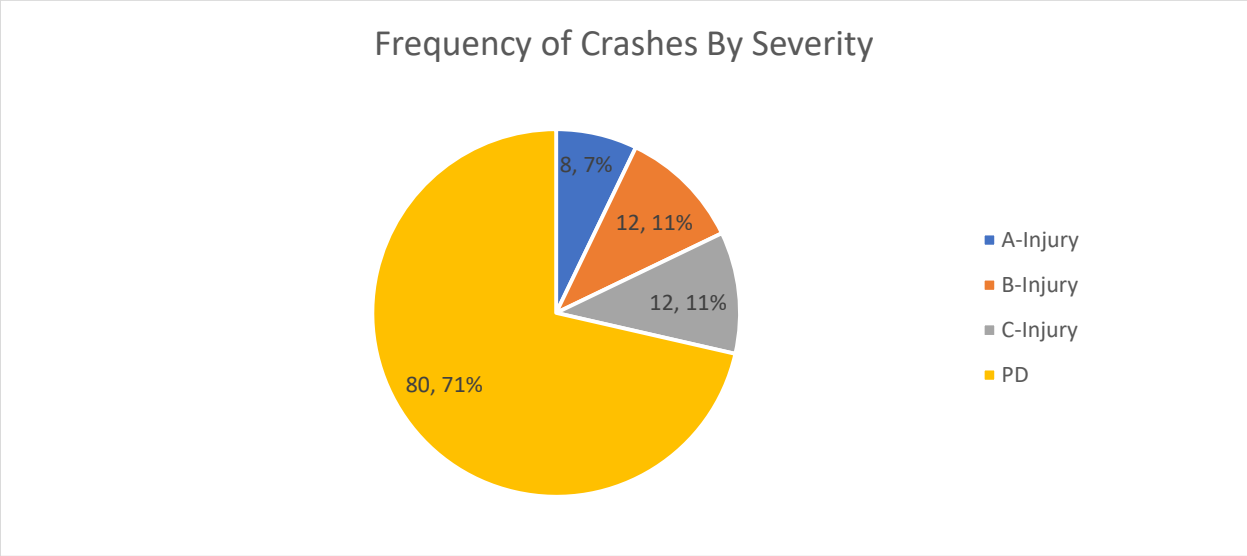
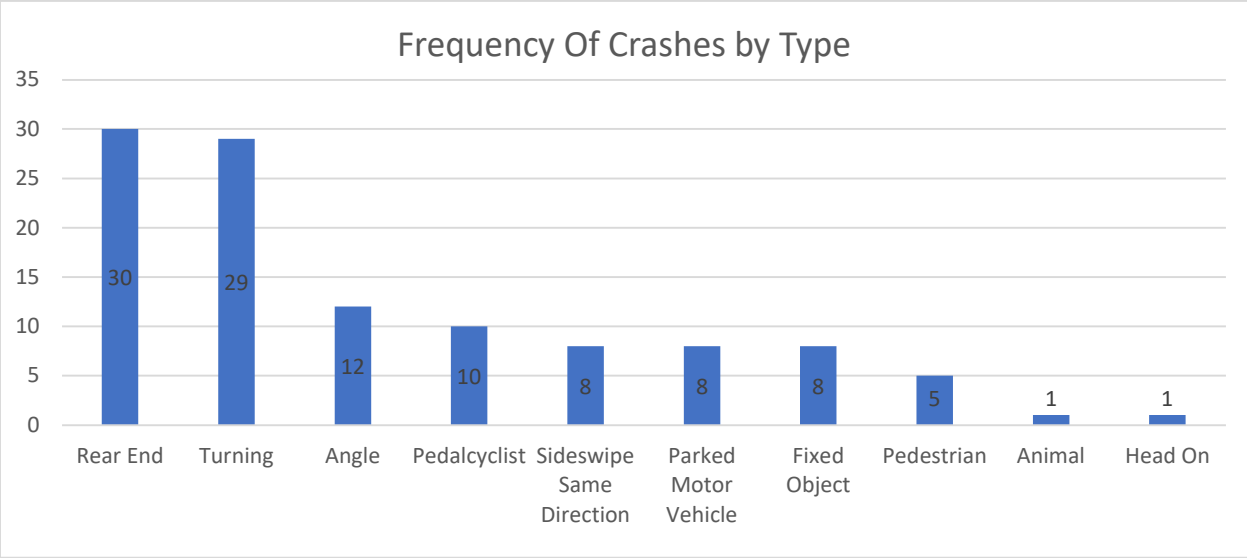


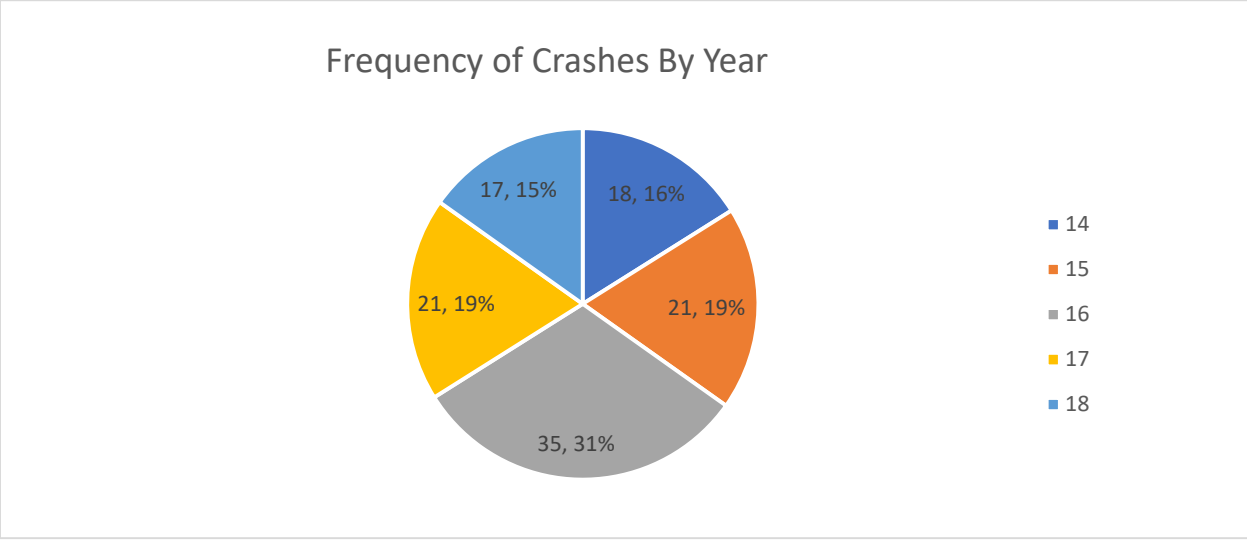
Figure 16 – Convert Washington Street to One-way Flow Northbound to eliminate the SB and EB conflict.

A more costly and larger footprint option would be to consider a roundabout at this location. However, the large footprint may have operational impacts on the railroad and adjacent signal. The geometric footprint and operational implications would need to be evaluated in further detail.

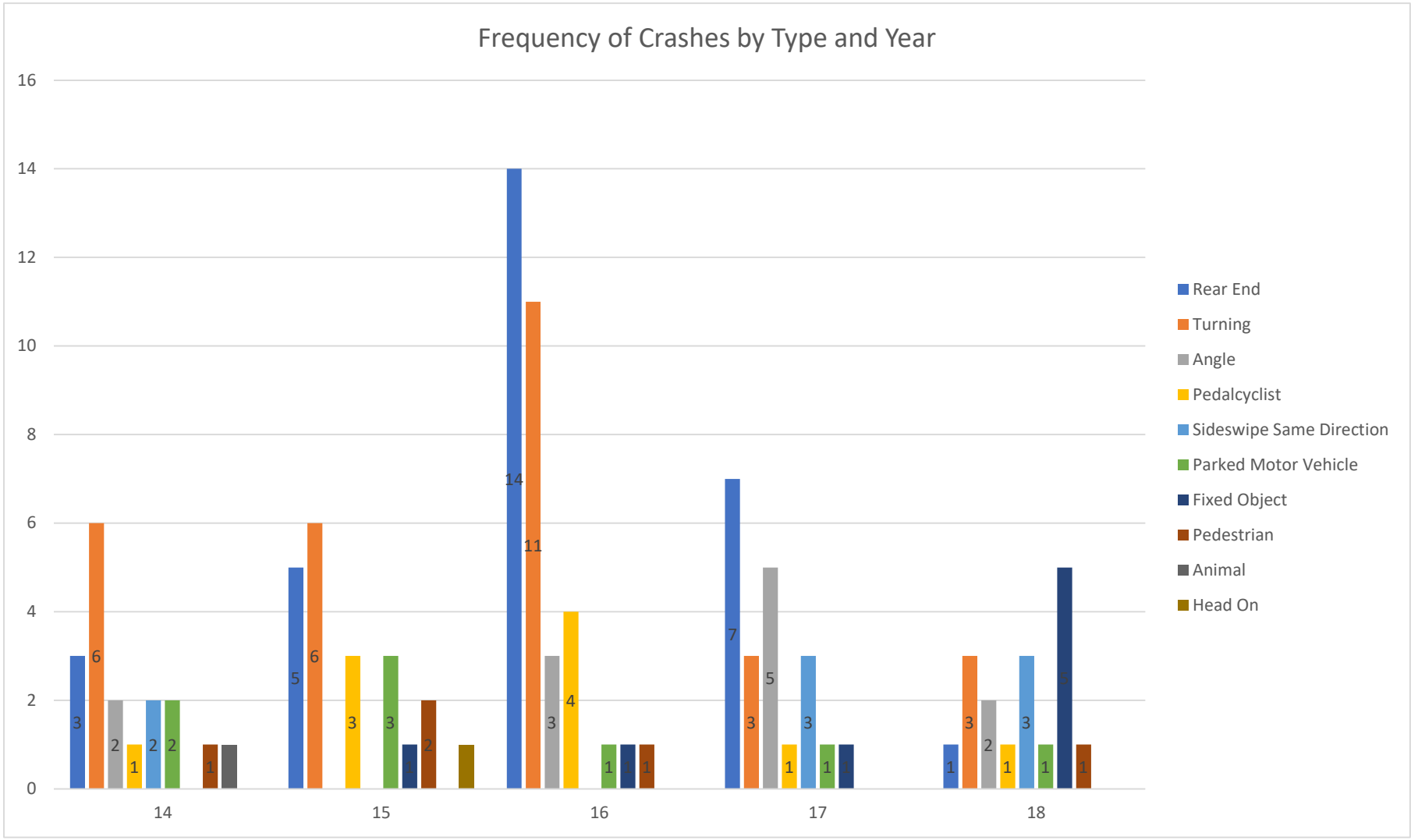
Grand Avenue Corridor Crashes - Washington Street to Lewis Street (2014-2018)



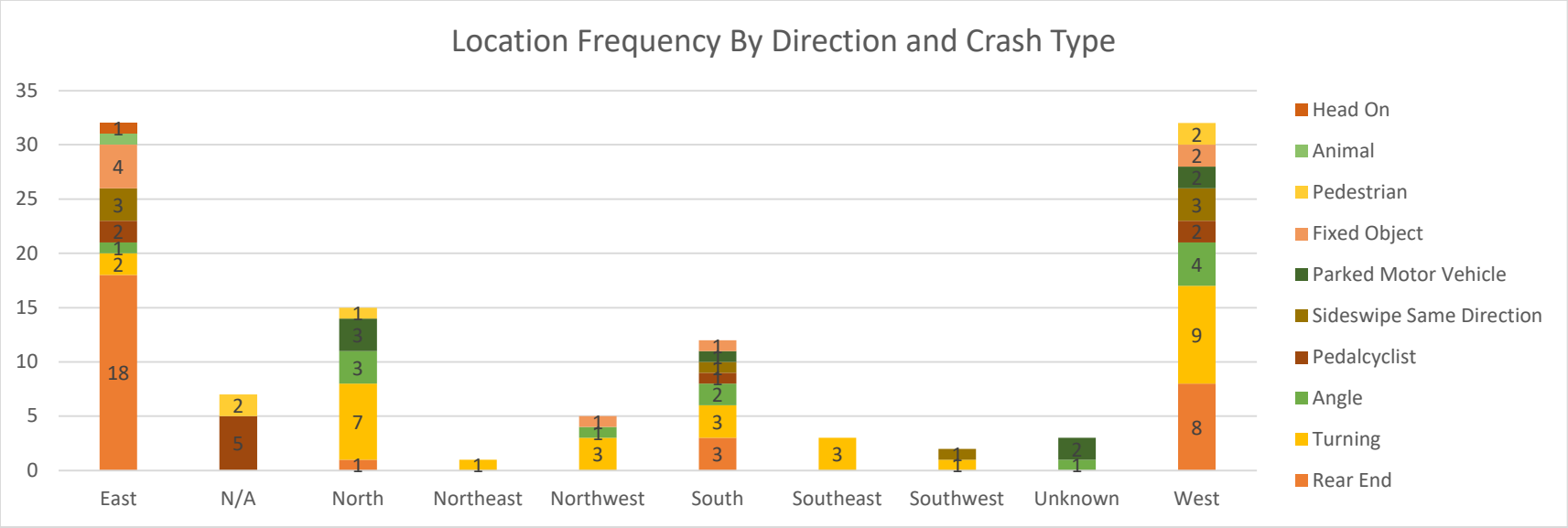


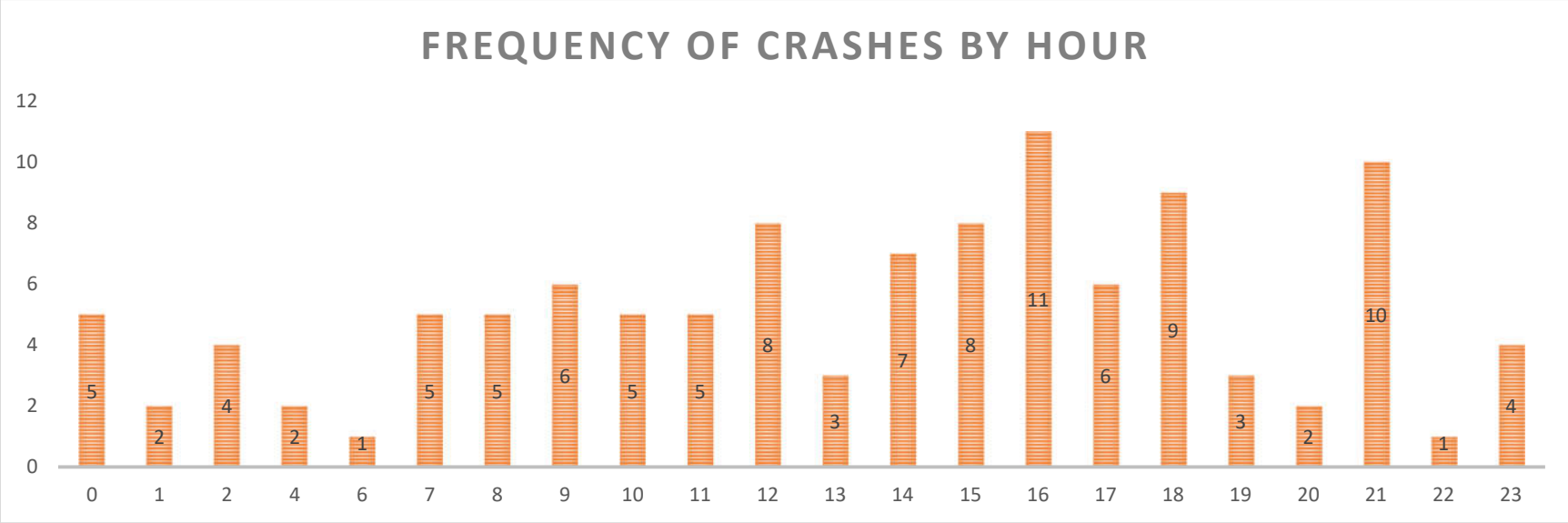


Grand Avenue Corridor Crashes - Washington Street to Lewis Street (2014-2018)



Grand Avenue Corridor Crashes - Washington Street to Lewis Street (2014-2018)





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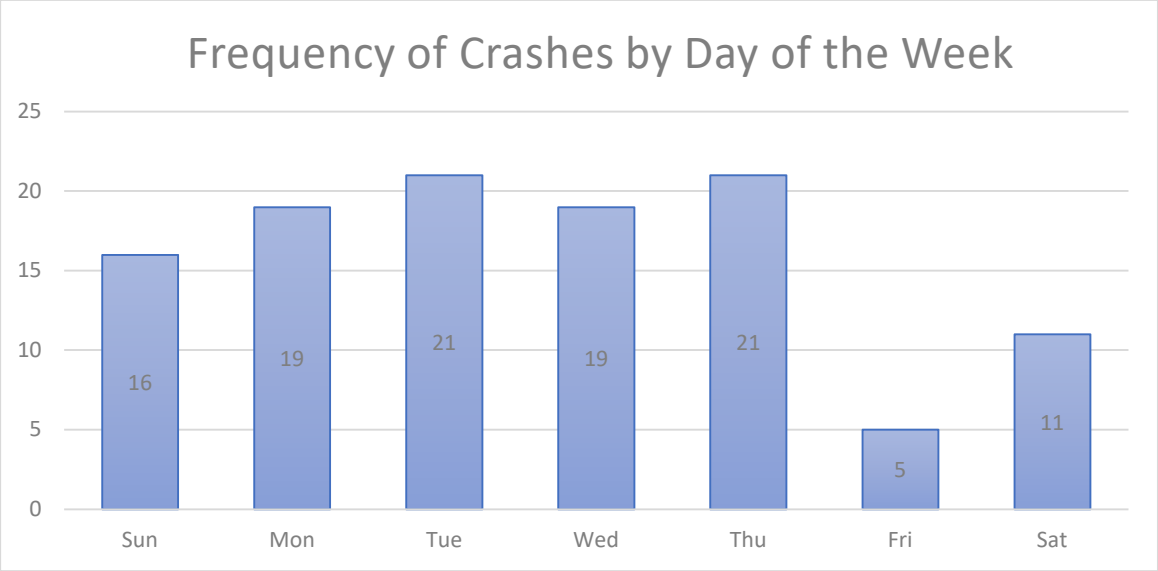
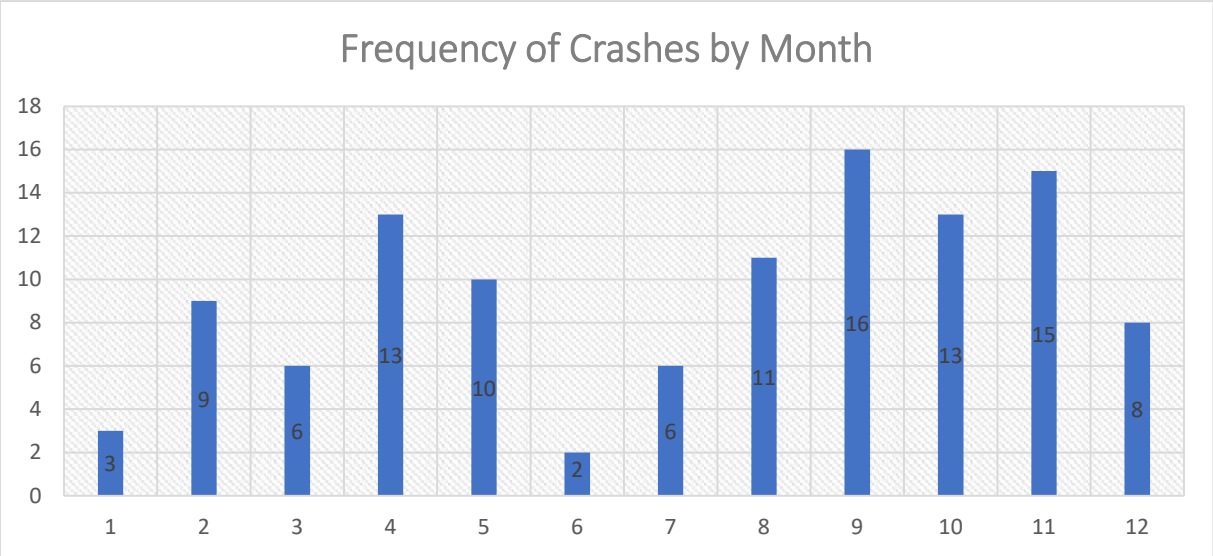
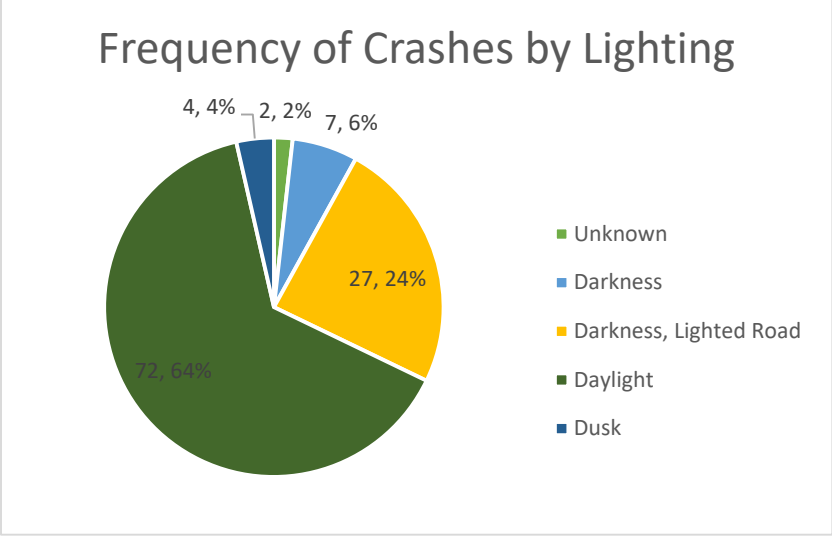
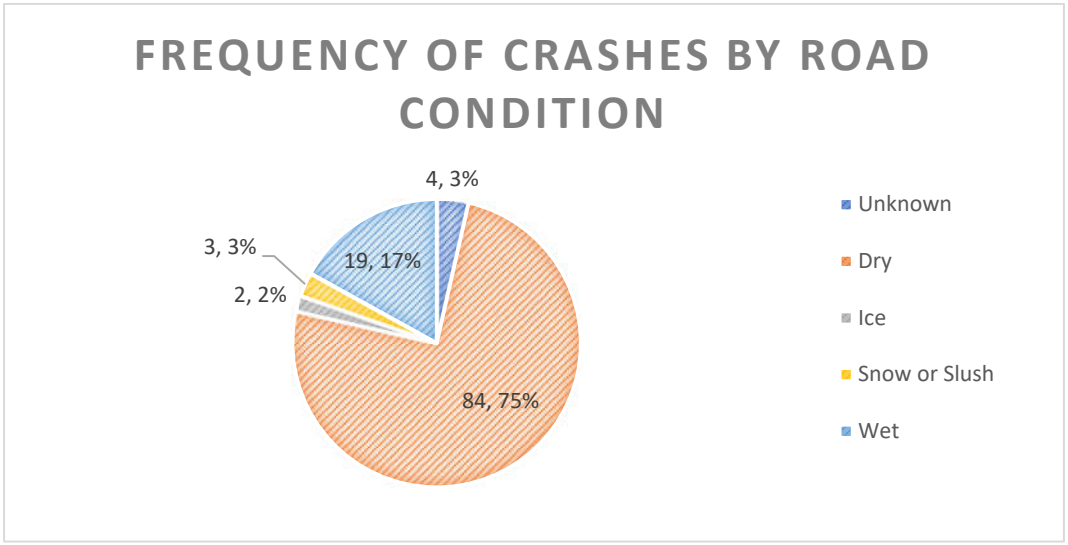
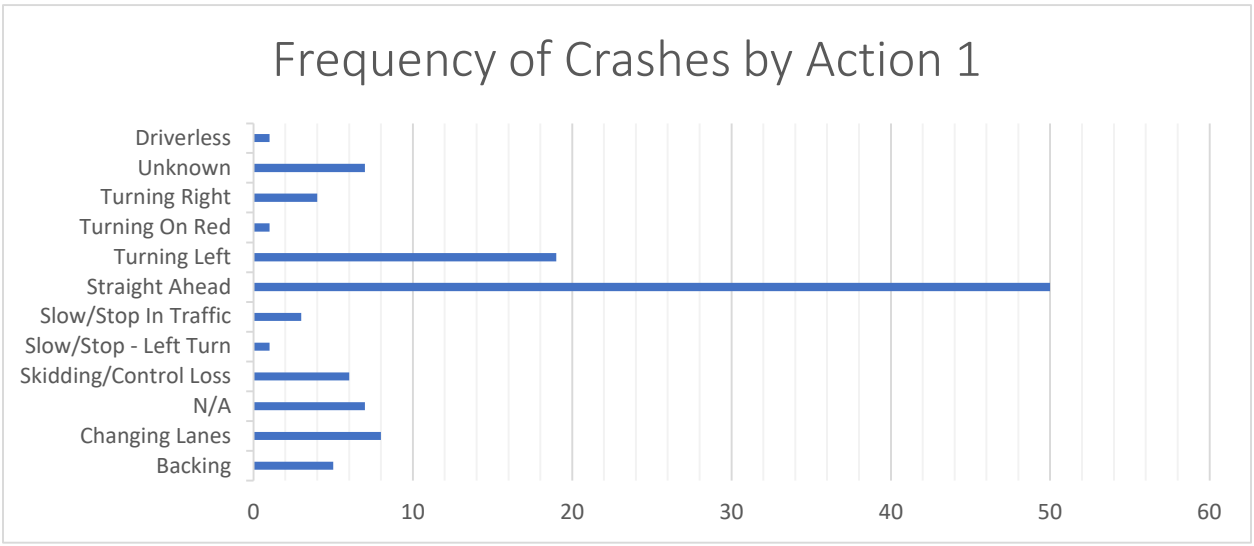


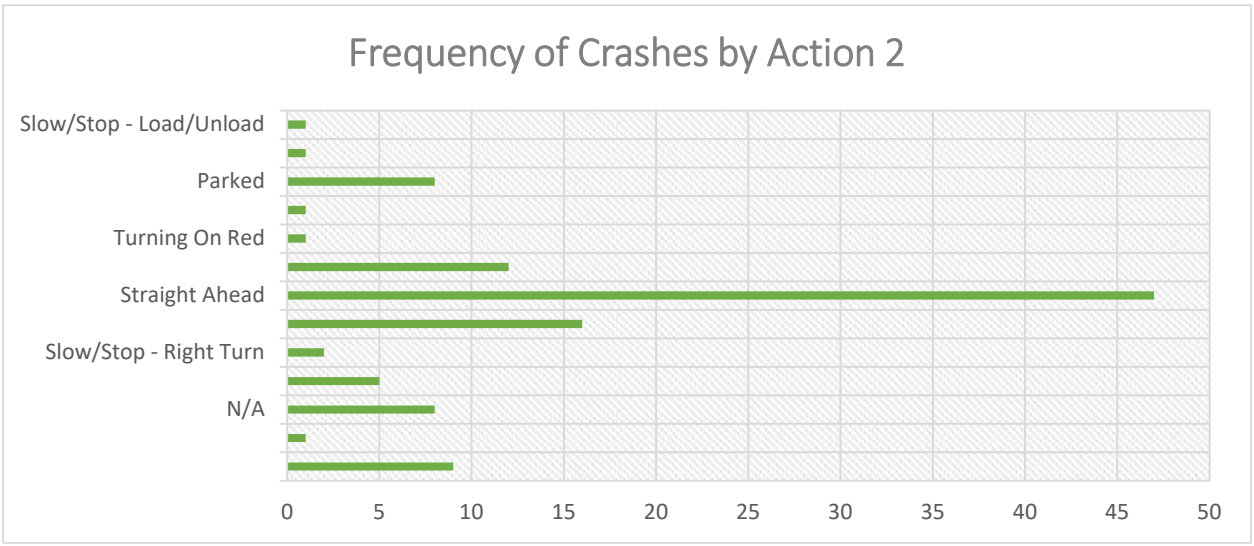




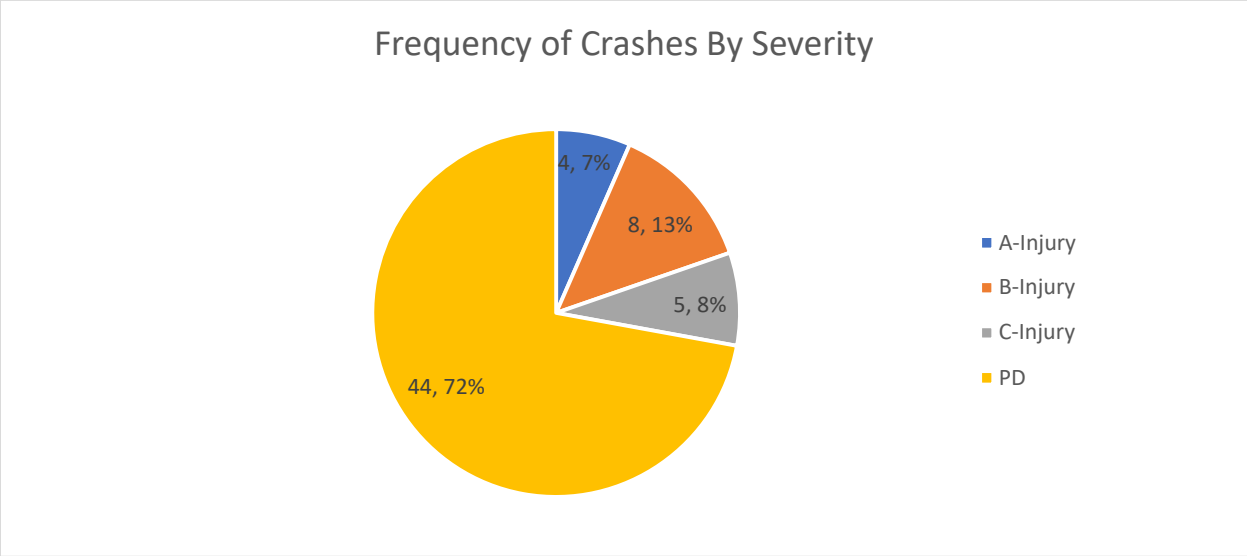
Grand Avenue Corridor Crashes - Washington Street to Lewis Street (2014-2018)

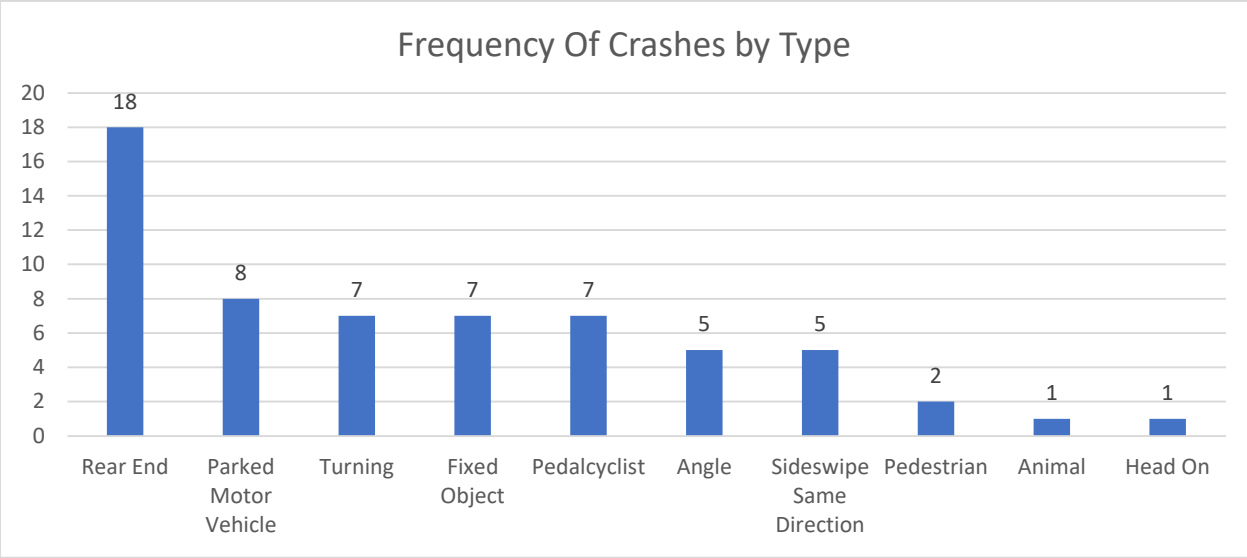


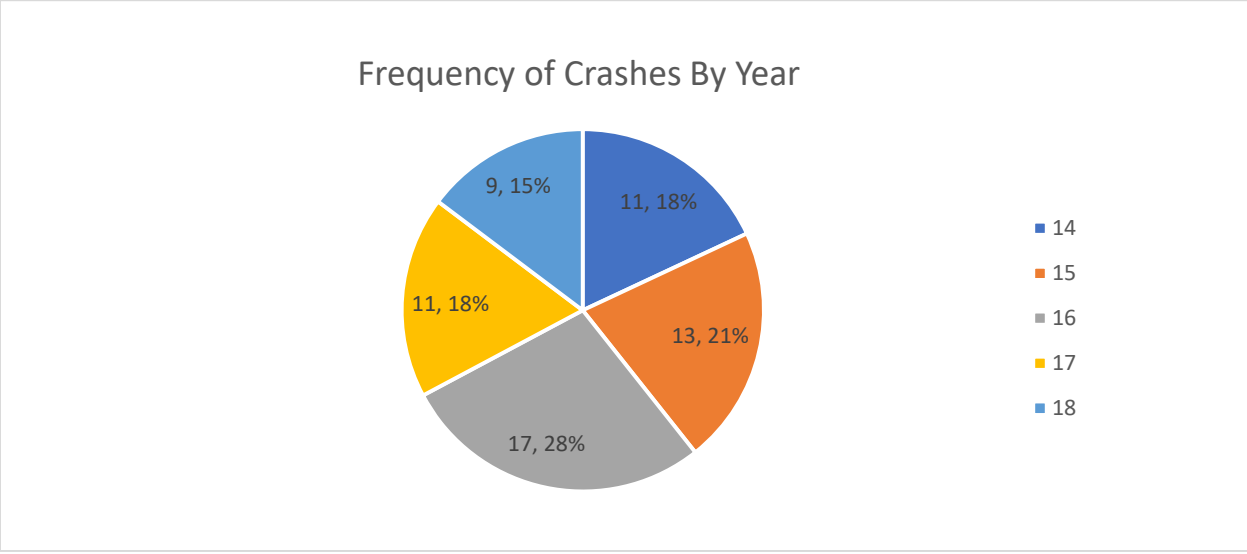




Segment Crashes along Grand Avenue from Washington Street to Lewis Street (2014-2108)







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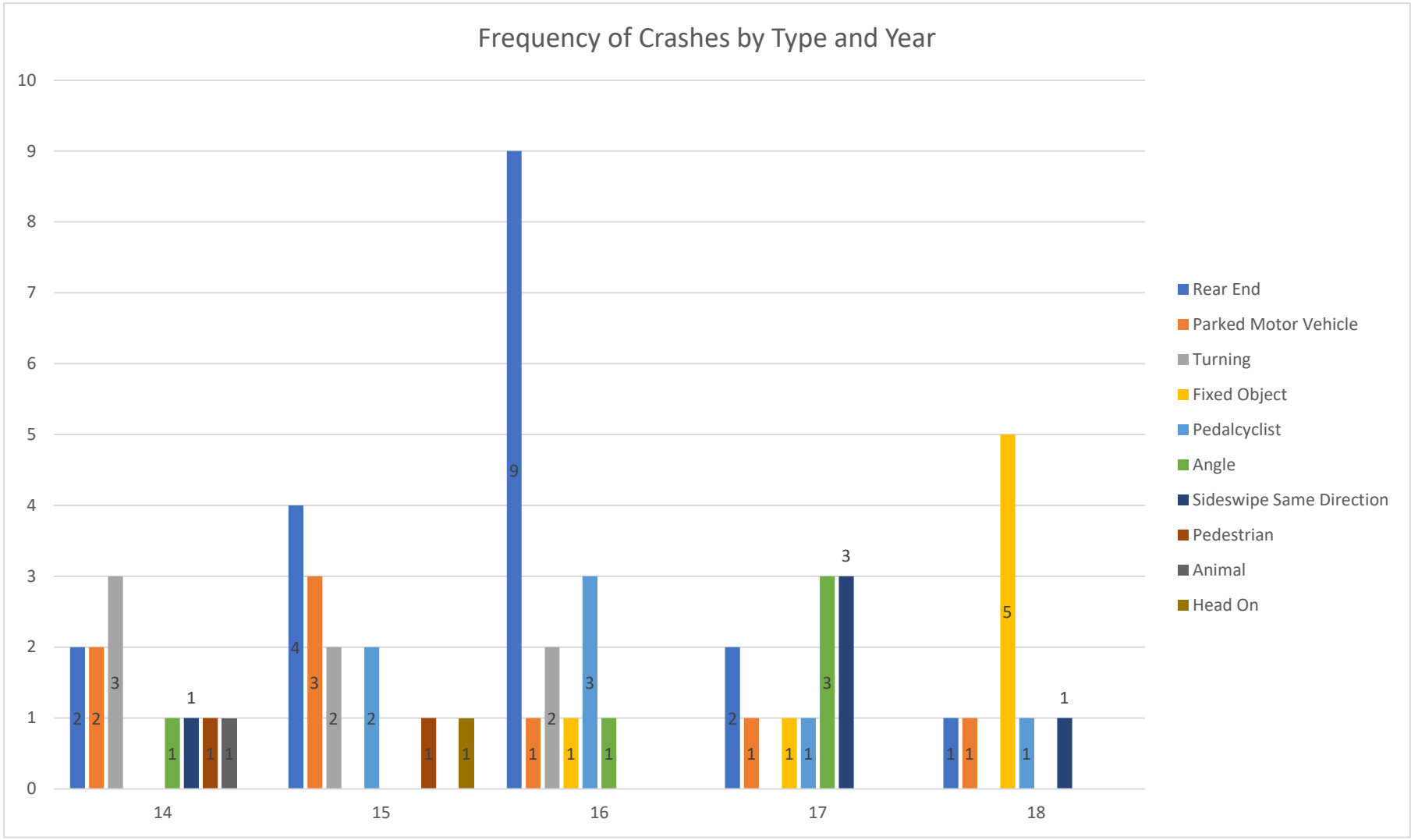

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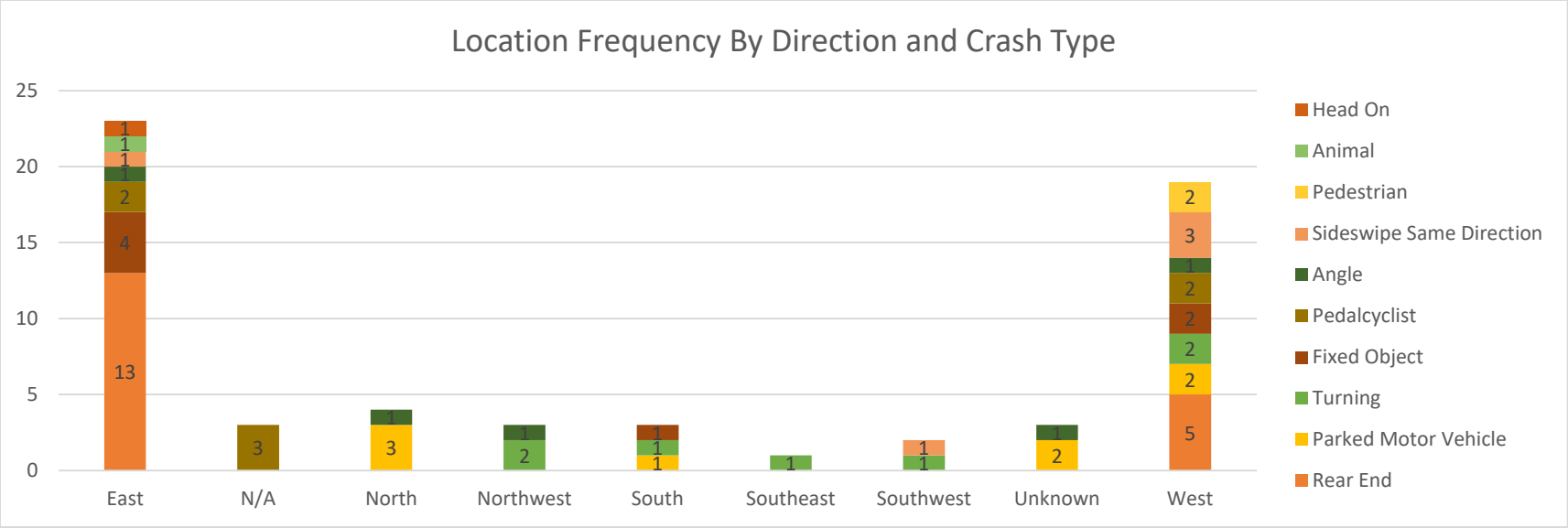

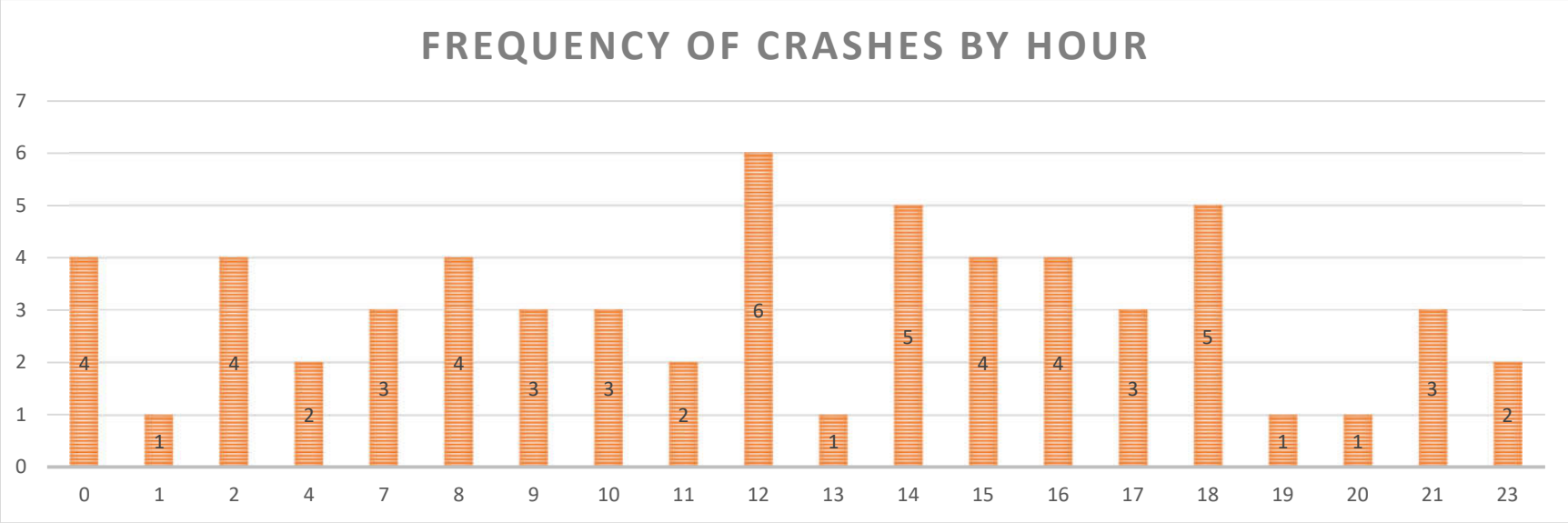

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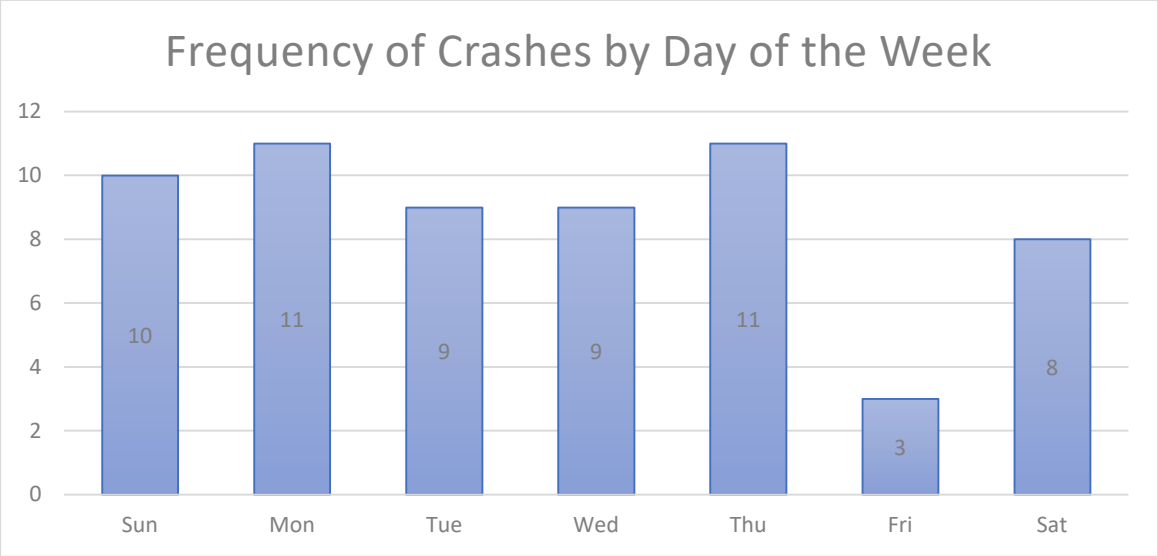

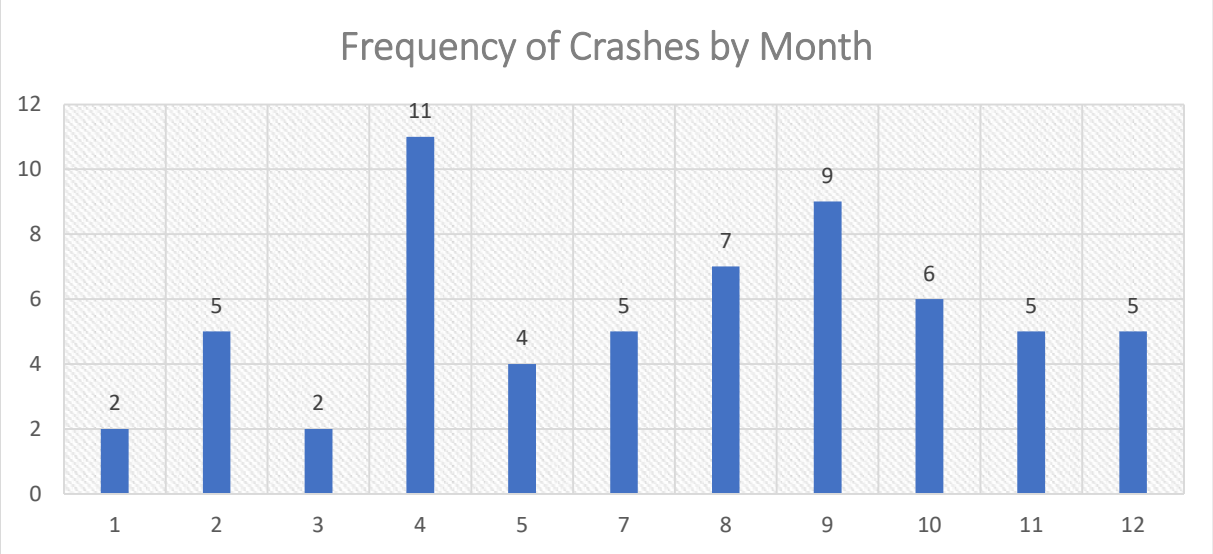

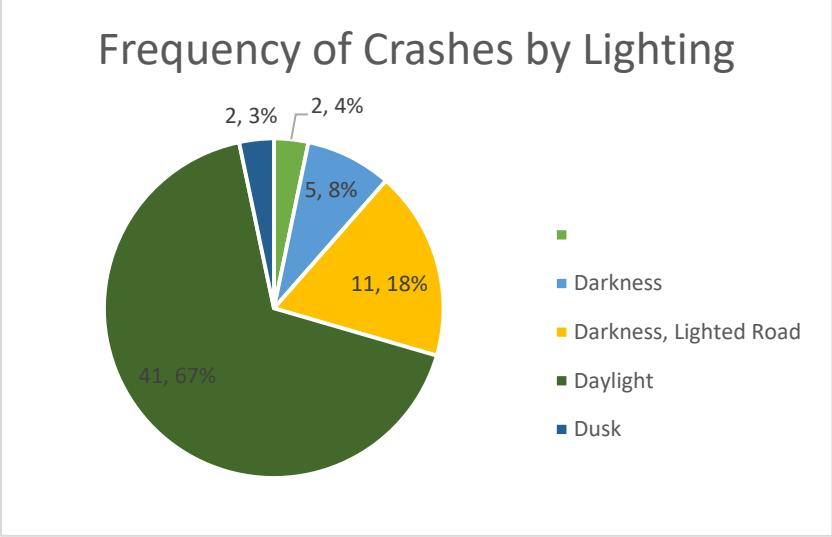

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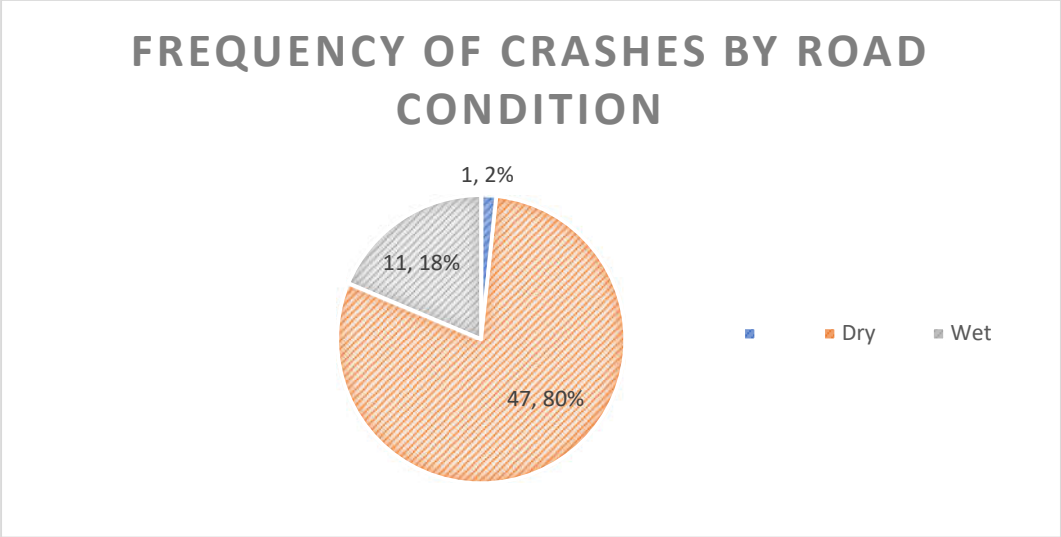
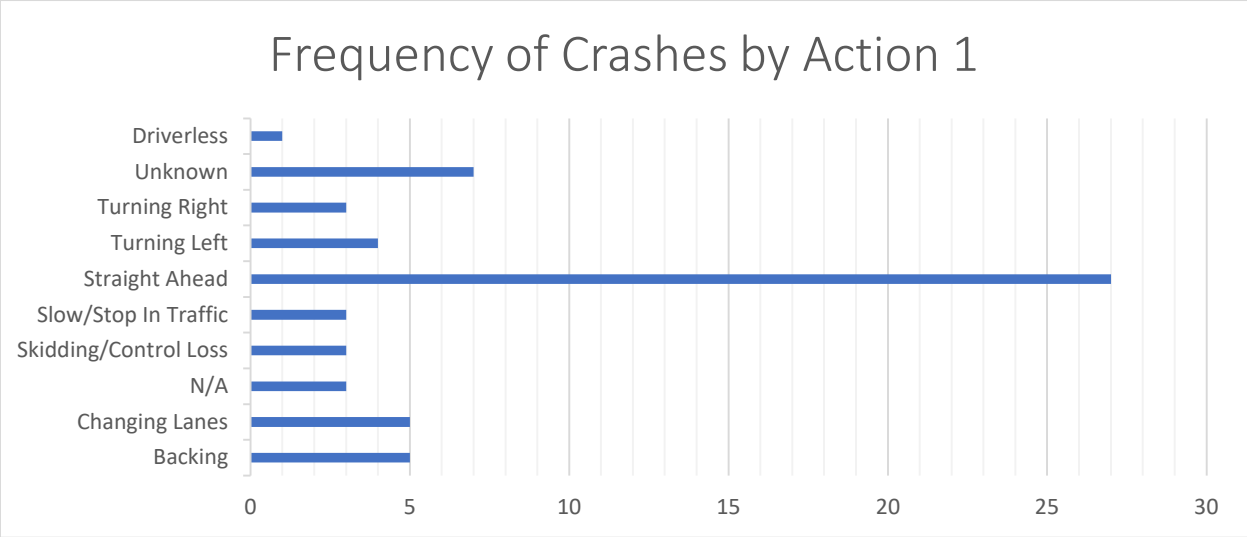
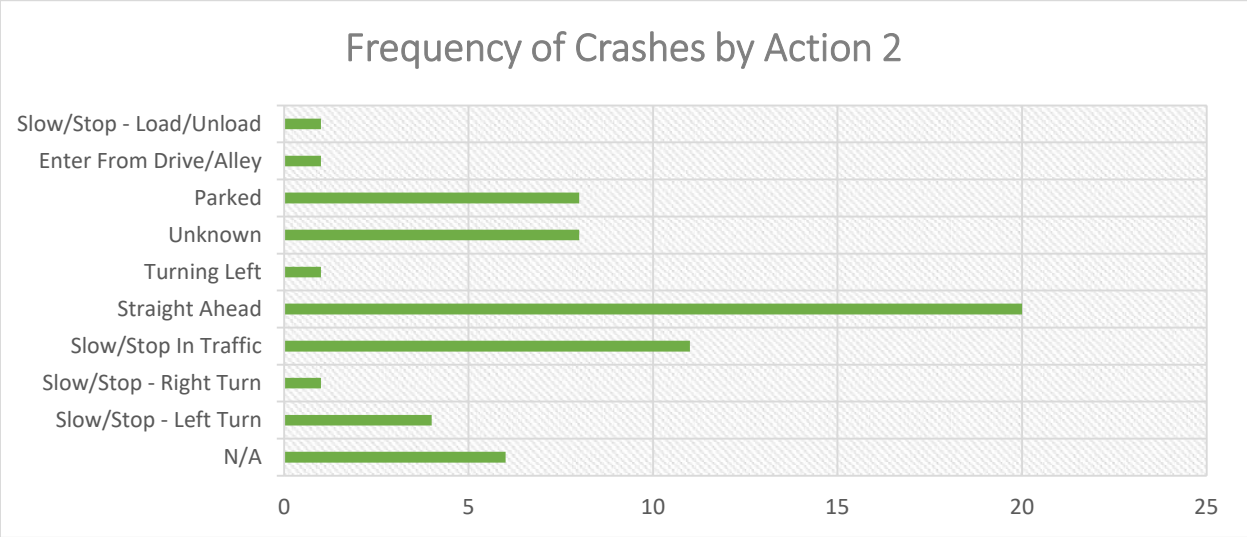
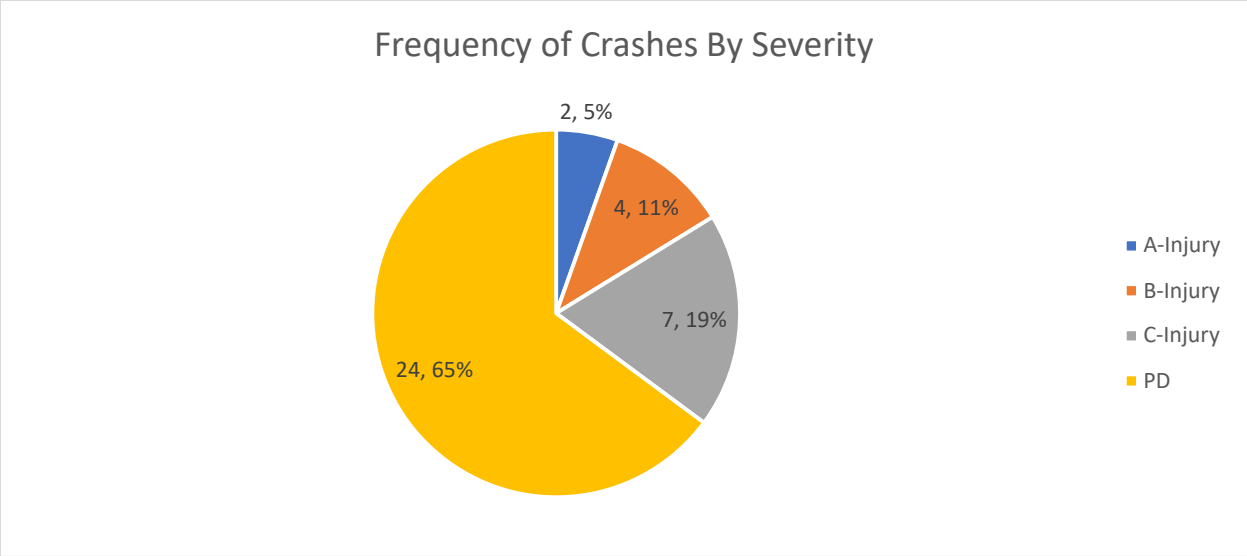
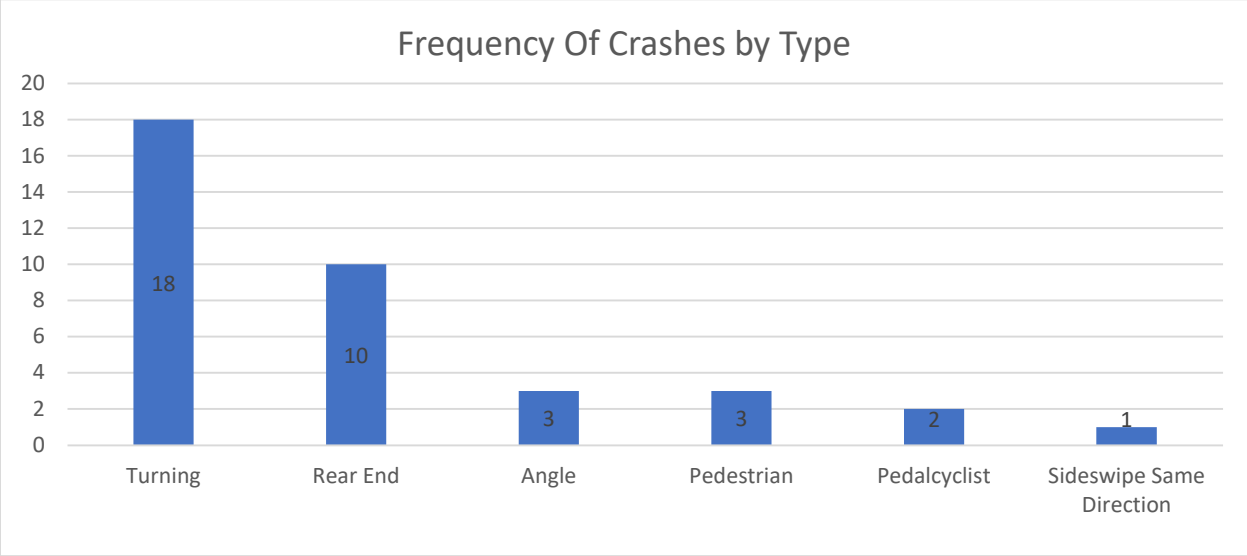


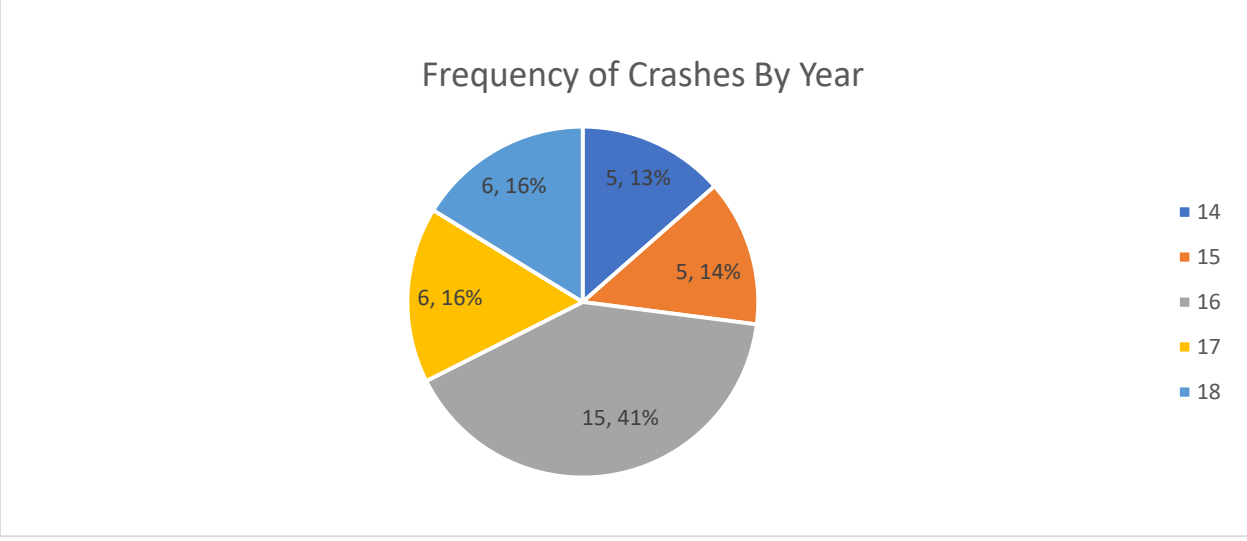




Intersection of Grand Avenue and Wall Street (2014-2018)







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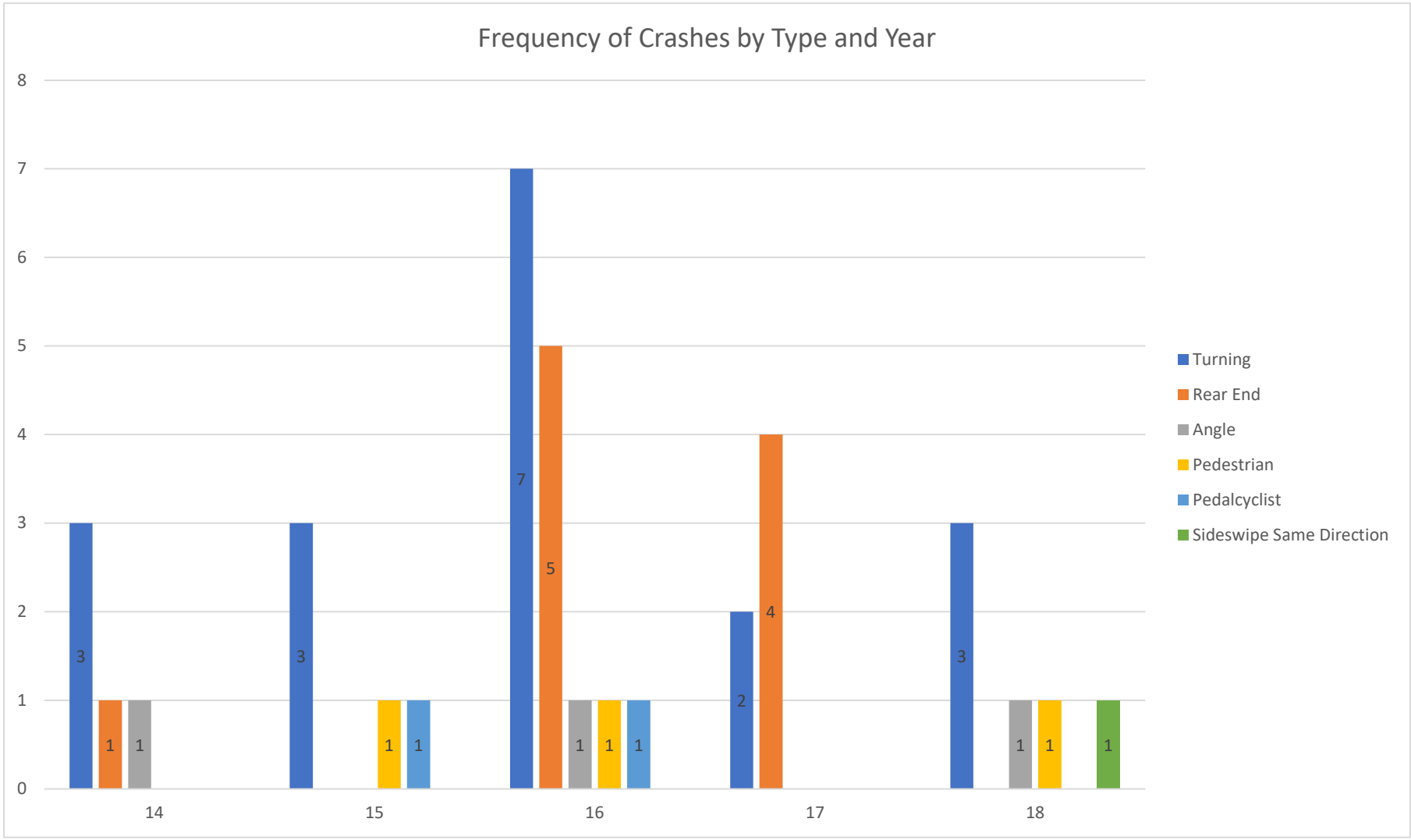

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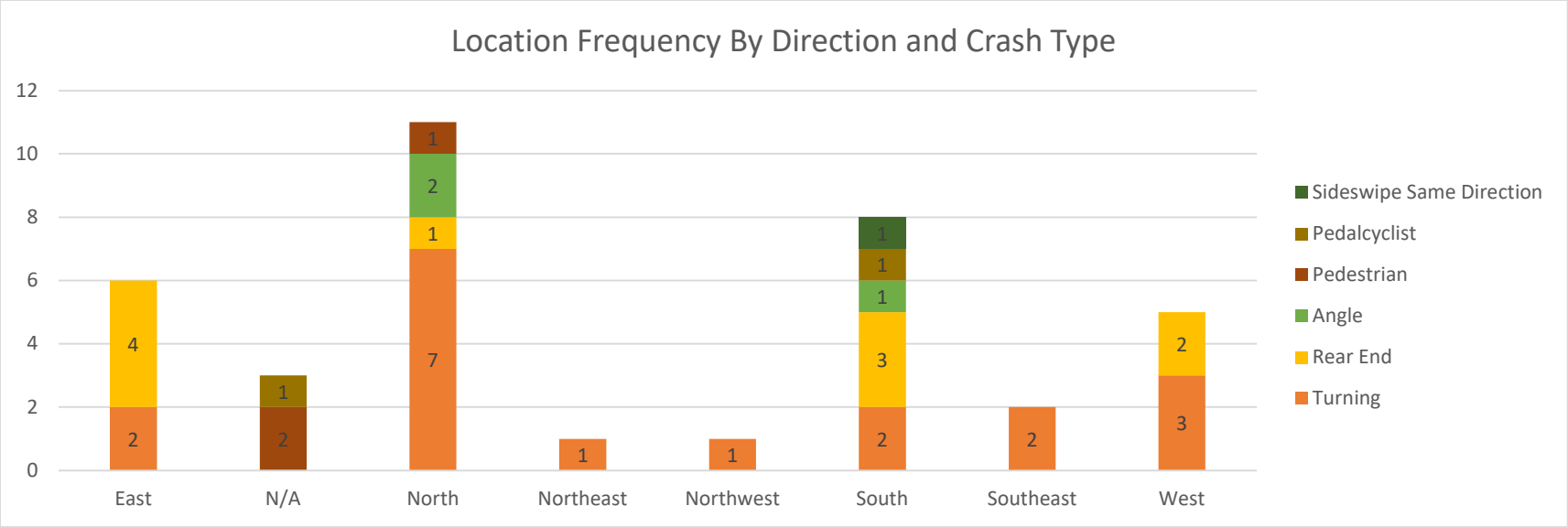

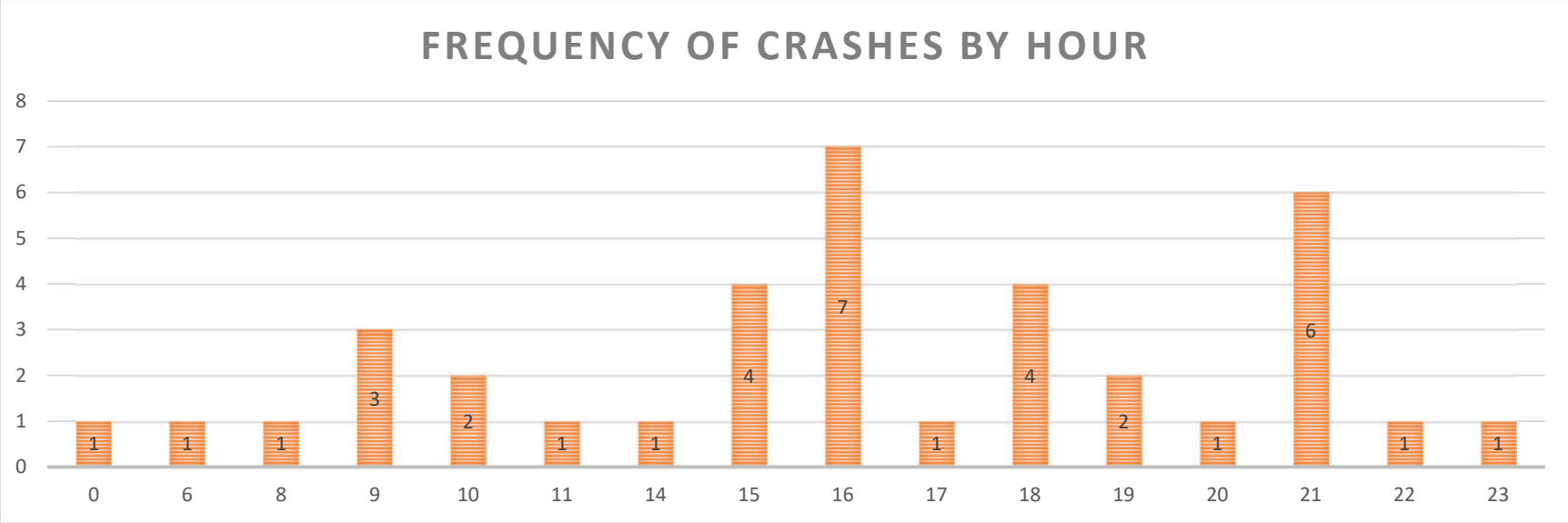

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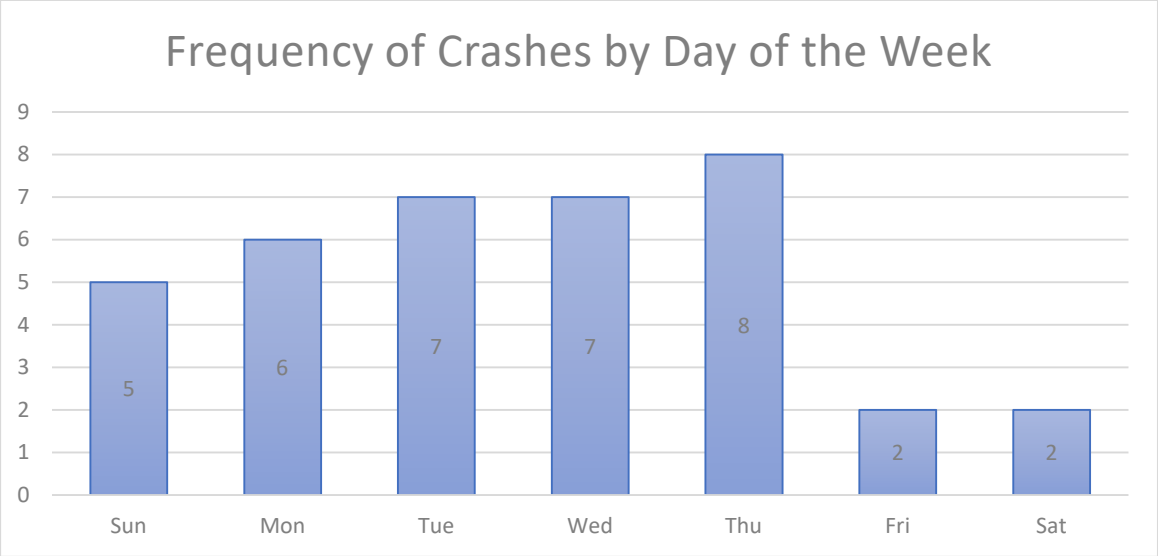

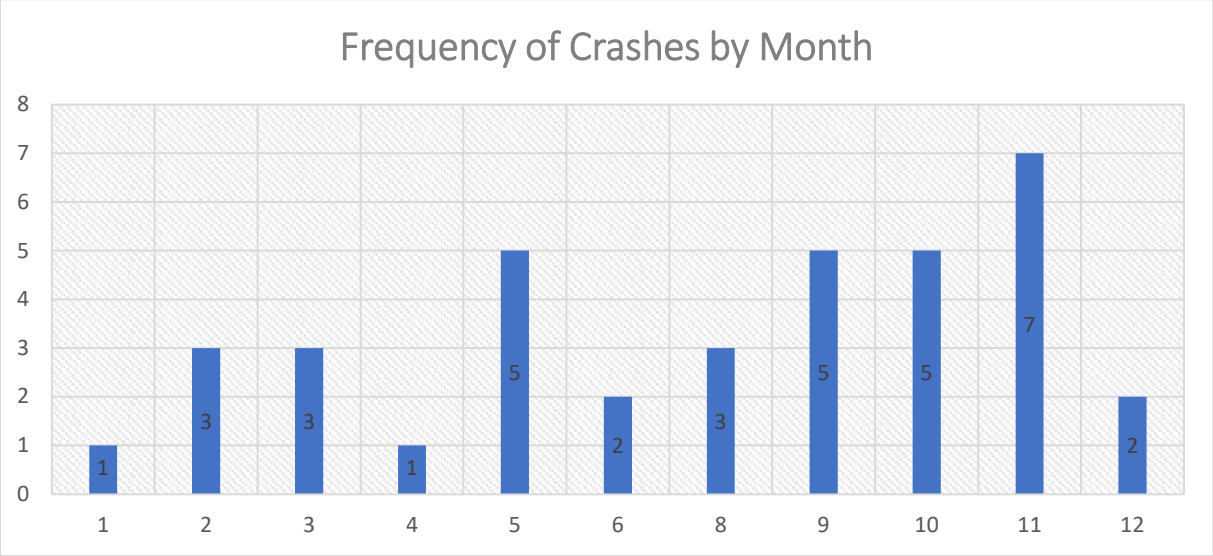

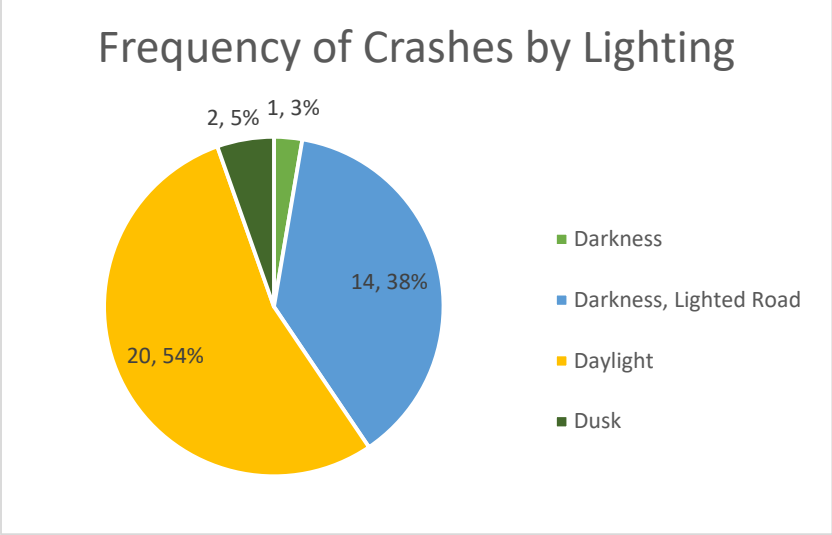

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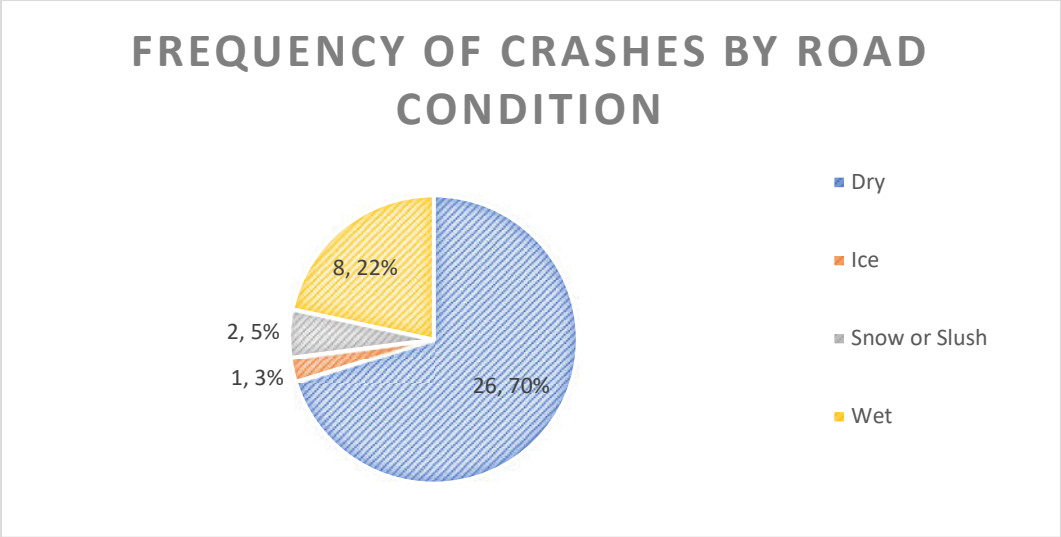

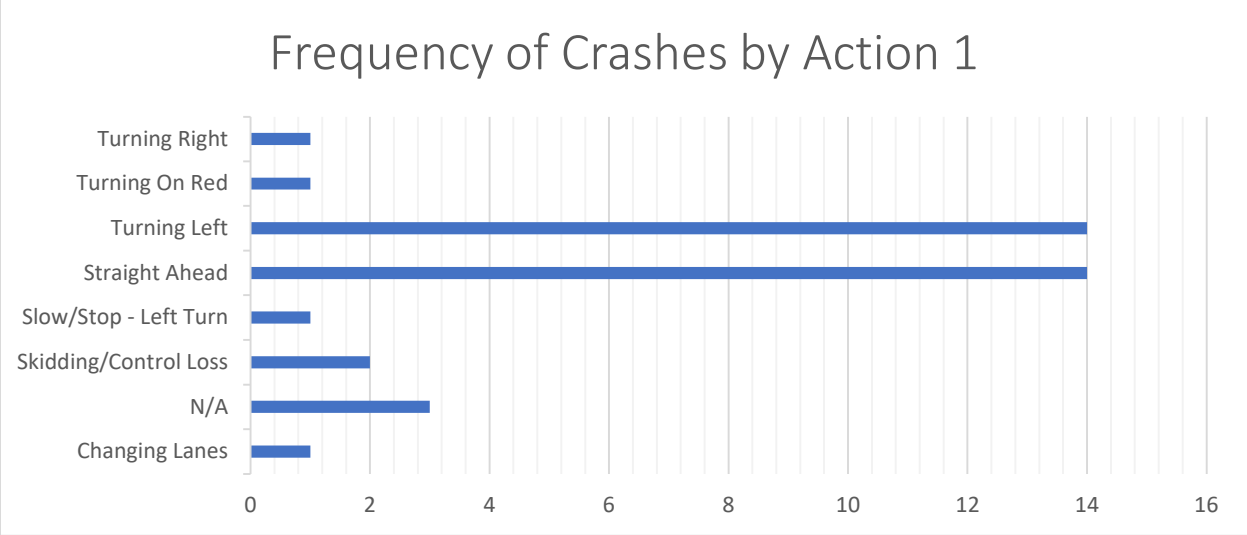

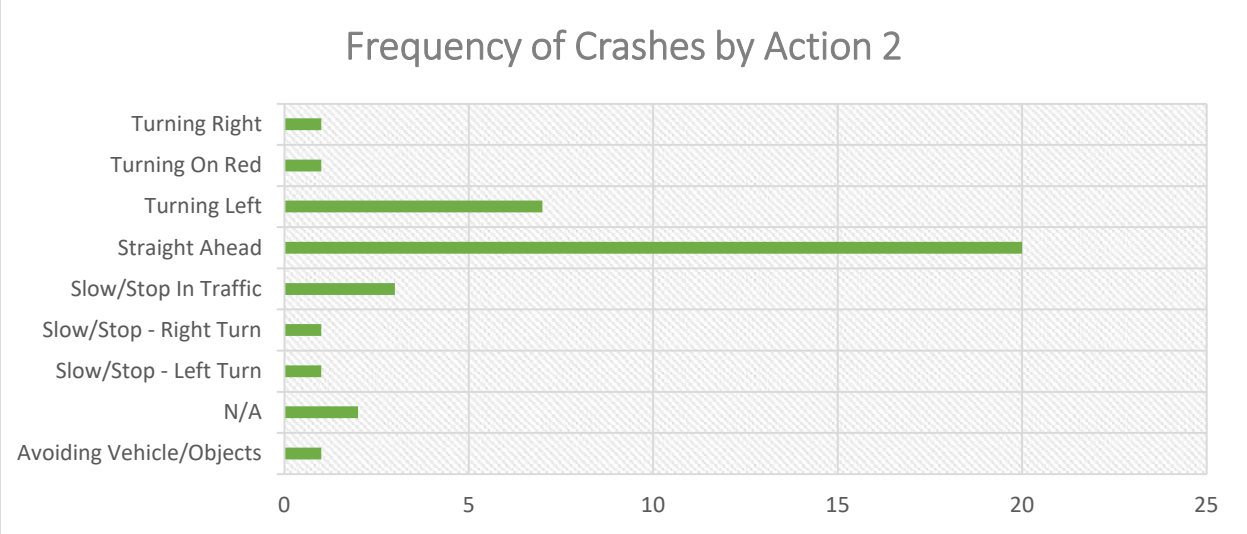

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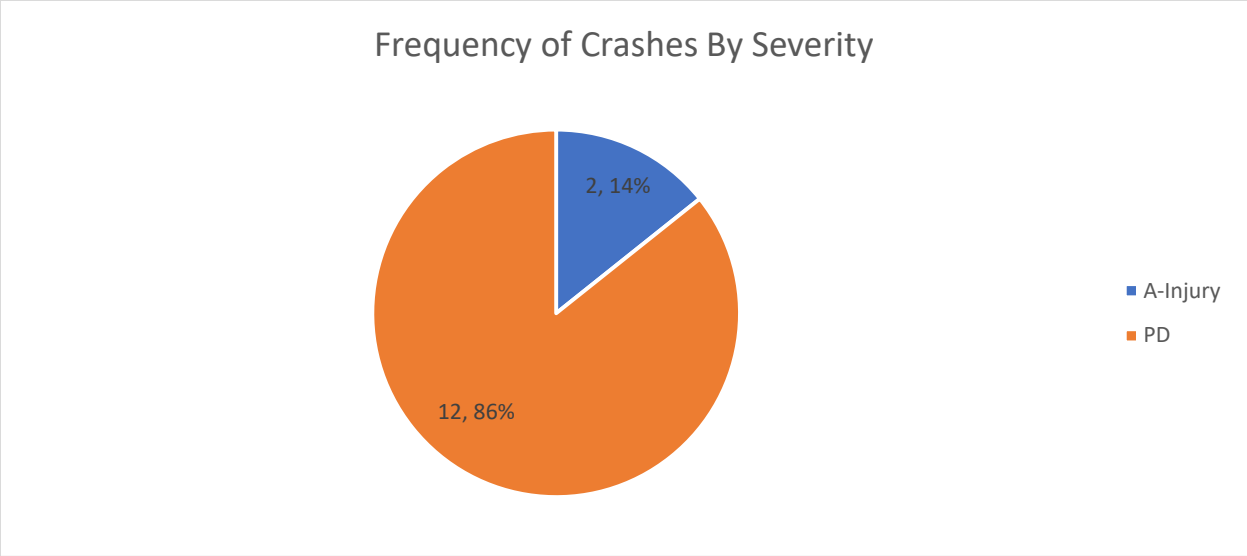

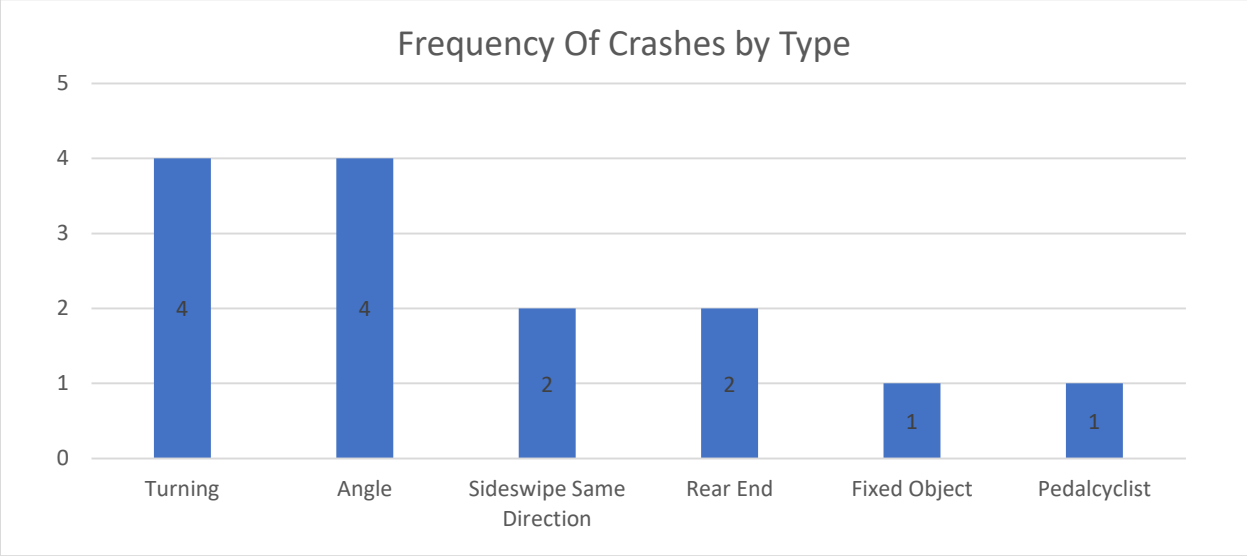

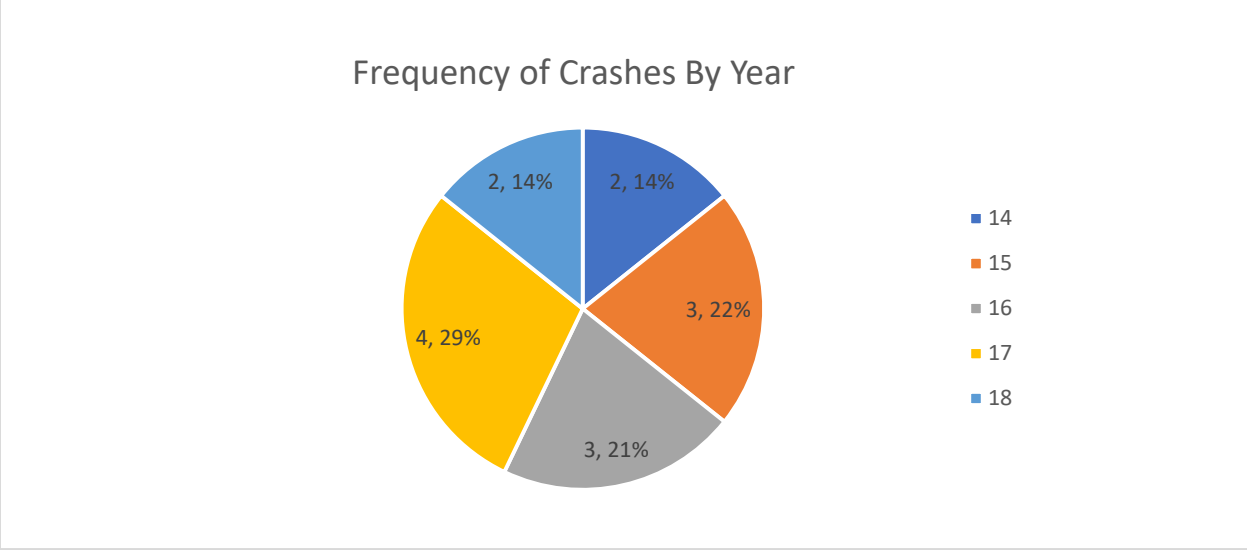

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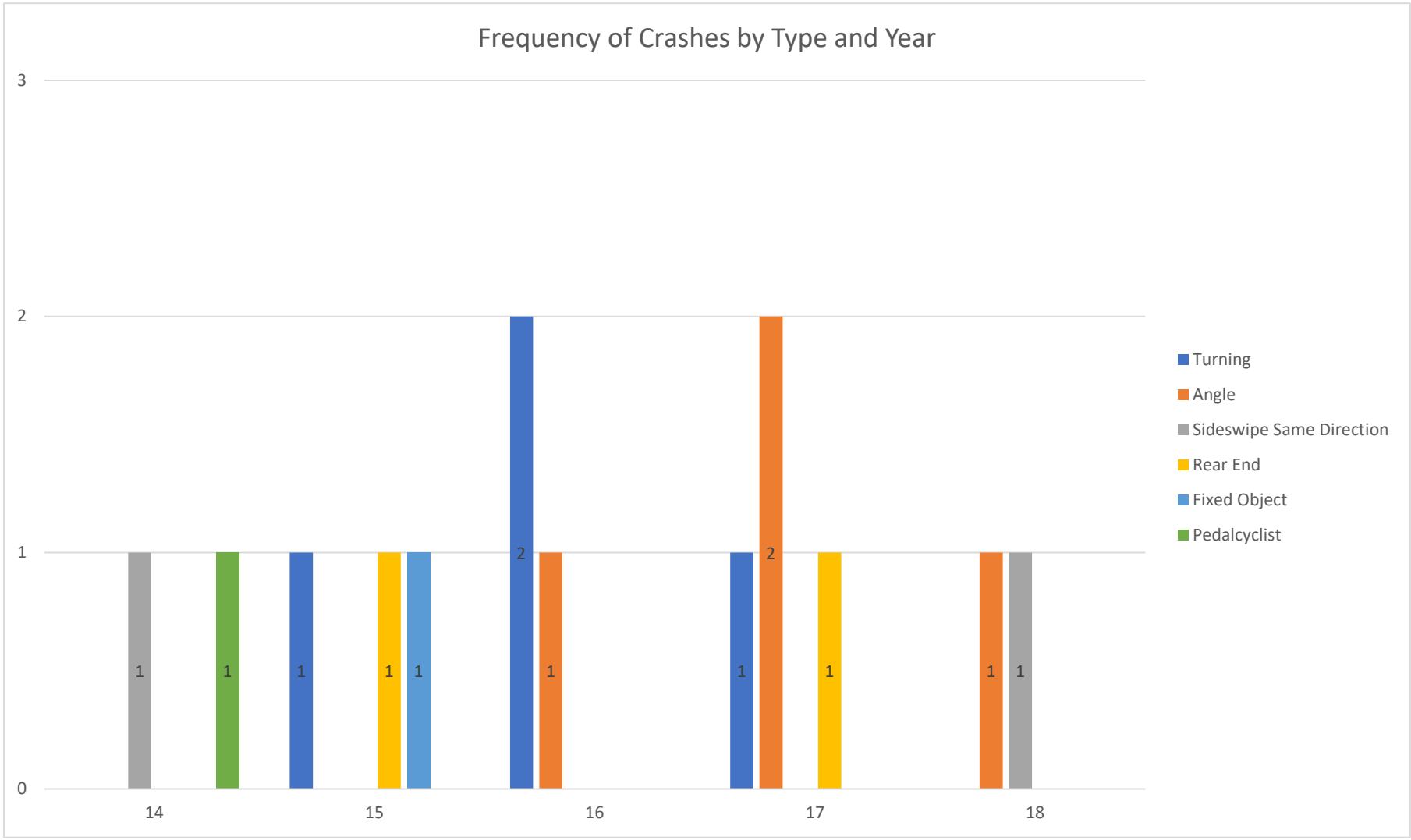

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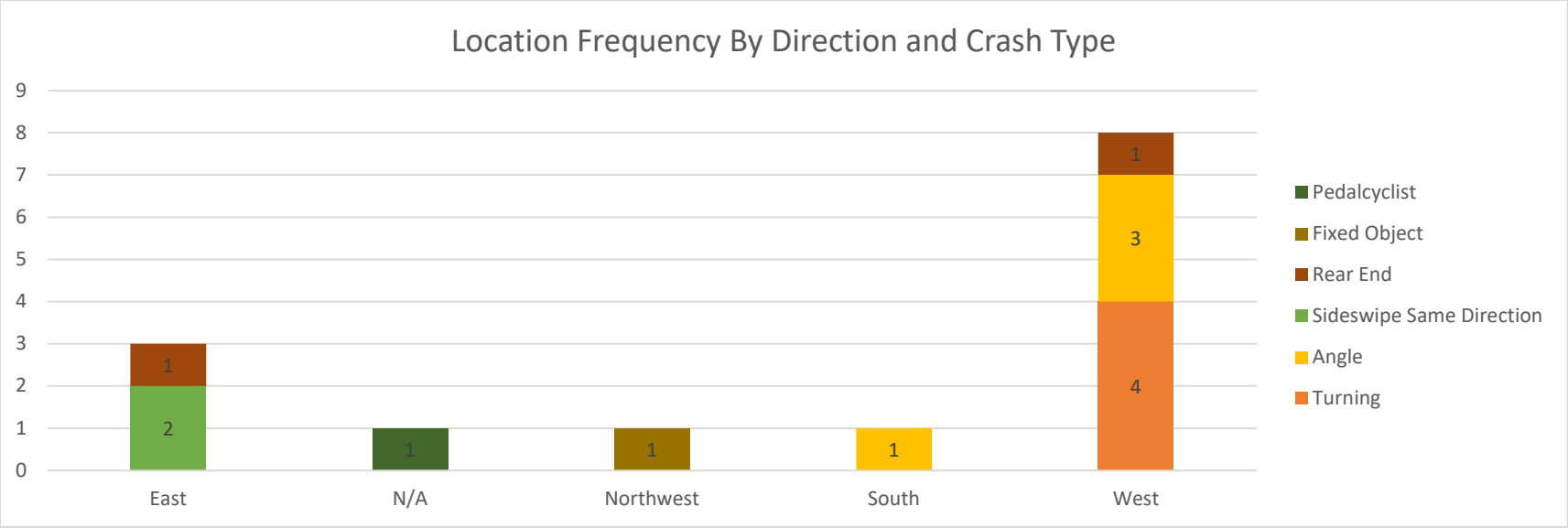

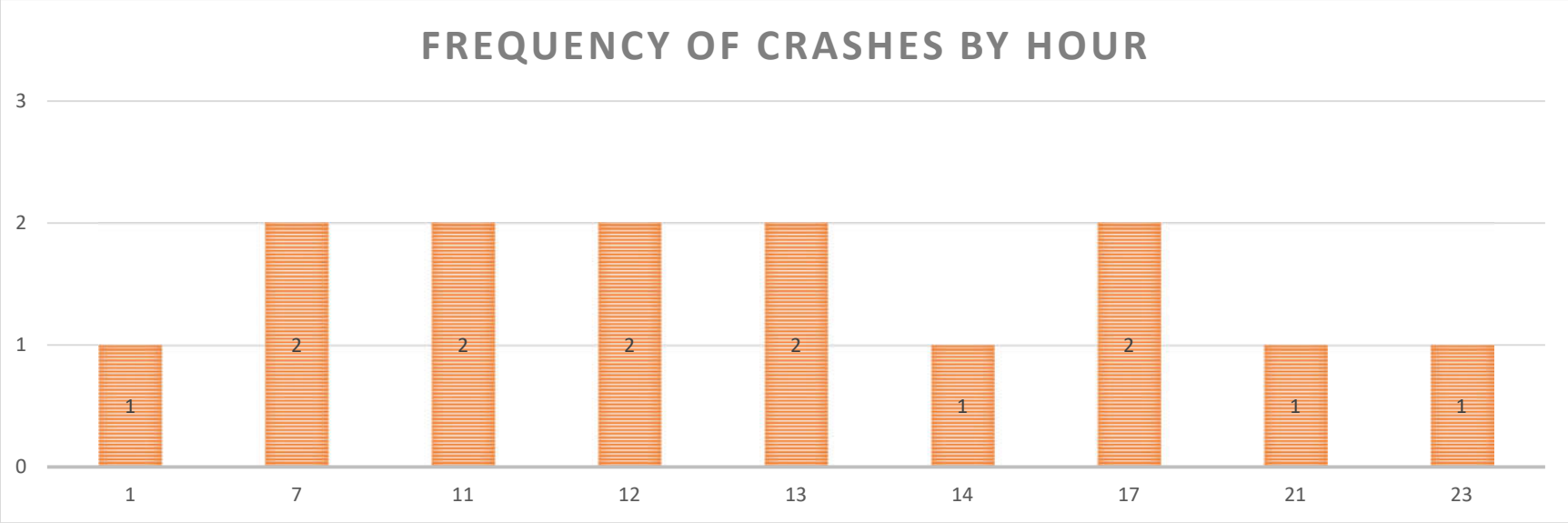

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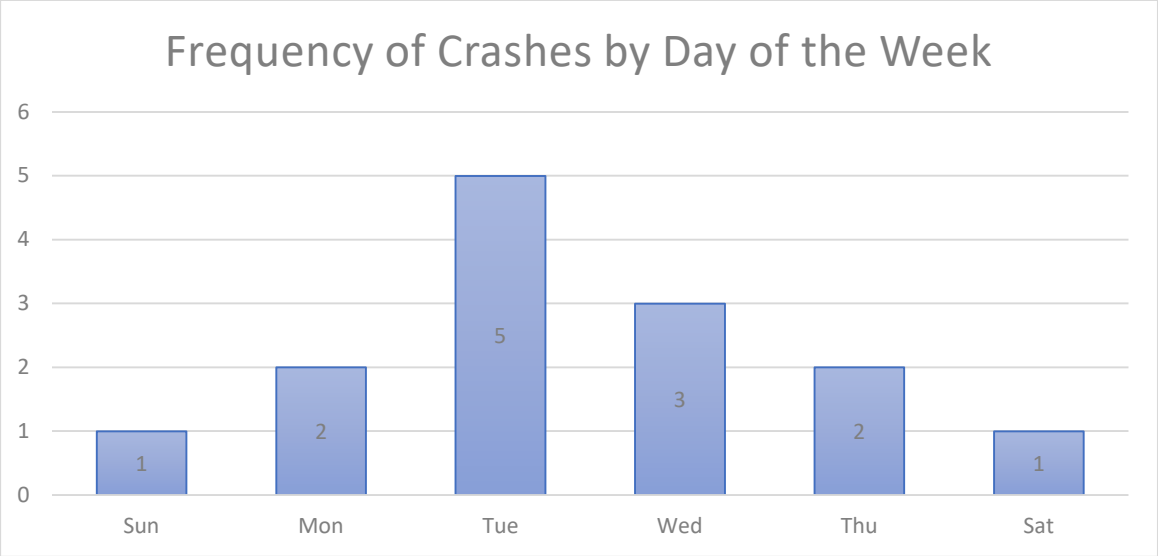

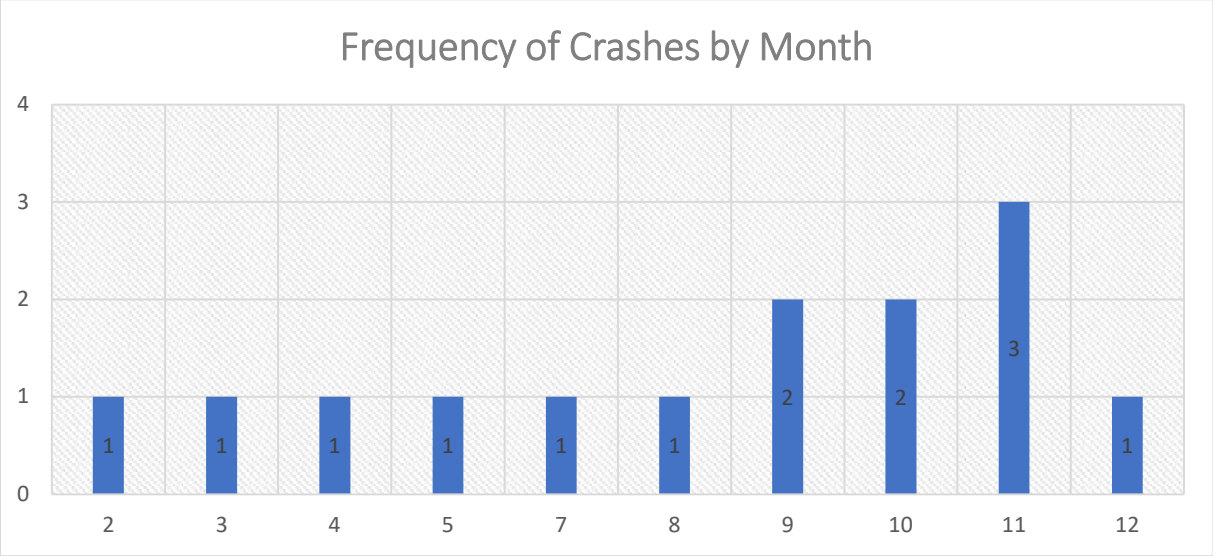

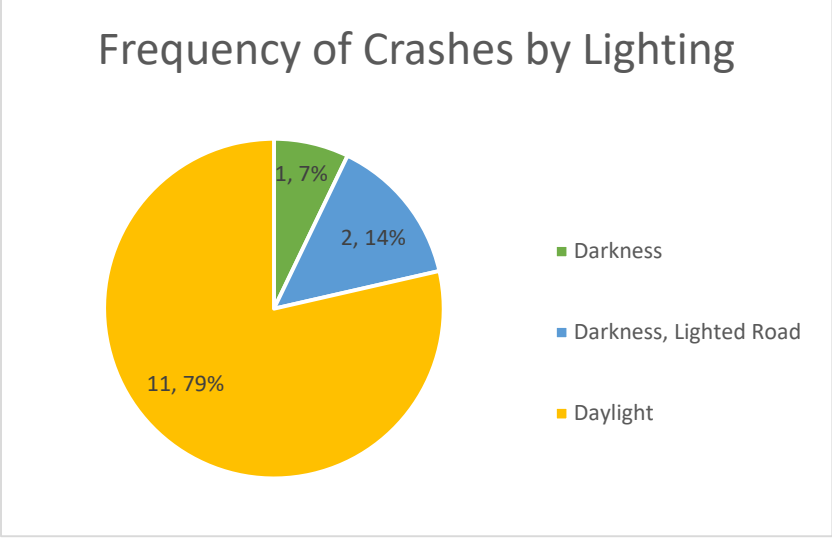

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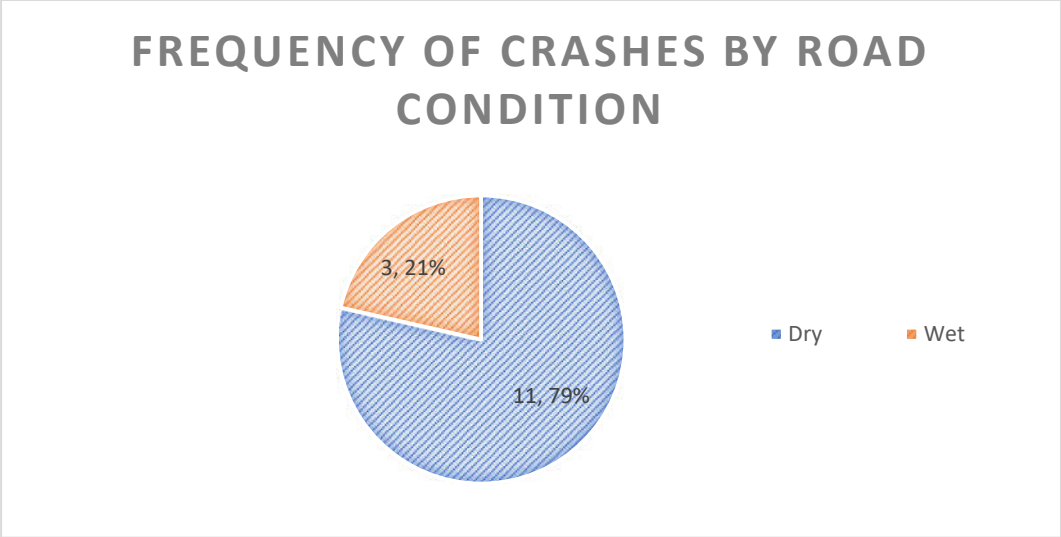
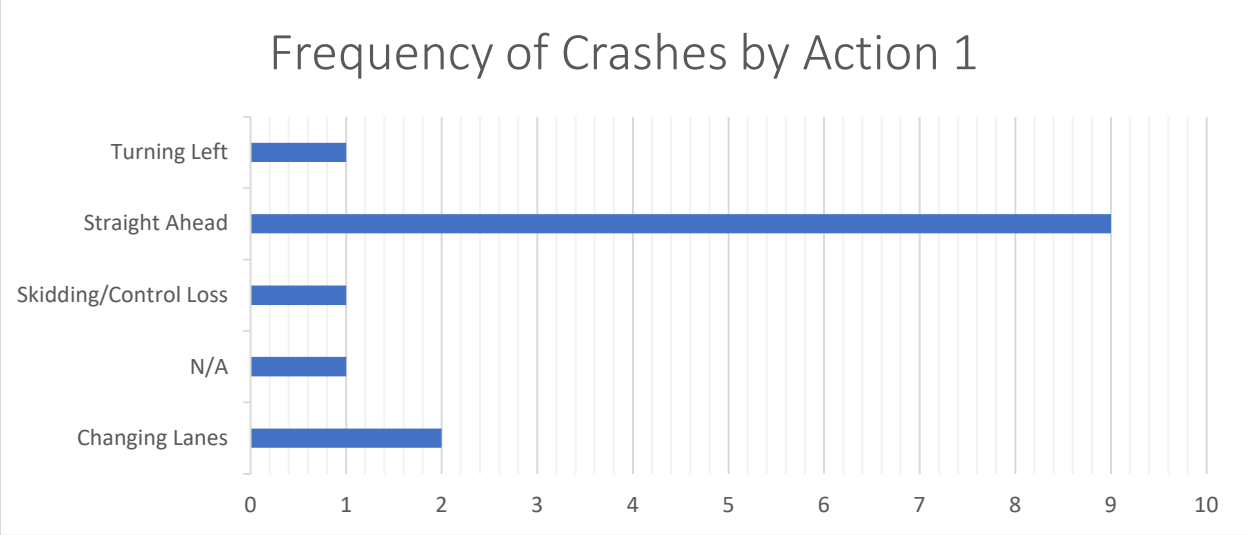
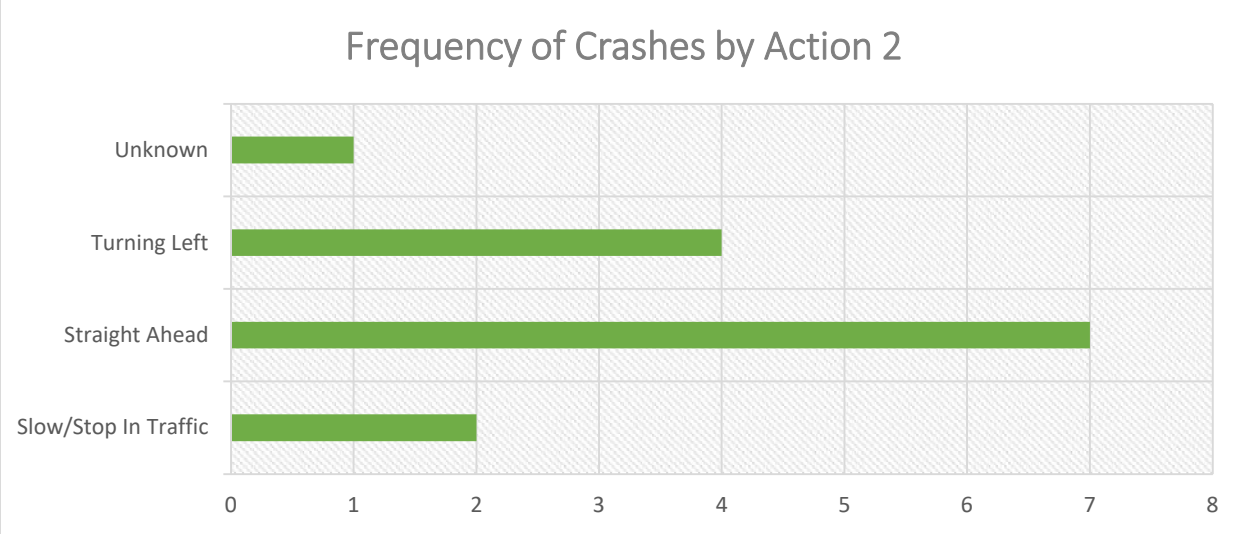
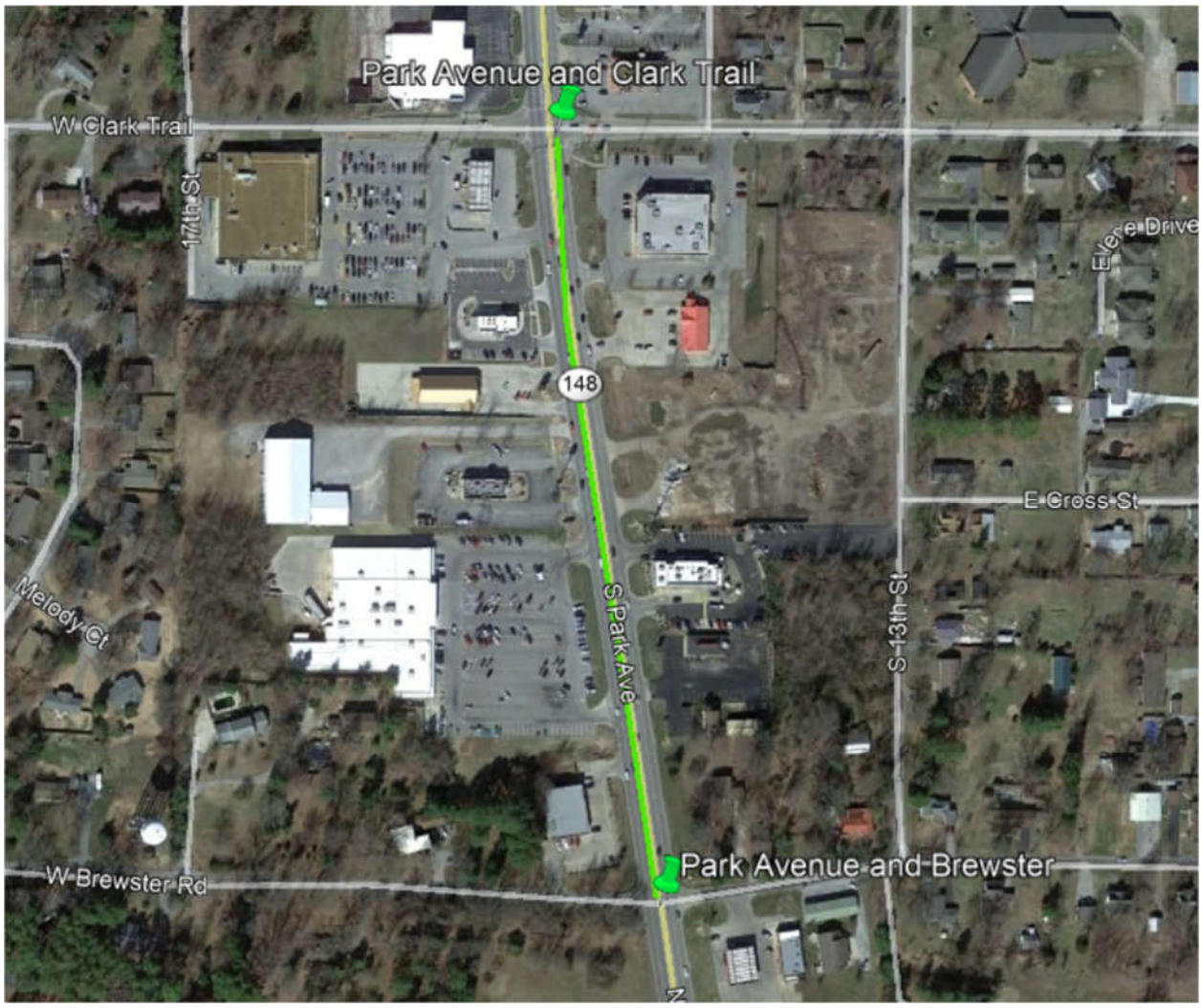






SIMPO SAFETY STUDY

Appendix : Illinois 148 (Park Avenue) Corridor – Clark Trail to Brewster Road/Railraod Street



prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

Illinois Route 148 Corridor - Clark Trail to Brewster Road

Introduction

The Illinois Route 148 (South Park Avenue) corridor is from Clark Trail to Brewster Road and including the intersection of Illinois Route 148 with Clark Trail and the intersection of Illinois 148 with Brewster Road. The corridor is about 0.25 miles long. **Figure 1** shows the study area and includes markers at the two intersections mentioned above.

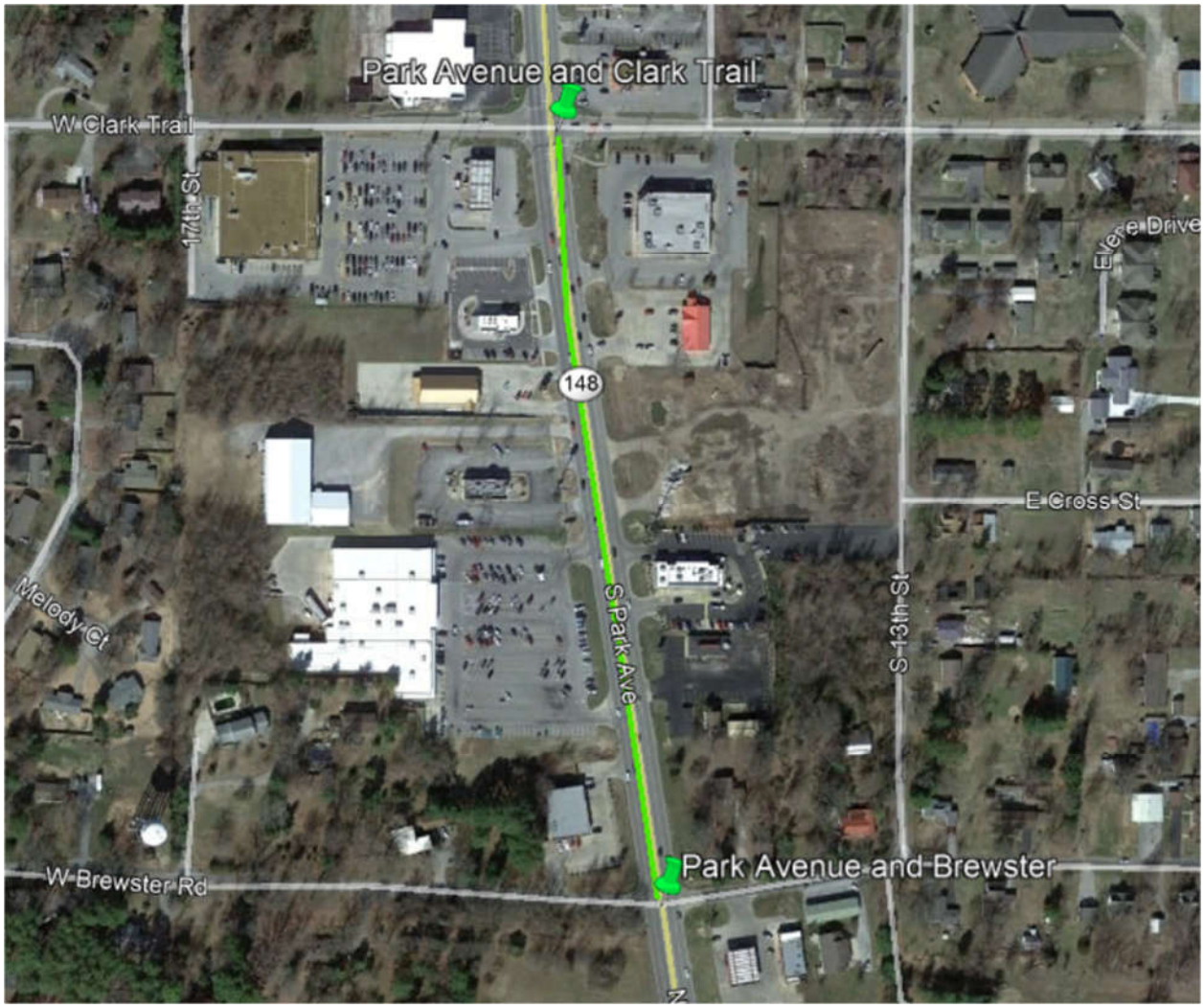


Figure 1: Study Area

Existing Condition

Illinois Route 148 (South Park Avenue) is located in Herrin, Illinois. The corridor is in a commercial area and provides access to restaurants and retail stores along the corridor, such as Walmart and Walgreens. The segment has two lanes in each direction and a center two-way left-turn lane (TWLTL). The corridor has a curb and gutter system and a posted speed limit of 35 miles per hour (mph). Just south of Brewster Road, the posted speed limit changes to 45 mph. There is a small section of sidewalk, offset about 20 feet from Illinois 148, along the west side of Illinois 148 from Arby's to near Taco Bell and there are no marked crosswalks across any of the access drives. A small section of sidewalk is also provided from the Walgreens store from near the intersection of Illinois 148 and Clark Trail, but the traffic signal lacks pedestrian accommodations (marked crosswalks, pedestrian indication heads/push buttons, etc.).

The access management along the corridor is poor and has a high percentage of driveways per mile. The west side of the road generally provides more than one access driveway to Illinois 148 even for small parcels and only one cross access connection to adjacent parcels. There are 11 driveways on the west side of Illinois 148, between Clark Trail and Brewster Road. The access management along the east side of Illinois 148 is slightly better, with some cross access to adjacent properties. There are 7 driveways on the east side of Illinois 148 between Clark Trail and Brewster Road. The McDonalds parcel also provides alternative access to 13th Street, which parallels Illinois 148 to the east. Further, the many access drives along Illinois 148 are not aligned to each other on the east and west side of the street, which can cause left-turn overlap problems in the TWLTL.

At the signalized intersection of Illinois Route 148 and Clark Trail, the center turn lane is striped as a separate left-turn lane. Both the eastbound and westbound approaches of Clark Trail have a separate left-turn lane and a shared through/right-turn lane. The signalized intersection has a combination of overhead and ground mounted signals, as seen in **Figure 2**. The north-south left-turns operate under a protected plus permissive phasing, while the east-west approaches operate under a common (permissive) phase.

Figure 2: Intersection of IL 148 and Clark Trail (Plan View)

The intersection of Illinois 148 and Brewster Road is unsignalized with vehicles on Brewster Road required to stop at Illinois 148, see **Figure 3**. Brewster Road is a two-lane road that is about 20 feet wide and has no pavement markings. A concrete apron with curb and gutter is provided at the intersection with Illinois 148. The sight distance to the south may be less than optimal due to an earth berm and signs along the west side of the road, see **Figure 4.** Intersection sight distance for left-turns on the side street is 625 feet assuming 50 mph design speed and a five-lane cross section.

Figure 3: Intersection of Illinois 148 and Brewster Road (Plan View)

Figure 4: Sight Distance Looking to the south from Brewster Road (Google Earth View)

Safety Analysis

The segment had a total 122 crashes in 2014 to 2018. **Figure 5** displays the frequency of crashes by year. The average number of crashes is 24.4 crashes per year. The two highest crash years are 2016 and 2018.

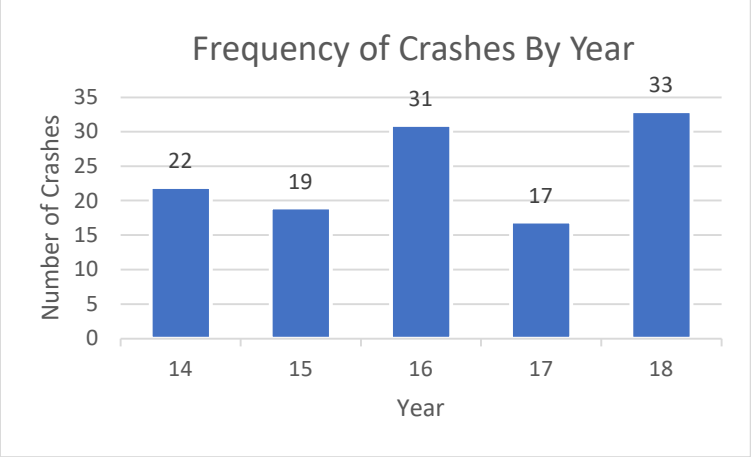


Figure 5: Frequency of Crashes by Year

The frequency of crashes by type is displayed in **Figure 6**. It shows the majority of crashes are turning crashes at 42 percent. Three out of the six A-injury crashes are turning crashes. Rear end and angle crashes make up another 39 percent of crashes and include the other three A-injury crashes on the corridor.

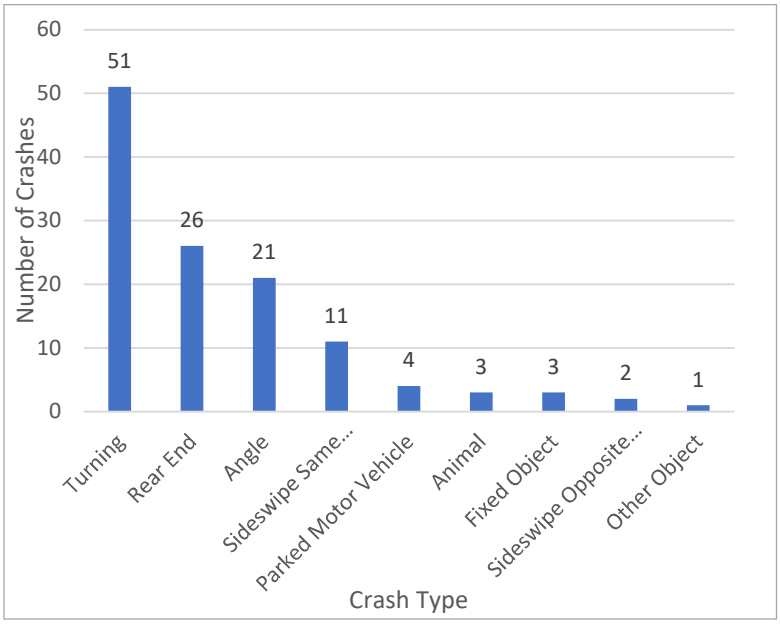


Figure 6: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 7**. Property damage crashes make up the majority of crashes at 74 percent. There are no fatal crashes in the years analyzed. Most of the injury crashes were rear end, angle, or turning crashes.

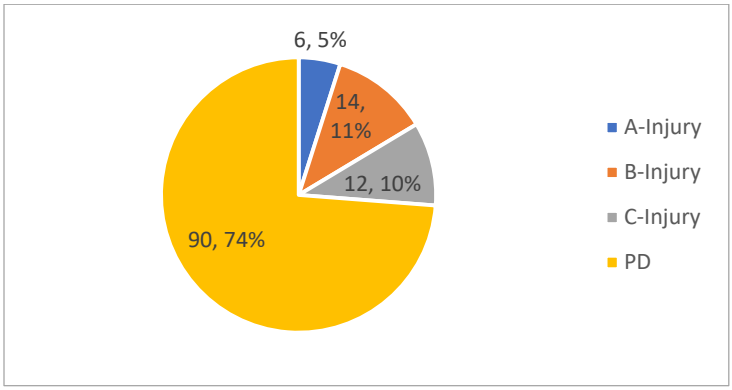


Figure 7: Frequency of Crashes by Severity

The frequency by direction and crash type is shown in **Figure 8**. Turning crashes are common for all directions but the eastbound direction has the highest number of turning related crashes. A majority of rear ends and sideswipes in the same direction occur in the northbound and southbound direction. The angle crashes are mostly in the eastbound with southbound or westbound with northbound.

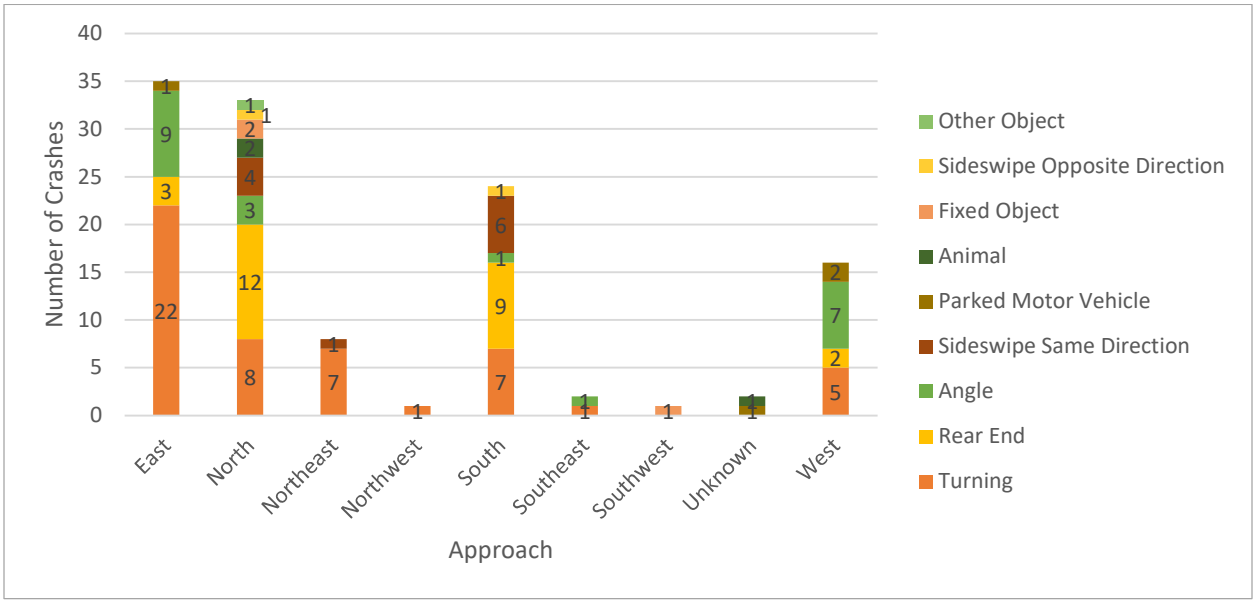


Figure 8: Frequency of Crashes by Direction and Crash Type

Figure 9 shows the frequency of crashes by hour. The crashes increase in the afternoon and evening peaks. This may correspond with surrounding land use along the corridor.

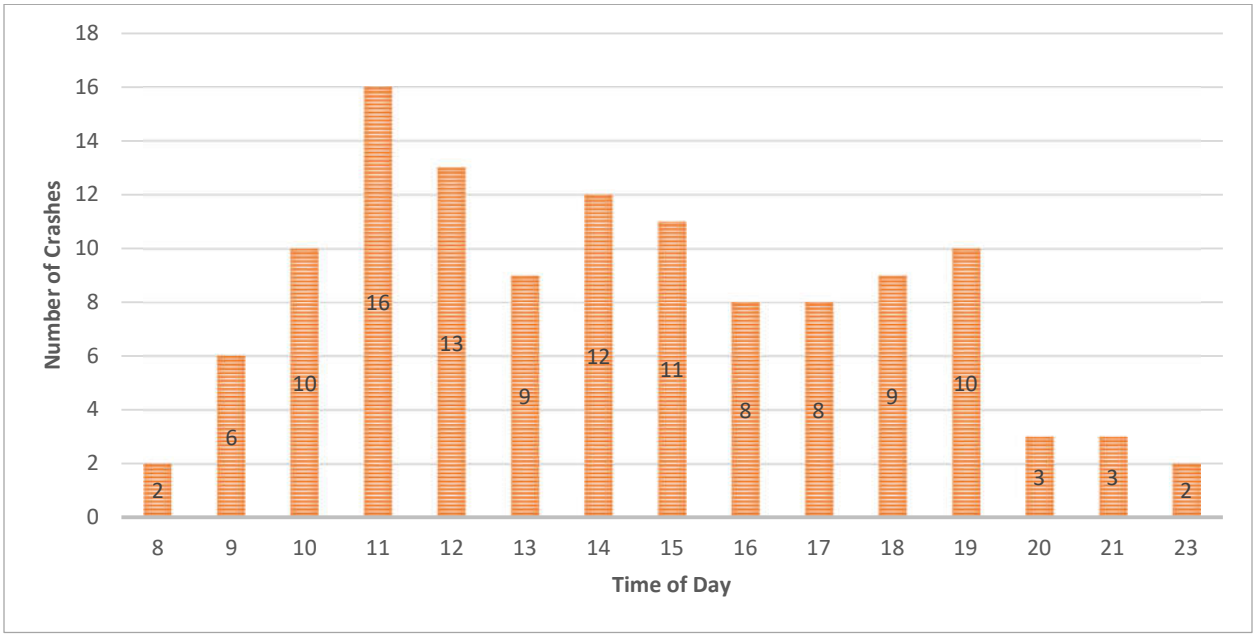


Figure 9: Frequency of Crashes by Hour

The weather condition is shown in **Figure 10**. The majority of crashes occurred on dry/clear days (83%)

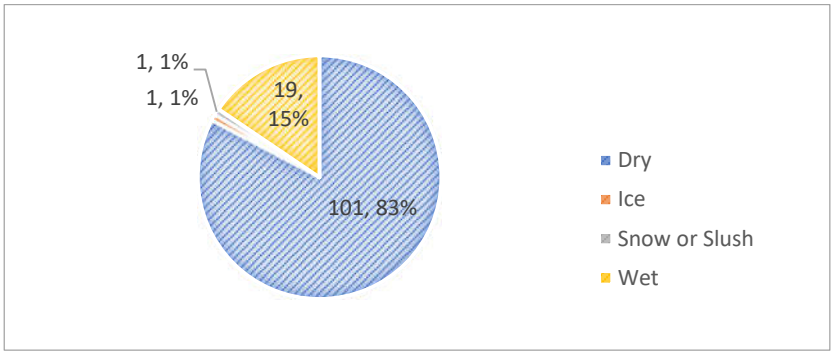


Figure 10: Frequency of Crashes by Weather

The lighting condition is shown in **Figure 11**. The majority of crashes occurred during daylight hours (83%)

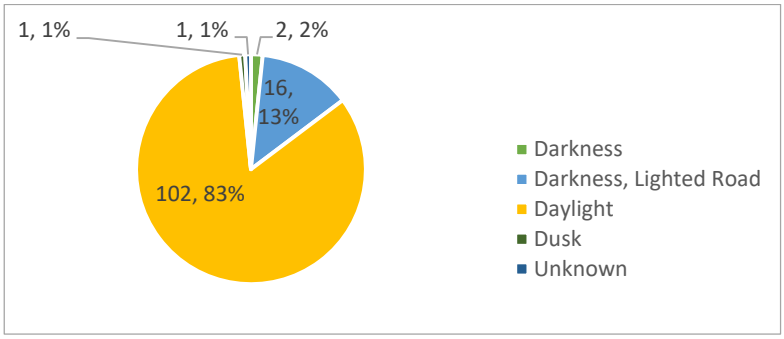


Figure 11: Frequency of Crashes by Lighting

The crash frequency by month is shown in **Figure 12.** March has the highest number of crashes, followed by January and December.

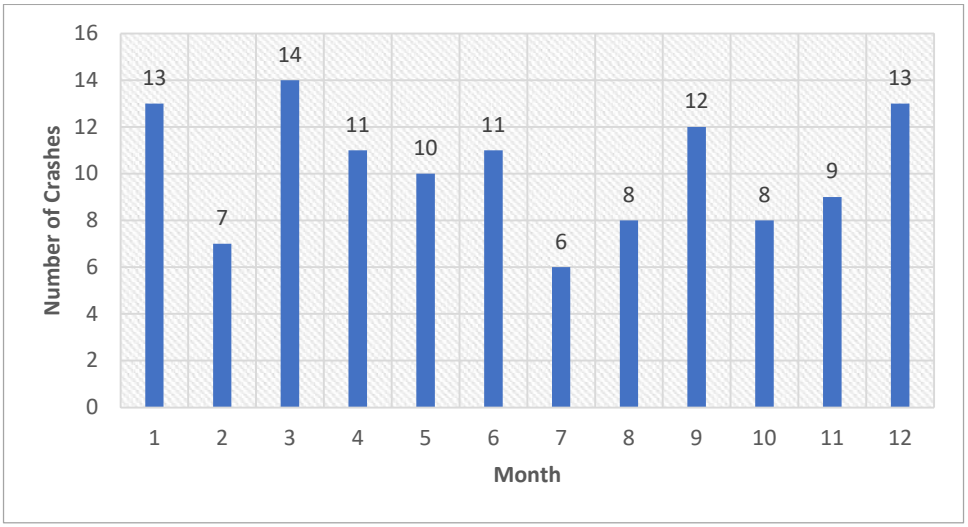


Figure 12: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures – Illinois 148, between Clark Trail and Brewster Road (Segment)

Areas of Concern

Illinois 148, between W. Clark Trail and W. Brewster Road is a five-lane road with poor access management. 54 of the 122 total crashes along the corridor occurred in the segment. Four of the six A injuries in the corridor occurred in the segment between Clark Trail and Brewster Road. Most crashes along the road segment are turning (39%), angle (17%) and rear end (17%) crashes with most of the injury crashes occurring near Walmart/McDonalds. The left-turn movements are the major contributing factors to the turning and angle crashes along the corridor.

Countermeasures

In order to reduce the turning and angle crashes, turning conflicts would need to be reduced. Restricting turning movements, specifically left-turns, would provide the most safety benefit when considering the crash data. The left-turn from driveways to the mainline (Illinois 148) are the most difficult to complete. Therefore, consideration should be given to restricting the left-turns from the driveways to Illinois 148 between Brewster Road and Clark Trail.

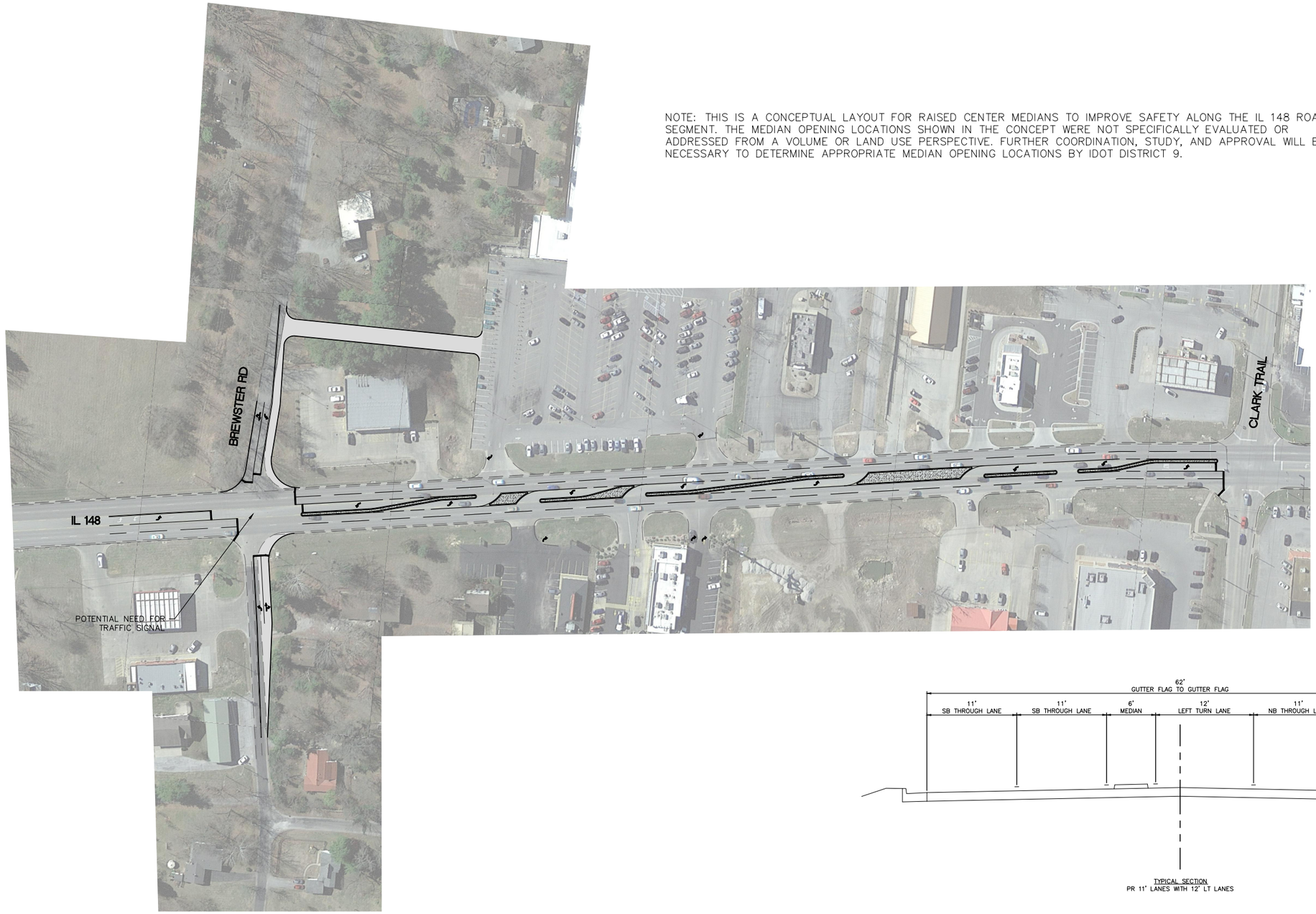
Should left-turns be restricted along the segment, alternative left-turn access should be available to Illinois 148. Left-turn restrictions could be accomplished in many different levels with varying degrees of effectiveness and safety benefits. For example, driveway left-turns could be restricted by signage, pavement markings, and/or enforcement, but the compliance maybe poor. Another option is to restrict side street left-turns at certain times of the day by posting signs and enforcing the restriction. Typically, turns would be prohibited when there are long queues and delays, i.e. the peak hours.

Physical restrictions would likely be needed to provide the most safety benefit. One way to physically restrict left-turn access would be to construct a center median in the middle of the road. Left-turns from Illinois 148 to a certain number of driveways could remain with a center median.

If center medians are constructed along Illinois 148, cross access will be needed between adjacent properties and left-turns would shift to new locations to access Illinois 148. In order to accommodate the left-turns out on the south end of the corridor, a cross access connection would be needed between multiple properties and between Walmart and Brewster Road. Depending on the amount of left-turn volume that would shift from the multiple driveways to Brewster Road, a signal maybe needed at the intersection Illinois 148 and Brewster Road.

Exhibit 1 shows a concept of raised center medians along Illinois 148 between Clark Trail and Brewster Road/Railroad Street with a cross access connection to Brewster Road and a potential signal at Brewster Road. The raised medians concept restricts the left-turns out of all driveways but allows left-turn in access at several locations. This concept illustrates a countermeasure that is needed to address the safety issues (left-turn and angle crashes) and will impact the businesses along this stretch of road. This concept layout did not specifically address impacts to specific land uses or businesses along the corridor and does not show the necessary cross access between all the properties. Traffic counts were not performed as a part of this safety study.

NOTE: THIS IS A CONCEPTUAL LAYOUT FOR RAISED CENTER MEDIANS TO IMPROVE SAFETY ALONG THE IL 148 ROAD SEGMENT. THE MEDIAN OPENING LOCATIONS SHOWN IN THE CONCEPT WERE NOT SPECIFICALLY EVALUATED OR ADDRESSED FROM A VOLUME OR LAND USE PERSPECTIVE. FURTHER COORDINATION, STUDY, AND APPROVAL WILL BE NECESSARY TO DETERMINE APPROPRIATE MEDIAN OPENING LOCATIONS BY IDOT DISTRICT 9.



TYPICAL SECTION
PR 11' LANES WITH 12' LT LANES

EXHIBIT 1: IL 148 between Clark Trail and Brewster Road – Raised Center Median Concept for ¾ Access

Job #: 039-20
6/30/2021

TRANSPORTATION ENGINEERS+PLANNERS

It is recommended that IDOT District 9 perform further studies and evaluations to understand impacts to traffic, gather input and support from the local businesses, and to refine the concept plan.

Alternatively, "partial pork chop" islands on the driveways could be considered to provide some physical restrictions for left-turns. However, in order to design for trucks to turn right out of the driveways, the radius on the "porkchop" islands typically need to be quite large. With large radius for trucks and a five-lane road, passenger vehicles maybe able to drive around the porkchop islands that are intended to limit left-turns out of the driveway.

An additional countermeasure to improve safety along the Illinois 148 corridor would be to reduce speeds. As noted, the posted speed limit changes for northbound Illinois 148 just south of Brewster Road. A safety countermeasure to reduce speed would be to install a speed feedback sign for northbound Illinois 148, so that vehicles are traveling at slower speeds approaching the busier commercial area.

Areas of Concern & Possible Countermeasures – Illinois 148 & Clark Trail (Signalized Intersection)

Areas of Concern

Illinois 148 and Clark Trail is a signalized intersection with separate left-turn lanes on all approaches with protected and permissive northbound and southbound left-turns and a common east-west phase. 45 of the 122 total crashes along the corridor occurred at this intersection with Clark Trail with 11 injury crashes. There was only one A-injury and it was an angle crash. One B-injury crash, turning type, and one C-injury crash, angle type, were recorded over the five-year period.

Countermeasures

There are a number of improvements that can be made to the signal to reduce crashes at the intersection.

- Adding flashing yellow arrows for the northbound and southbound left-turns could reduce angle and turning crashes.
- Protected only phasing for the northbound and southbound left-turns would also reduce angle and turning crashes, though there could be negative impacts related to capacity and queues.
- Reflective back plates could be added to each of the primary signal heads to reduce the angle and turning crashes.
- The east and west pedestal signals could be upgraded to mast arms in order to provide protected and permissive left-turn phasing since separate left-turn lanes are already provided on both approaches.
- Additional signal heads could be installed over each lane so drivers are more likely to see the correct signal indication.
- Pedestrian accommodations could be added to the intersection to reduce the crash risk. There are currently two curb ramps on the southeast corner of the intersection that do not have a connecting ramp on the other side of the approach.

Since the intersection only has one A injury crash, this intersection may not score well for HSIP funds.

Areas of Concern & Possible Countermeasures – Illinois 148 & Brewster Road (Side-Street Stop Intersection)

Areas of Concern

Illinois 148 at Brewster Road is a side-street stop with less than optimal sight distance to the south with the speed limit changing south of Brewster Road. Most of the crashes at Brewster involve vehicles turning to and from the side-street. Eastbound Brewster Road has the highest number of these turning crashes.

Countermeasures

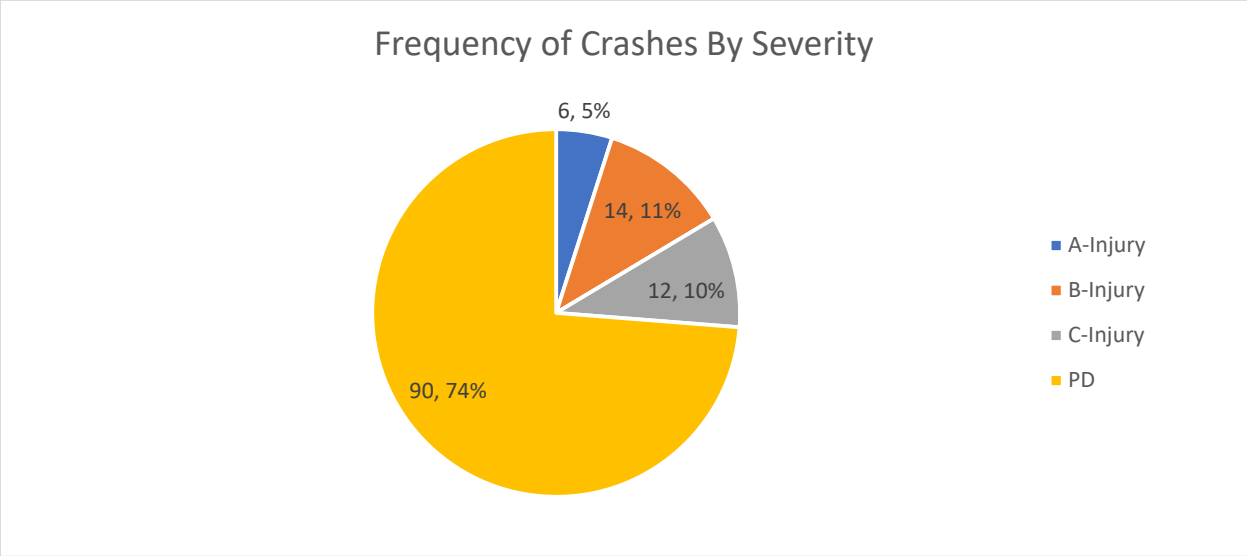
Consideration should be given to improving the sight distance to the south of the intersection. The vegetation should be cleared, the berm should be pushed back, and the sign in the southwest quadrant of the intersection should be moved to provide improved sight distance.

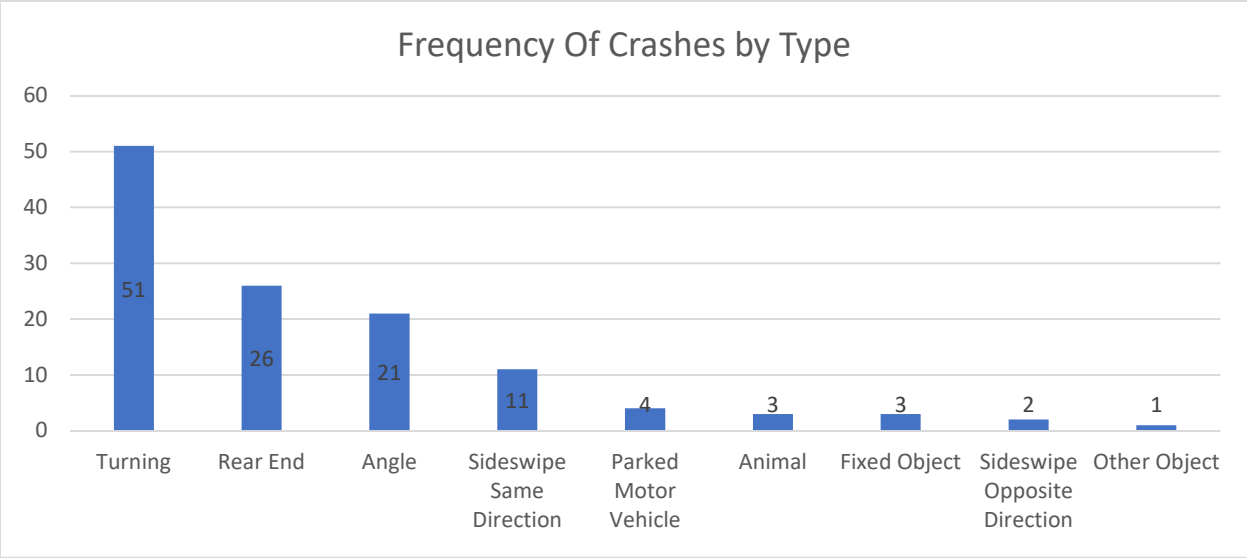
To aid in reducing turning crashes improve signage and striping could be installed. Painted stop bars on Brewster Road/Railroad Avenue could be provided on the side-streets to provide visual cues that the side-street is required to stop. Additionally, a flashing LED stop sign could be installed on the eastbound and westbound approaches so that motorist are more aware of the stop condition.

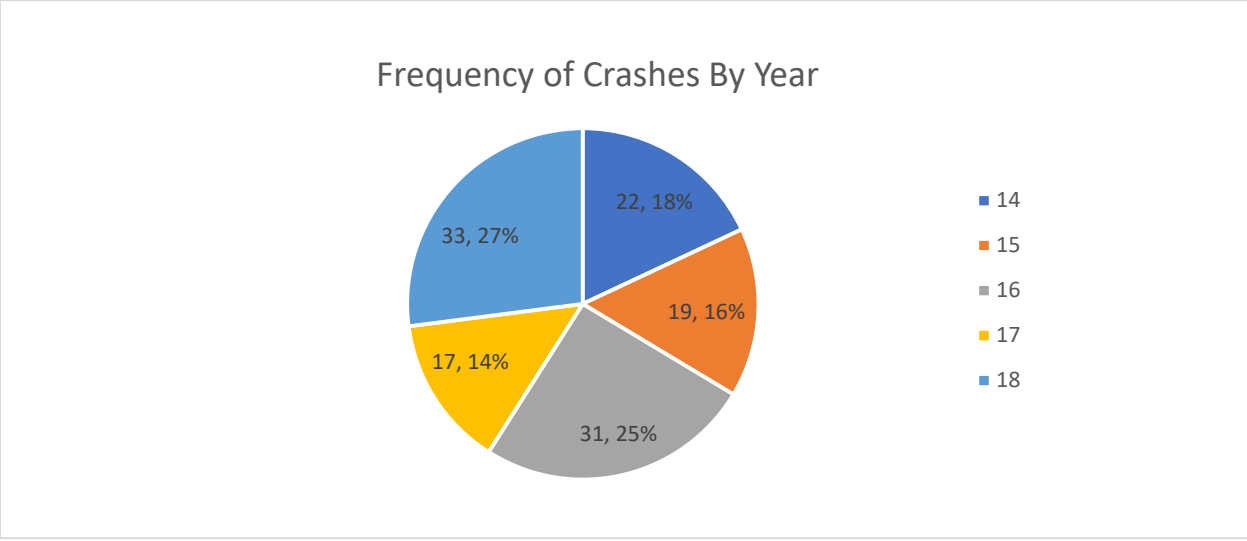
As noted for the segment, speed feedback signs could be considered for the northbound direction to slow vehicle speeds entering the commercial area.

Since the intersection only had 1 A injury crash, this intersection may not score well for HSIP funds.

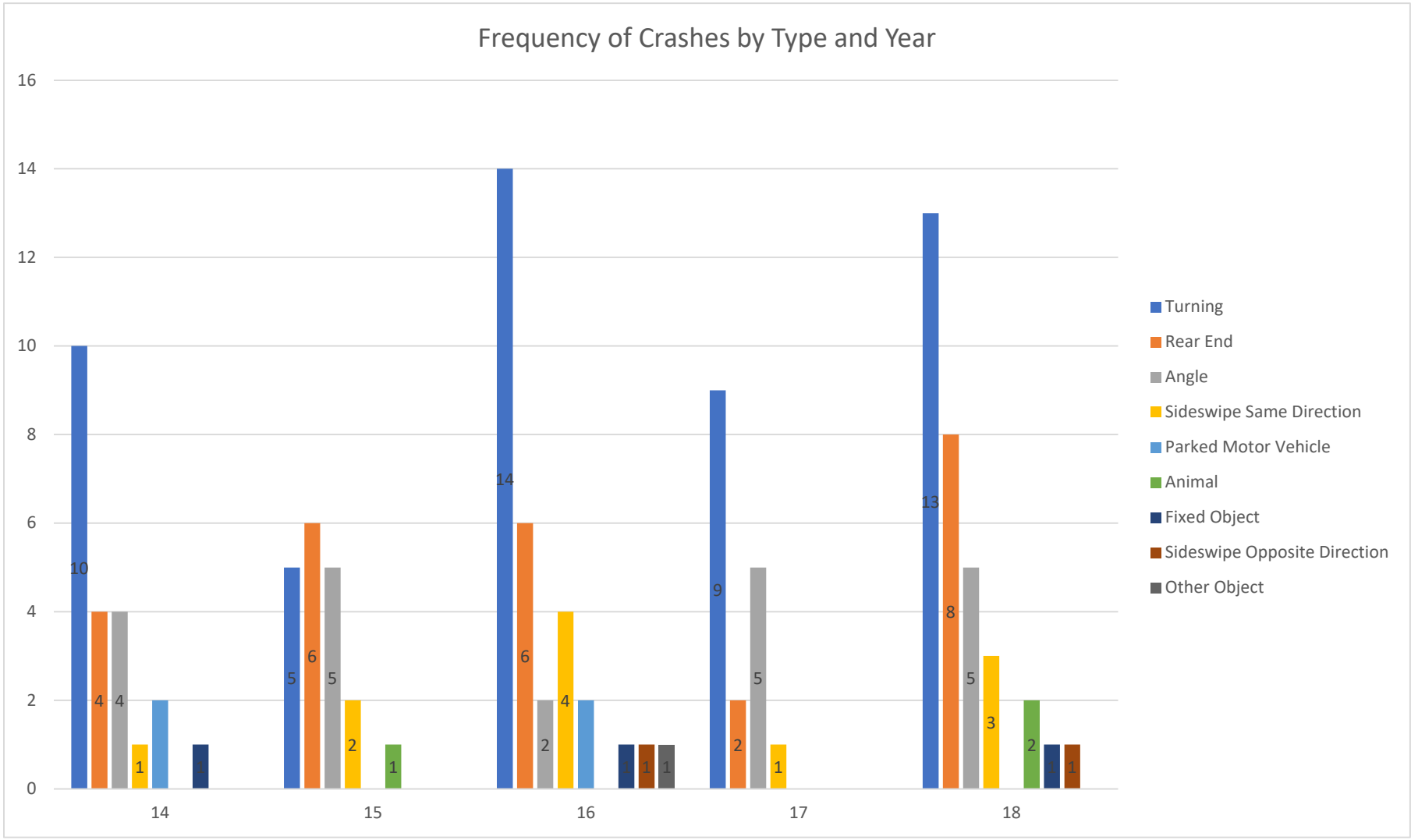
IL 148 (Park Avenue) Corridor - Clark Trail to Brewster Road/Railroad Street (2014-2018)



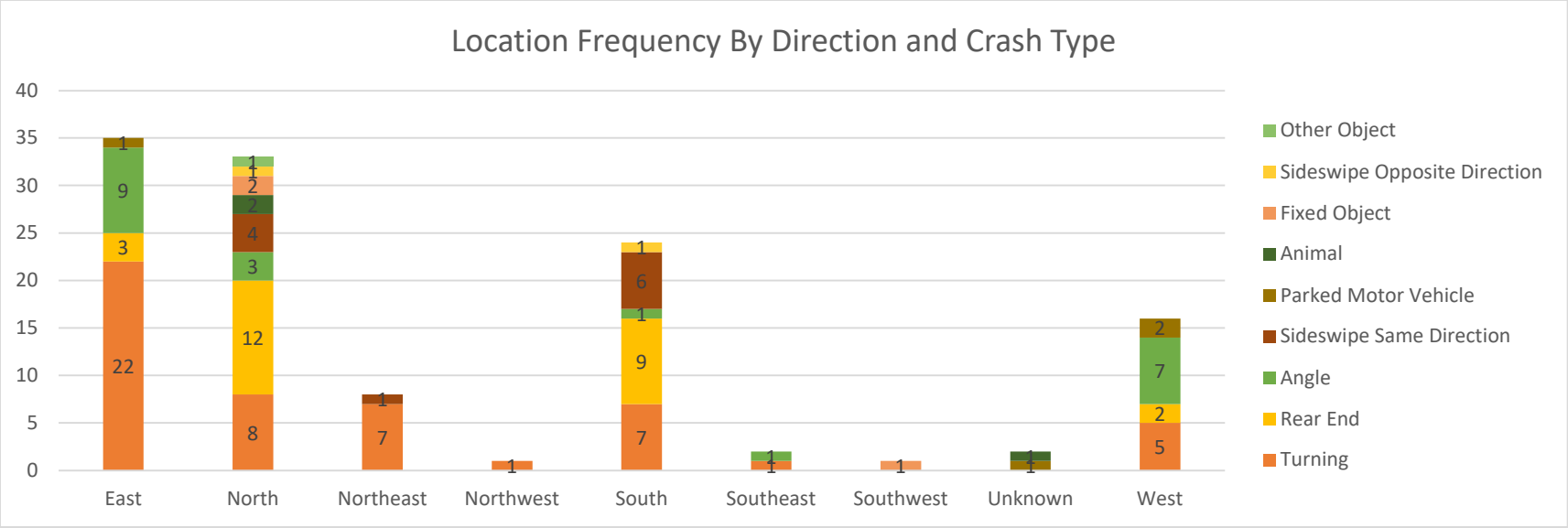


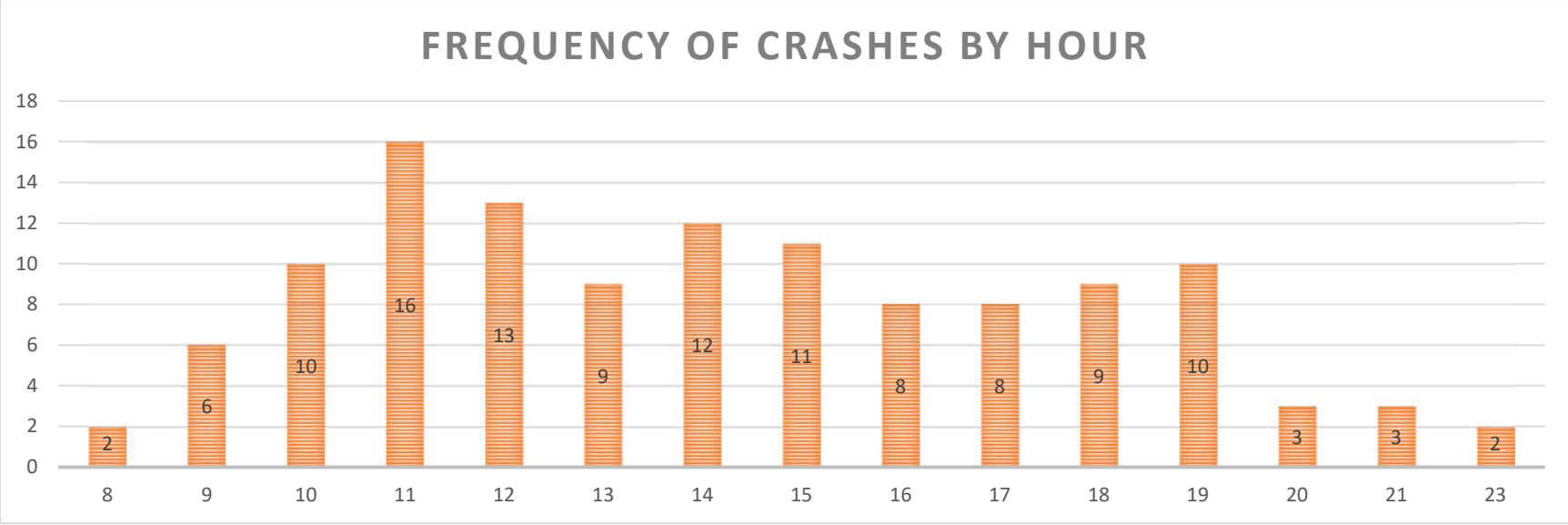


IL 148 (Park Avenue) Corridor - Clark Trail to Brewster Road/Railroad Street (2014-2018)

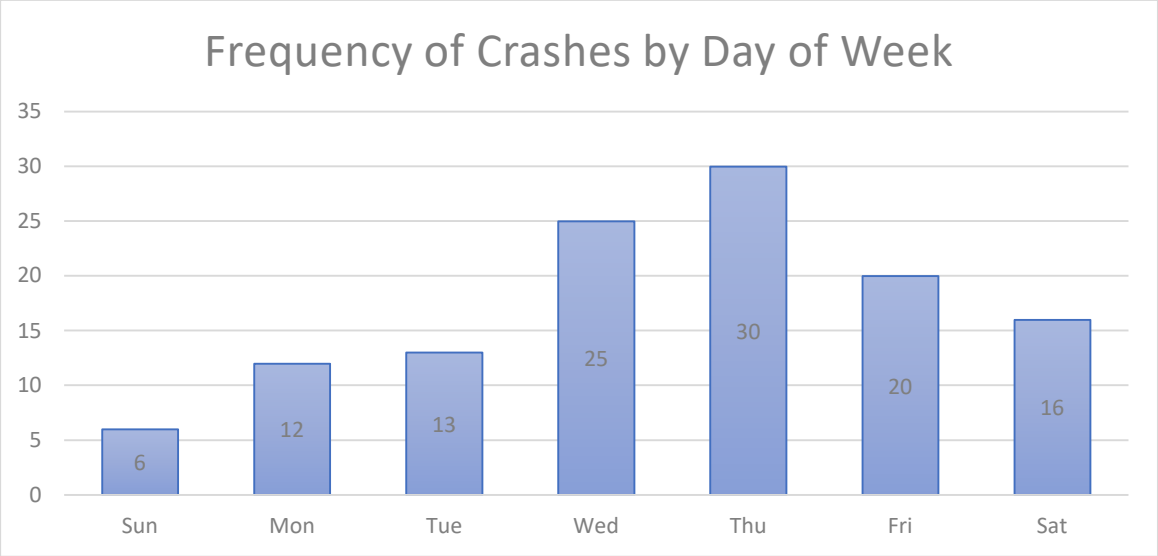


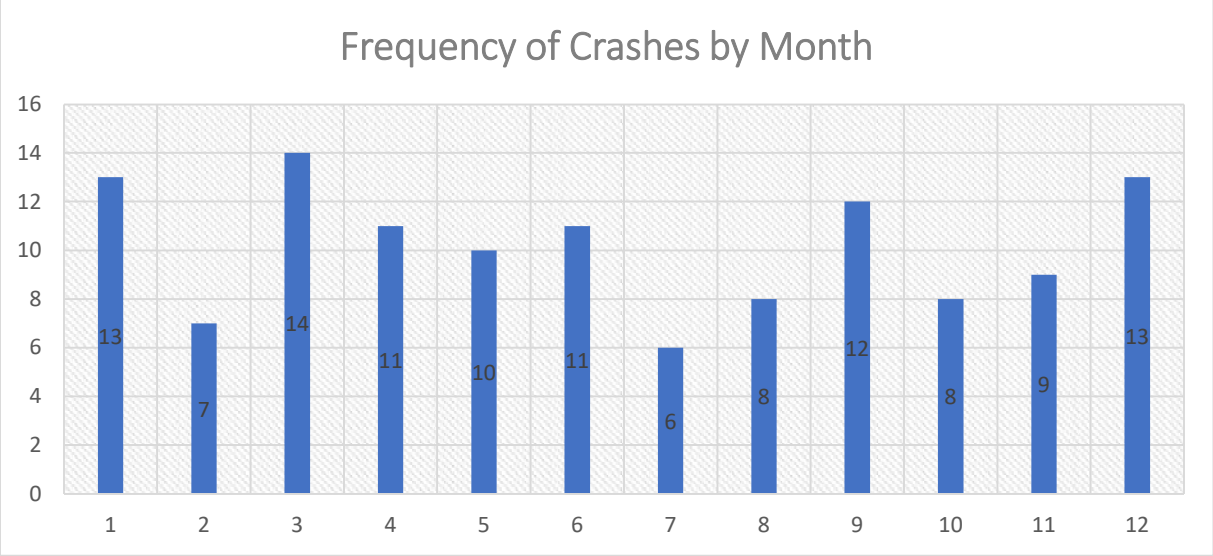
IL 148 (Park Avenue) Corridor - Clark Trail to Brewster Road/Railroad Street (2014-2018)

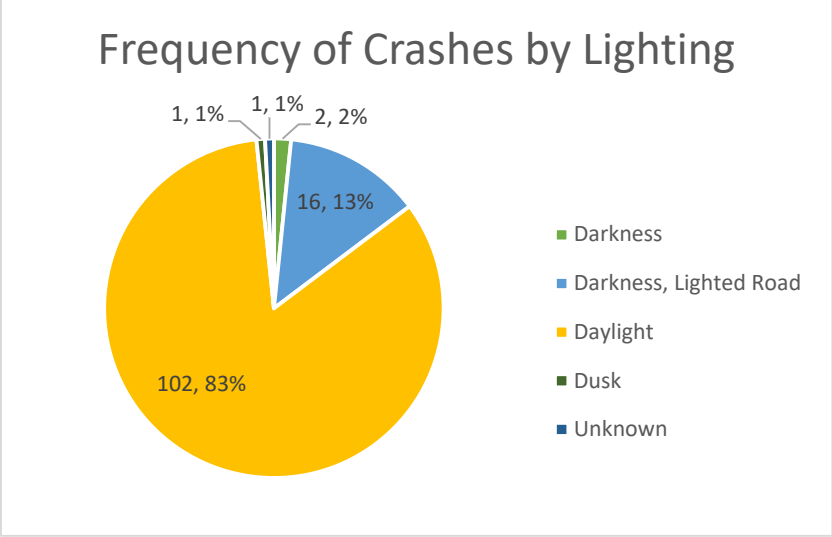




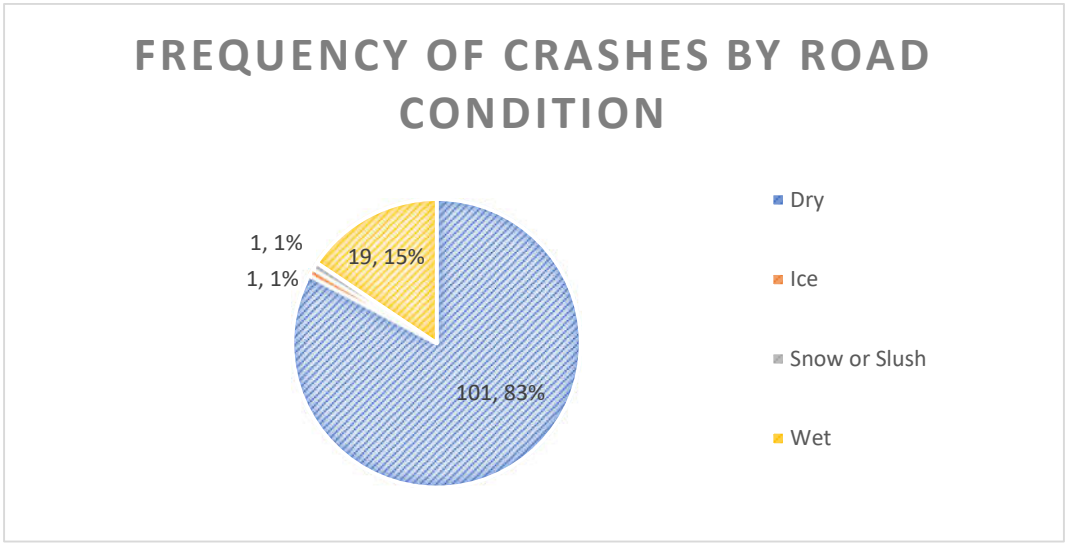
IL 148 (Park Avenue) Corridor - Clark Trail to Brewster Road/Railroad Street (2014-2018)

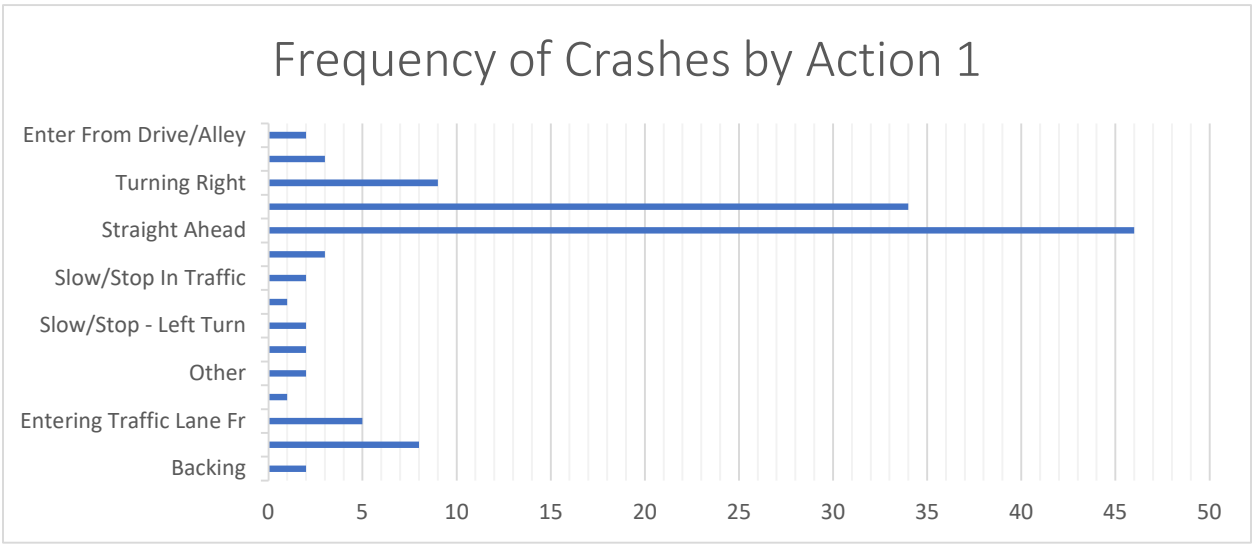


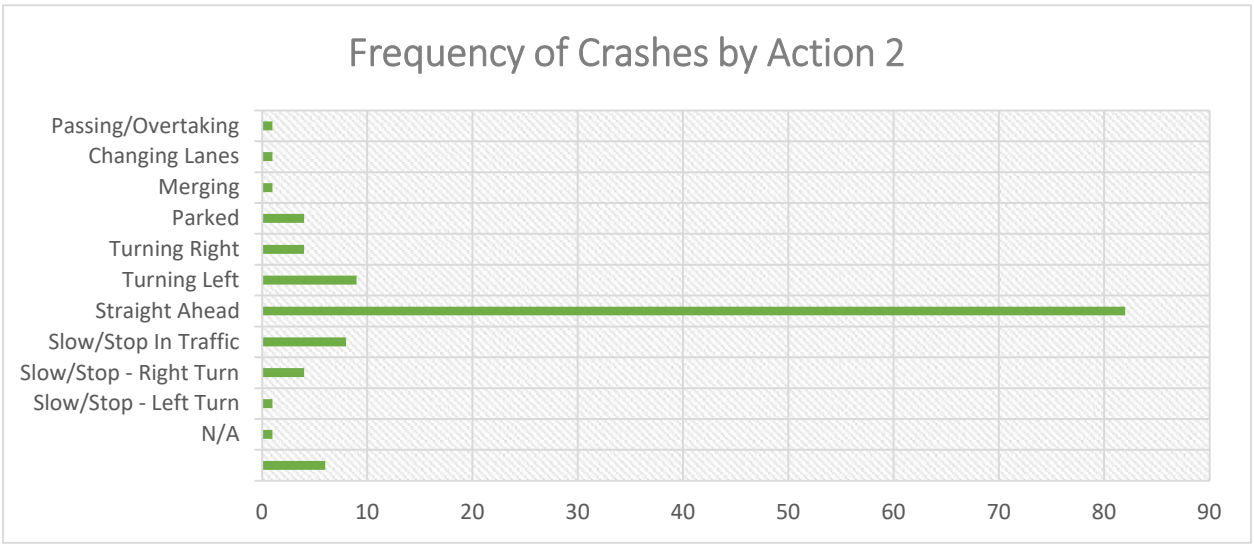




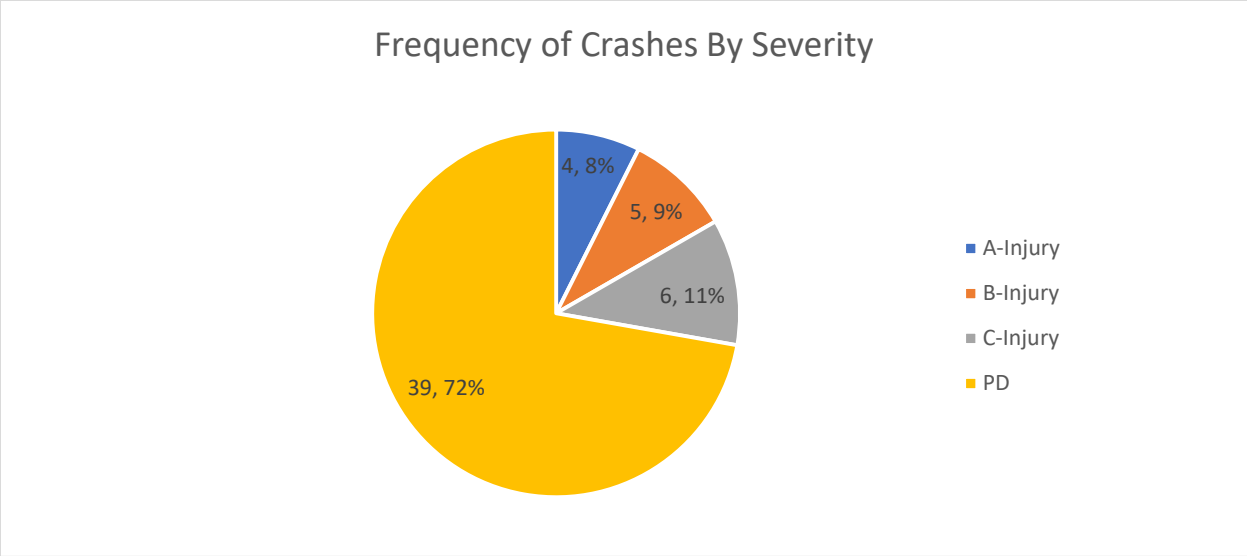
IL 148 (Park Avenue) Corridor - Clark Trail to Brewster Road/Railroad Street (2014-2018)

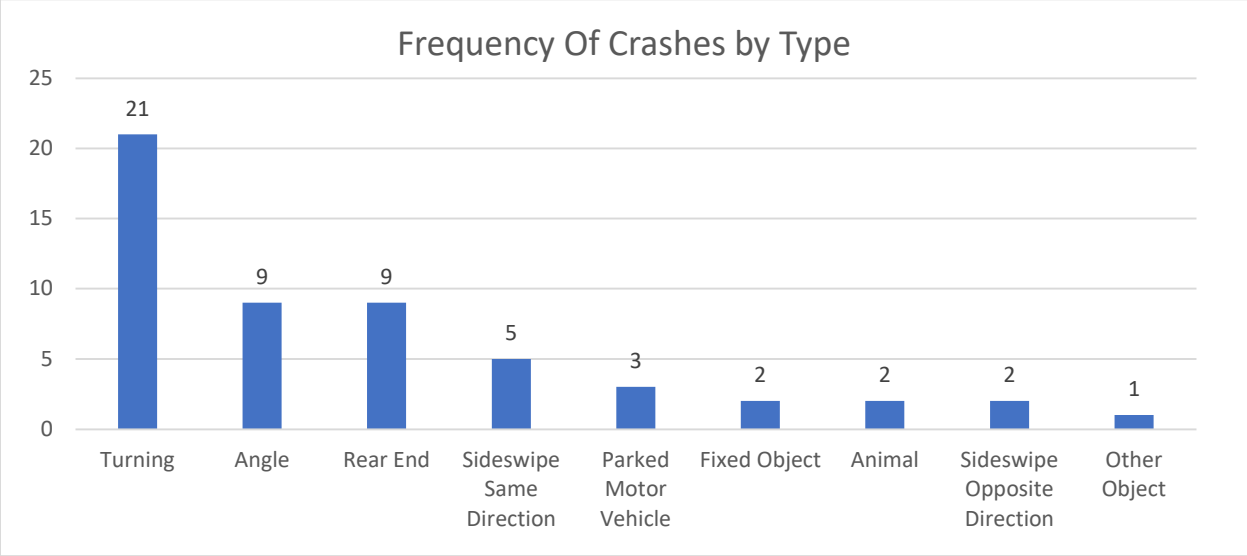


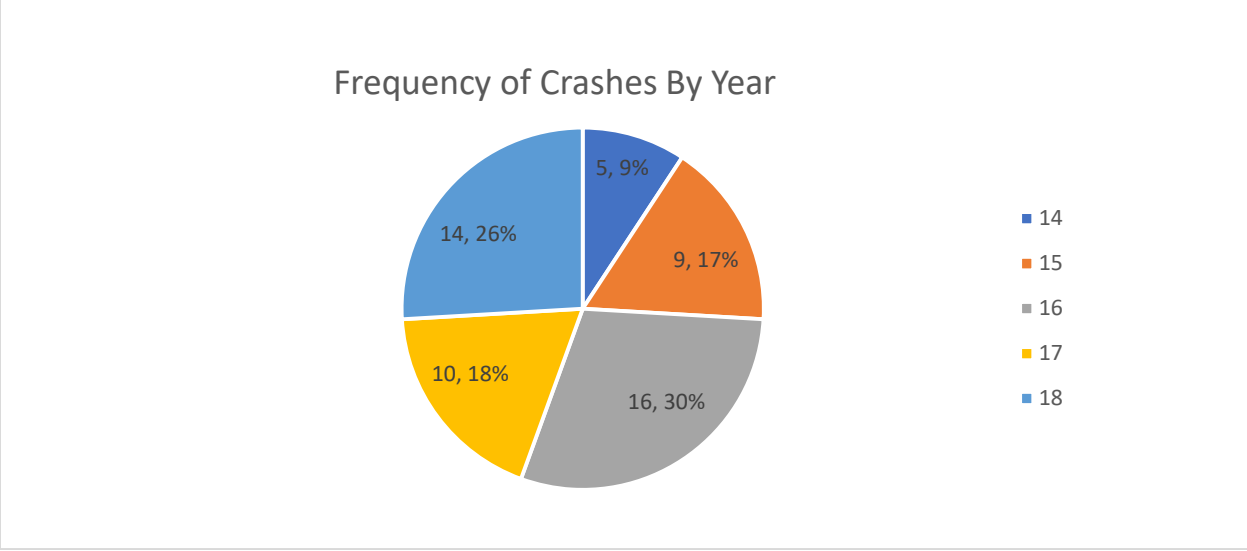




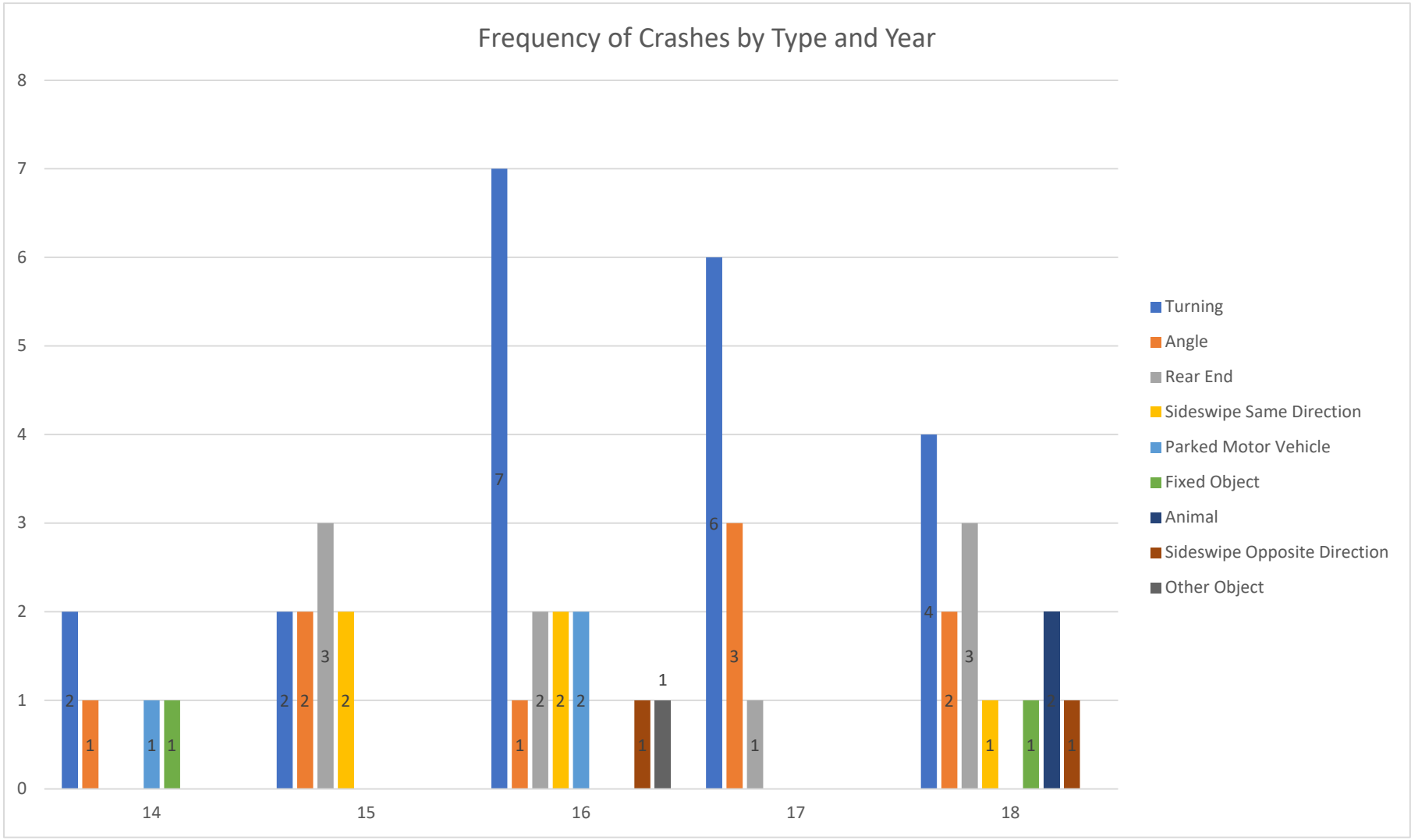
Segment Crashes along IL 148 from Clark Trail to Brewster Road (2014-2018)



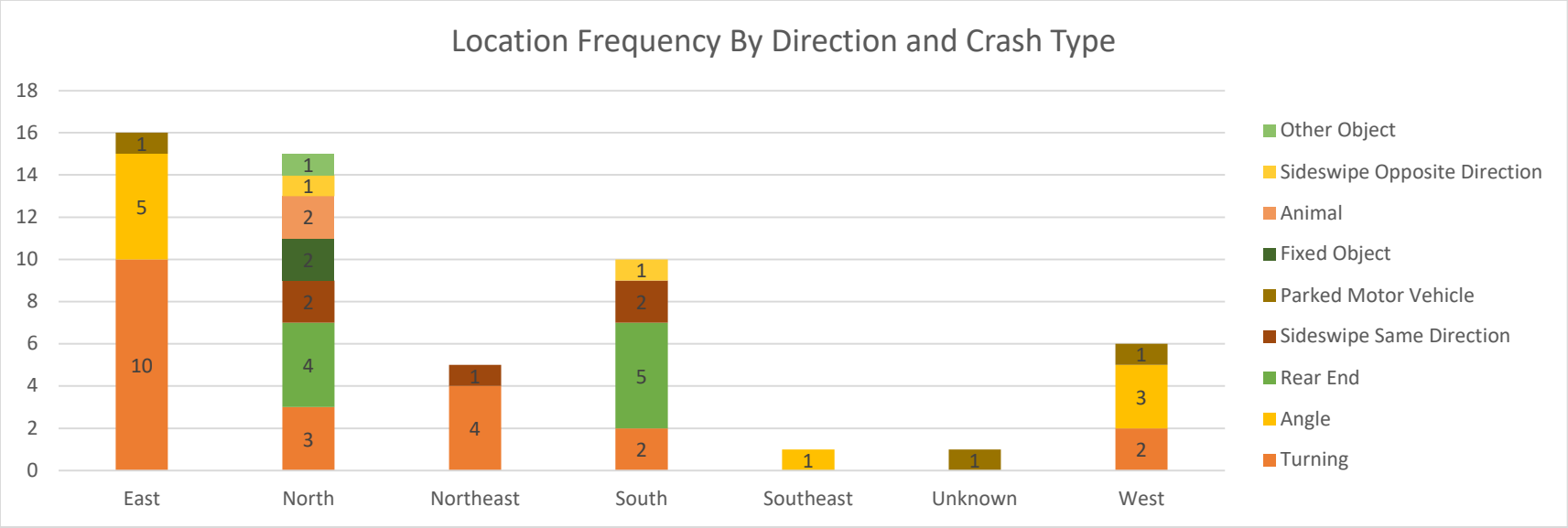


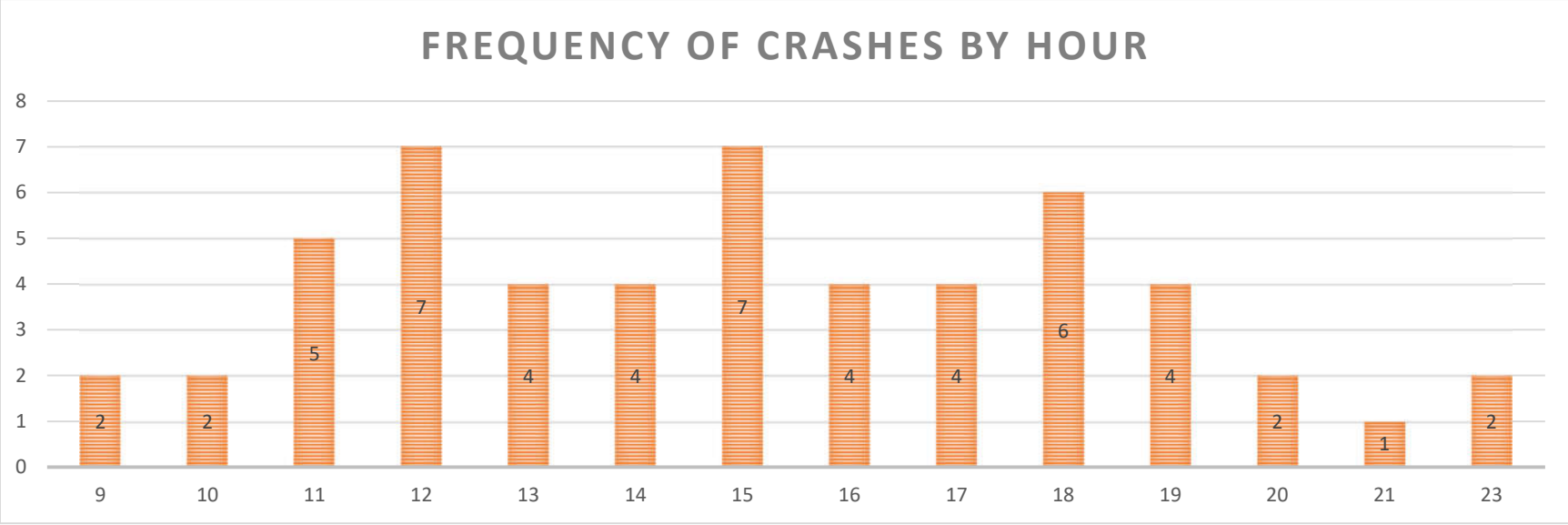


Segment Crashes along IL 148 from Clark Trail to Brewster Road (2014-2018)

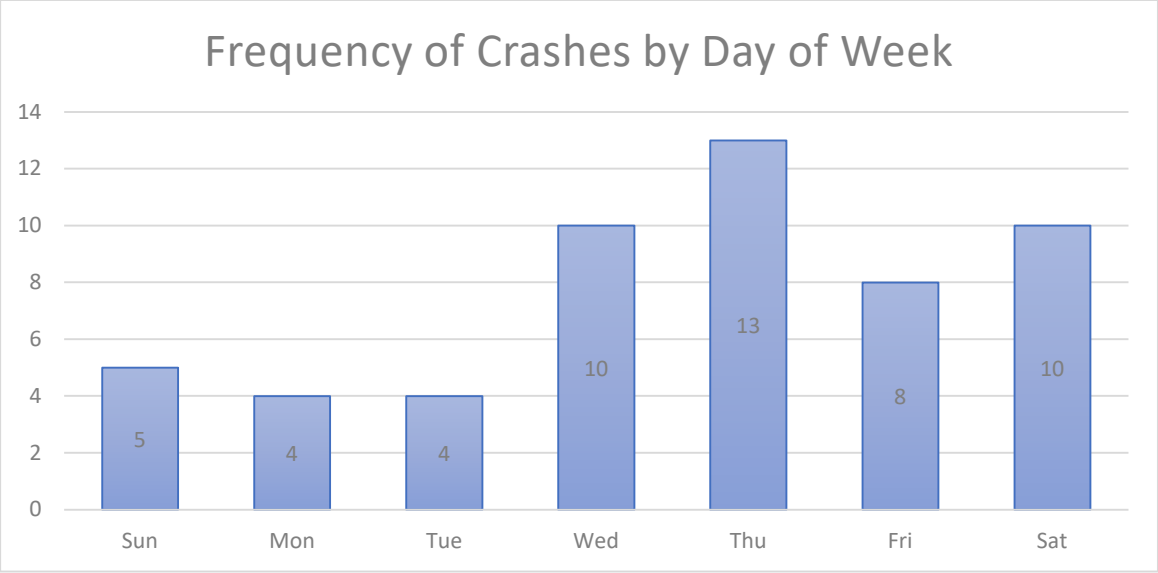


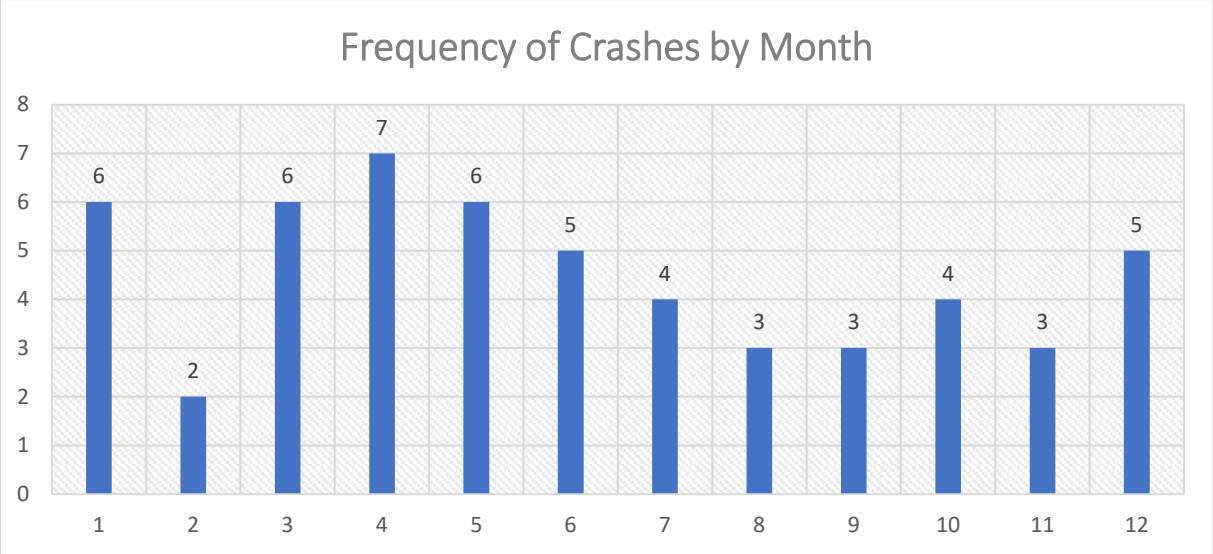
Segment Crashes along IL 148 from Clark Trail to Brewster Road (2014-2018)

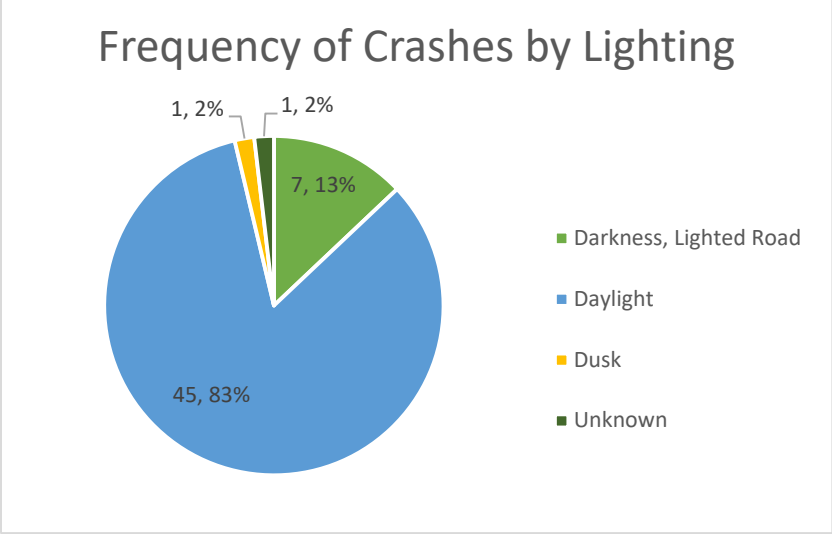




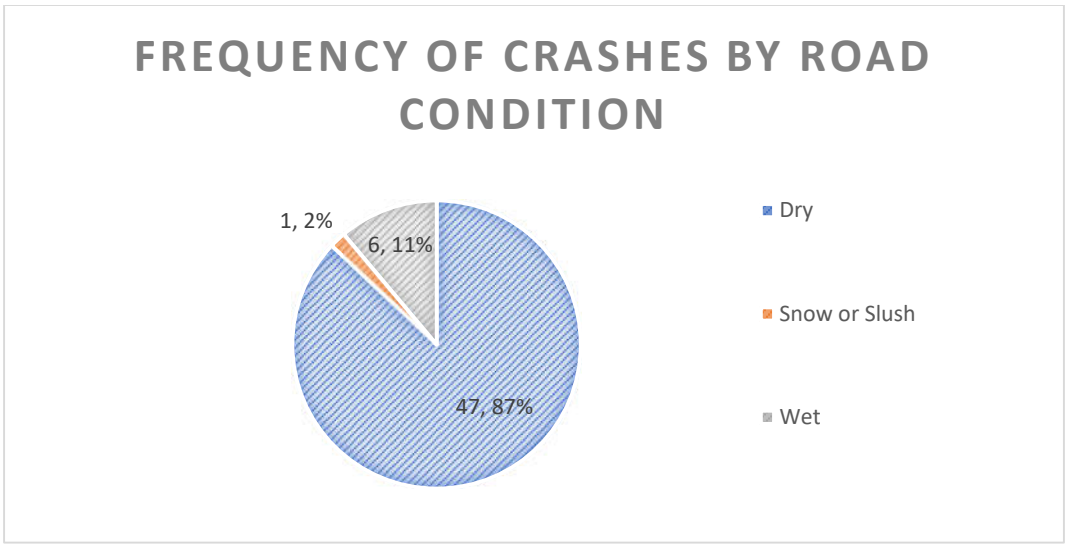
Segment Crashes along IL 148 from Clark Trail to Brewster Road (2014-2018)

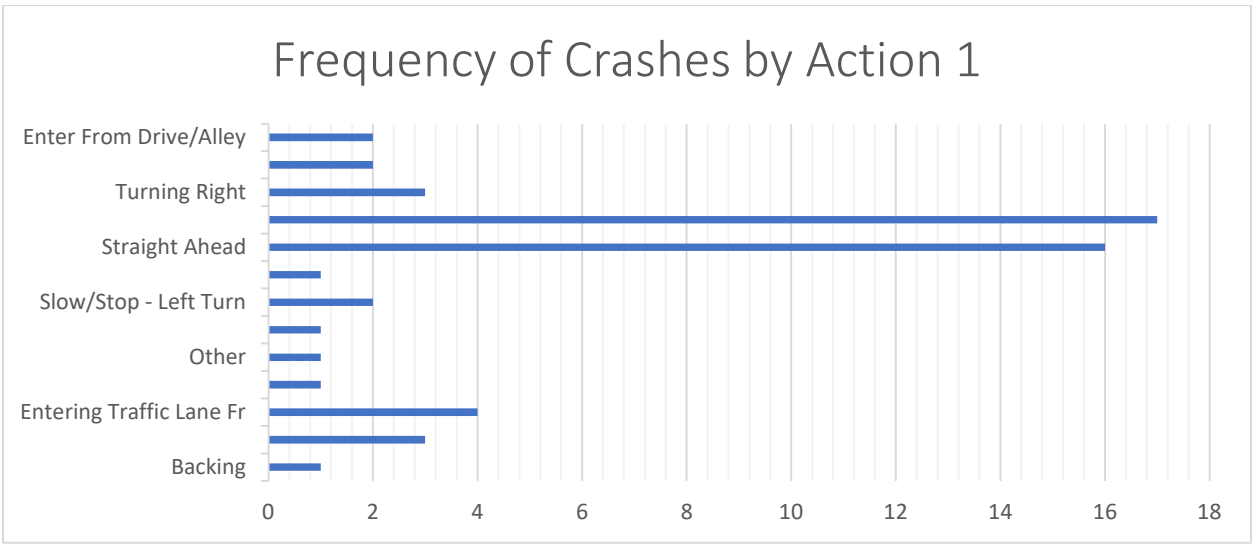


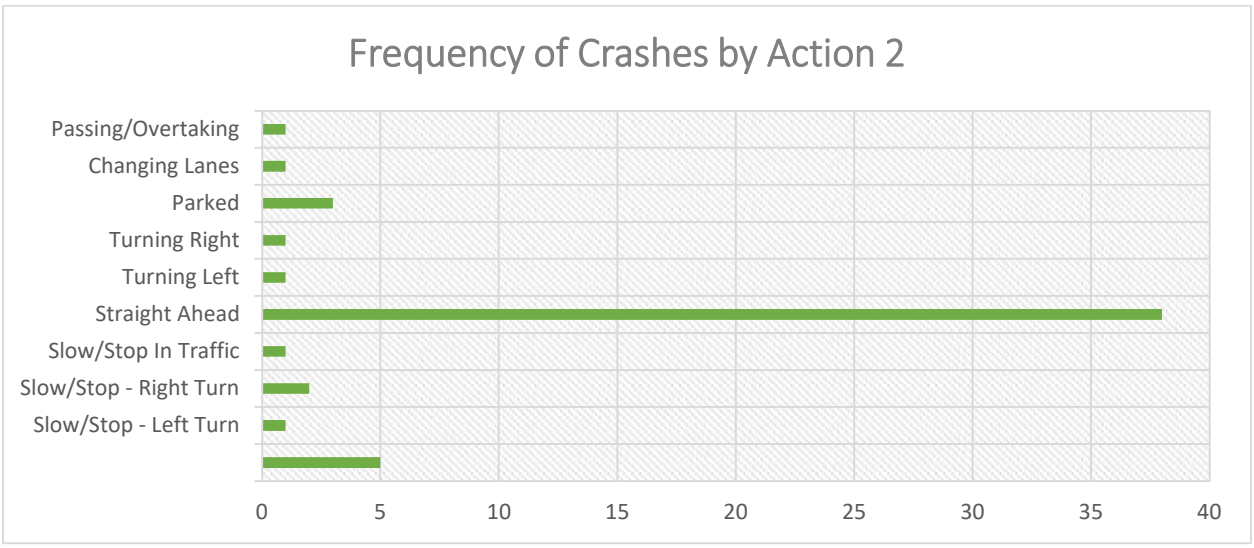




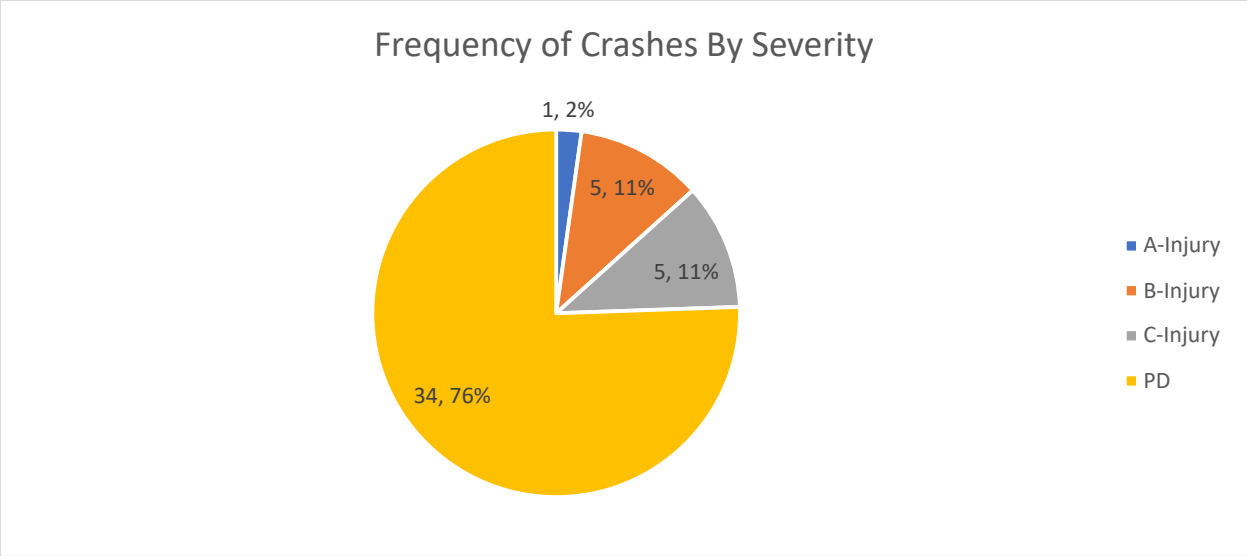
Segment Crashes along IL 148 from Clark Trail to Brewster Road (2014-2018)

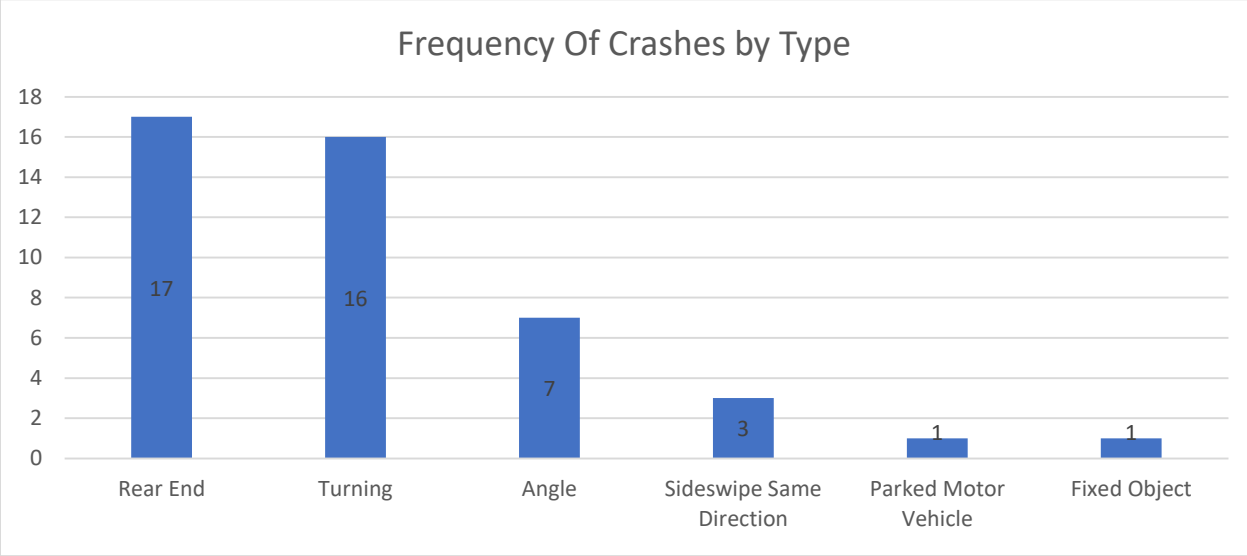


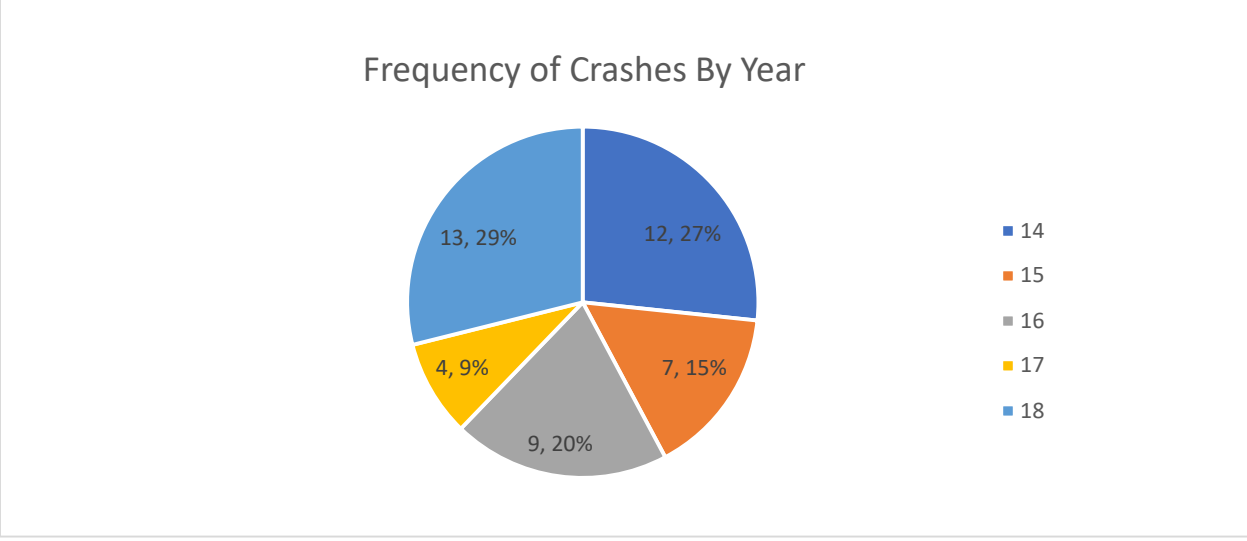




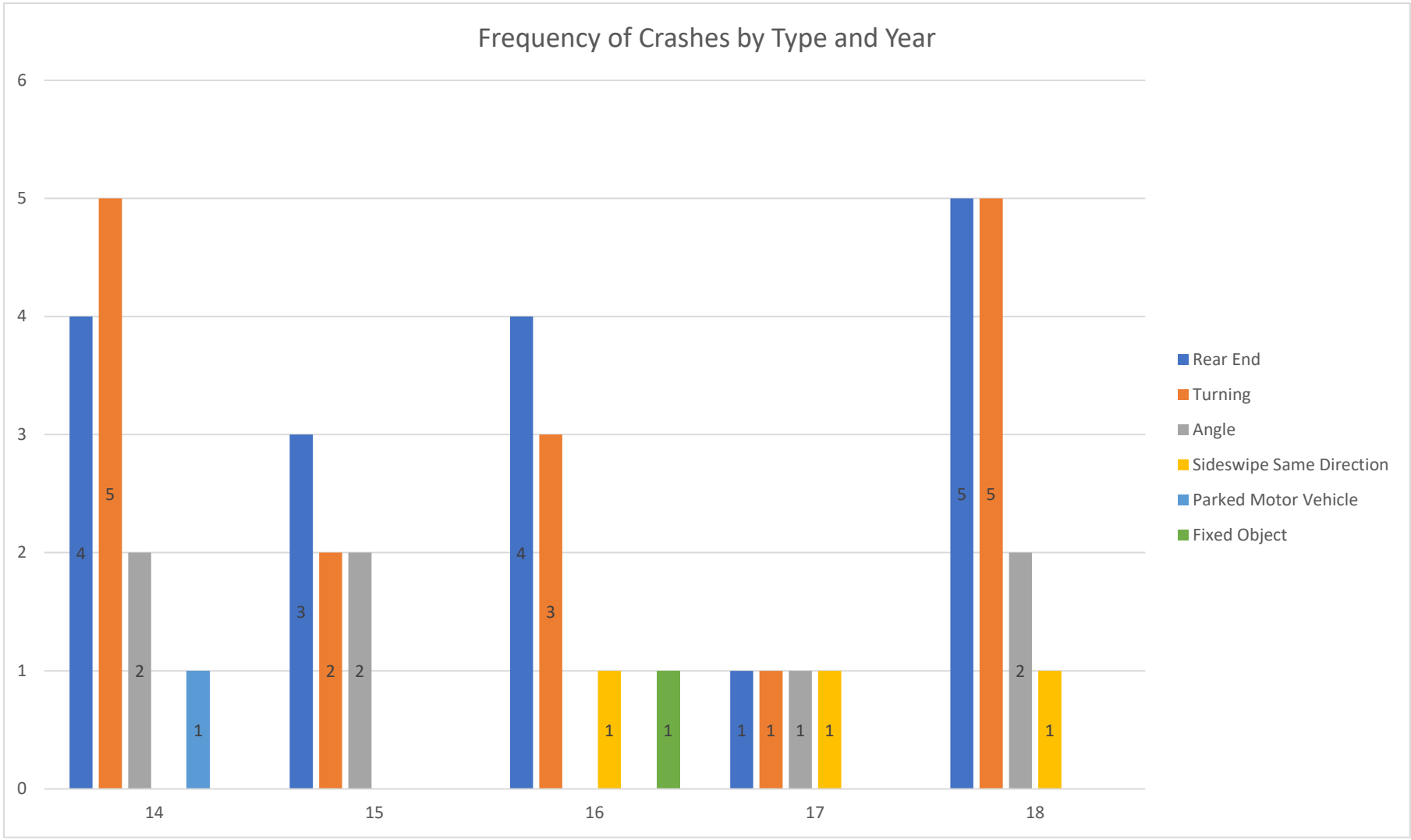
Intersection of IL 148 and Clark Trail (2014-2018)



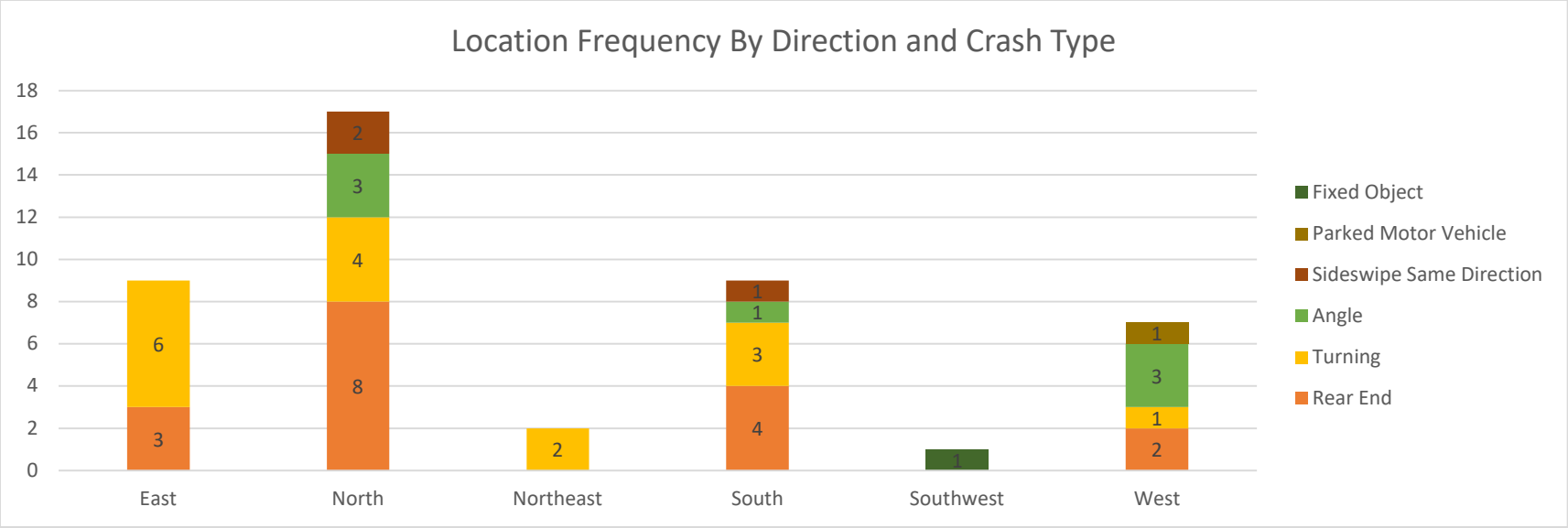


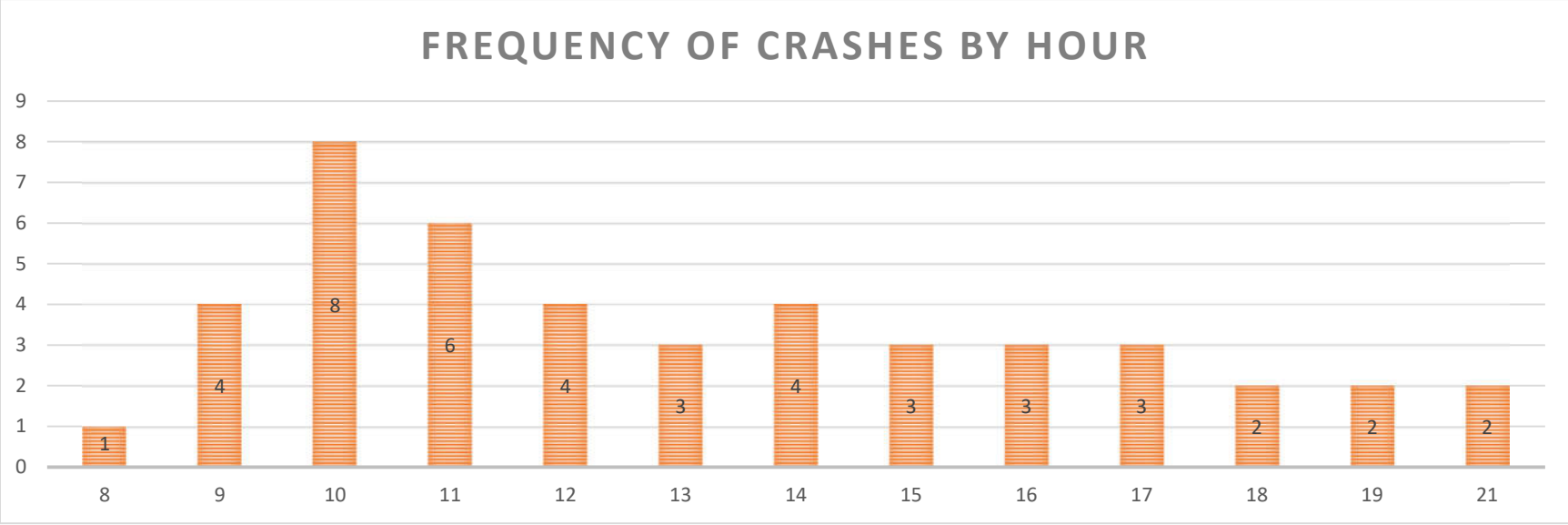


Intersection of IL 148 and Clark Trail (2014-2018)

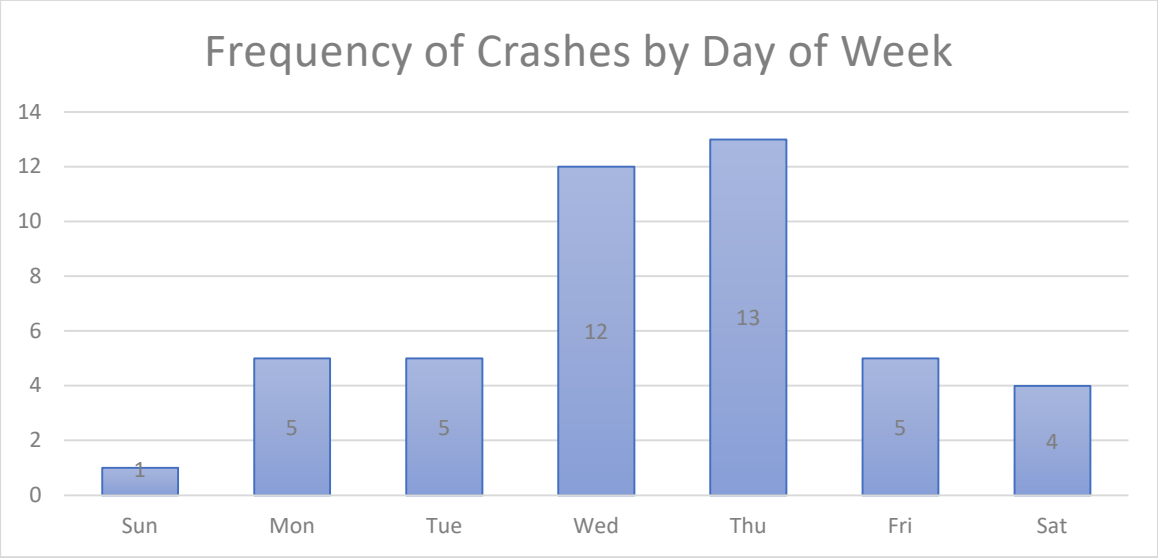


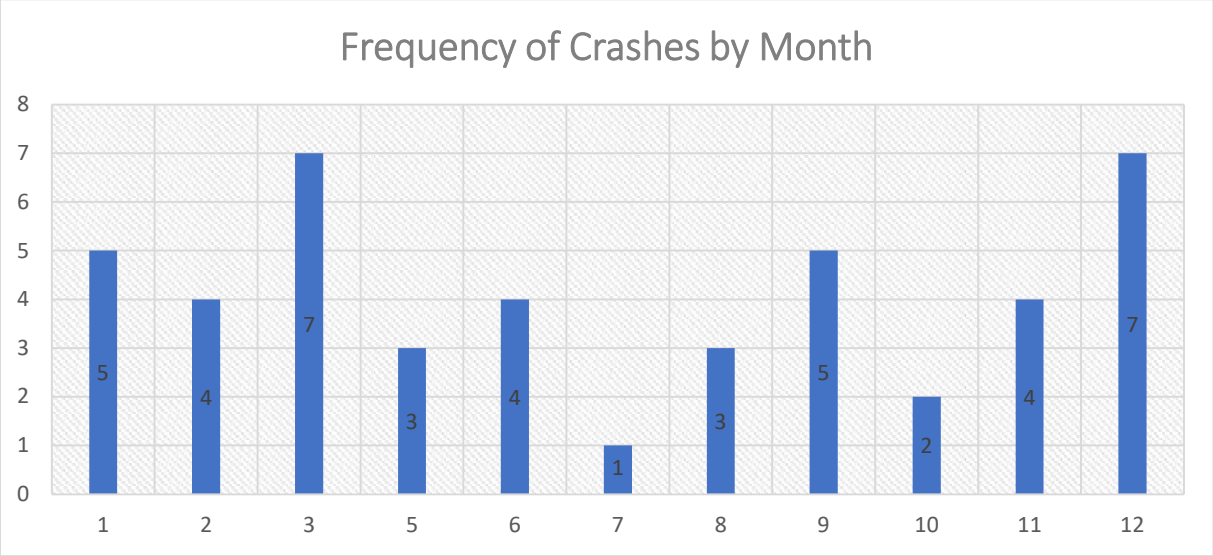
Intersection of IL 148 and Clark Trail (2014-2018)

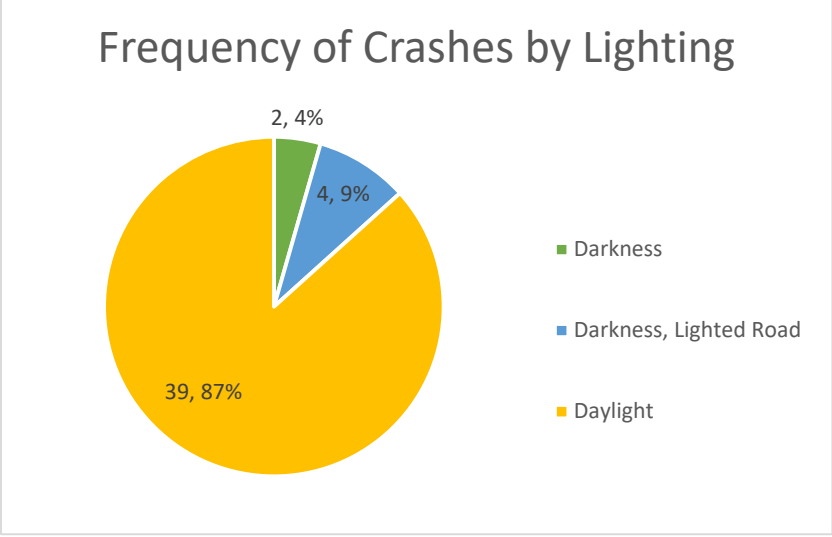




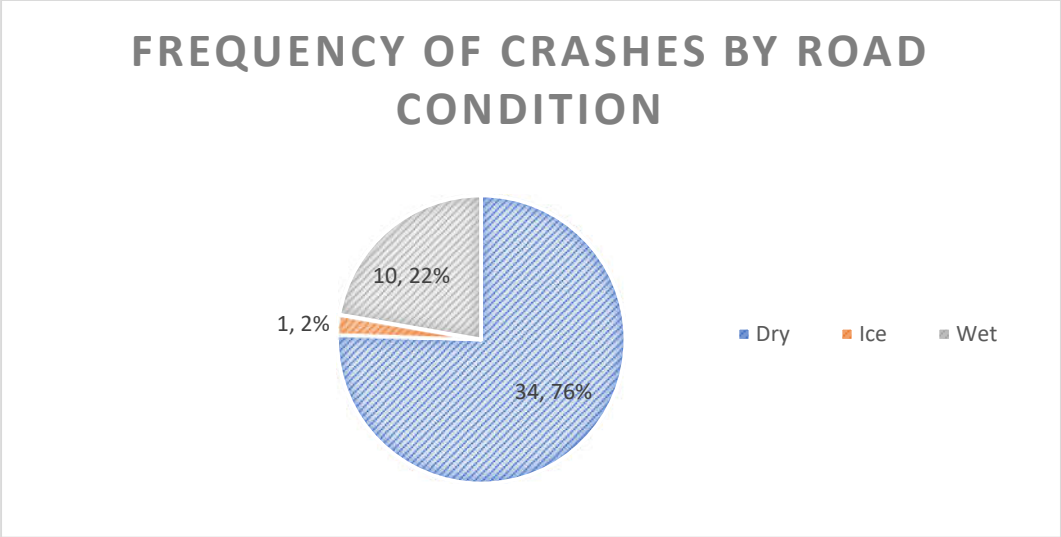
Intersection of IL 148 and Clark Trail (2014-2018)

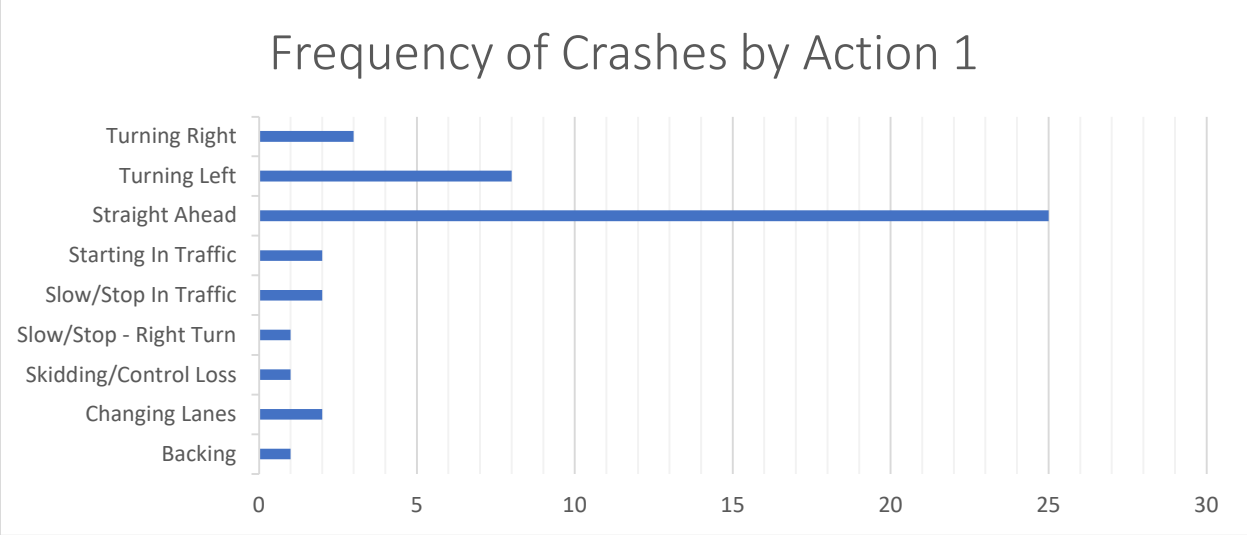


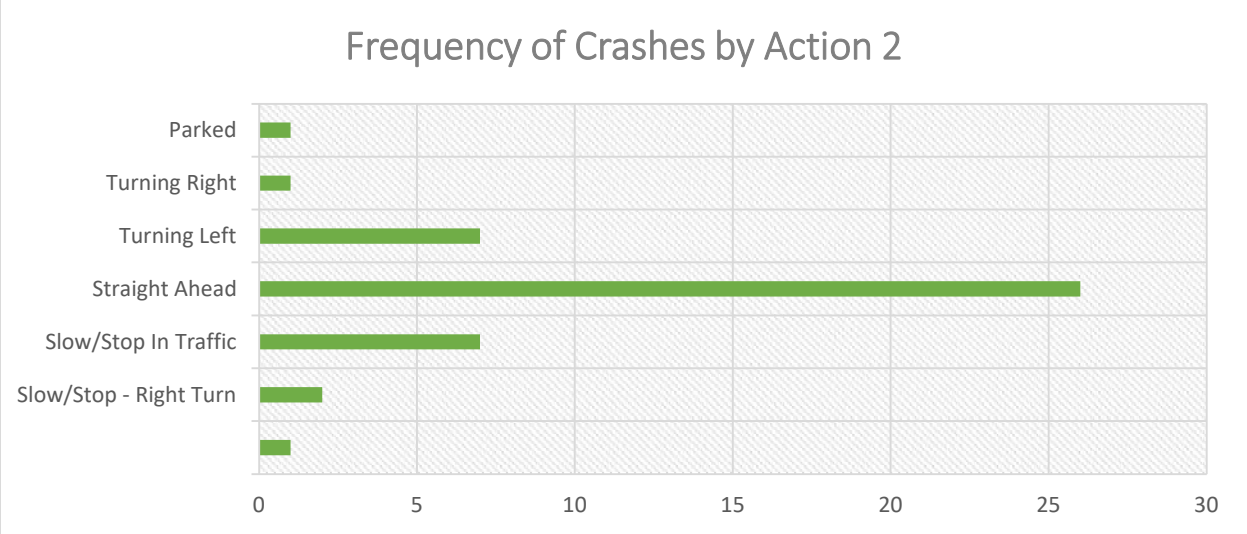




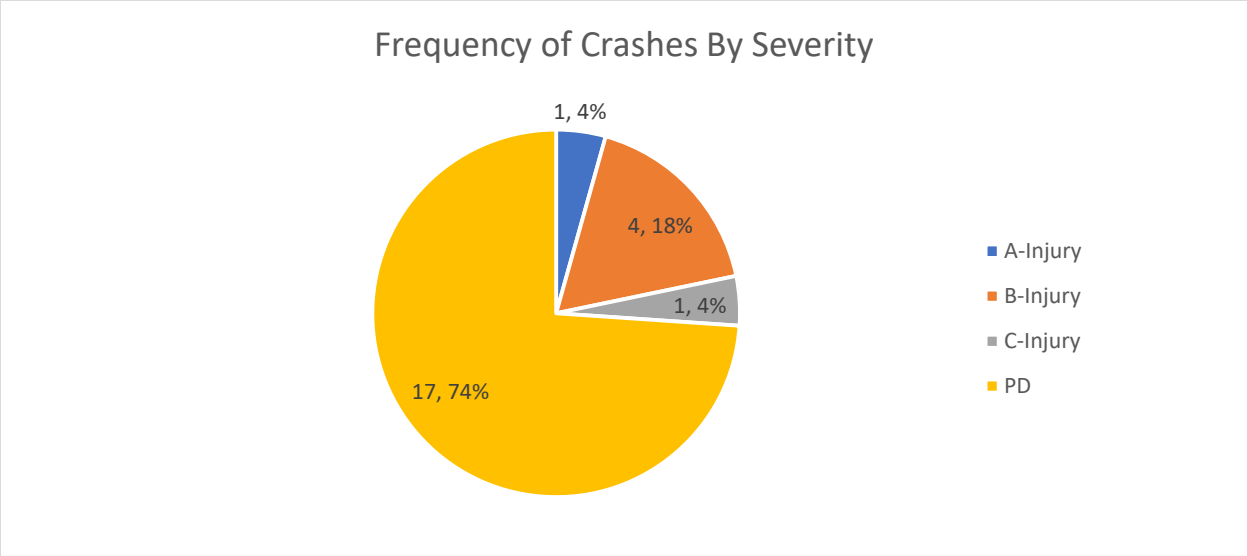
Intersection of IL 148 and Clark Trail (2014-2018)

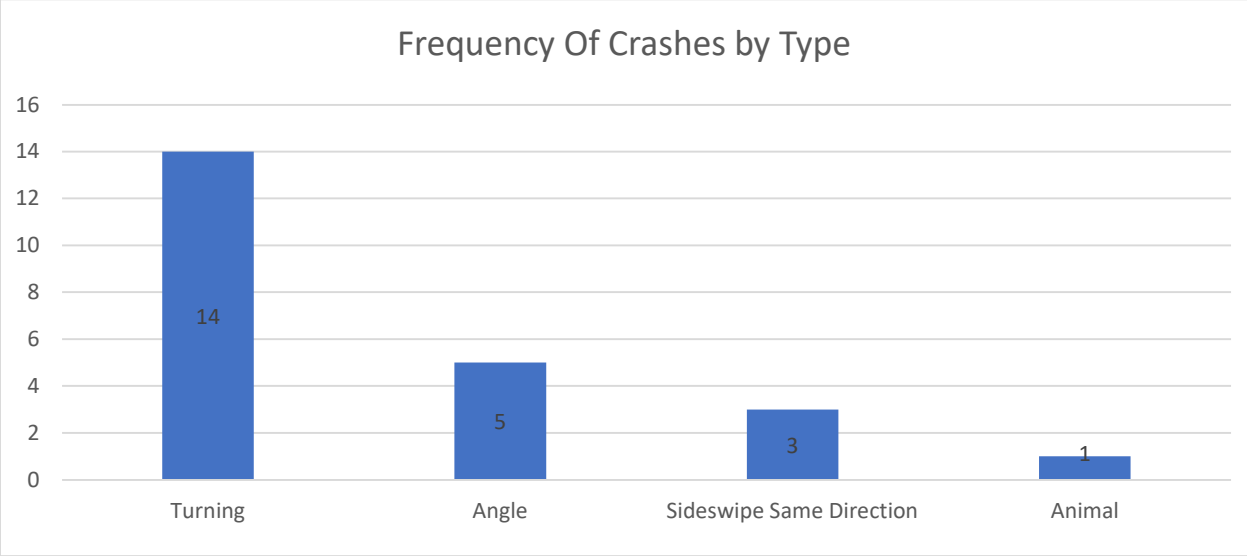


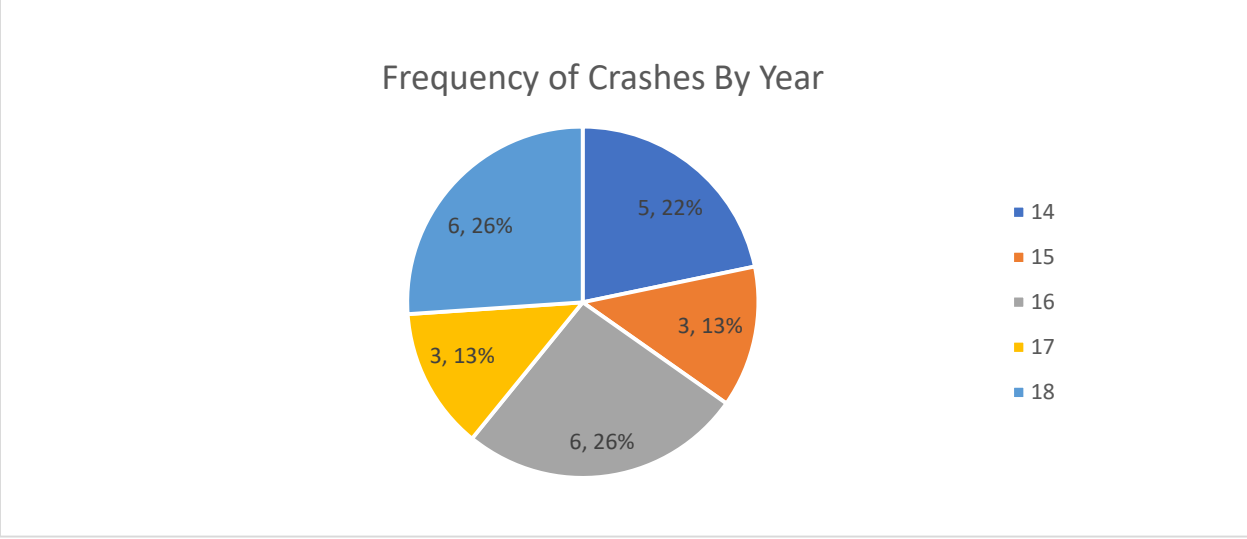




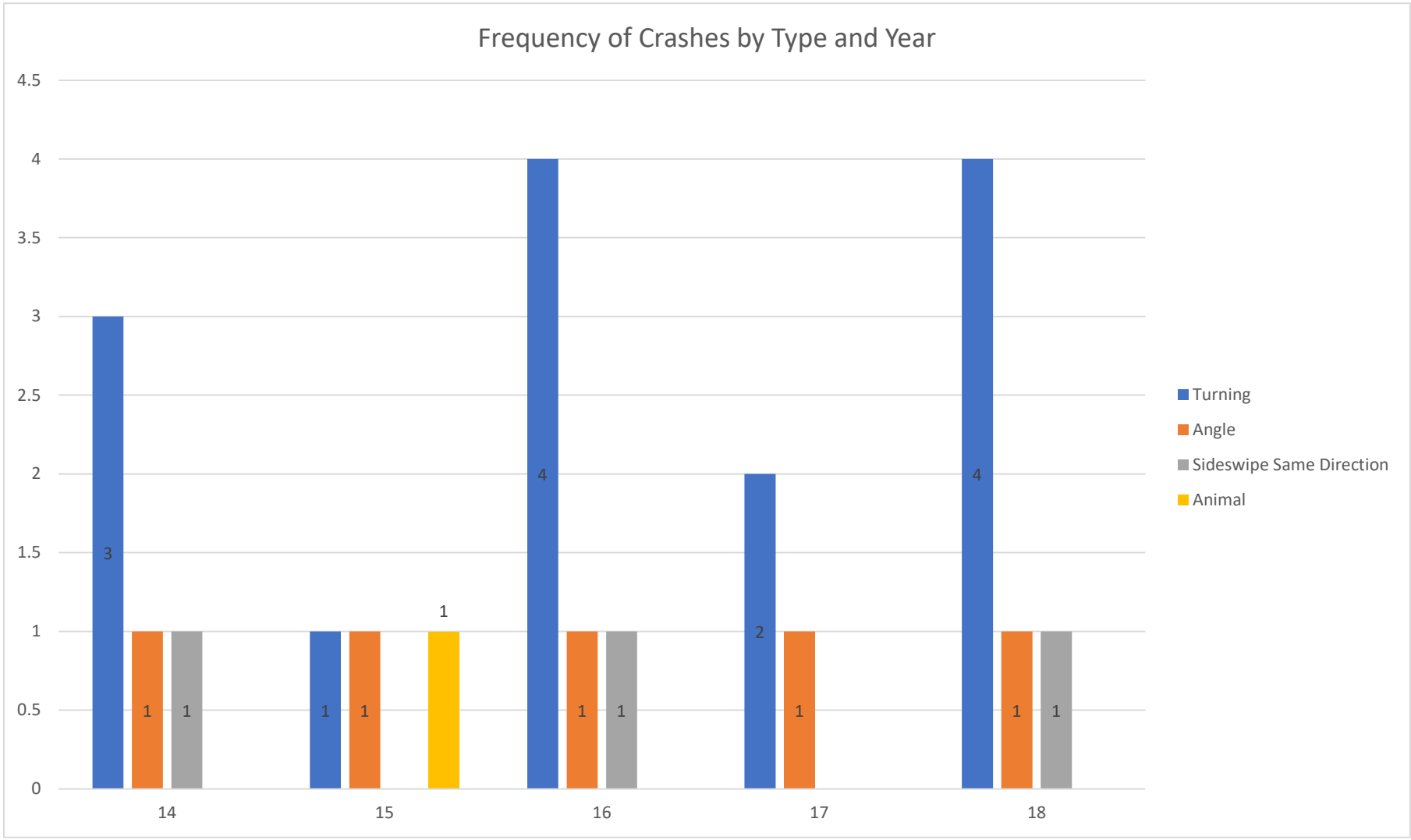
Intersection of IL 148 and Brewster Road/Railroad Street (2014-2018)



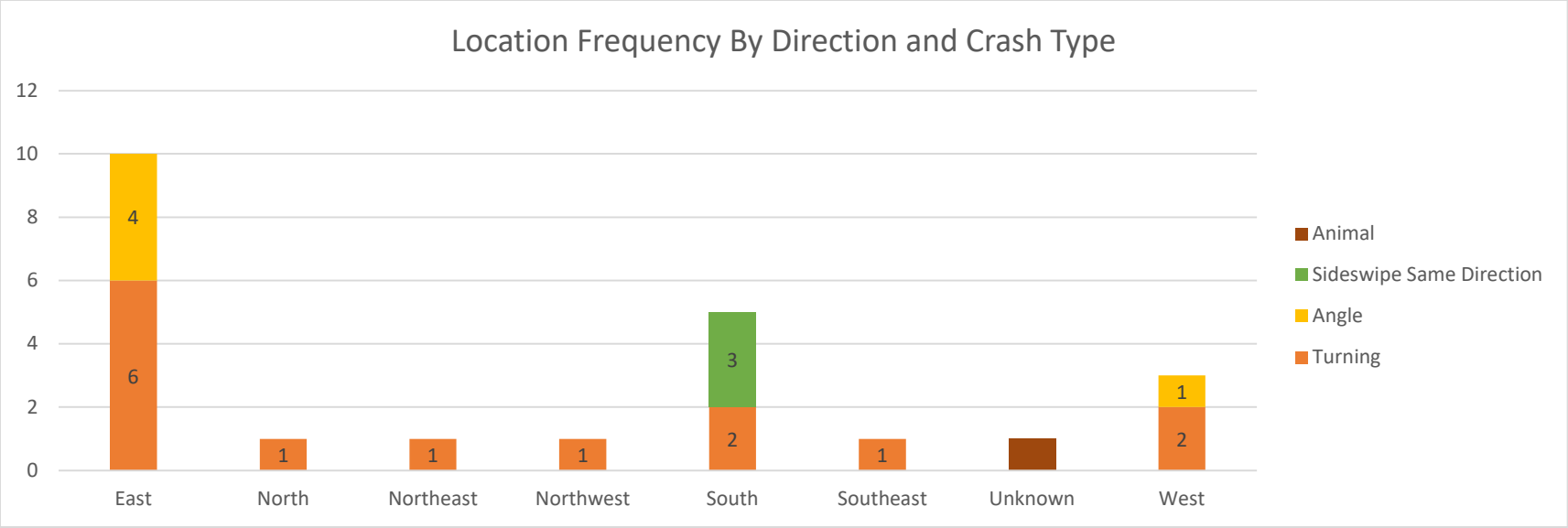


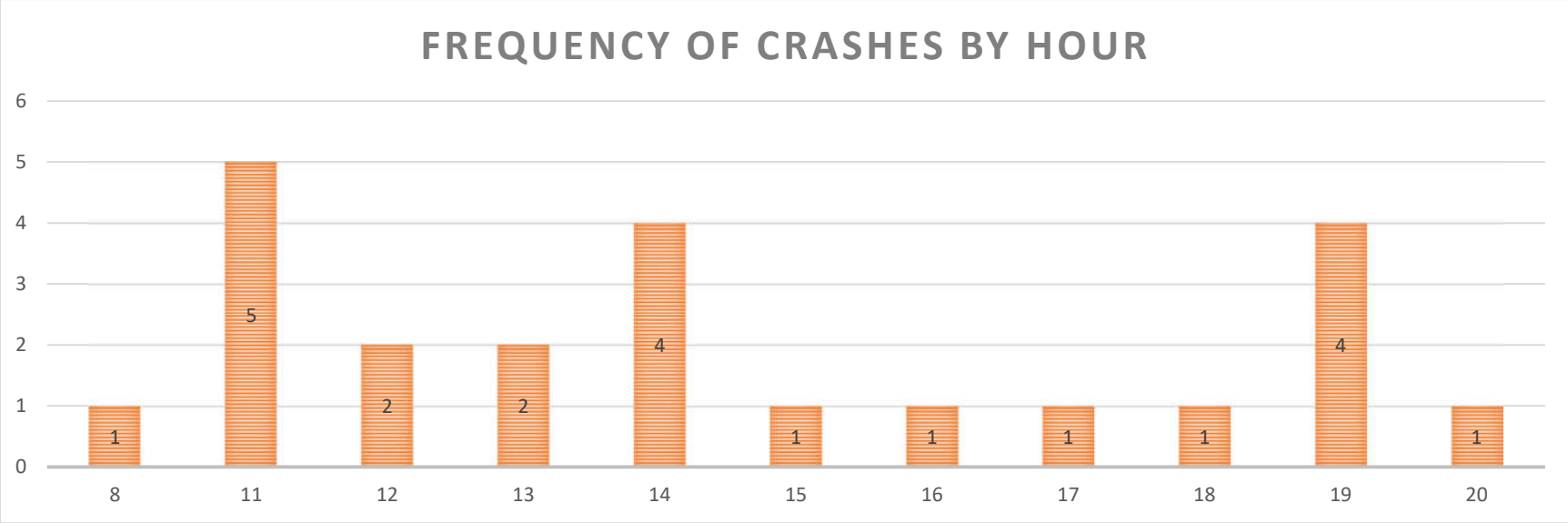


Intersection of IL 148 and Brewster Road/Railroad Street (2014-2018)

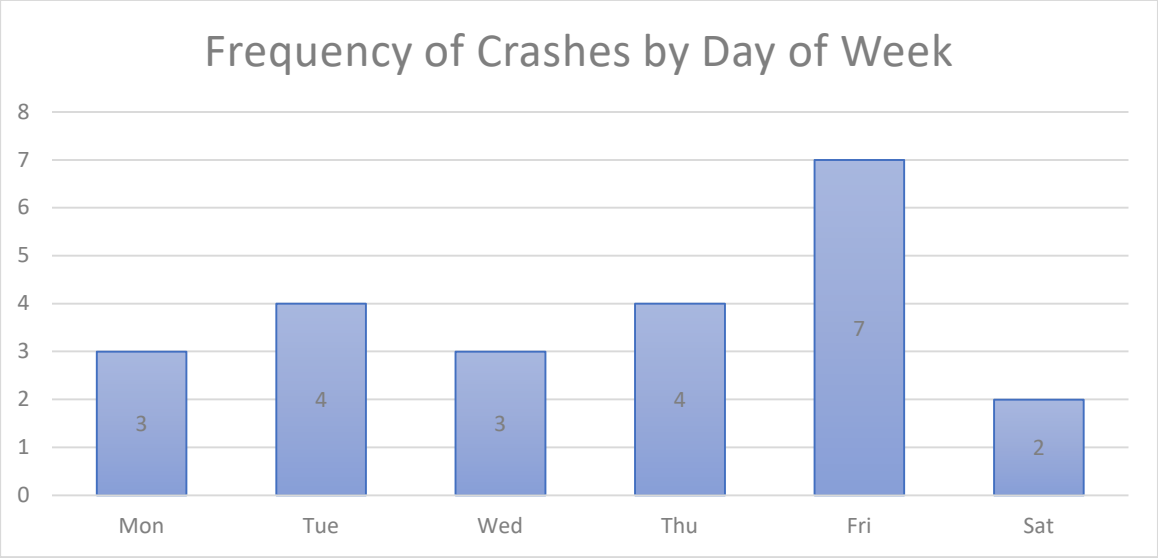


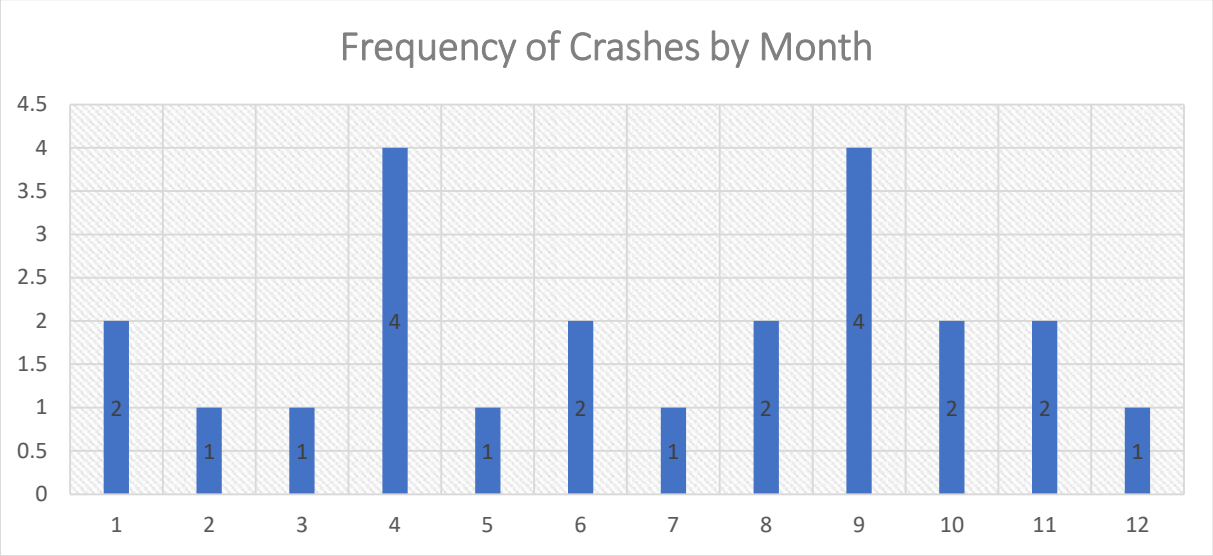
Intersection of IL 148 and Brewster Road/Railroad Street (2014-2018)

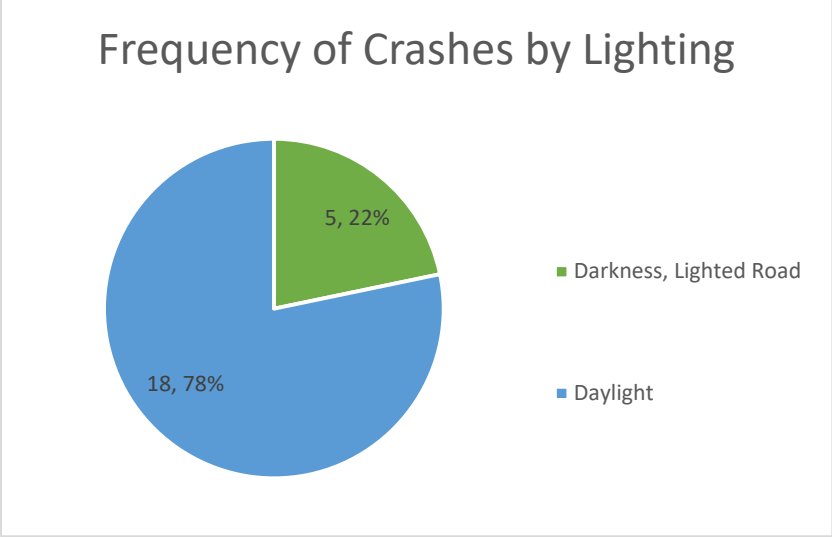




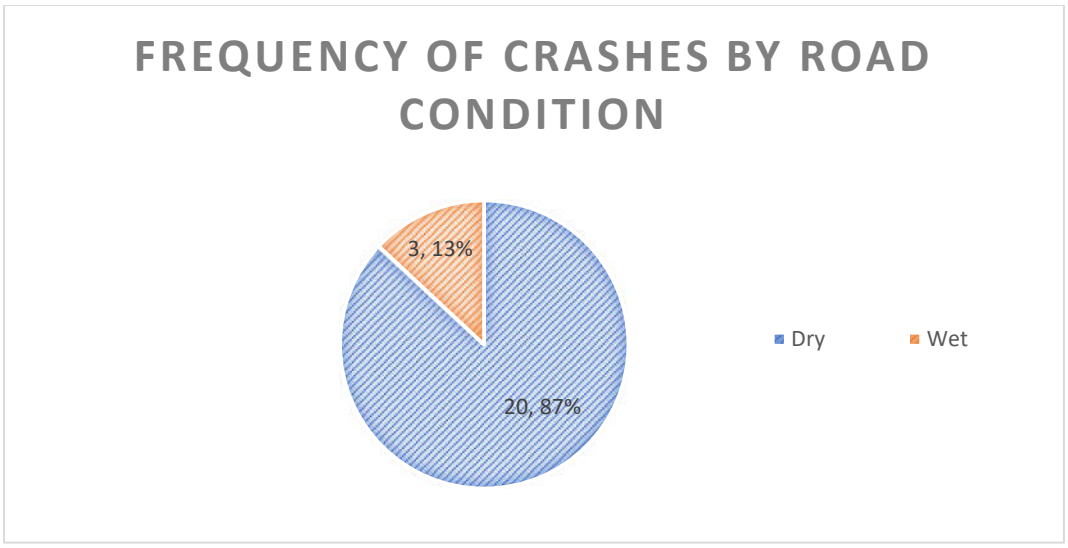
Intersection of IL 148 and Brewster Road/Railroad Street (2014-2018)

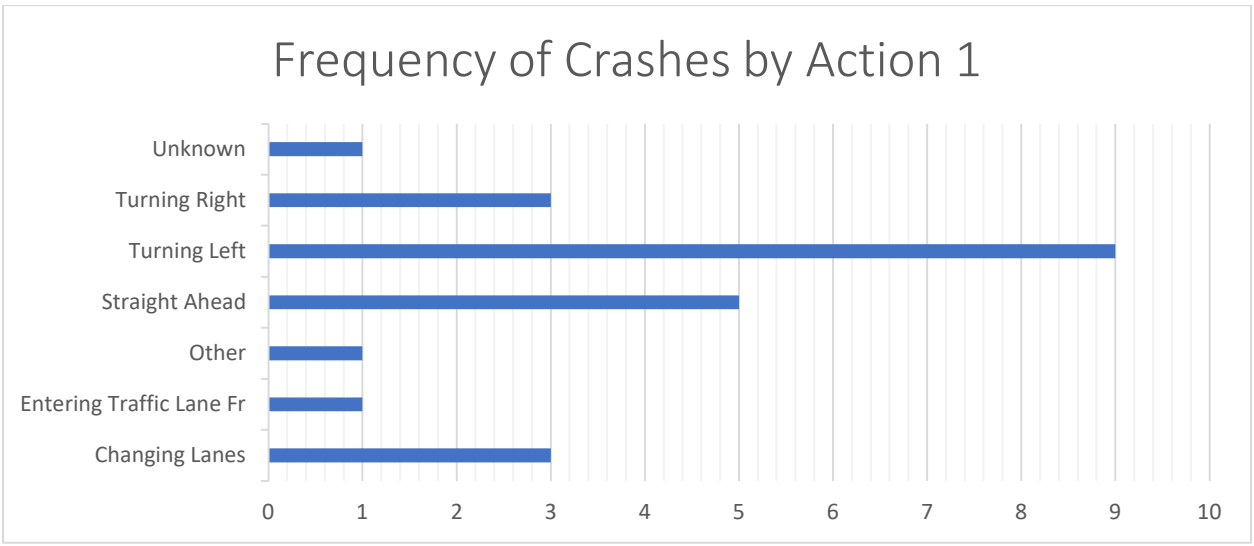


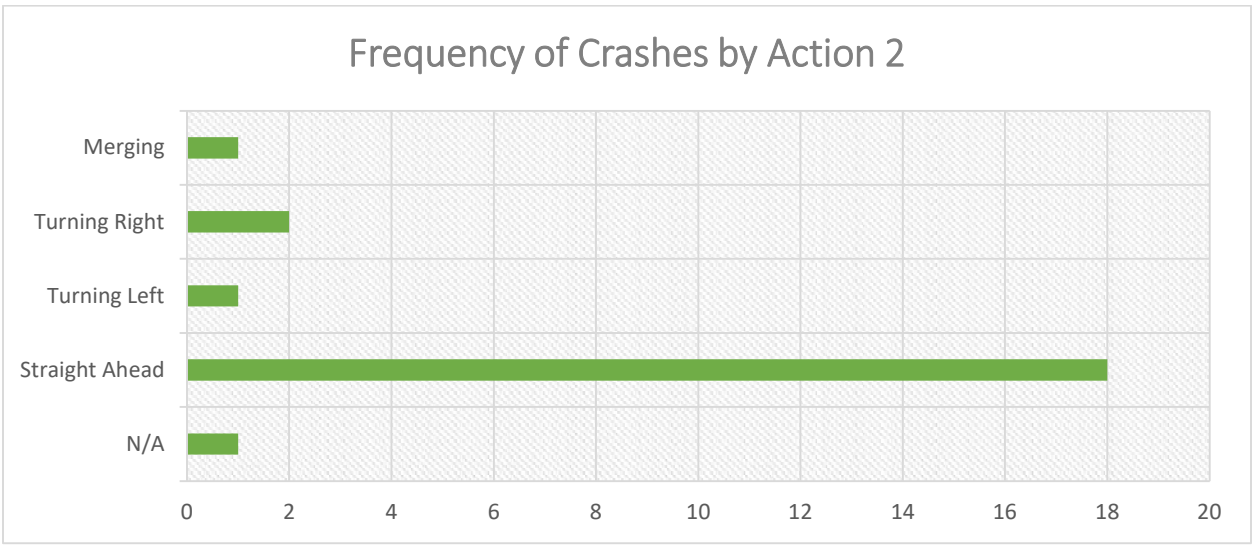




Intersection of IL 148 and Brewster Road/Railroad Street (2014-2018)







CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE	Intersection_Name
201601463044	16	9	30	13	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Energy	Normal	Passenger	North	Turning Left	On Pavement (Roadway)	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	PD	Segment
201801074483	18	3	2	9	Fri	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201801115733	18	4	16	15	Mon	2	0	0	Angle	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Starting In Traffic	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201801226458	18	7	25	12	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201801234990	18	7	28	12	Sat	1	0	0	Fixed Object	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	North	Turning Left	Off Pavement - Right						PD	Segment
201601408889	16	6	9	14	Thu	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Energy	Other/Unknown	SUV	South	Changing Lanes	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201801434748	18	4	18	16	Wed	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Energy	Normal	Passenger	West	Turning Left	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201801472660	18	9	28	8	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Energy	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Turning Right	On Pavement (Roadway)	PD	Brewster
201400460498	14	12	26	11	Fri	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Energy	Normal	Passenger	West	Turning Left	On Pavement (Roadway)	Normal	Pickup	South	Turning Left	On Pavement (Roadway)	PD	Brewster
201501186842	15	1	15	13	Thu	2	2	0	Turning	Clear	Daylight	Wet	Stop Sign/Flasher	Energy	Normal	SUV	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	Brewster
201501470907	15	9	29	14	Tue	2	0	0	Angle	Clear	Daylight	Dry	No Controls	Energy	Normal	Passenger	East	Other	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201501480966	15	11	10	18	Tue	1	0	0	Animal	Clear	Darkness, Lighted Road	Dry	No Controls	Energy	Other/Unknown	Unknown	Unknown	Unknown	On Pavement (Roadway)	N/A	N/A	N/A	N/A	N/A	PD	Brewster
201601144313	16	6	24	19	Fri	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Energy	Normal	SUV	East	Straight Ahead	Intersection	Normal	SUV	North	Straight Ahead	Intersection	PD	Brewster
201601384837	16	4	29	20	Fri	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	No Controls	Energy	Normal	Pickup	Northeast	Turning Left	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201601444720	16	8	19	13	Fri	2	1	0	Turning	Clear	Daylight	Dry	No Controls	Energy	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Turning Right	On Pavement (Roadway)	B-Injury	Brewster
201701373775	17	2	1	11	Wed	3	1	0	Angle	Clear	Daylight	Dry	No Controls	Energy	Normal	Passenger	East	Straight Ahead	Intersection	Normal	SUV	South	Straight Ahead	Intersection	C-Injury	Brewster
201701394258	17	3	15	19	Wed	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Energy	Normal	SUV	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201801160257	18	5	24	17	Thu	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201801468032	18	9	21	15	Fri	2	1	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Energy	Normal	Passenger	East	Turning Right	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	Brewster
201801474818	18	10	8	12	Mon	2	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Energy	Normal	Passenger	East	Straight Ahead	Intersection	Normal	SUV	North	Straight Ahead	Intersection	A-Injury	Brewster
201400436129	14	11	22	19	Sat	2	0	0	Angle	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Passenger	West	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	Van/Mini-Van	North	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201601426629	16	7	2	14	Sat	2	0	0	Turning	Rain	Daylight	Wet	No Controls	Herrin	Normal	Passenger	Northwest	Turning Right	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201801416644	18	1	29	19	Mon	2	0	0	Sideswipe Same Direction	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Passenger	South	Changing Lanes	On Pavement (Roadway)	Normal	Passenger	South	Merging	On Pavement (Roadway)	PD	Brewster
201400212203	14	4	11	12	Fri	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Herrin	Other/Unknown	Passenger	South	Changing Lanes	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201400285363	14	10	14	11	Tue	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201400206666	14	8	5	11	Tue	2	0	0	Turning	Clear	Daylight	Dry	Lane Use Marking	Herrin	Normal	Motorcycle (Over 150cc)	East	Turning Left	On Pavement (Roadway)	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201601463035	16	9	29	11	Thu	3	2	0	Turning	Rain	Daylight	Wet	No Controls	Herrin	Normal	Passenger	South	Turning Left	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	B-Injury	Brewster
201701407907	17	4	24	14	Mon	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	Southeast	Turning Right	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Brewster
201601488245	16	11	17	13	Thu	2	0	0	Turning	Clear	Daylight	Dry	No Passing	Herrin	Other/Unknown	Unknown	East	Turning Left	On Pavement (Roadway)	Normal	Van/Mini-Van	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701408792	17	5	1	17	Mon	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	South	Turning Left	On Pavement (Roadway)	Normal	Van/Mini-Van	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201801074484	18	3	1	17	Thu	2	1	0	Turning	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	SUV	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	Segment
201801100219	18	4	1	12	Sun	2	2	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	Northeast	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	Segment
201801121998	18	4	22	12	Sun	2	1	0	Rear End	Rain	Daylight	Wet	No Controls	Herrin	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	low/Stop - Right Tur	On Pavement (Roadway)	A-Injury	Segment
201801269391	18	7	20	11	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201801310751	18	10	10	12	Wed	2	2	0	Angle	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	B-Injury	Segment
201801342323	18	11	5	15	Mon	1	0	0	Animal	Rain	Daylight	Wet	No Controls	Herrin	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)						PD	Segment
201601353738	16	2	26	19	Fri	2	0	0	Sideswipe Opposite Direction	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701369707	17	1	11	10	Wed	3	2	0	Rear End	Rain	Daylight	Wet	No Controls	Herrin	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	A-Injury	Segment
201701435232	17	6	20	14	Tue	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Pickup	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201400454606	14	12	17	14	Wed	2	0	0	Parked Motor Vehicle	Clear	Daylight	Dry	No Controls	Herrin	ad Been Drinkin	Pickup	West	Backing	Other		Passenger	East	Parked	Other	PD	Segment
201501203605	15	1	22	9	Thu	2	1	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	C-Injury	Segment
201601384676	16	4	7	20	Thu	2	0	0	Parked Motor Vehicle	Clear	Unknown	Dry		Herrin	Other/Unknown	Unknown	East	Unknown	Other		Pickup	Southwest	Parked	Other	PD	Segment
201701471630	17	10	21	19	Sat	2	1	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	North	low/Stop - Left Tur	On Pavement (Roadway)	A-Injury	Segment
201400187009	14	3	29	11	Sat	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Other/Unknown	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Turning Left	On Pavement (Roadway)	PD	Segment
201601464589	16	9	21	18	Wed	2	0	0	Parked Motor Vehicle	Clear	Daylight	Dry	No Passing	Herrin	Other/Unknown	Unknown	Unknown	Unknown	Other		Van/Mini-Van	Unknown	Parked	Other	PD	Segment
201601498625	16	12	13	16	Tue	2	1	0	Angle	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Enter From Drive/Alley	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	C-Injury	Segment
201701395849	17	3	24	16	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	SUV	Northeast	Turning Left	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201801209670	18	1	24	21	Wed	1	0	0	Animal	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)						PD	Segment
201801418608	18	2	6	15	Tue	2	0	0	Sideswipe Same Direction	oudy/Overca	Daylight	Dry	No Controls	Herrin	Normal	Passenger	South	Merging	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201501440184	15	5	7	16	Thu	2	0	0	Angle	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Slow/Stop - Left Turn	On Pavement (Roadway)	Normal	Van/Mini-Van	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201501236715	15	1	29	15	Thu	2	0	0	Angle	Clear	Daylight	Dry	No Controls	Herrin	Normal	Pickup	East	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701418873	17	5	14	18	Sun	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	East	Turning Left	Intersection	Normal	Passenger	South	low/Stop - Right Tur	Intersection	PD	Segment
201501477552	15	10	17	20	Sat	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Lane Use Marking	Herrin	Normal	Passenger	North	Turning Right	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601313779	16	1	14	13	Thu	1	0	0	Other Object	Clear	Daylight	Dry	No Controls	Herrin	Other/Unknown	Van/Mini-Van	North	Straight Ahead	On Pavement (Roadway)						PD	Segment
201601394355	16	5	7	10	Sat	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Lane Use Marking	Herrin	Normal	Van/Mini-Van	Northeast	Slow/Stop - Left Turn	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601439819	16	8	5	11	Fri	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	South	Changing Lanes	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701408546	17	4	29	12	Sat	2	2	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	SUV	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	C-Injury	Segment
201801489261	18	11	29	23	Thu	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Pickup	West	Turning Right	On Pavement (Roadway)	Normal	Passenger	North	Passing/Overtaking	On Pavement (Roadway)	PD	Segment
201601448158	16	8	6	18	Sat	2	2	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	Other	Normal	Passenger	South	Straight Ahead	Other	C-Injury	Segment
201400460165	14	12	24	11	Wed	2	1	0	Angle	Rain	Daylight	Wet	No Controls	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	C-Injury	Segment
201601406931	16	6	5	15	Sun	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601429974	16	7	14	16	Thu	2	1	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	Northeast	Turning Left	On Pavement (Roadway)	Normal	Motor Driven Cycl	South	Straight Ahead	On Pavement (Roadway)	A-Injury	Segment
201801104304	18	4	5	12	Thu	2	0	0	Sideswipe Opposite Direction	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	North	Enter From Drive/Alley	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201501463923	15	8	15	19	Sat	2	0	0	Sideswipe Same Direction		Darkness, Lighted Road	Dry	Yield	Herrin	Other/Unknown	Passenger	North	Other	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201501489659	15	12	16	13	Wed	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	Northeast	Turning Right	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701393455	17	3	10	18	Fri	2	1	0	Angle	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Passenger	East	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	C-Injury	Segment
201501435422	15	4	23	15	Thu	3	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601249617	16	10	20	14	Thu	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	SUV	South	Changing Lanes	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701460364	17	9	9	18	Sat	2	0	0	Angle	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	Passenger	South	Changing Lanes	On Pavement (Roadway)	PD	Segment
201601413245	16	6	7	15	Tue	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Other/Unknown	SUV	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601146852	16	6	24	18	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Van/Mini-Van	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201400264023	14	6	7	23	Sat	1	0	0	Fixed Object	Clear	Darkness, Lighted Road	Wet	No Controls	Herrin	Normal	Passenger	North	Skidding/Control Loss	Off Pavement - Right						PD	Segment
201501198502	15	1	21	17	Wed	2	0	0	Sideswipe Same Direction	Clear	Dusk	Dry	No Controls	Herrin	Normal	Passenger	North	Changing Lanes	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701422522	17	5	22	17	Mon	2	3	0	Angle	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	Southeast	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	Segment
201400130334	14	3	2	14	Sun	2	1	0	Turning	Sleet/Hail	Daylight	Snow or Slush	No Controls	Herrin	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	Northeast	Turning Right	On Pavement (Roadway)	B-Injury	Segment
201501489596	15	12	16	19	Wed	2	0	0	Rear End		Daylight	Dry		Herrin	Other/Unknown	Unknown	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601389797	16	5	12	11	Thu	2	0	0	Turning	Clear	Daylight	Wet	No Controls	Herrin	Normal	Passenger	West	Turning Left	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	PD	Segment
201400454595	14	12	17	18	Wed	2	0	0	Parked Motor Vehicle	Clear	Darkness	Dry	No Controls	Herrin	Other/Unknown	Passenger	West	Backing	On Pavement (Roadway)		Passenger	East	Parked	On Pavement (Roadway)	PD	W Clark Trail
201400460203	14	12	24	10	Wed	2	1	0	Turning	Rain	Daylight	Wet	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Van/Mini-Van	South	Straight Ahead	On Pavement (Roadway)	B-Injury	W Clark Trail
201501411613	15	3	4	11	Wed	2	0	0	Rear End	Snow	Daylight	Ice	No Controls	Herrin	Normal	Passenger	North	Skidding/Control Loss	On Pavement (Roadway)	Normal	Pickup	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	W Clark Trail
201701453973	17	8	17	17	Thu	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Herrin	Normal	Pickup	North	Starting In Traffic	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201400118520	14	2	19	10	Wed	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201400129152	14	3	1	21	Sat	2	2	0	Turning	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	Northeast	Turning Right	On Pavement (Roadway)	C-Injury	W Clark Trail
201400263953	14	6	5	14	Thu	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Illness	SUV	West	Straight Ahead	Other	Normal	Passenger	West	ow/Stop - Right Tur	Other	PD	W Clark Trail
201400312699	14	11	20	17	Thu	2	0	0	Rear End	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Van/Mini-Van	South	ow/Stop - Right Tur	On Pavement (Roadway)	PD	W Clark Trail
201400416813	14	10	22	15	Wed	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	Northeast	Turning Left	On Pavement (Roadway)	Normal	Van/Mini-Van	Southwest	Turning Left	On Pavement (Roadway)	PD	W Clark Trail
201601302615	16	1	5	9	Tue	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Pickup	North	Turning Left	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201601407472	16	6	3	10	Fri	2	0	0	Rear End	Rain	Daylight	Wet	Traffic Signal	Herrin	Other/Unknown	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201801273290	18	8	30	17	Thu	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	SUV	North	Straight Ahead	Intersection	Normal	SUV	West	Straight Ahead	Intersection	PD	W Clark Trail
201801275770	18	9	7	18	Fri	2	0	0	Turning	oudy/Overca	Daylight	Wet	Traffic Signal	Herrin	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201801295964	18	9	27	11	Thu	2	2	0	Rear End	Clear	Daylight	Wet	Traffic Signal	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	W Clark Trail
201801300117	18	9	28	11	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Turning Right	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201801332499	18	10	29	11	Mon	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Lane Use Marking	Herrin	Normal	Pickup	North	Changing Lanes	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail

CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE	Intersection_Name
201801347418	18	11	7	9	Wed	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Pickup	East	Turning Right	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201801359282	18	11	20	13	Tue	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	SUV	West	Turning Left	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201801403268	18	12	20	16	Thu	2	0	0	Angle	Rain	Darkness, Lighted Road	Wet	Traffic Signal	Herrin	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201400063066	14	1	3	19	Fri	2	0	0	Rear End	Clear	Darkness, Lighted Road	Dry	Traffic Signal	Herrin	Normal	Passenger	West	Straight Ahead	Intersection	Normal	Passenger	Unknown	Slow/Stop In Traffic	Intersection	PD	W Clark Trail
201400161235	14	3	19	9	Wed	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Van/Mini-Van	East	Turning Left	Intersection	PD	W Clark Trail
201400366887	14	8	5	16	Tue	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Pickup	North	Straight Ahead	Intersection	Normal	Passenger	West	Straight Ahead	Intersection	PD	W Clark Trail
201400385943	14	9	4	9	Thu	2	1	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Van/Mini-Van	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	C-Injury	W Clark Trail
201400460640	14	12	27	10	Sat	2	0	0	Angle	Rain	Daylight	Wet	Traffic Signal	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201501052368	15	3	7	11	Sat	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)	Normal	Other	North	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201501315006	15	3	11	14	Wed	2	1	0	Turning	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	Southwest	Turning Left	On Pavement (Roadway)	C-Injury	W Clark Trail
201501315013	15	3	15	12	Sun	2	1	0	Turning	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Passenger	East	Starting In Traffic	On Pavement (Roadway)	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	C-Injury	W Clark Trail
201501329089	15	6	29	10	Mon	2	1	0	Angle	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	SUV	West	Straight Ahead		Normal	Passenger	North	Straight Ahead		B-Injury	W Clark Trail
201501442823	15	5	22	13	Fri	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Unknown	North	Straight Ahead	On Pavement (Roadway)	Normal	torcycle (Over 15(	North	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201501458783	15	7	15	10	Wed	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Van/Mini-Van	East	Straight Ahead	On Pavement (Roadway)	Normal	SUV	East	Slow/Stop In Traffic	On Pavement (Roadway)	PD	W Clark Trail
201601125928	16	6	2	12	Thu	2	0	0	Rear End	Clear	Daylight	Dry	Lane Use Marking	Herrin	Normal	Pickup	North	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	Pickup	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	W Clark Trail
201601307990	16	1	13	14	Wed	2	2	0	Sideswipe Same Direction	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	SUV	South	Changing Lanes	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	W Clark Trail
201601395912	16	5	16	12	Mon	1	0	0	Fixed Object	Rain	Daylight	Wet	Traffic Signal	Herrin	Fatigued	Passenger	Southwest	Turning Left	Intersection						PD	W Clark Trail
201601396620	16	5	12	12	Thu	2	1	0	Rear End	Rain	Daylight	Wet	Traffic Signal	Herrin	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	Pickup	North	Slow/Stop In Traffic	On Pavement (Roadway)	C-Injury	W Clark Trail
201601487136	16	11	8	13	Tue	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Other/Unknowr	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201601498888	16	12	14	10	Wed	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Van/Mini-Van	South	Straight Ahead	Intersection	Normal	Pickup	Northeast	Turning Left	Intersection	PD	W Clark Trail
201601506211	16	12	28	15	Wed	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	SUV	North	Straight Ahead	Intersection	Normal	Passenger	Southwest	Turning Left	Intersection	PD	W Clark Trail
201701380340	17	2	13	14	Mon	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Passenger	North	Straight Ahead	Intersection	Normal	Passenger	Unknown	Slow/Stop In Traffic	Intersection	PD	W Clark Trail
201701393324	17	3	9	8	Thu	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Pickup	West	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201701459191	17	9	5	19	Tue	2	5	0	Turning	Clear	Darkness	Dry	Traffic Signal	Herrin	Normal	Passenger	South	Turning Left	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	A-Injury	W Clark Trail
201801061424	18	1	4	16	Thu	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD	W Clark Trail
201801403267	18	12	20	10	Thu	2	0	0	Rear End	Clear	Daylight	Wet	Traffic Signal	Herrin	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	W Clark Trail
201801411420	18	1	11	15	Thu	2	1	0	Rear End	Rain	Daylight	Wet	No Controls	Herrin	Normal	Pickup	North	Straight Ahead		Normal	Passenger	North	Straight Ahead		B-Injury	W Clark Trail
201801419771	18	2	10	21	Sat	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Herrin	Other/Unknowr	Pickup	Northeast	Turning Right	Intersection	Normal	Pickup	Southeast	Turning Left	Intersection	PD	W Clark Trail
201801420379	18	2	12	11	Mon	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	SUV	East	Slow/Stop - Right Turn	Intersection	Normal	Passenger	East	Straight Ahead	Intersection	PD	W Clark Trail

SIMPO SAFETY STUDY

Appendix : West Herrin Street Corridor: West of Herrin Elementary School to 35th Street

prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

CBB Job No. 39-20

Herrin Street Corridor - West of Herrin Elementary to 35th Street

Introduction

The Herrin Street corridor extends from west of Herrin Elementary to 35th Street and includes the intersection of Herrin Street and 35th Street. The segment is about 0.85 miles long and is shown in **Figure 1**. The intersection of Herrin Street and 35th Street is pinned in **Figure 1** and shown in **Figure 2**.

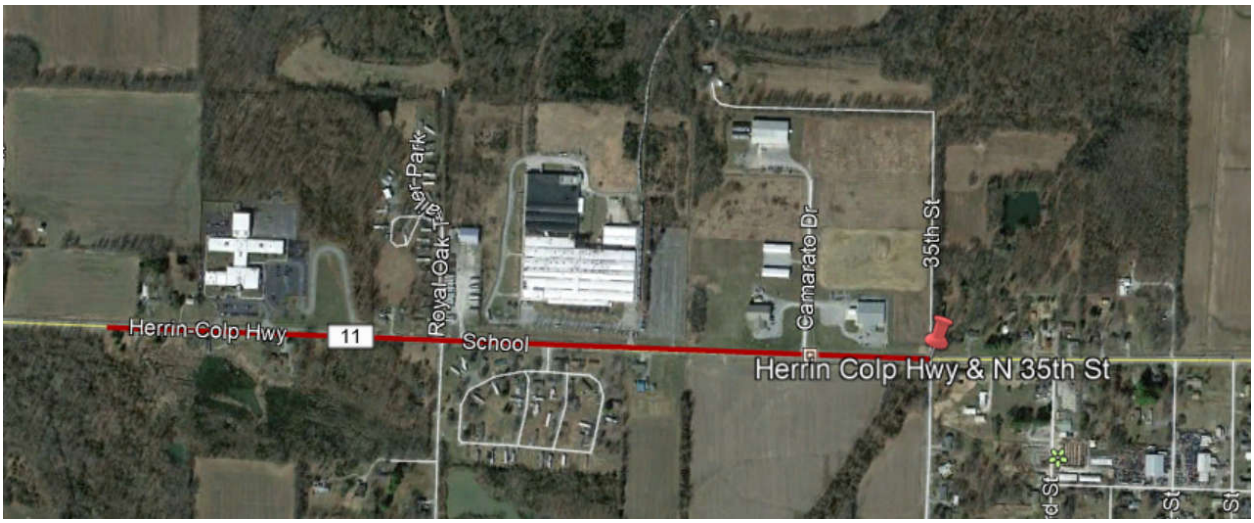


Figure 1: Study Area

Existing Conditions

Herrin Street is located in Herrin, Illinois. The corridor is in a more rural area providing access to some residential properties and Herrin Elementary shown in **Figure 3**. The segment includes several public street intersections that are side-street stop-controlled as well as one signalized intersection that serves Herrin Elementary. Herrin Street is two lanes, one in each direction. Separate westbound right-turn lanes are provided at the signalized intersection for the school as well as the center school entrance (bus and staff entrance during arrival and dismissal). A sperate eastbound left-turn is provided at the middle entrance and the taper extends through the west entrance. West of the school, Herrin Street includes a two-foot paved shoulder and rumbles on both sides of the road. The study corridor (from 35th street to Herrin Elementary) has some gravel shoulders along the road with ditch drainage. There are no sidewalks or crosswalks along the corridor. The corridor has a posted speed limit of 45 miles per hour (mph) and also includes a School Zone Ahead sign assembly with flashing beacon for eastbound traffic, west of the school.

Figure 2: Intersection of Herrin Street and 35th Street (Aerial View)

Figure 3: Herrin Elementary School (Street View)

Safety Analysis

The Herrin Street Corridor has a total of 67 crashes from 2014 to 2018. The frequency of crash by year is shown in **Figure 4**. Years 2015 and 2017 have the highest number of crashes at 17. The average number of crashes per year is 13.4.

The distribution of frequency of crashes by type is shown in **Figure 5**. The largest number of crashes along the corridor were rear ends at 33 percent, of which approximately 23 percent were injury. Animal was the second most common crash type at 27 percent of which about 11 percent were injury. Fixed object crashes were the third most common at 18 percent of the total, of which about 42 percent were injury crashes. Turning crashes were the fourth most common at 9 percent of the total, of which about 50 percent were injury/fatal crashes.

Figure 6 shows the frequency of crashes by severity. The majority of crashes were property damage at 70 percent. There was one fatal crash on the corridor. The fatal crash involved a motorcycle making a northbound left-turn from 35th Street and an eastbound vehicle on West Herrin Street in the dark. There were seven A-injury crashes which is a combination of head on (2), animal (1), fixed object (1), sideswipe same direction (1), overturned (1), and turning crashes (1). The majority of crashes resulting in injury were rear end (5), fixed object (5), and turning crashes (3) which are similar to frequency of crashes by type.

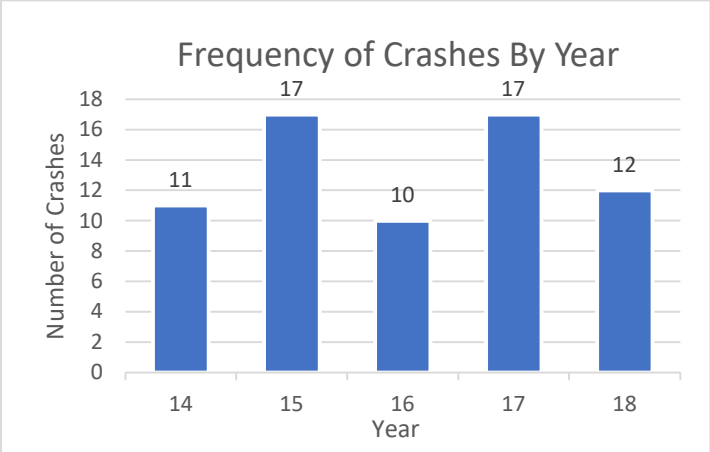


Figure 4: Frequency of Crashes by Year

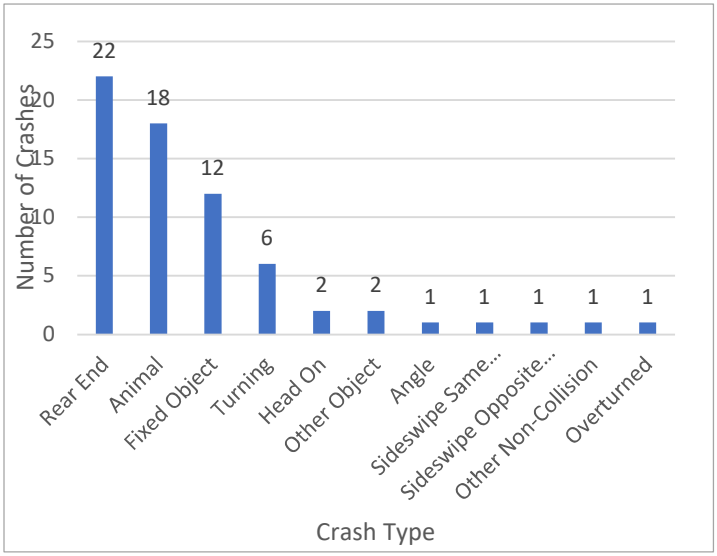


Figure 5: Frequency of Crashes by Type

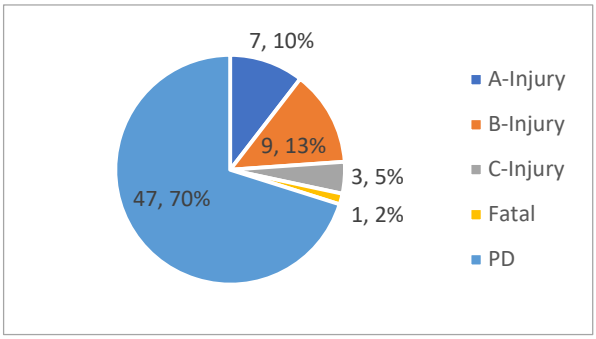


Figure 6: Frequency of Crashes by Severity

In **Figure 7** the frequency of crashes by direction and crash type is shown. Most crashes are traveling westbound and some eastbound. A majority of fixed object crashes are drivers traveling westbound. One cause for this, is the ditch for drainage on the side of the roadway.

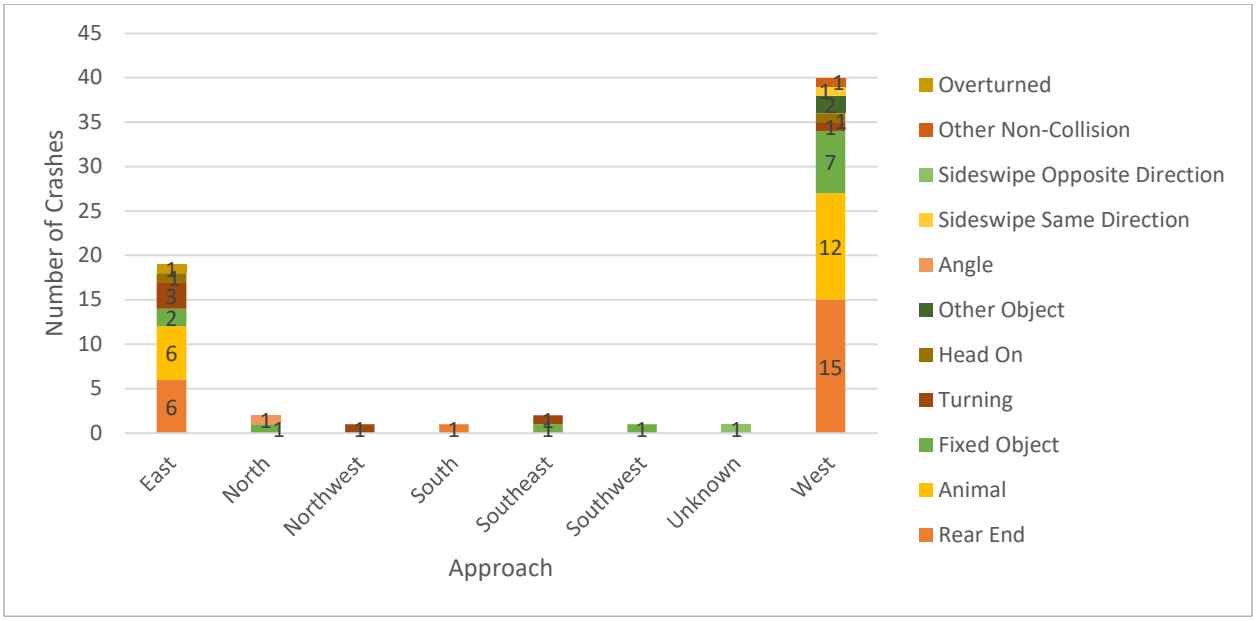


Figure 7: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 8**. The crashes increase in the morning peak and evening peak which correlates with school hours. There is another peak later in the evening at 7pm. Most of the crashes at 7 pm were animal related crashes which are more frequent in the evening/dark hours.

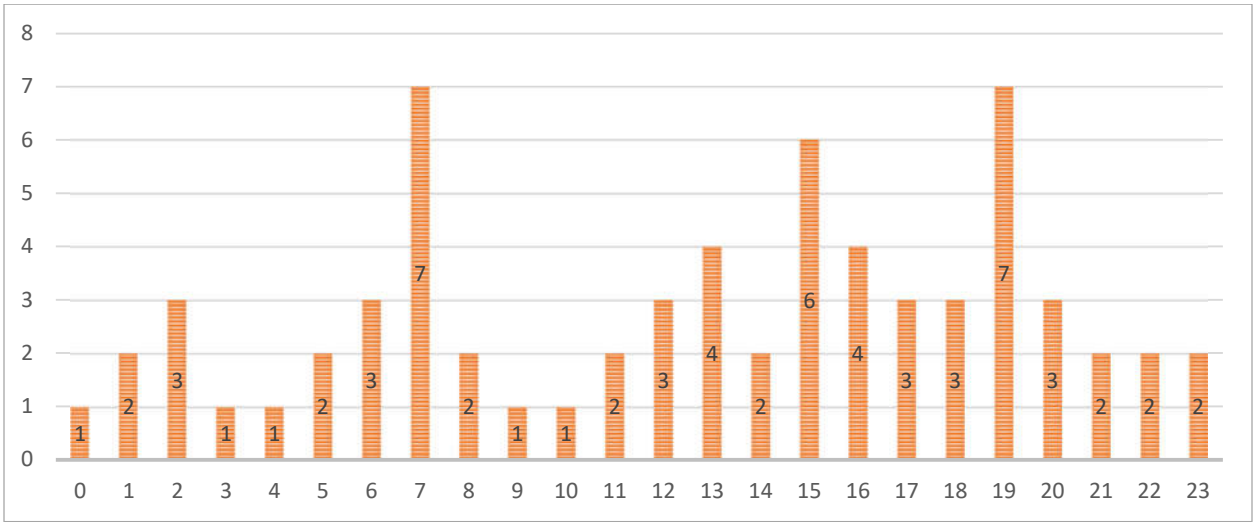


Figure 8: Frequency of Crashes by Hour

The frequency of crashes by month is shown in **Figure 9**. The months of October, November, and March are the peak months. The animal crashes are heavy in these peak months.

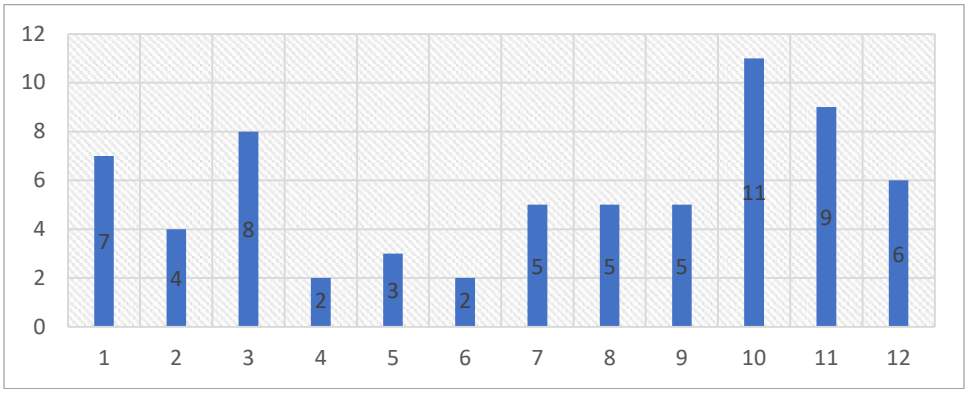


Figure 9: Frequency of Crashes by Month

The weather condition is shown in **Figure 10**. The majority of crashes occurred on clear days (72%). It should be noted that non-dry conditions were a contributing factor in nearly half of the fixed object, angle/turning crashes, and about 30 percent of the rear ends.

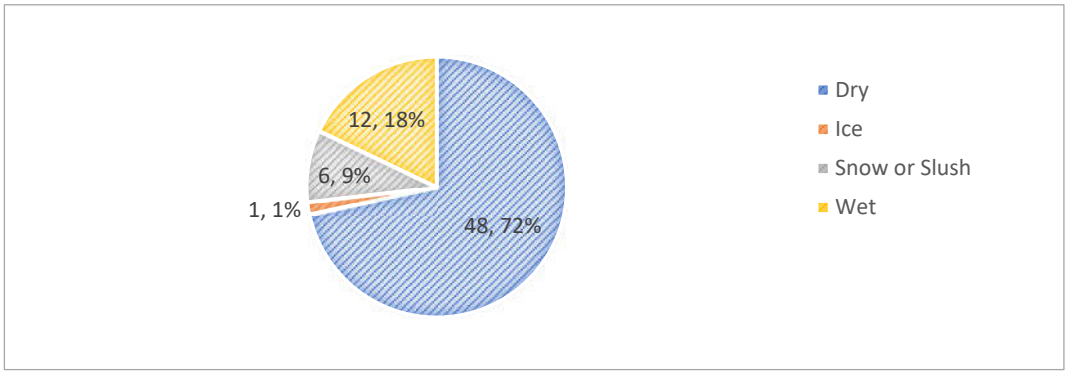


Figure 10: Frequency of Crashes by Weather

The lighting condition is shown in **Figure 11**. Approximately half of crashes occurred during daylight hours (51%), while about 40 percent occurred in the dark or during the dusk/dawn hours and 9 percent in the dark on a lighted road. A large portion of the dark crashes involved animals.

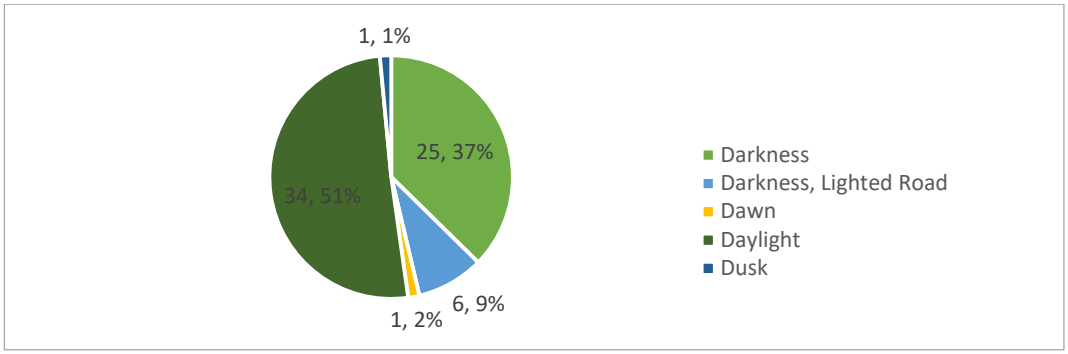


Figure 11: Frequency of Crashes by Lighting

Areas of Concern & Possible Countermeasures

Areas of Concern

W. Herrin Street from west of Herrin Elementary school to 35th Street is a rural, higher speed road (45 mph speed limit) with no paved shoulders or rumble strips. This road serves an elementary school and is a relatively straight. There is a high concentration of intersection crashes at 35th Street. The more severe segment crashes are run-off-road and head-on crashes, followed by turning and rear end crashes. The main areas of concern are the 35th Street intersection, run-off-road crashes, and rear end crashes.

Countermeasures

Rear end crashes make up 33% of the total crashes along the corridor, 23 percent of which are injury crashes. The highest concentration of total crashes is at 35th Street. In order to mitigate turning and angle crashes at 35th Street, consideration should be given to construction of a separate westbound left and/or eastbound right-turn on Herrin Street at 35th Street. Providing separate turn lanes on the mainline removes turning vehicles from the thru lane; thereby reducing potential for rear end and turning crashes. No traffic volumes were gathered as part of this study to determine which turn is heavier, but the crash data indicates nearly 70 percent of the rear ends were westbound.

Run-off-road crashes make up 50 percent of the A- and B-injury crashes. Fixed object crashes, specifically, consist of 18% of the total crashes, 42 percent of which are injury crashes. To mitigate run-off-road crashes, several countermeasures could be implemented.

Short-term low-cost countermeasures include:

- Provide wider pavement markings along the edgelines and/or centerlines to enhance the visibility of pavement markings to drivers. This countermeasure is intended to help keep drivers on the road.
- Add reflective strips to poles and sign assemblies to bring attention to fixed objects.
- Consider centerline and/or edgeline rumble strips to help prevent vehicles from going into oncoming traffic and/or off the road by providing audio feedback to drivers.
- Larger turning radius at intersection/driveways, which could help to reduce the amount of rear ends related to right-turns.

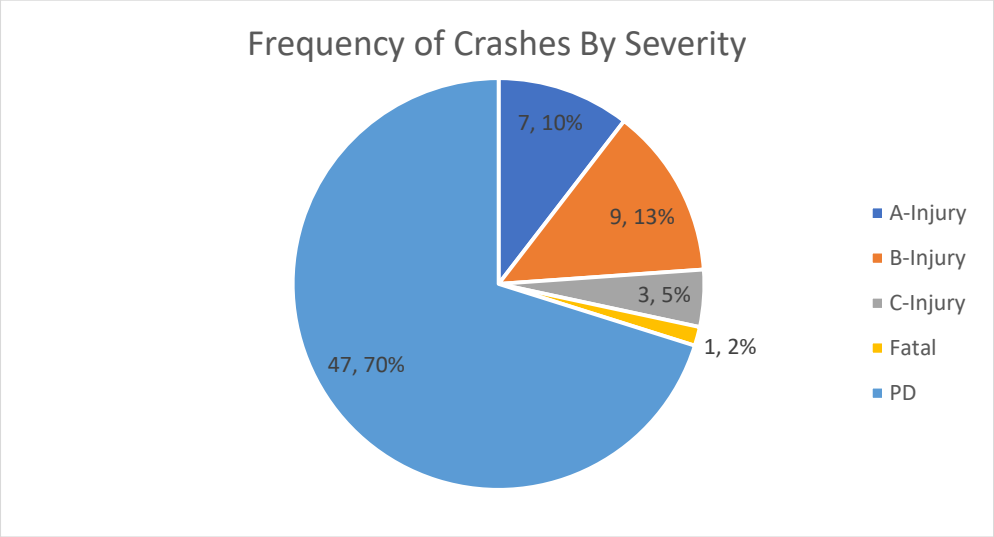
Mid-term countermeasures include:

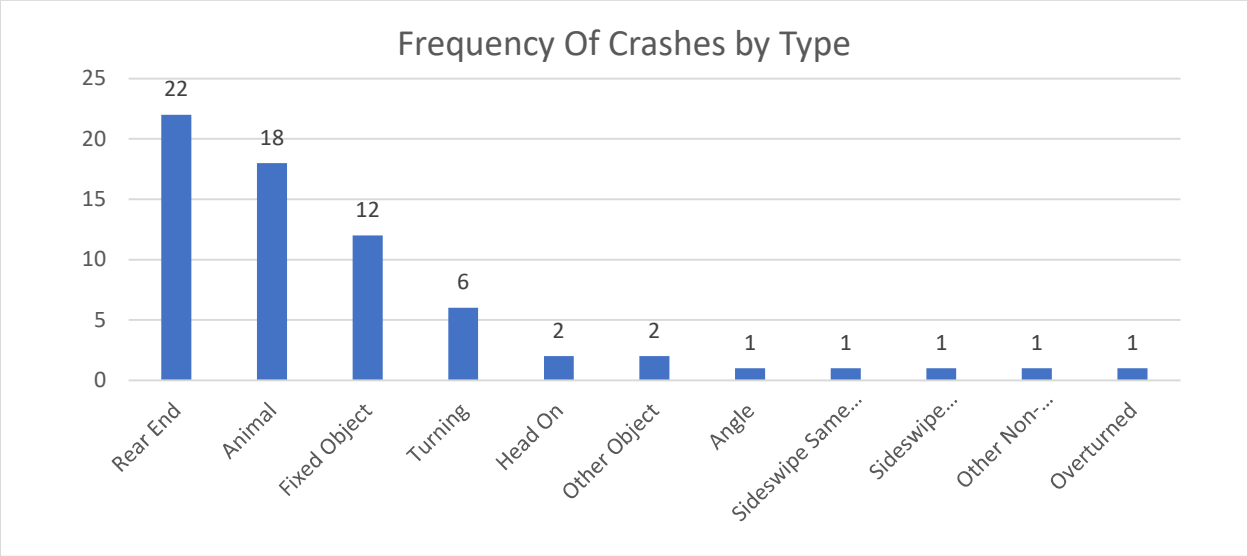
- Speed feedback signs at strategic locations along the corridor to slow vehicles down. Drivers at slower speeds have more time to react to unforeseen events like a vehicle braking in front or an object/animal in the roadway.

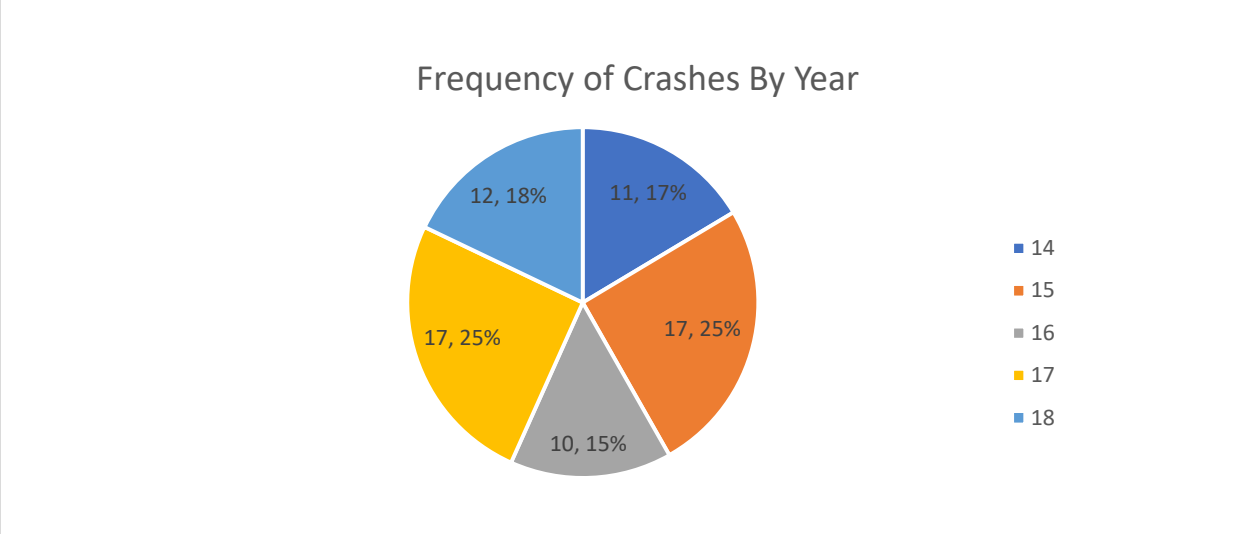
Long-term countermeasures include:

- Provide paved shoulders, centerline rumbles, and edgeline rumbles to provide both audio feedback as well as extra recovery area for errant vehicles.

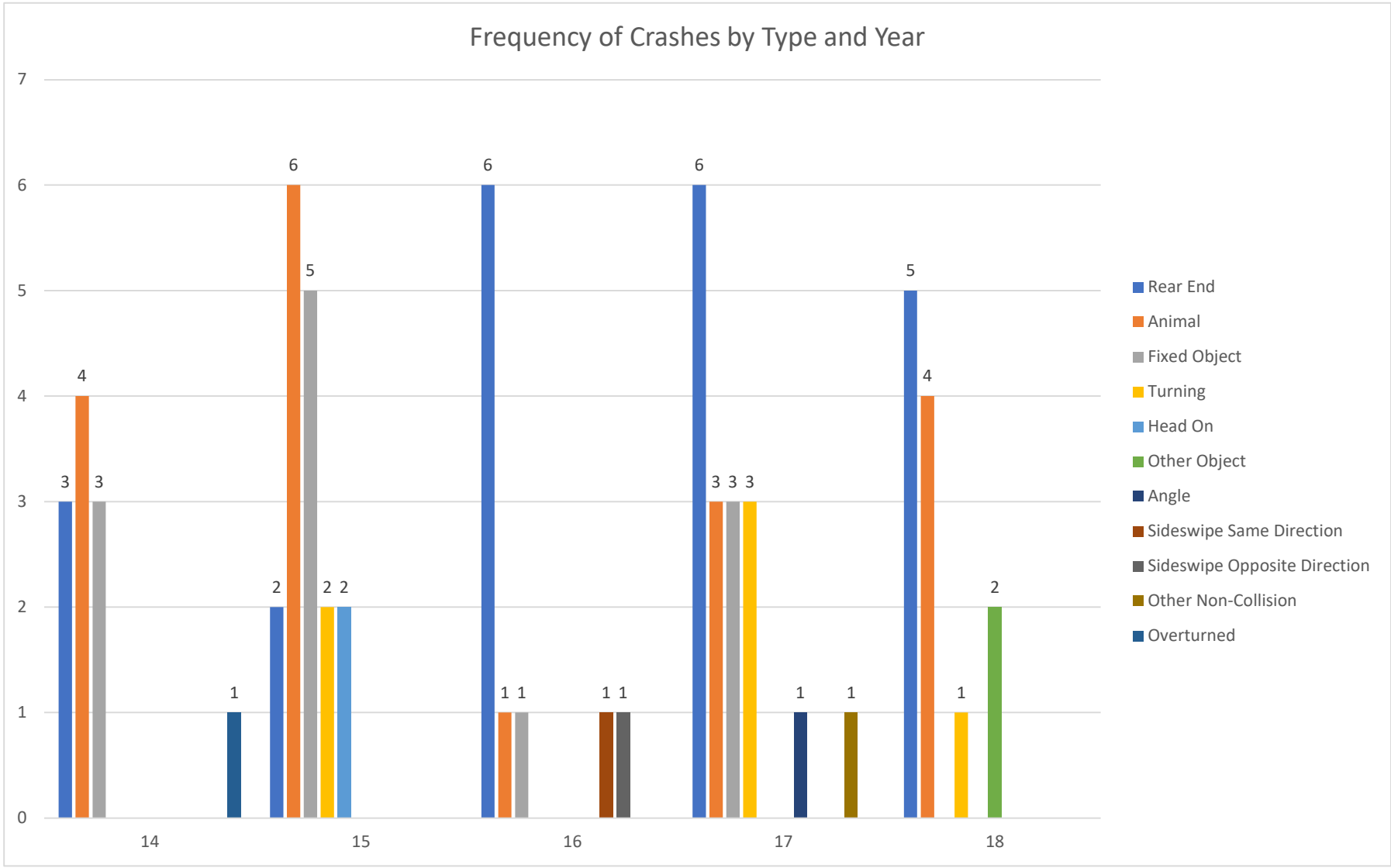
West Herrin Street Corridor: West of Herrin Elementary to 35th Street (2014-2018)



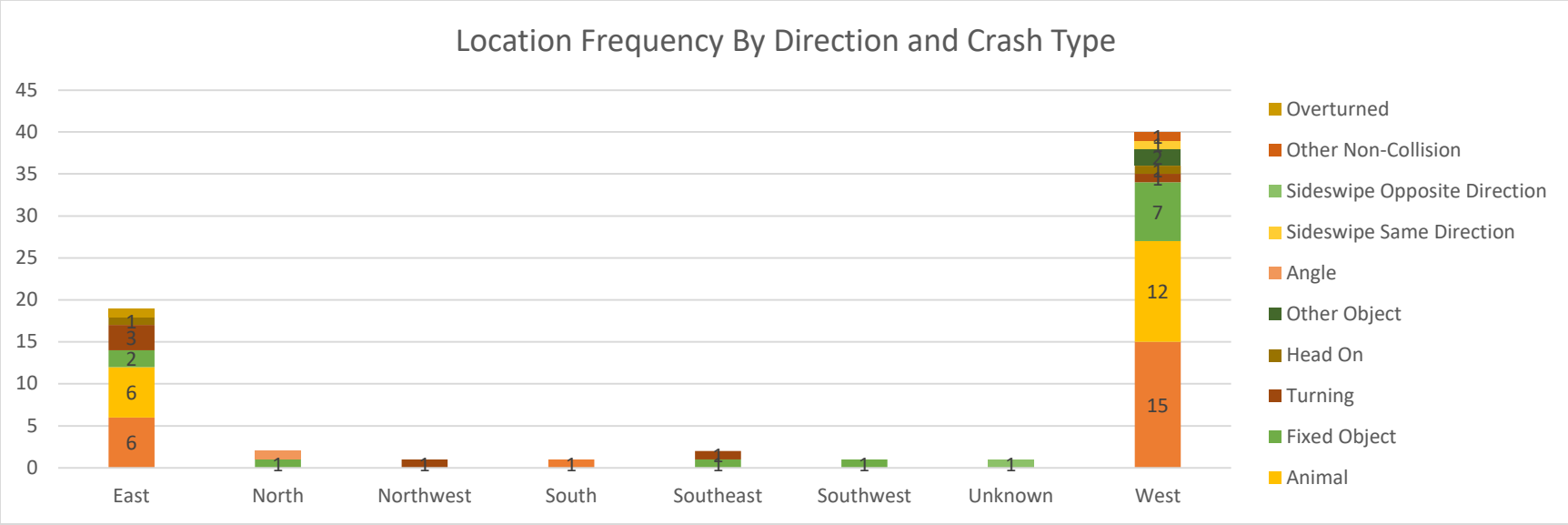


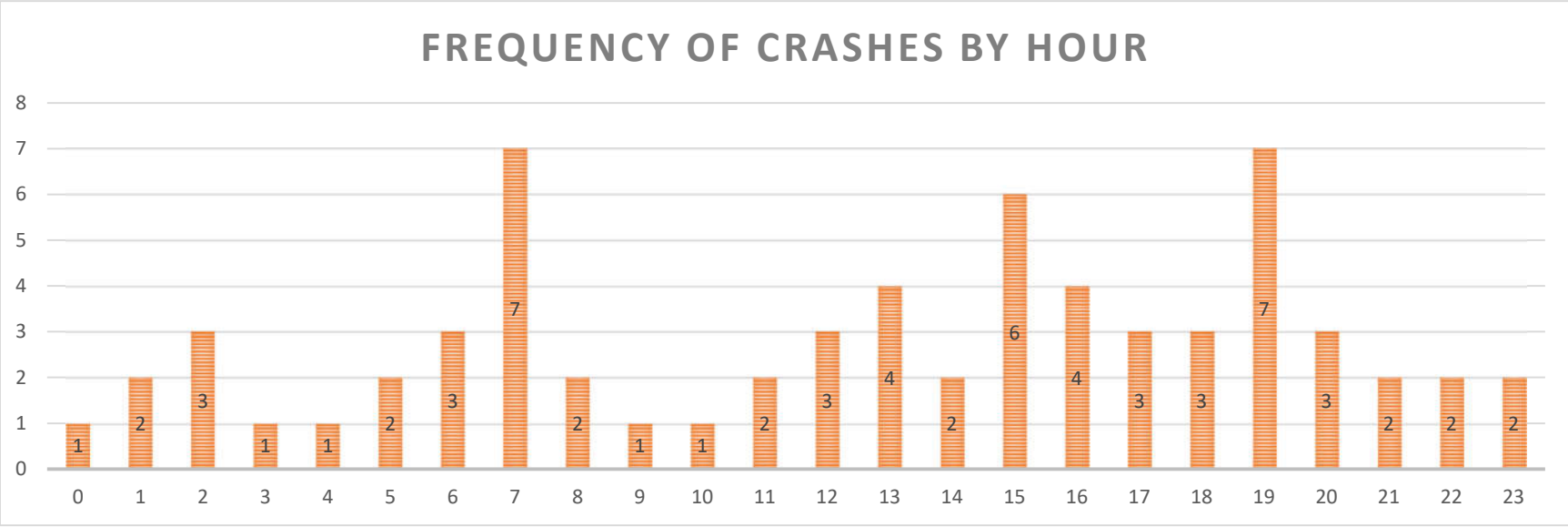


West Herrin Street Corridor: West of Herrin Elementary to 35th Street (2014-2018)

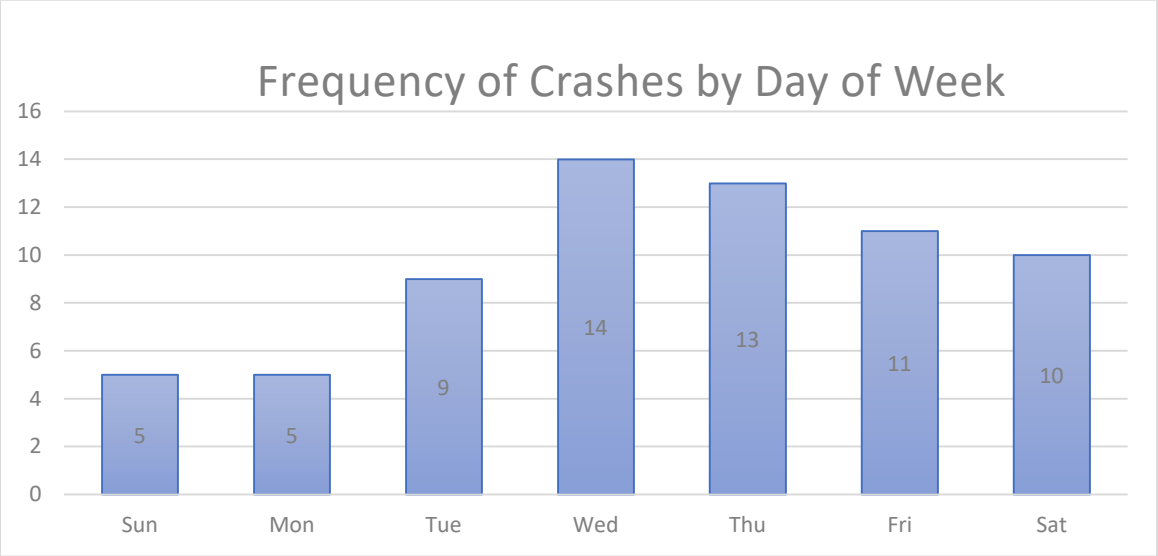


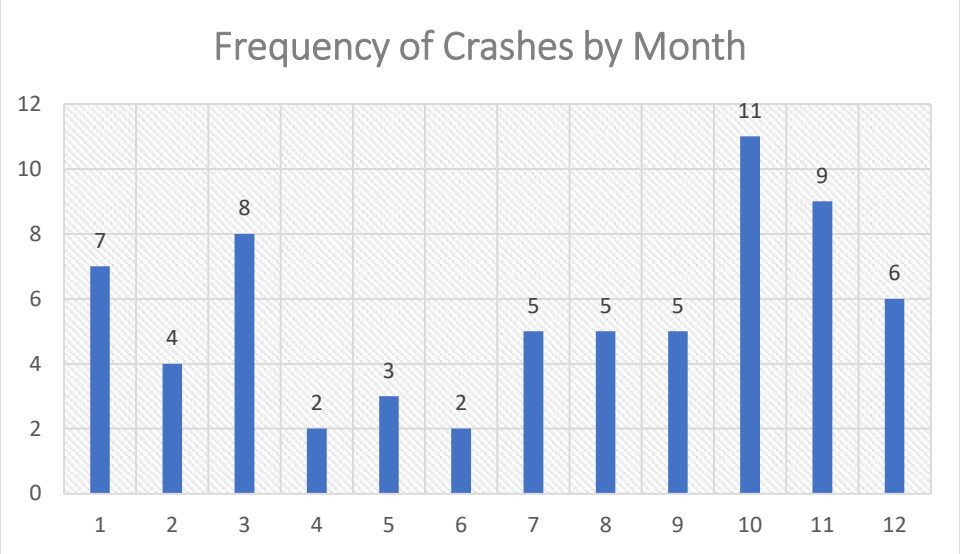
West Herrin Street Corridor: West of Herrin Elementary to 35th Street (2014-2018)

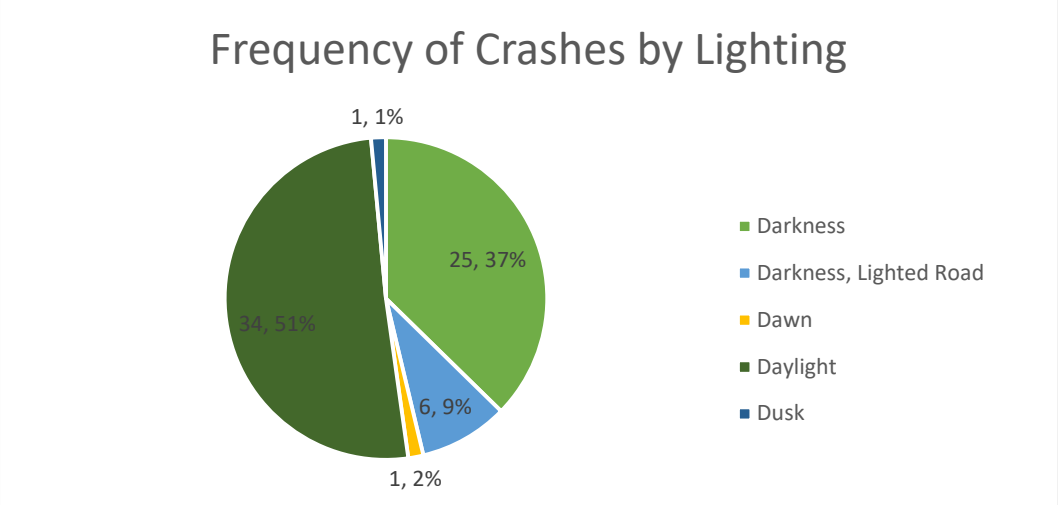




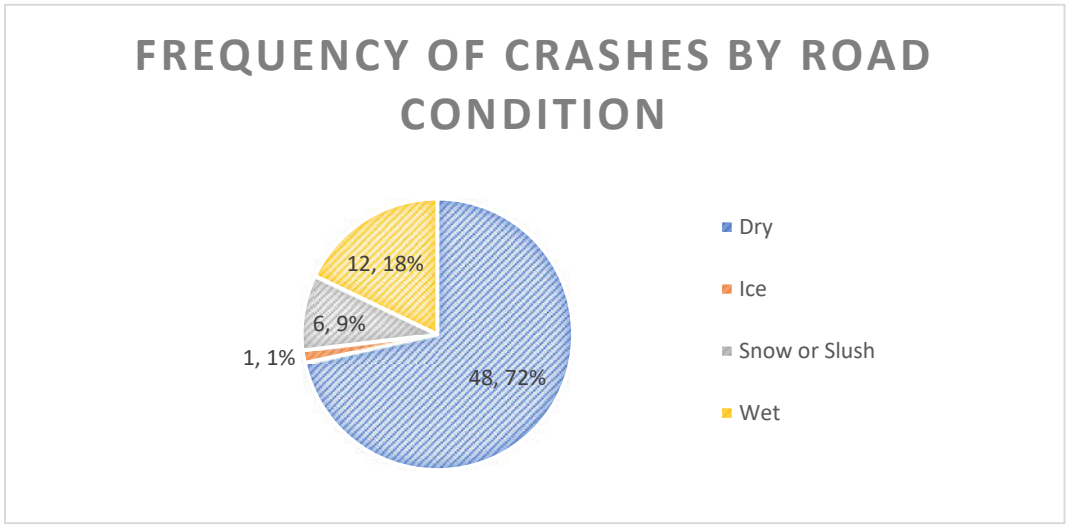
West Herrin Street Corridor: West of Herrin Elementary to 35th Street (2014-2018)

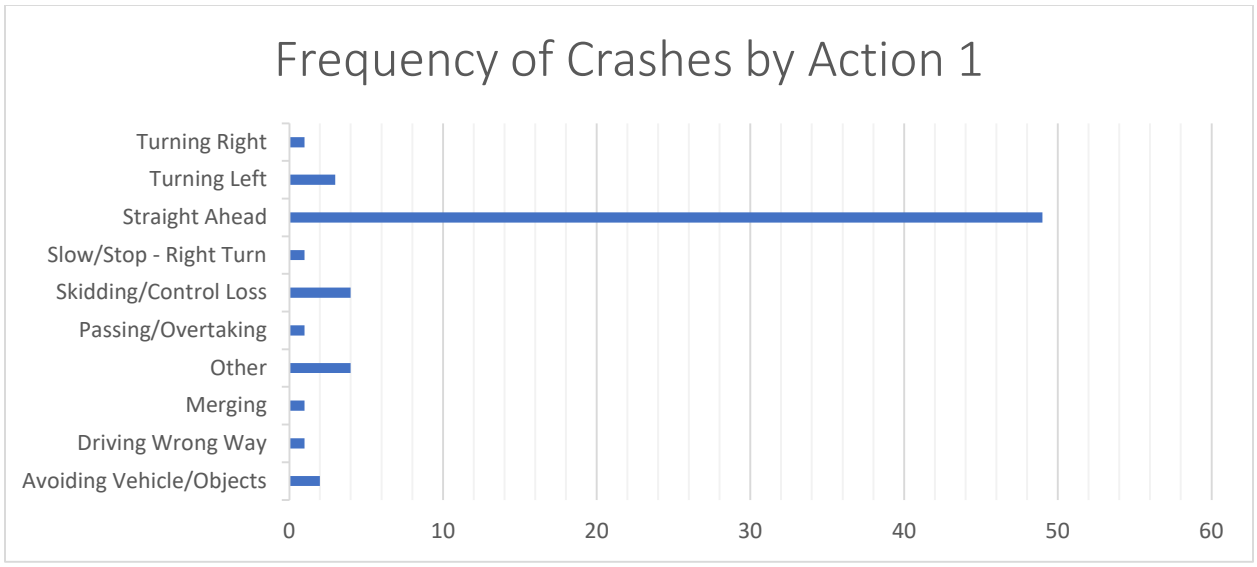


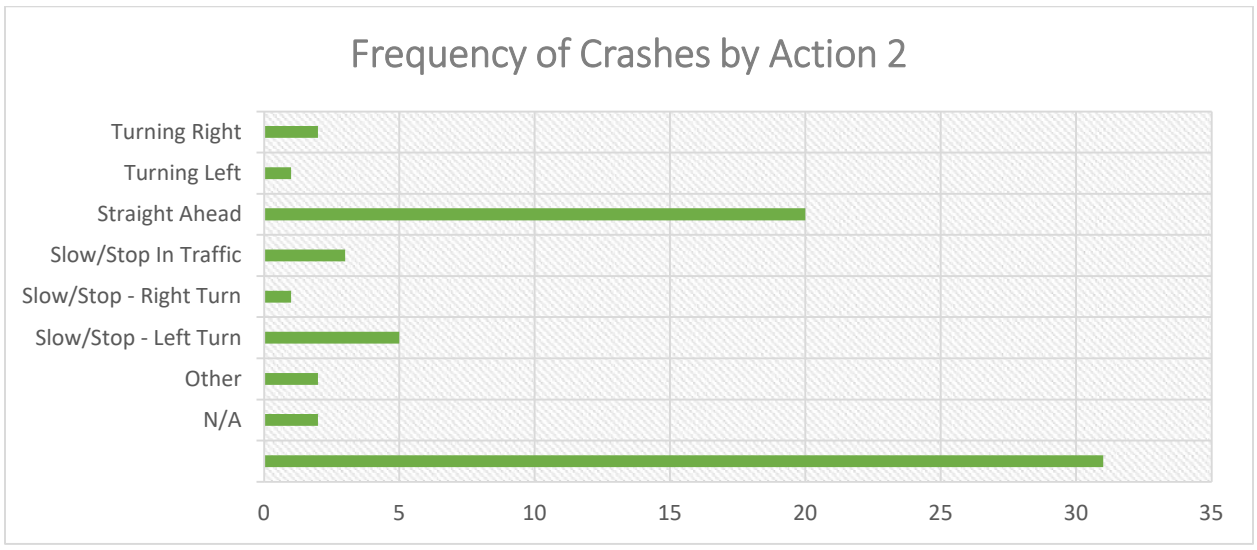




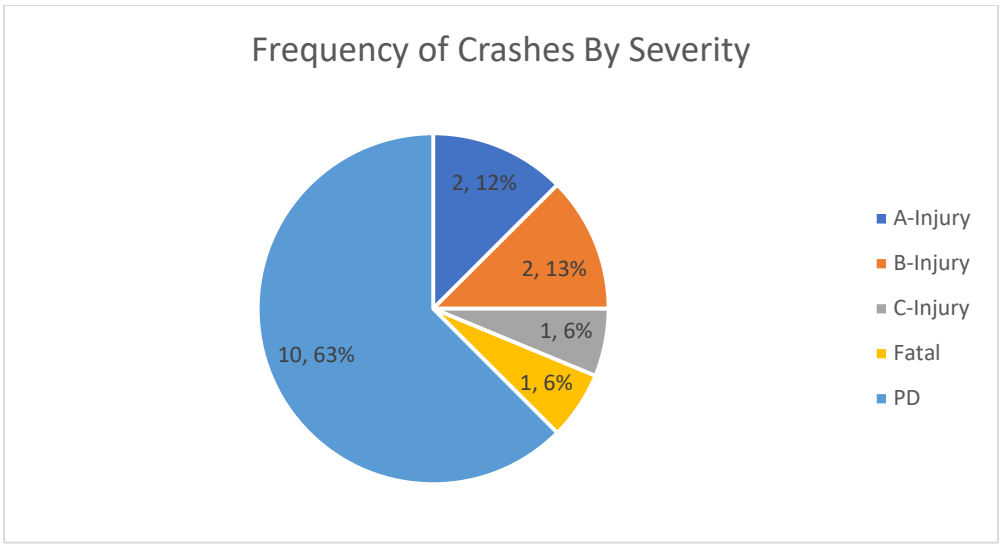
West Herrin Street Corridor: West of Herrin Elementary to 35th Street (2014-2018)

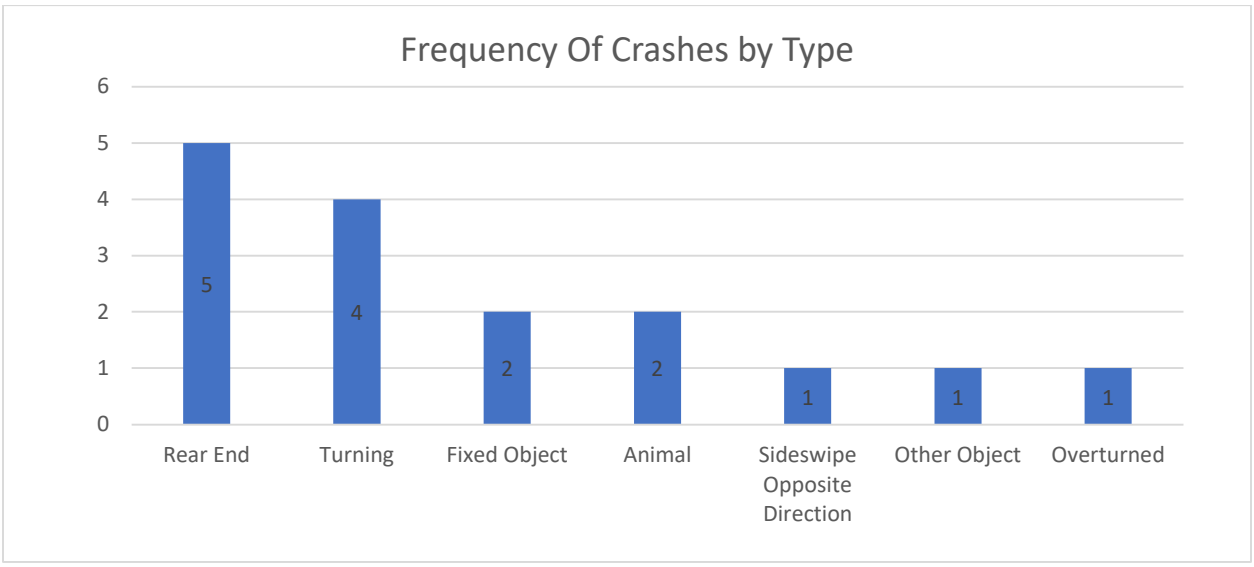


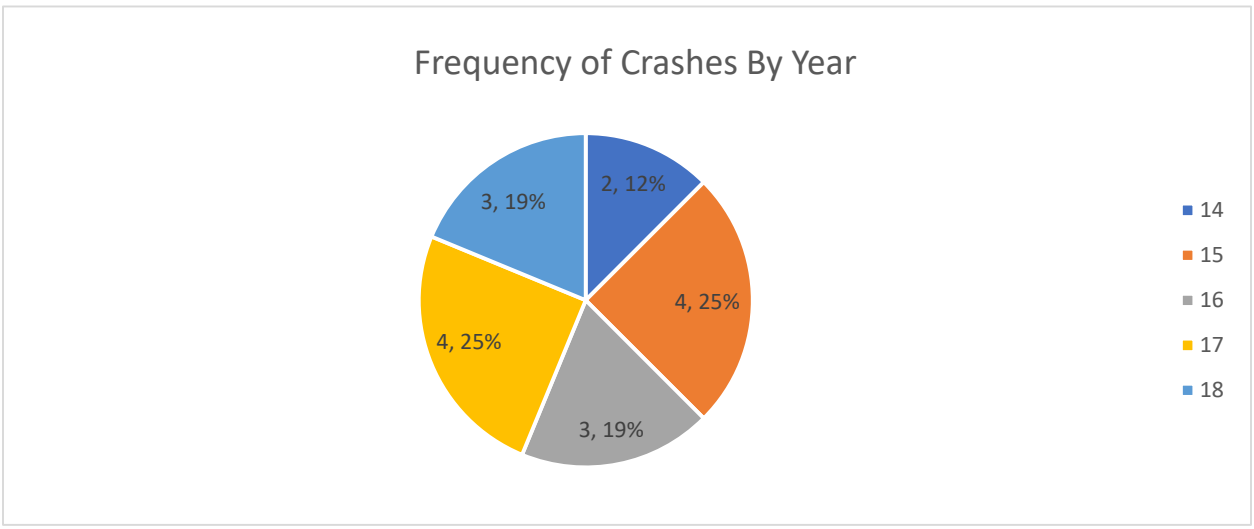




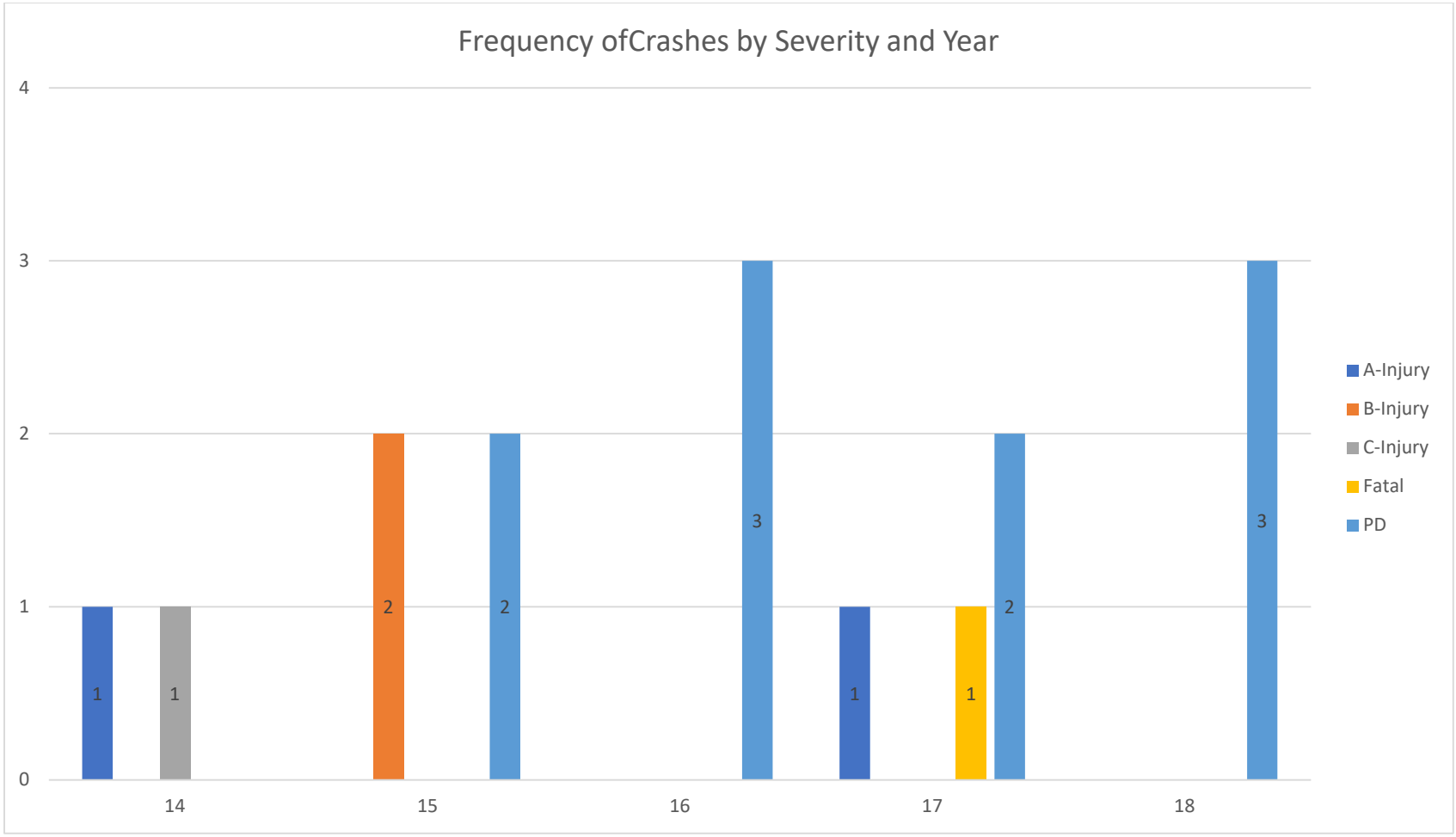
Intersection of West Herrin Street at 35th Street (2014-2018)



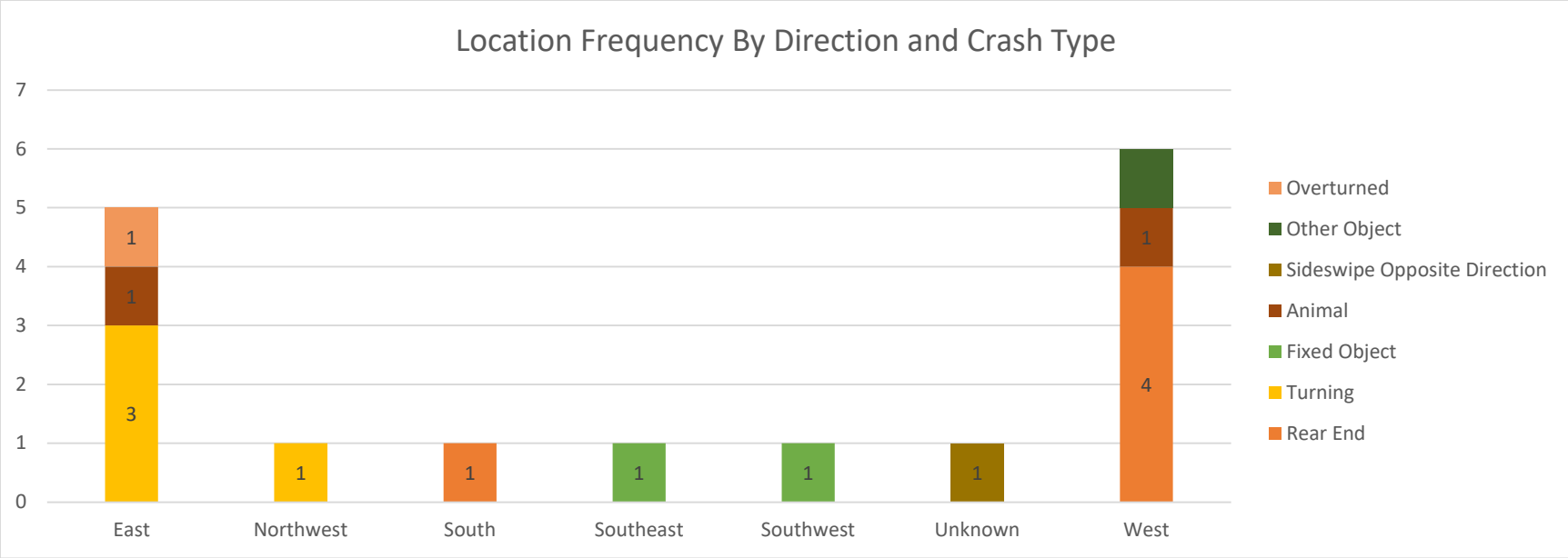


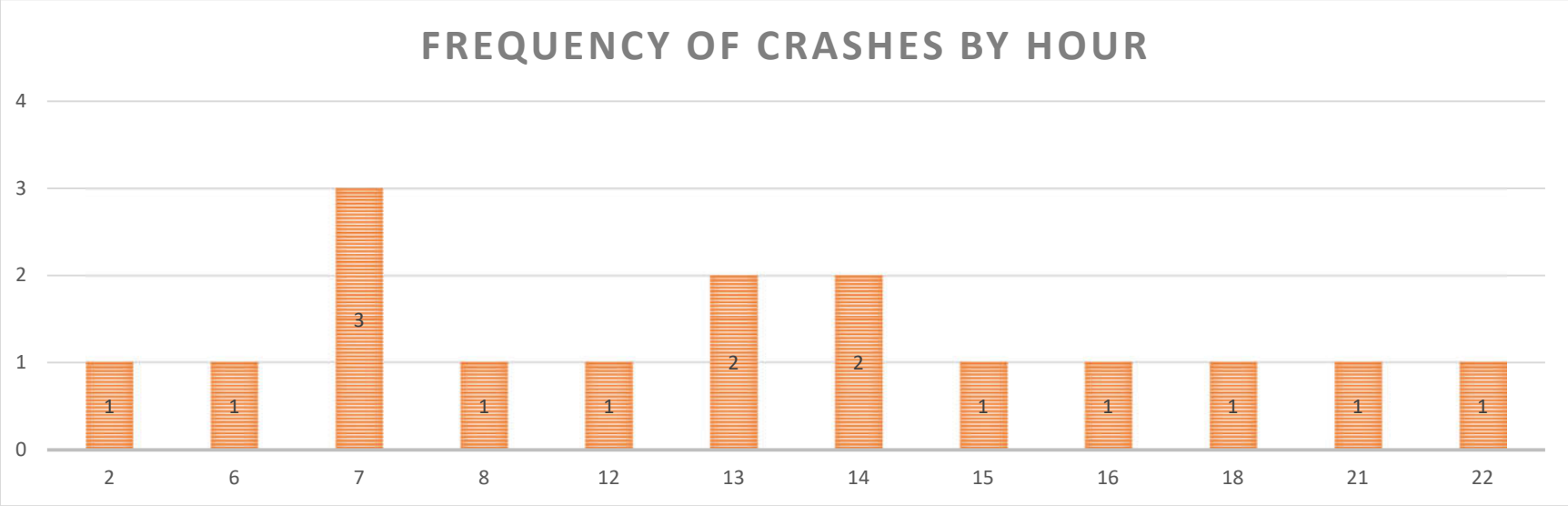


Intersection of West Herrin Street at 35th Street (2014-2018)

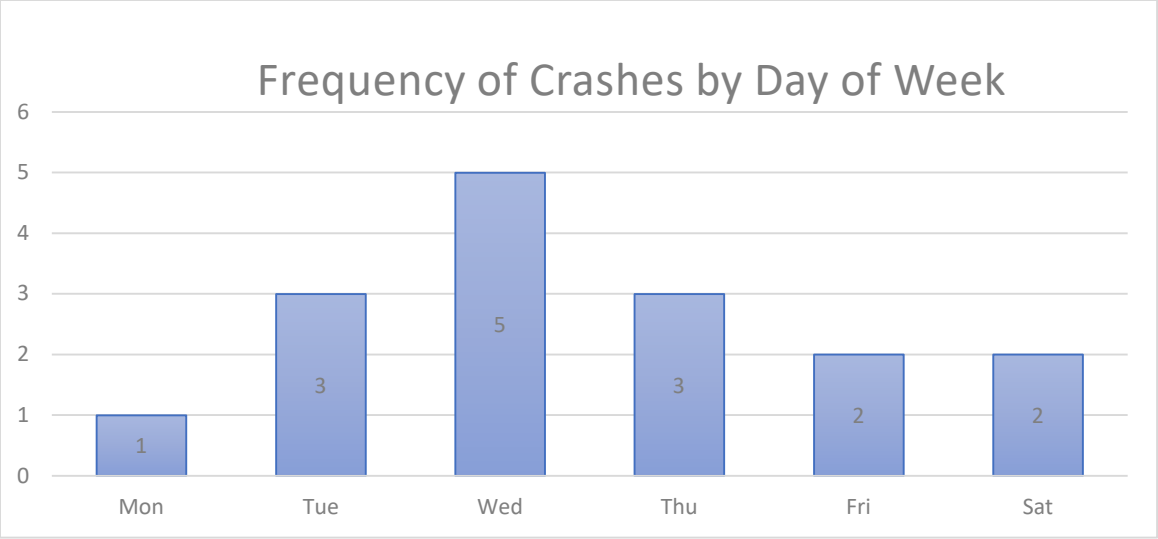


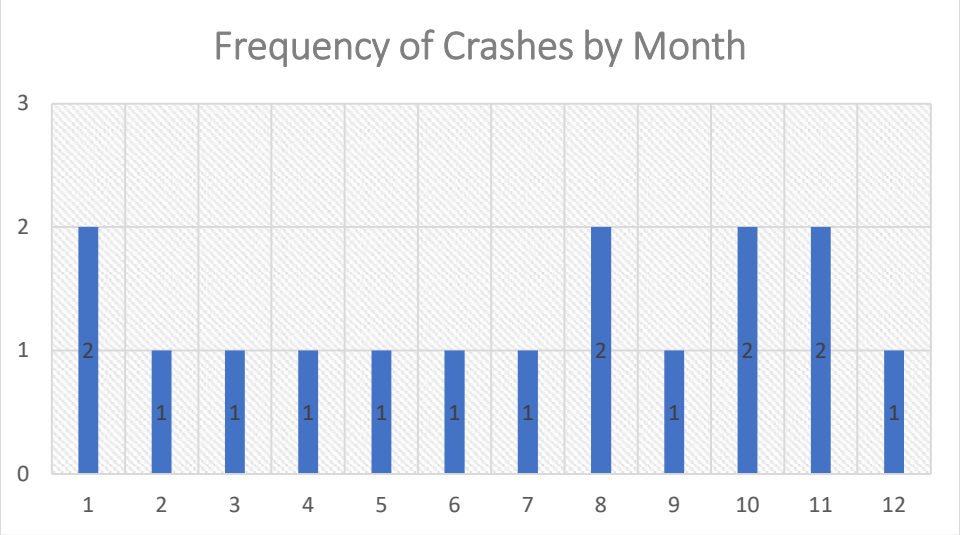
Intersection of West Herrin Street at 35th Street (2014-2018)

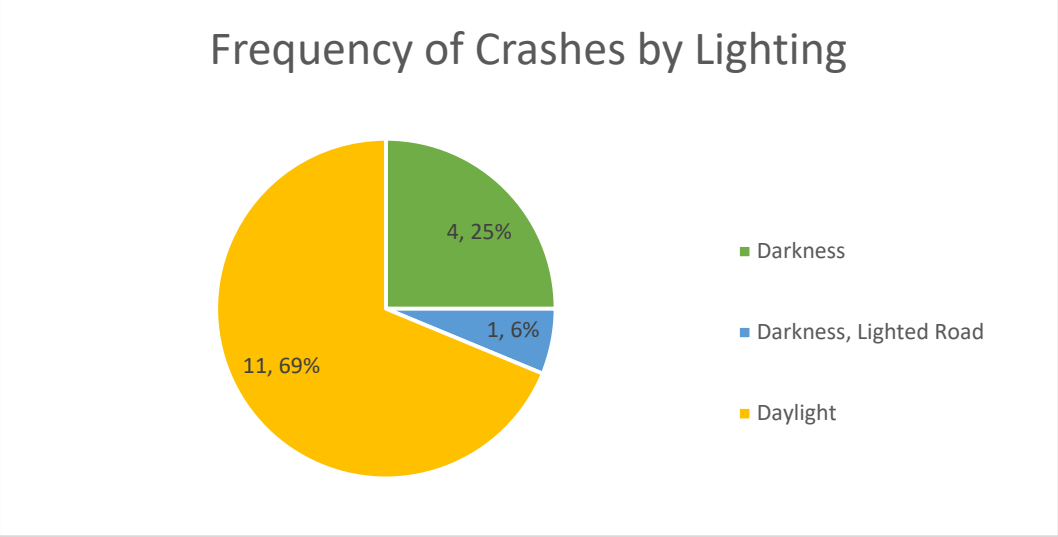




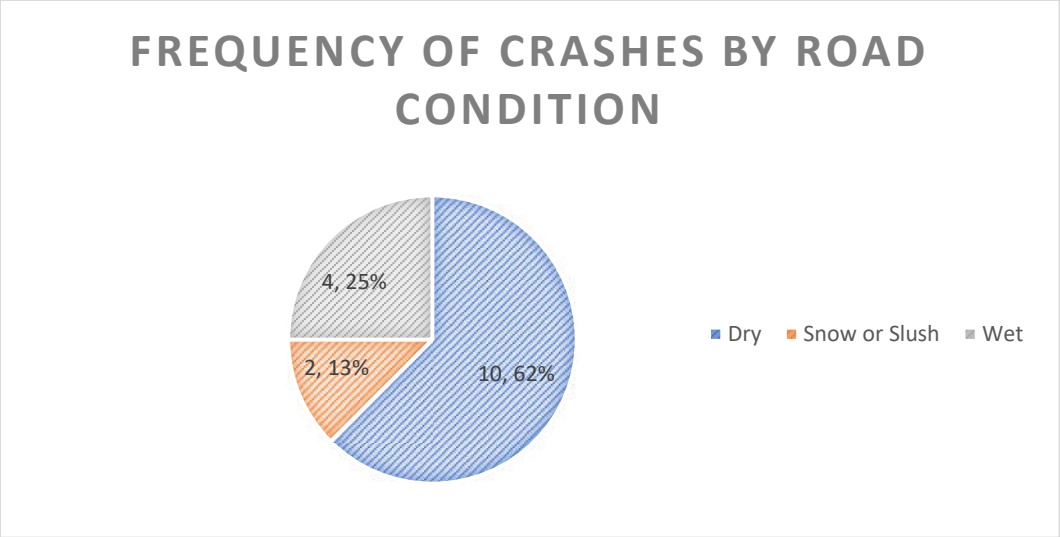
Intersection of West Herrin Street at 35th Street (2014-2018)

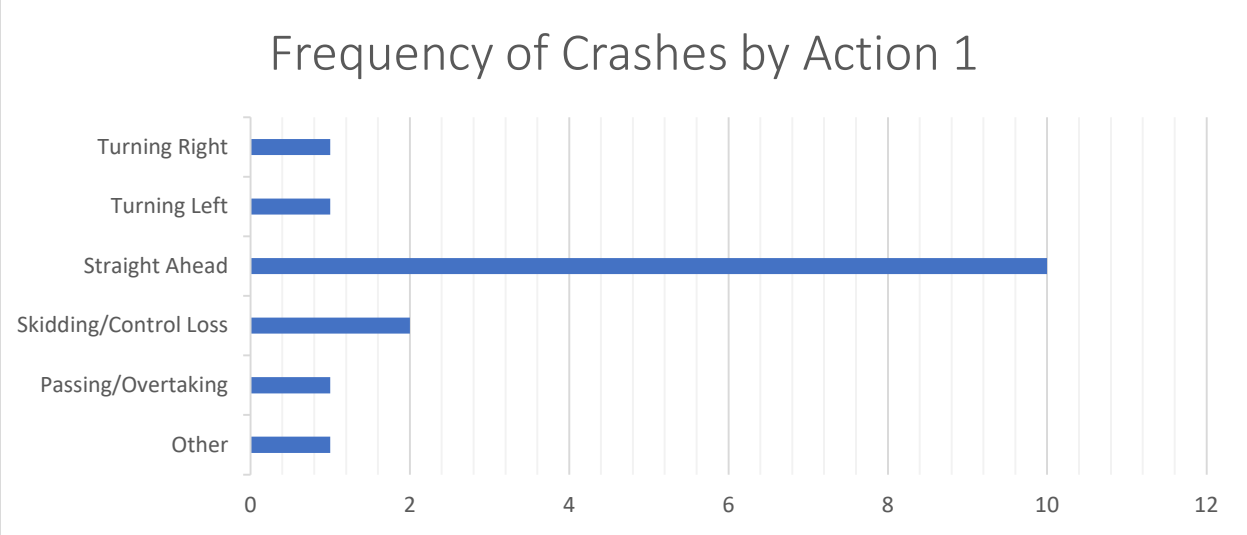


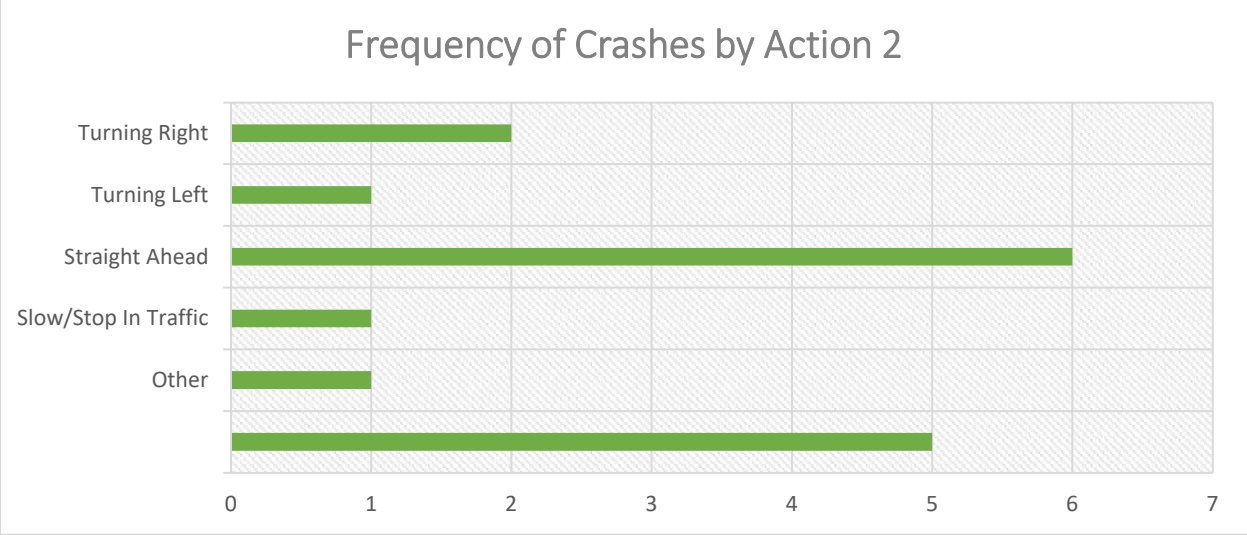




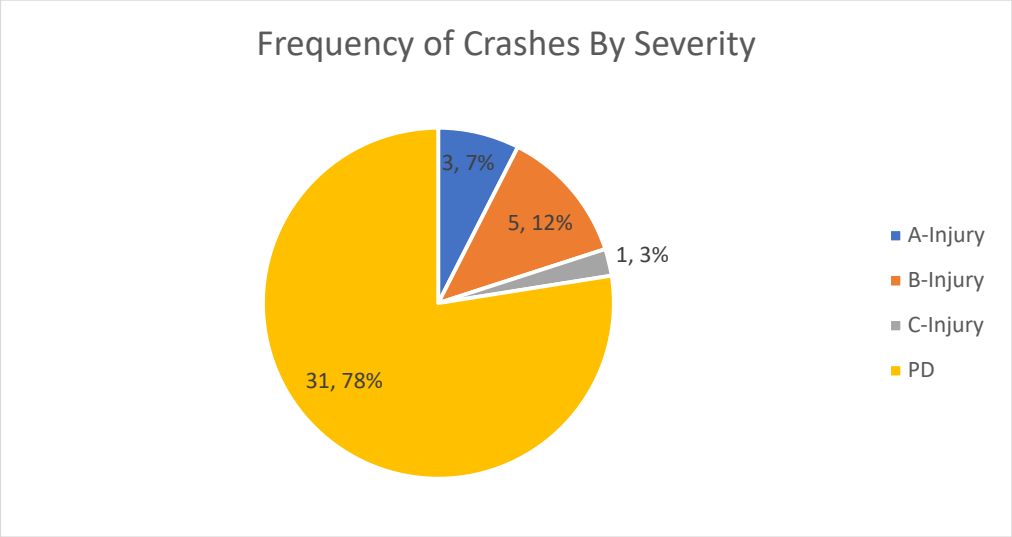
Intersection of West Herrin Street at 35th Street (2014-2018)

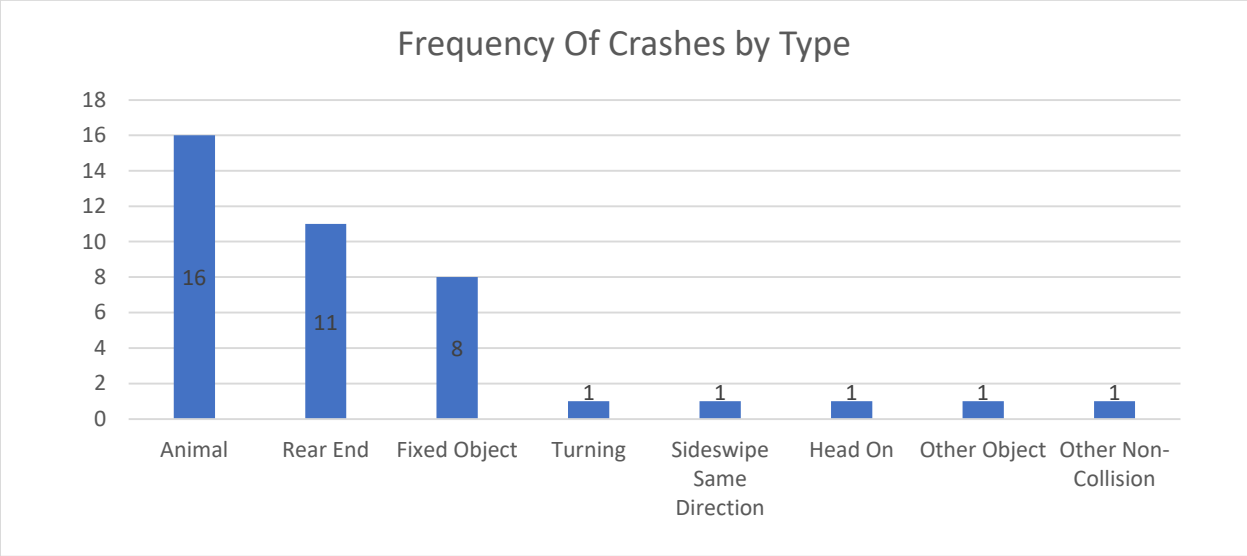


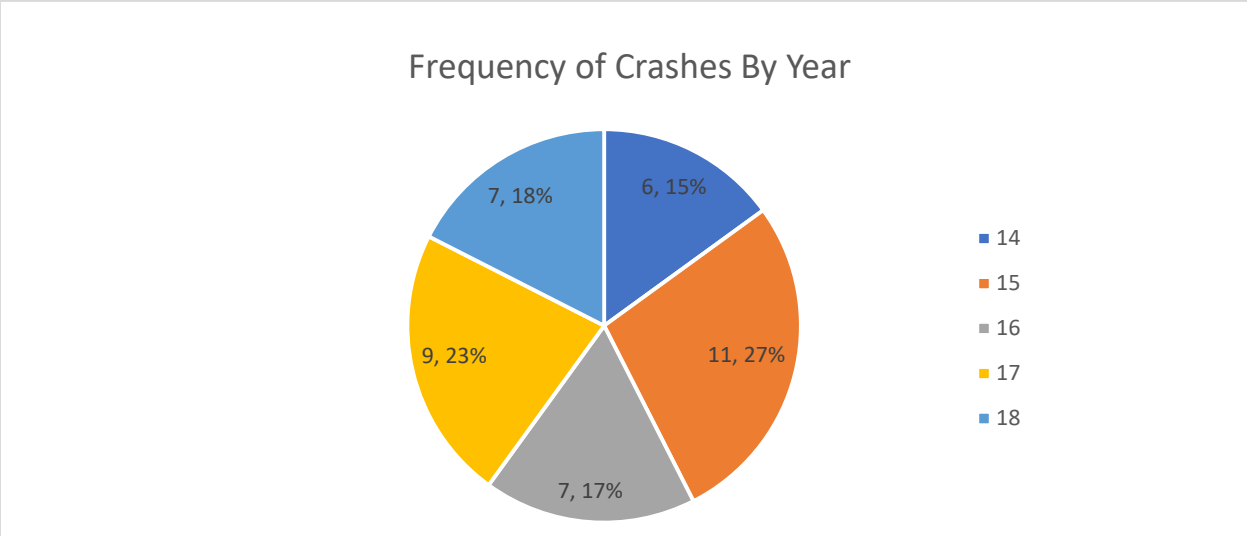




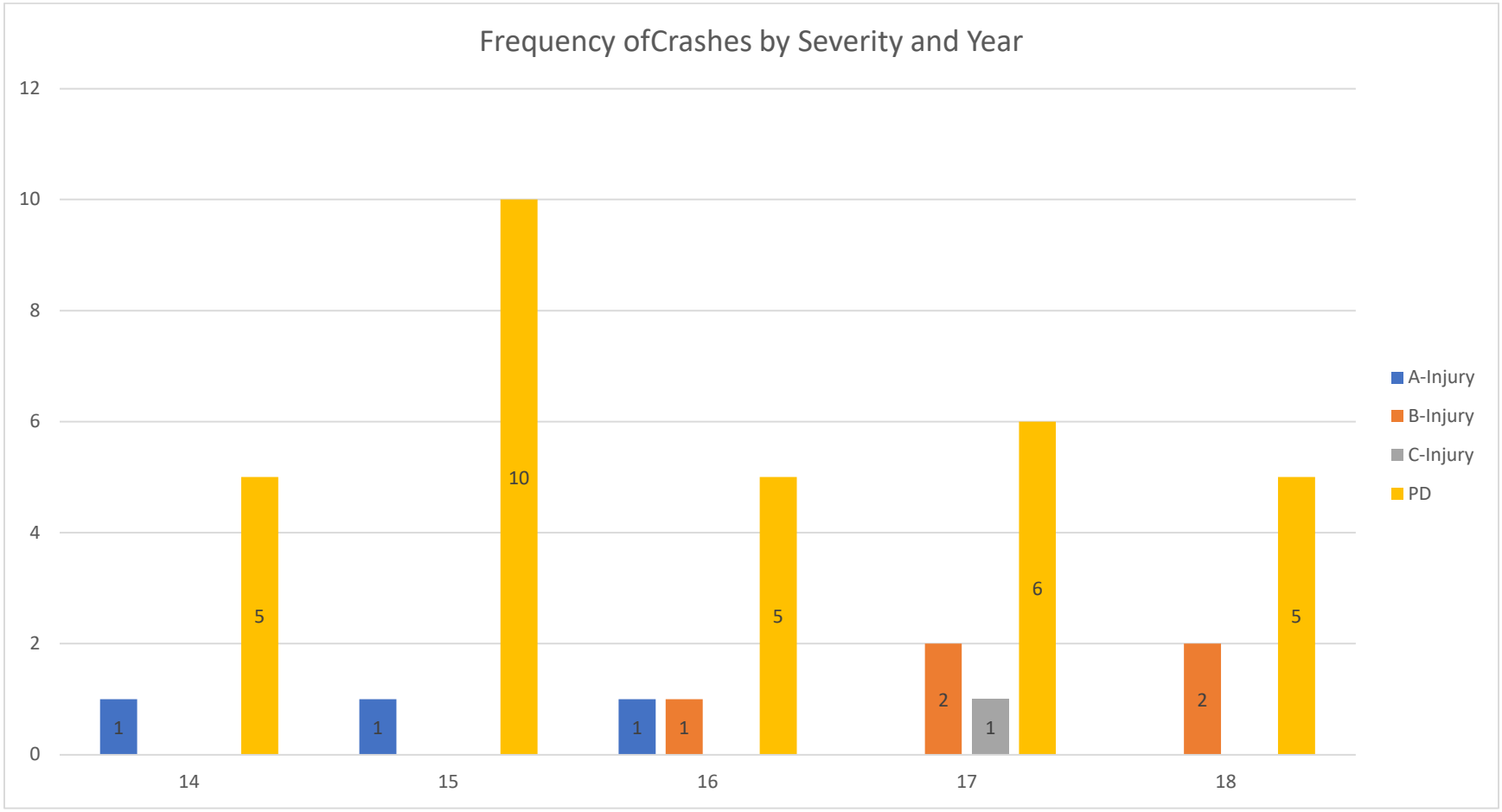
Segment Crashes along West Herrin Street from West of Herrin Elementary School to 35th Street (2014-2018)



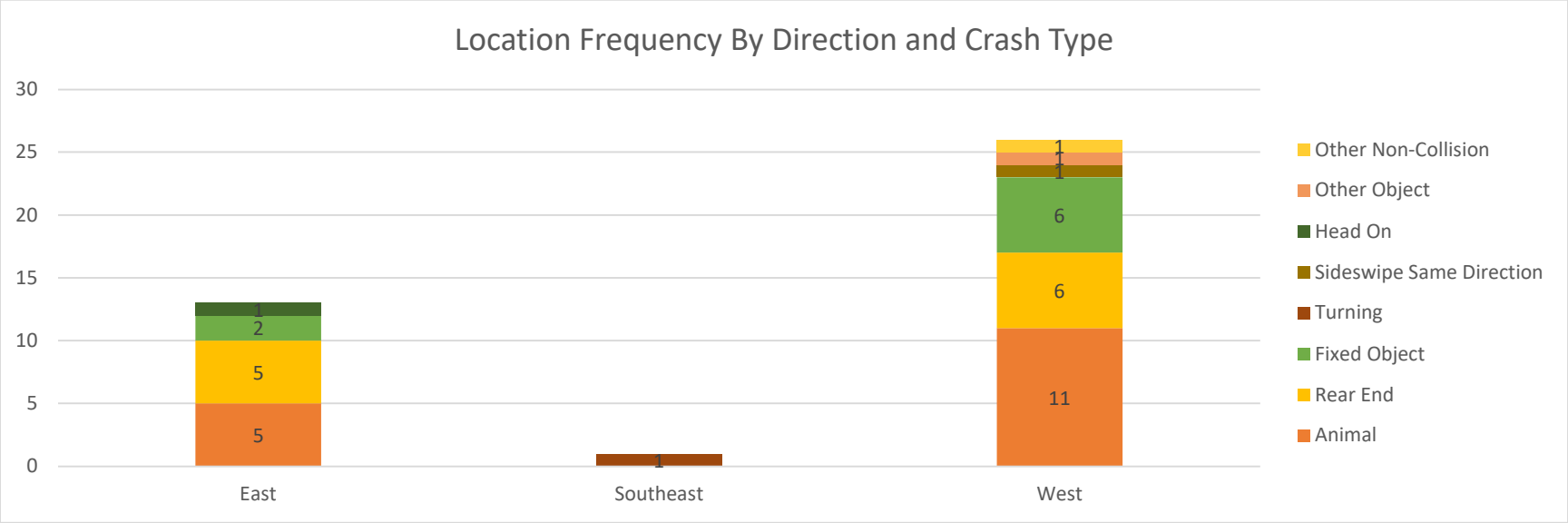


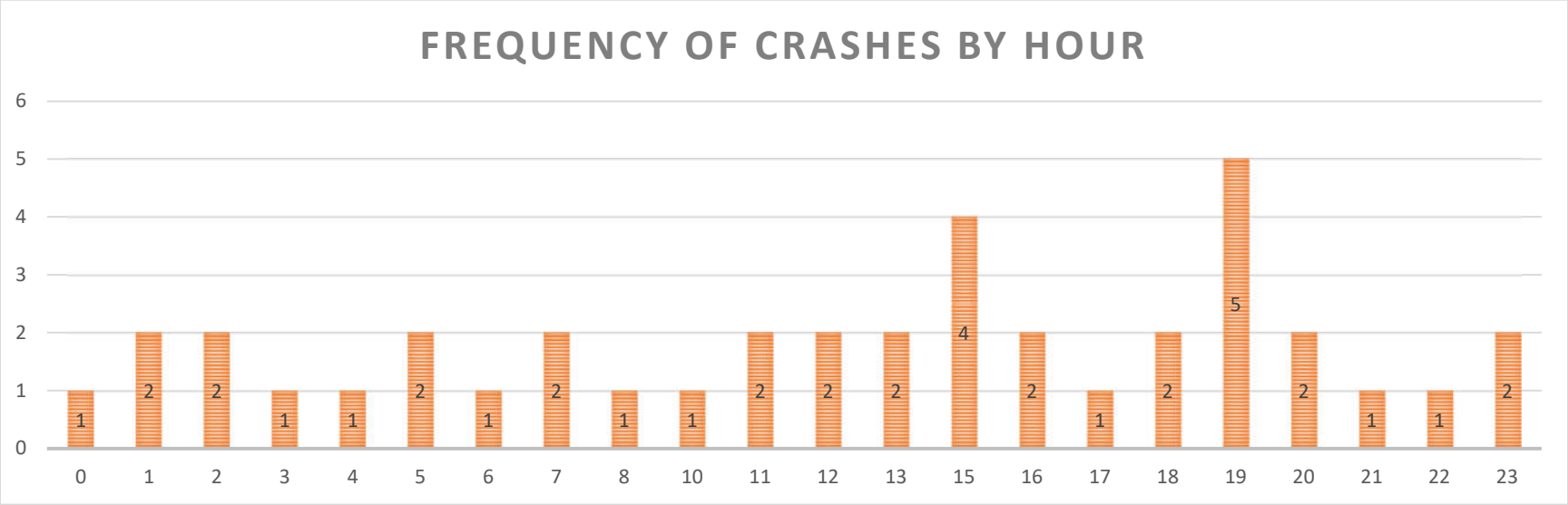


Segment Crashes along West Herrin Street from West of Herrin Elementary School to 35th Street (2014-2018)

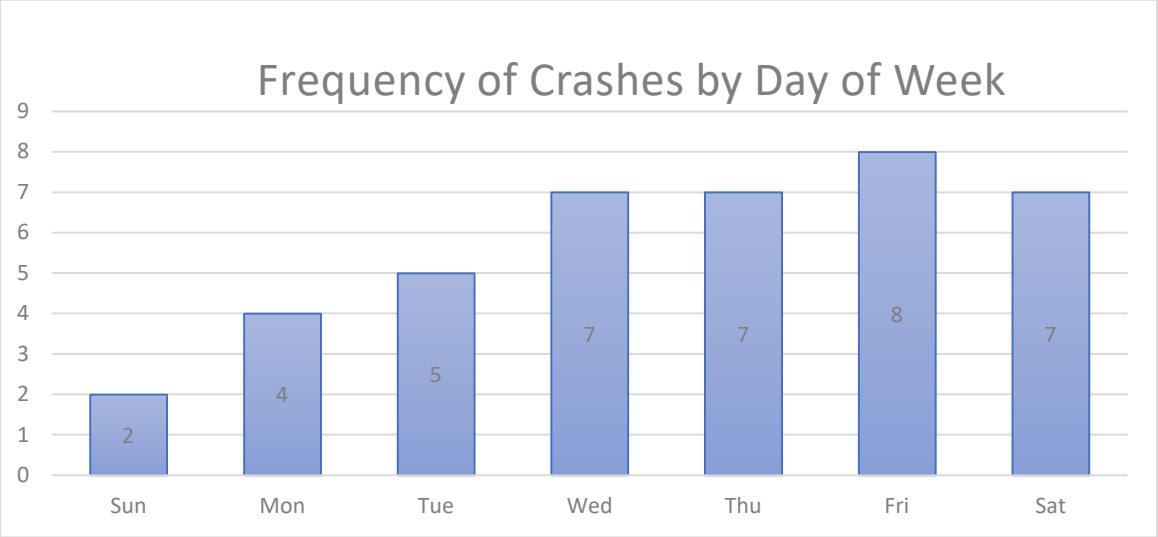


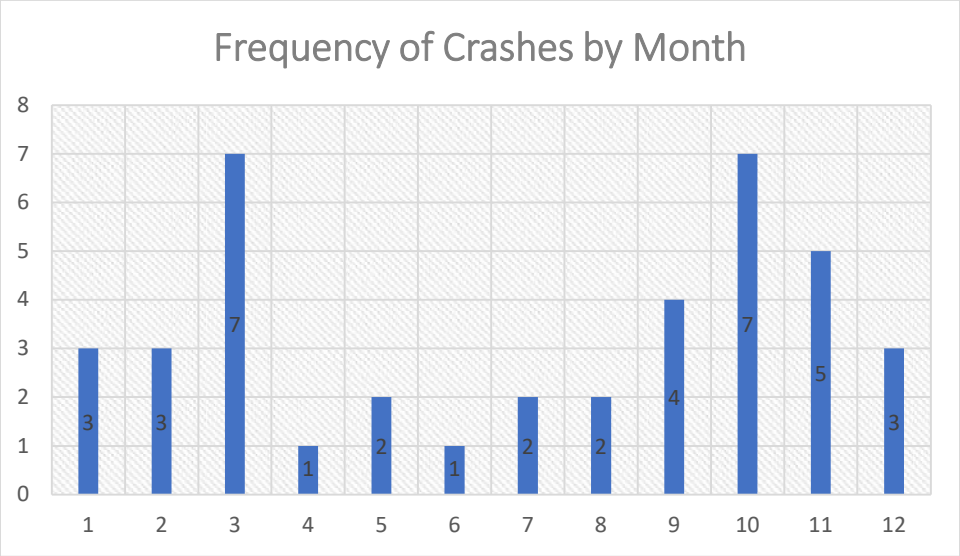
Segment Crashes along West Herrin Street from West of Herrin Elementary School to 35th Street (2014-2018)

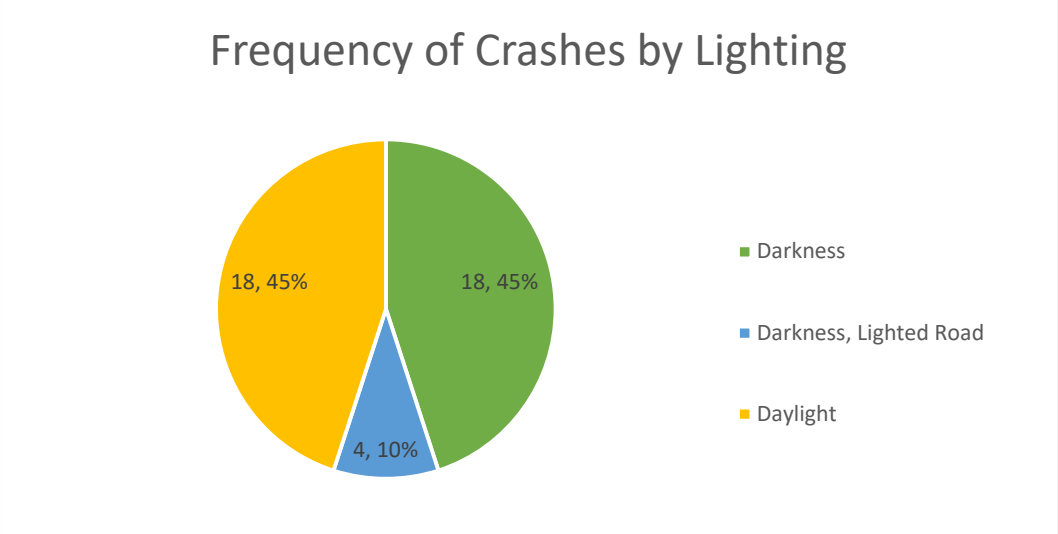




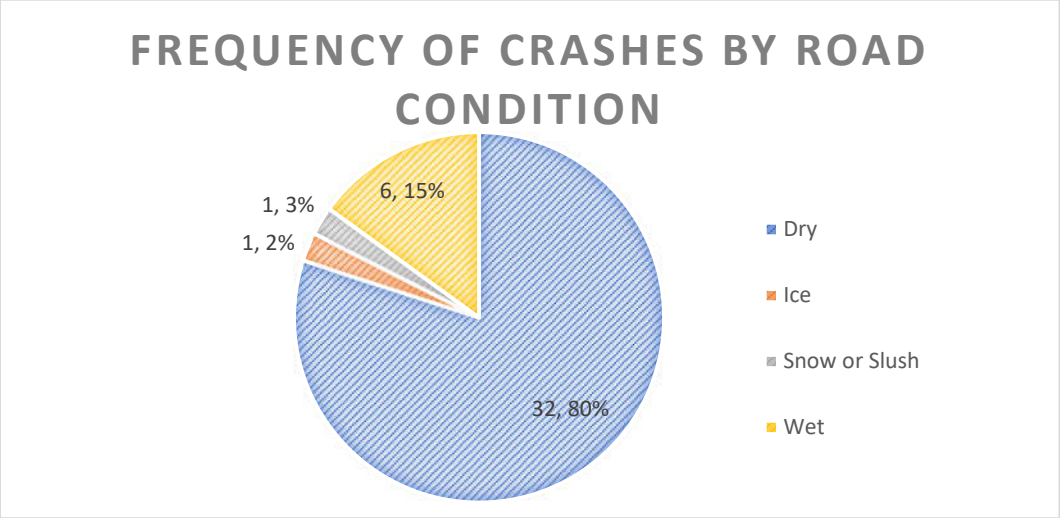
Segment Crashes along West Herrin Street from West of Herrin Elementary School to 35th Street (2014-2018)

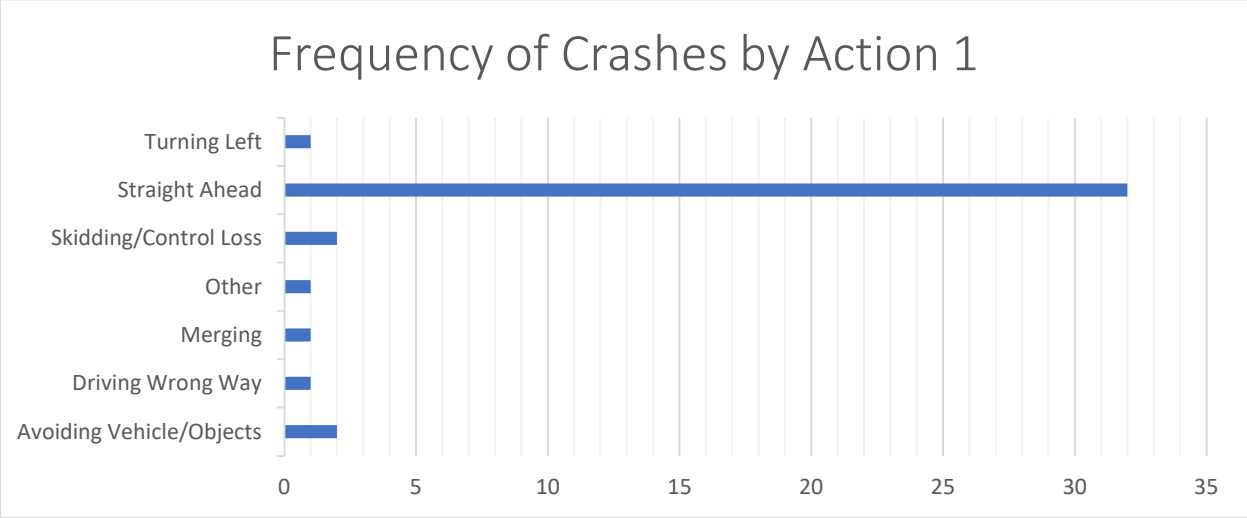


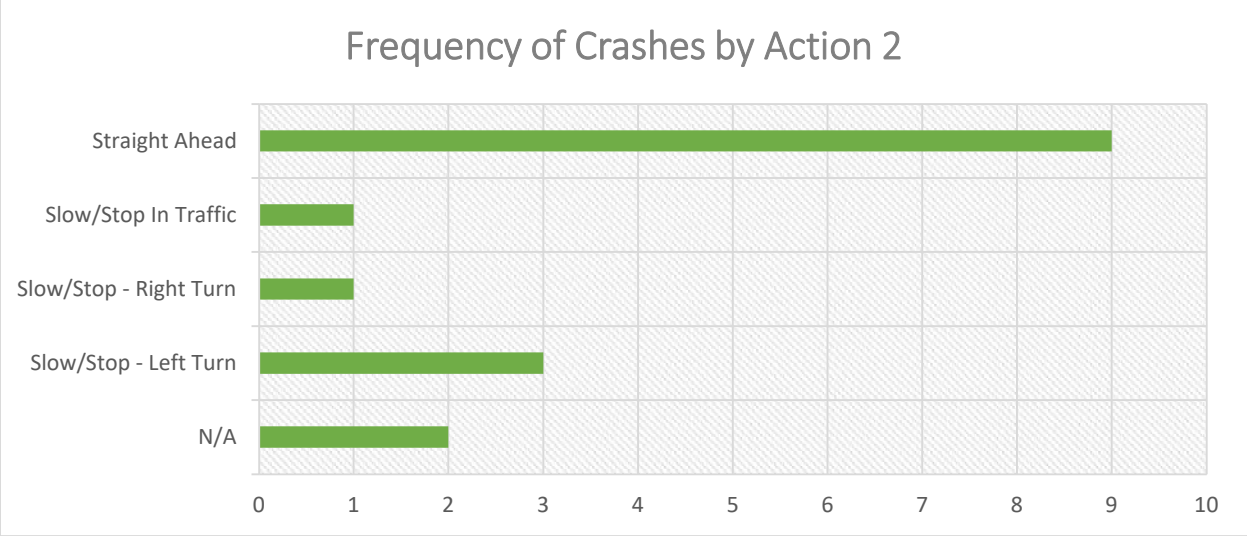




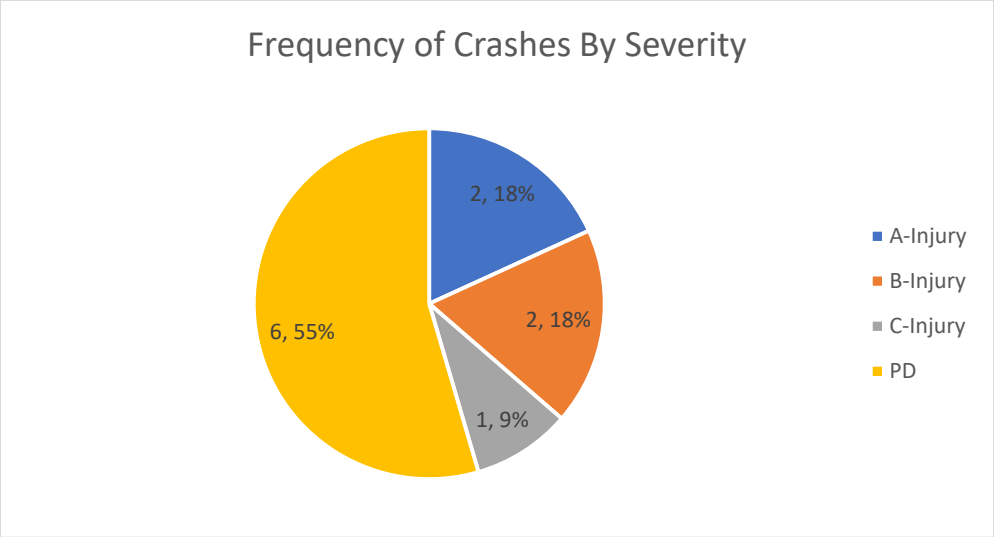
Segment Crashes along West Herrin Street from West of Herrin Elementary School to 35th Street (2014-2018)

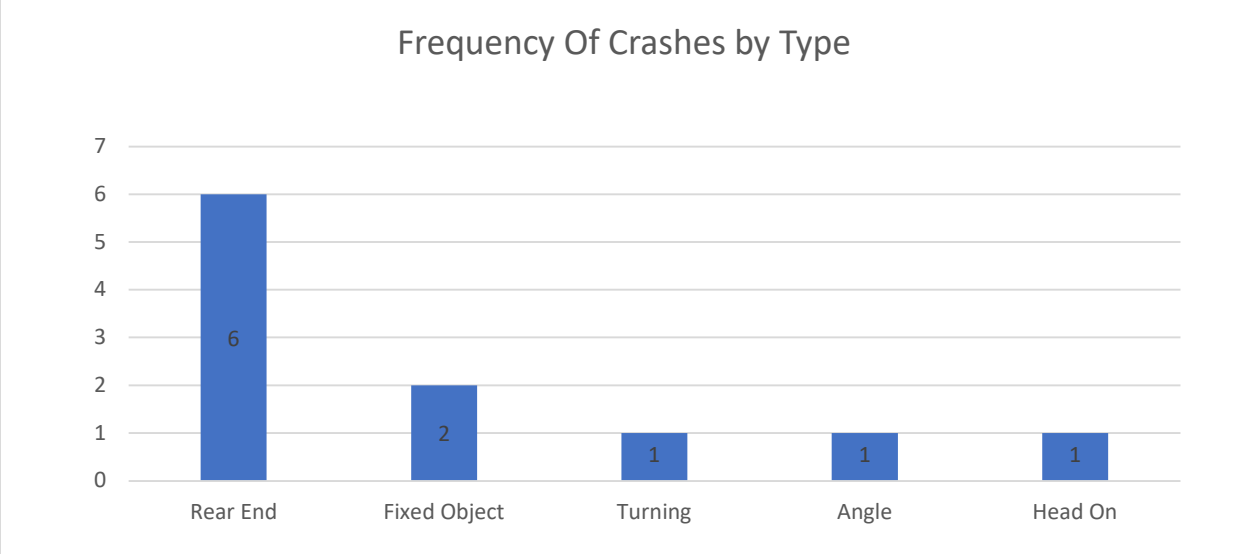


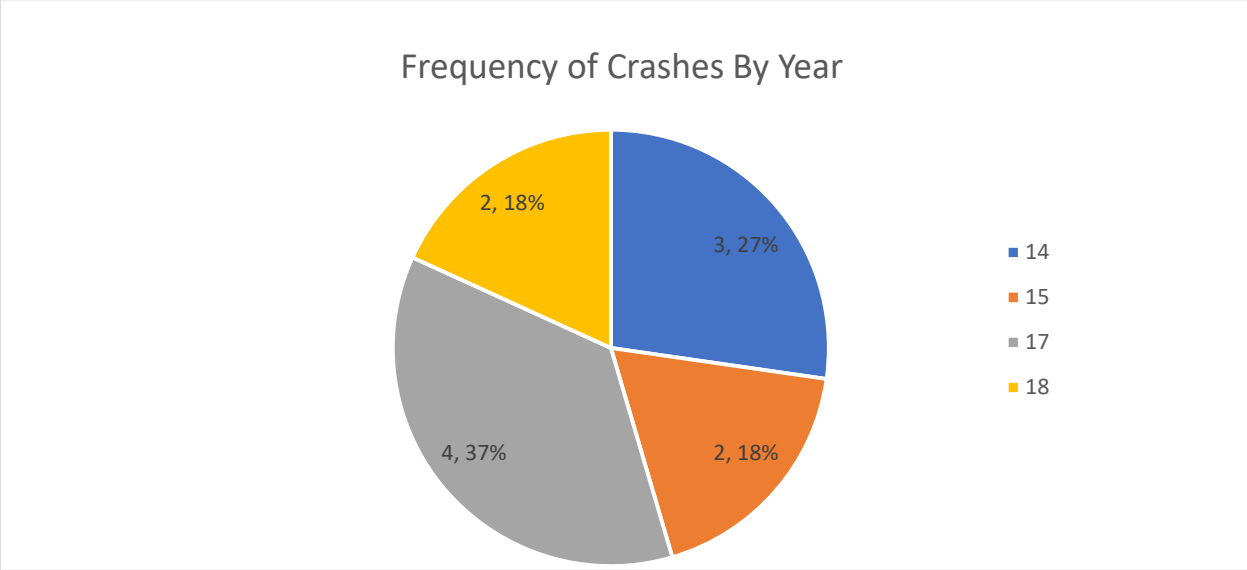




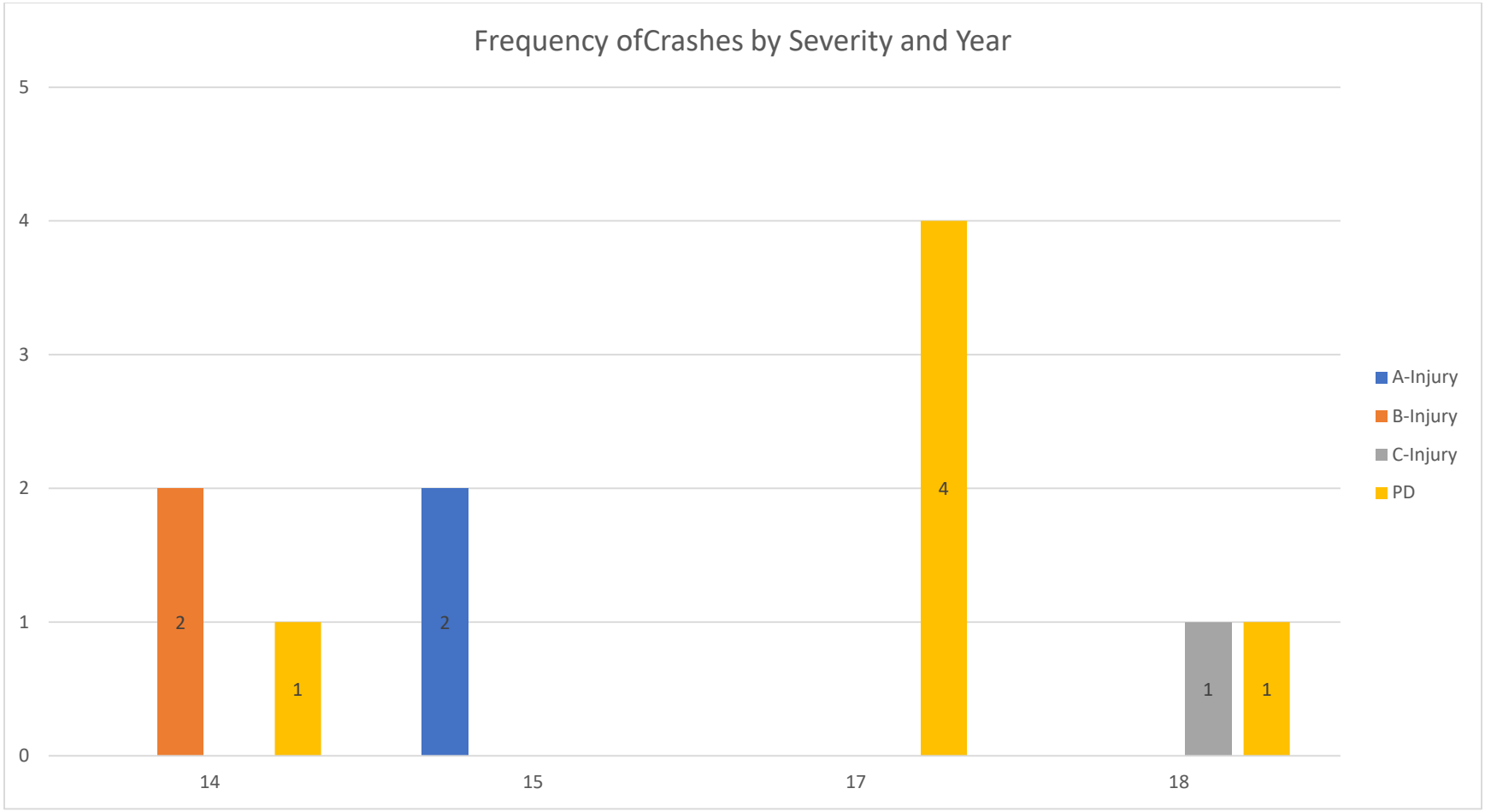
Intersection of West Herrin Street at 43rd Street (2014-2018)



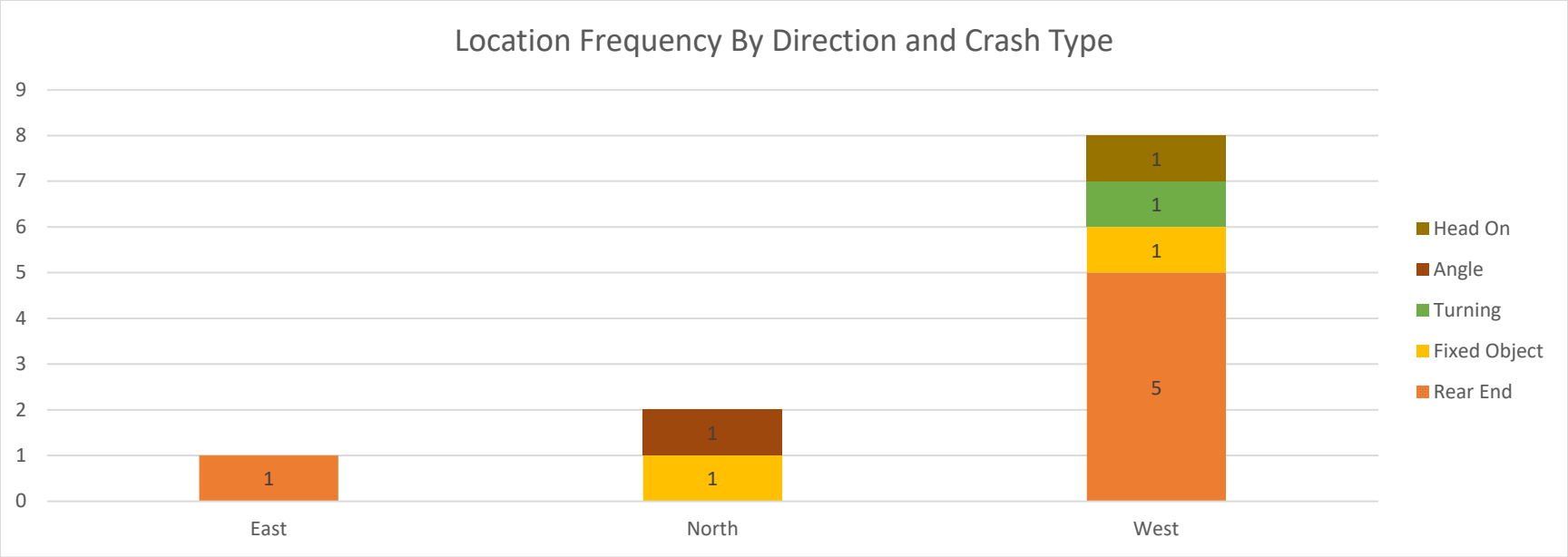


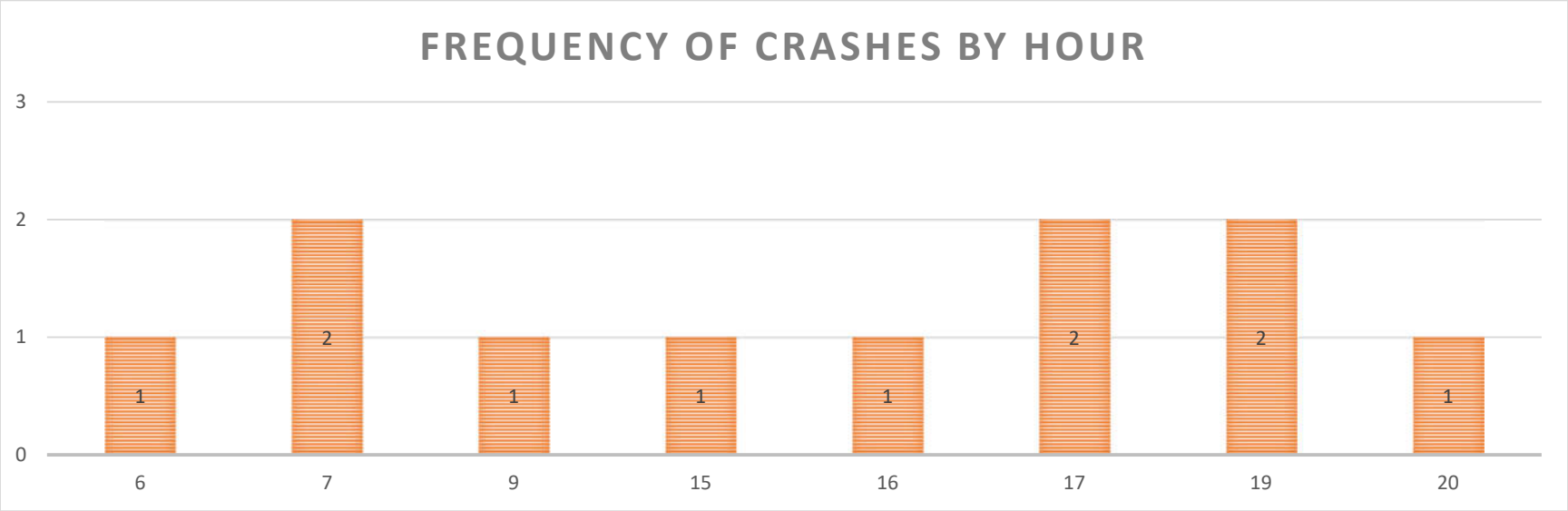


Intersection of West Herrin Street at 43rd Street (2014-2018)

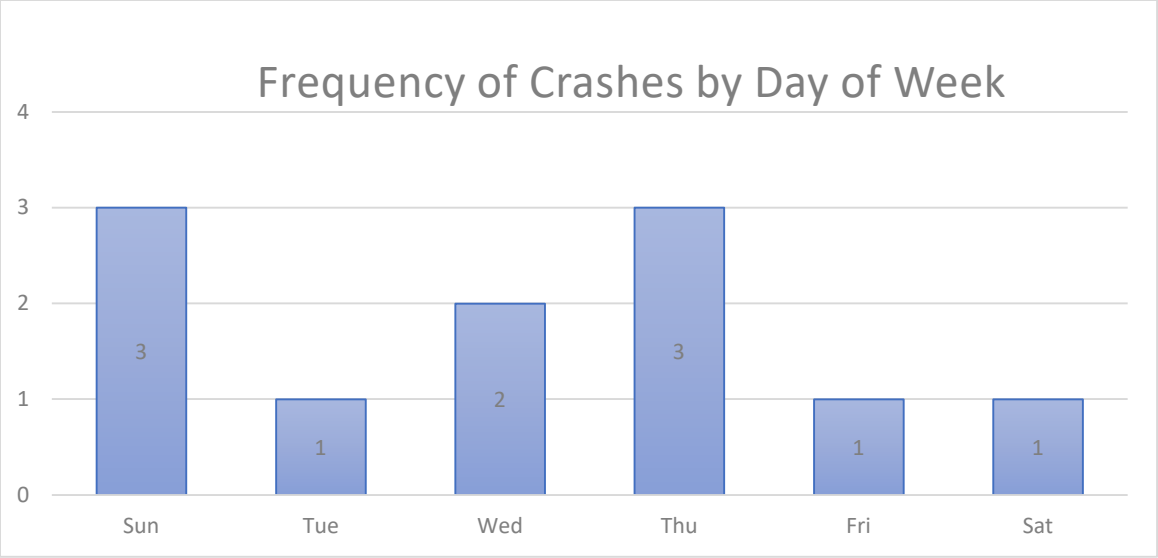


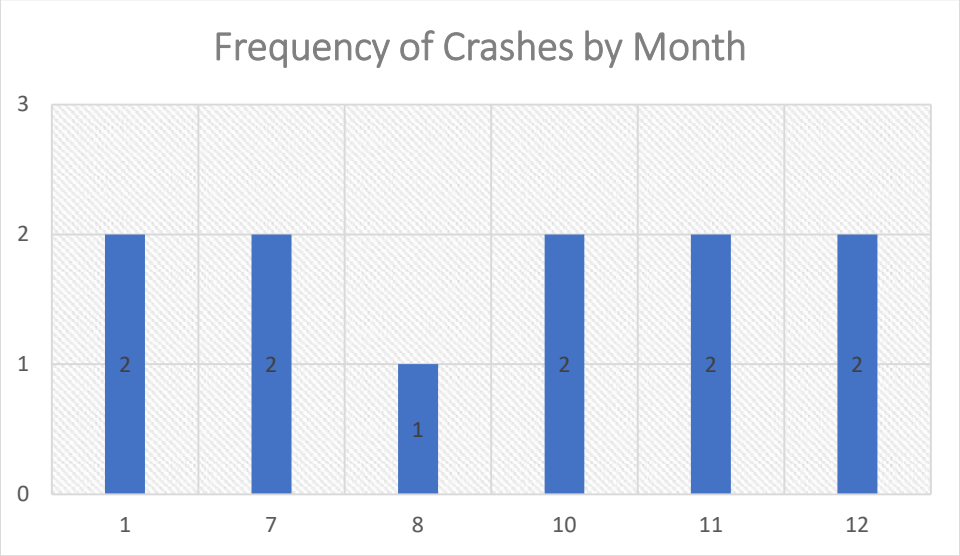
Intersection of West Herrin Street at 43rd Street (2014-2018)

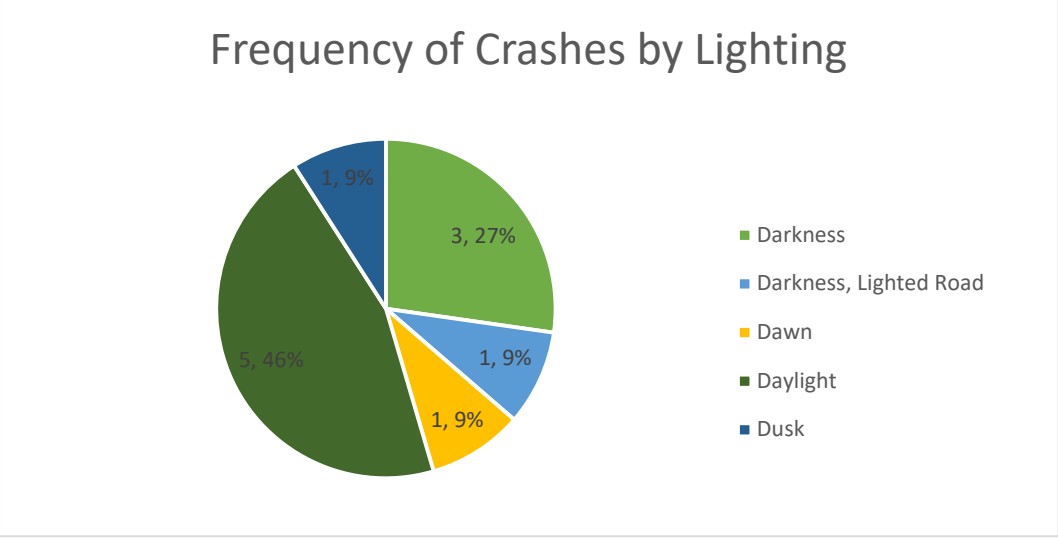




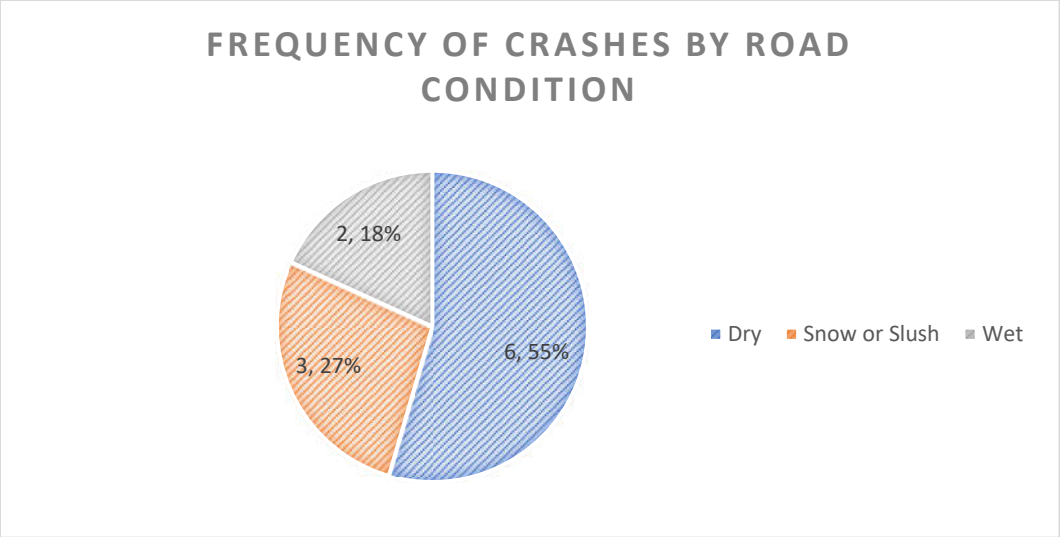
Intersection of West Herrin Street at 43rd Street (2014-2018)

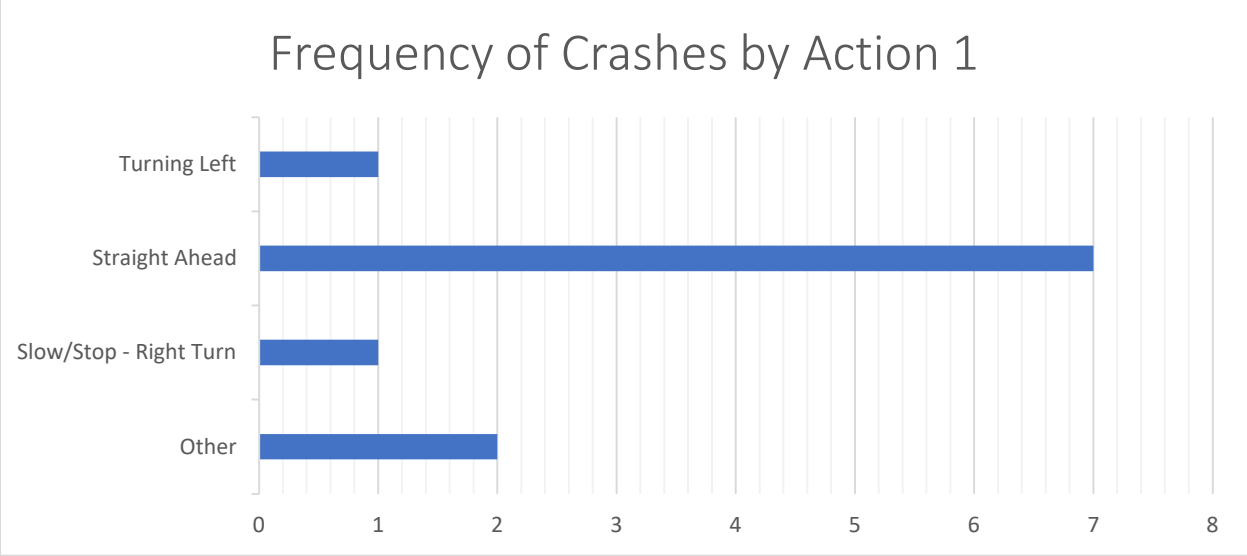


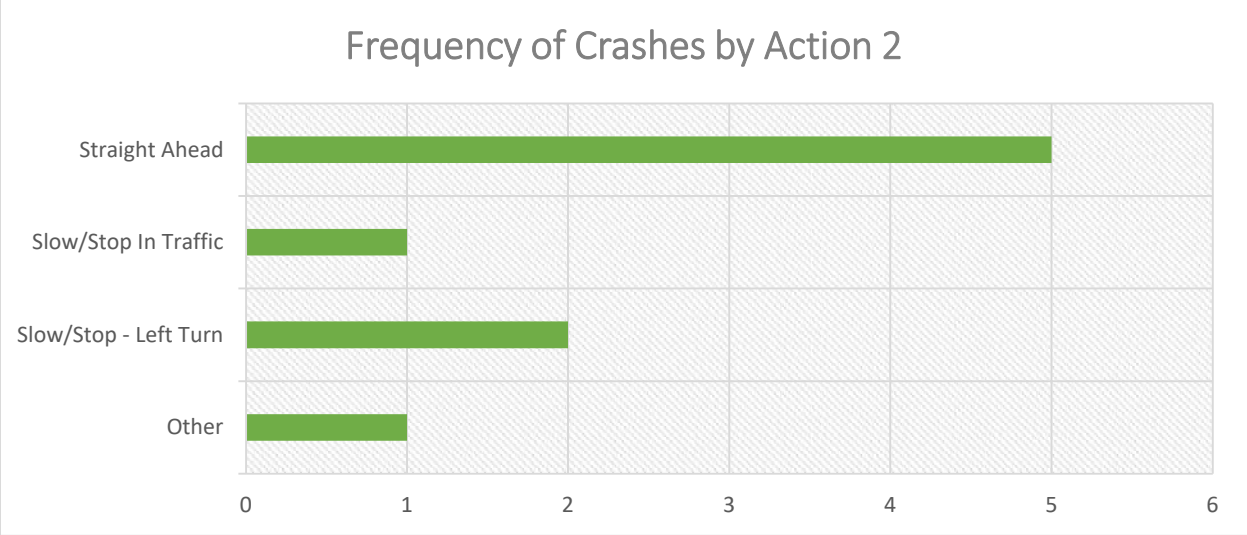




Intersection of West Herrin Street at 43rd Street (2014-2018)



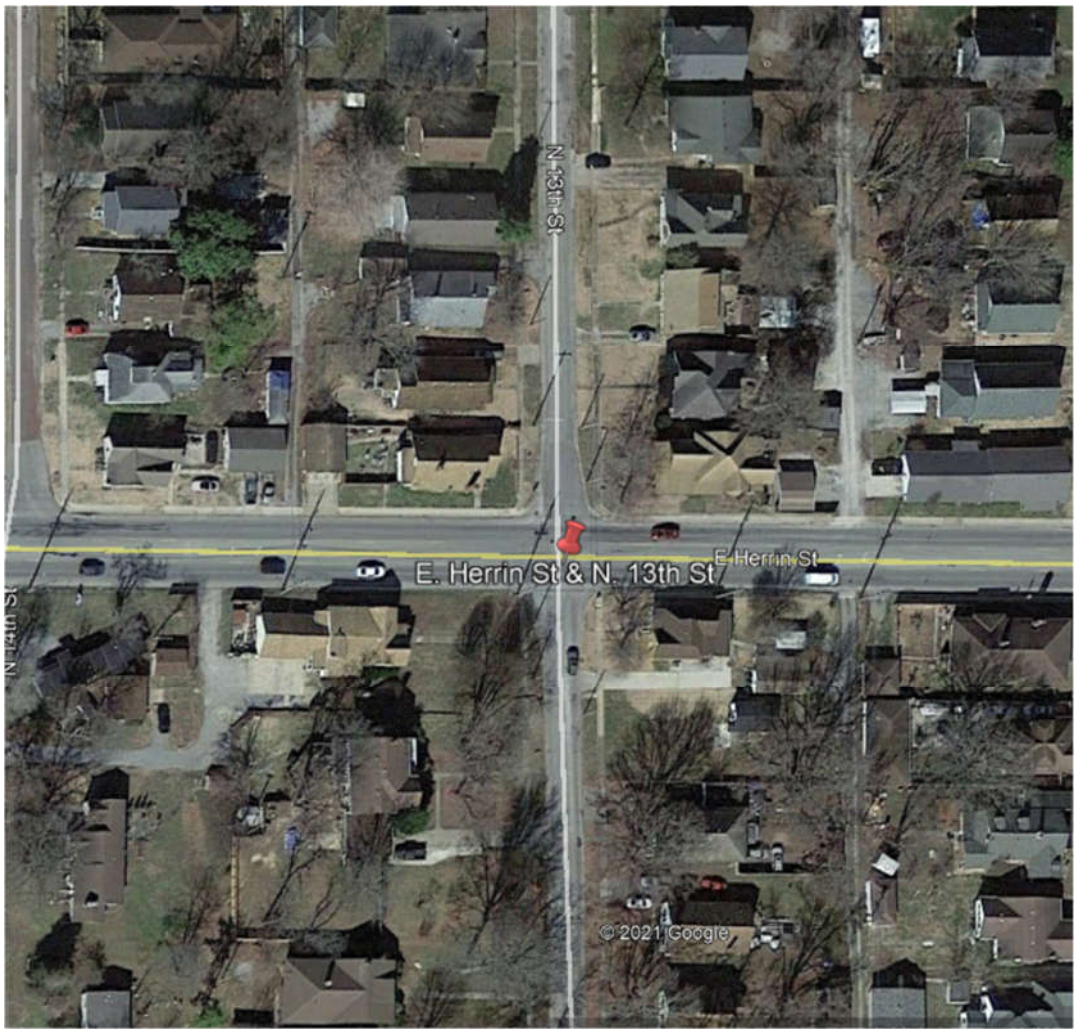




CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE	Intersection_Name
201400163022	14	3	20	3	Thu	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)					PD	Segment
201400166696	14	3	22	20	Sat	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)					PD	Segment
201400218749	14	7	11	1	Fri	1	0	0	Fixed Object	Clear	Darkness	Dry	Traffic Signal	Herrin	Normal	Passenger	West	Avoiding Vehicle/Objects	Off Pavement - Right					PD	East School Ent
201400233485	14	5	15	11	Thu	1	0	0	Fixed Object	Clear	Daylight	Wet	No Controls	Herrin	Normal	Passenger	East	Straight Ahead	Off Pavement - Right					PD	Segment
201400285507	14	9	29	14	Mon	1	1	0	Overturned	Clear	Daylight	Dry	No Controls	Herrin	Normal	Van/Mini-Van	East	Skidding/Control Loss	Off Pavement - Right					A-Injury	35th St
201400293878	14	10	8	15	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	SUV	East	Other	On Pavement (Roadway)	PD	43rd St
201400352426	14	7	10	4	Thu	1	1	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Motorcycle (Over 150cc)	East	Straight Ahead	On Pavement (Roadway)					A-Injury	Segment
201400359994	14	7	22	20	Tue	2	2	0	Rear End	Clear	Dusk	Dry	No Controls	Herrin	Had Been Drinking	Passenger	West	Straight Ahead	Intersection	Passenger	West	Slow/Stop - Left Turn	Intersection	B-Injury	43rd St
201400430939	14	11	12	16	Wed	3	1	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Van/Mini-Van	West	Straight Ahead	On Pavement (Roadway)	Passenger	West	Slow/Stop In Traffic	On Pavement (Roadway)	C-Injury	35th St
201400450728	14	12	14	17	Sun	1	1	0	Fixed Object	Clear	Darkness	Dry	No Controls	Herrin	Other/Unknown	Passenger	West	Other	Off Pavement - Left					B-Injury	43rd St
201400460988	14	12	28	22	Sun	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201501185159	15	1	14	18	Wed	1	0	0	Animal	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Other/Unknown	Passenger	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201501186726	15	1	15	7	Thu	1	1	0	Fixed Object	Snow	Daylight	Snow or Slush	Stop Sign/Flasher	Herrin	Normal	Pickup	Southeast	Turning Right	Off Pavement - Left					B-Injury	35th St
201501187057	15	1	15	6	Thu	2	2	0	Head On	Snow	Dawn	Snow or Slush	No Controls	Herrin	Normal	Passenger	West	Other	On Pavement (Roadway)	Passenger	East	Straight Ahead	On Pavement (Roadway)	A-Injury	43rd St
201501187068	15	1	15	6	Thu	1	0	0	Animal	Snow	Daylight	Ice	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201501264962	15	2	3	21	Tue	2	3	0	Head On	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Alcohol Impaired	Pickup	East	Driving Wrong Way	On Pavement (Roadway)	Passenger	West	Straight Ahead	On Pavement (Roadway)	A-Injury	Segment
201501300658	15	2	18	13	Wed	1	0	0	Fixed Object	Snow	Daylight	Snow or Slush	No Controls	Herrin	Other/Unknown	Pickup	Southwest	Skidding/Control Loss	Off Pavement - Left					PD	35th St
201501354030	15	10	17	19	Sat	1	1	0	Fixed Object	Clear	Darkness	Dry	Stop Sign/Flasher	Herrin	Other/Unknown	Passenger	North	Straight Ahead						A-Injury	43rd St
201501355052	15	10	23	14	Fri	2	2	0	Turning	Rain	Daylight	Wet	Stop Sign/Flasher	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	SUV	East	Turning Right	On Pavement (Roadway)	B-Injury	35th St
201501361676	15	3	16	5	Mon	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201501376716	15	8	8	20	Sat	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)					PD	Segment
201501377159	15	9	23	19	Wed	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Pickup	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201501377460	15	10	6	23	Tue	1	0	0	Animal	Fog/Smoke/Haze	Darkness	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201501404655	15	12	17	6	Thu	2	0	0	Rear End	Clear	Darkness	Dry	No Controls	Herrin	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)	Tractor With Semi-Traile	West	Straight Ahead	On Pavement (Roadway)	PD	35th St
201501460880	15	8	15	2	Sat	1	0	0	Fixed Object	Fog/Smoke/Haze	Darkness	Dry	Lane Use Marking	Herrin	Normal	Passenger	East	Straight Ahead	Off Pavement - Right					PD	Segment
201501467318	15	9	9	5	Wed	1	0	0	Fixed Object	Clear	Darkness	Dry	No Controls	Herrin	Normal	Passenger	West	Avoiding Vehicle/Objects	On Pavement (Roadway)					PD	Segment
201501479506	15	10	28	13	Wed	3	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD	Segment
201501486408	15	11	23	2	Mon	2	0	0	Turning	Clear	Daylight	Dry	Lane Use Marking	Herrin	Normal	Pickup	Southeast	Turning Left	On Pavement (Roadway)	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601302501	16	1	1	1	Fri	1	0	0	Fixed Object	Clear	Darkness	Dry	Lane Use Marking	Unincorporated	Alcohol Impaired	Passenger	West	Other	Off Pavement - Right					PD	Middle School Ent
201601313322	16	1	15	8	Fri	2	0	0	Rear End	Rain	Daylight	Wet	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD	35th St
201601350658	16	2	12	12	Fri	2	0	0	Rear End	Snow	Daylight	Snow or Slush	Traffic Signal	Herrin	Normal	Pickup	West	Straight Ahead	On Pavement (Roadway)	Passenger	West	Slow/Stop In Traffic	On Pavement (Roadway)	PD	East School Ent
201601388295	16	5	4	7	Wed	2	0	0	eswipe Opposite Direct	Rain	Daylight	Wet	No Passing	Herrin	Other/Unknown	Unknown	Unknown	Other	On Pavement (Roadway)	Pickup	East	Straight Ahead	On Pavement (Roadway)	PD	35th St
201601392615	16	5	4	7	Wed	2	2	0	Rear End	Rain	Daylight	Wet		Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Passenger	East	Straight Ahead	On Pavement (Roadway)	B-Injury	Segment
201601451396	16	10	27	18	Thu	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)					PD	35th St
201601456755	16	9	3	13	Sat	3	3	0	deswipe Same Directio	Clear	Daylight	Dry	Lane Use Marking	Herrin	Other/Unknown	SUV	West	Merging	On Pavement (Roadway)	Passenger	West	Straight Ahead	On Pavement (Roadway)	A-Injury	Segment
201601470726	16	10	7	7	Fri	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD	East School Ent
201601477826	16	10	28	16	Fri	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Other/Unknown	Passenger	West	Straight Ahead	On Pavement (Roadway)	Pickup	West	Straight Ahead	On Pavement (Roadway)	PD	Segment
201601489002	16	11	15	23	Tue	2	0	0	Rear End	Clear	Darkness	Dry	No Controls	Herrin	Other/Unknown	Unknown	West	Straight Ahead	On Pavement (Roadway)	Passenger	West	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	Segment
201701193883	17	7	4	21	Tue	2	3	1	Turning	Clear	Darkness	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	Northwest	Turning Left	Intersection	Motorcycle (Over 150cc	East	Straight Ahead	Intersection	Fatal	35th St
201701282908	17	10	26	19	Thu	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201701299514	17	11	3	19	Fri	1	0	0	Animal	Clear	Darkness	Dry	Lane Use Marking	Herrin	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201701363374	17	1	5	7	Thu	2	0	0	Angle	Snow	Daylight	Snow or Slush	Stop Sign/Flasher	Herrin	Normal	SUV	North	Slow/Stop - Right Turn	Intersection	SUV	East	Straight Ahead	Intersection	PD	43rd St
201701392931	17	3	6	15	Mon	2	0	0	Rear End	Rain	Daylight	Wet	Traffic Signal	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	SUV	East	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	East School Ent
201701393997	17	3	14	15	Tue	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	SUV	South	Other	On Pavement (Roadway)	PD	35th St
201701396499	17	3	30	15	Thu	1	0	0	Fixed Object	Other	Daylight	Wet	No Controls	Herrin	Normal	Passenger	West	Skidding/Control Loss	Off Pavement - Right					PD	Segment
201701406348	17	4	15	22	Sat	2	2	0	Turning	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Alcohol Impaired	Passenger	East	Passing/Overtaking	Off Pavement - Left	Passenger	East	Turning Left	Off Pavement - Left	A-Injury	35th St
201701428360	17	11	7	17	Tue	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)					PD	Segment
201701436321	17	6	23	18	Fri	1	1	0	Fixed Object	Rain	Daylight	Wet	No Controls	Herrin	Normal	Pickup	West	Straight Ahead	Off Pavement - Right					B-Injury	Segment
201701455698	17	8	23	13	Wed	3	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	Intersection	Passenger	West	Straight Ahead	Intersection	PD	35th St
201701456899	17	8	27	16	Sun	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Turning Left	On Pavement (Roadway)	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD	43rd St
201701461111	17	9	12	16	Tue	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Pickup	West	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	Segment
201701470804	17	10	18	10	Wed	1	1	0	Fixed Object	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	Off Pavement - Right					B-Injury	Segment
201701481296	17	11	30	7	Thu	2	0	0	Rear End	Clear	Daylight	Wet	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Passenger	West	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	43rd St
201701484554	17	12	13	12	Wed	1	1	0	Other Non-Collision	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	Off Pavement - Right					C-Injury	Segment
201701486743	17	12	22	17	Fri	2	0	0	Rear End	Rain	Darkness	Wet	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Passenger	West	Slow/Stop In Traffic	On Pavement (Roadway)	PD	43rd St
201801067806	18	2	25	19	Sun	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	N/A	N/A	N/A	N/A	PD	Segment
201801075150	18	3	3	19	Sat	1	0	0	Animal	Clear	Darkness, Lighted Road	Dry	No Controls	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	N/A	N/A	N/A	N/A	PD	Segment
201801084225	18	3	15	0	Thu	1	0	0	Other Object	Clear	Darkness, Lighted Road	Dry	Traffic Signal	Herrin	Fatigued	Pickup	West	Skidding/Control Loss	Off Pavement - Right					PD	Middle School Ent
201801101811	18	4	2	11	Mon	1	1	0	Animal	Rain	Darkness	Wet	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)					B-Injury	Segment
201801189678	18	6	16	2	Sat	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Herrin	Alcohol Impaired	Passenger	East	Straight Ahead	On Pavement (Roadway)					PD	35th St
201801201834	18	7	1	9	Sun	2	2	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Passenger	West	Straight Ahead	On Pavement (Roadway)	C-Injury	43rd St
201801259139	18	8	21	7	Tue	2	0	0	Turning	Clear	Daylight	Wet	No Controls	Herrin	Other	SUV	East	Straight Ahead	On Pavement (Roadway)	Pickup	East	Turning Right	On Pavement (Roadway)	PD	35th St
201801309019	18	10	6	15	Sat	2	1	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Van/Mini-Van	East	Straight Ahead	On Pavement (Roadway)	B-Injury	Segment
201801353607	18	11	14	12	Wed	2	0	0	Other Object	Clear	Daylight	Dry	No Controls	Herrin	Normal	Pickup	West	Straight Ahead	On Pavement (Roadway)	Pickup	East	Straight Ahead	On Pavement (Roadway)	PD	35th St
201801355691	18	11	9	8	Fri	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Pickup	West	Slow/Stop - Right Turn	On Pavement (Roadway)	PD	Segment
201801355693	18	11	14	19	Wed	2	0	0	Rear End	Snow	Darkness, Lighted Road	Snow or Slush	No Controls	Herrin	Other/Unknown	SUV	West	Straight Ahead	On Pavement (Roadway)	Pickup	West	Straight Ahead	On Pavement (Roadway)	PD	43rd St
201801378475	18	12	1	15	Sat	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Van/Mini-Van	West	Straight Ahead	On Pavement (Roadway)	PD	Segment

SIMPO SAFETY STUDY

Appendix : Intersection of Herrin Street at North 13th Street



prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

The Intersection of Herrin Street and 13th Street

Introduction

The Herrin Street and 13th Street intersection is located within the City of Herrin, Illinois. The intersection is an unsignalized all-way stop. The intersection includes stop signs as well as an overhead single red flashing beacon for each approach. **Figure 1** shows the location of the intersection.

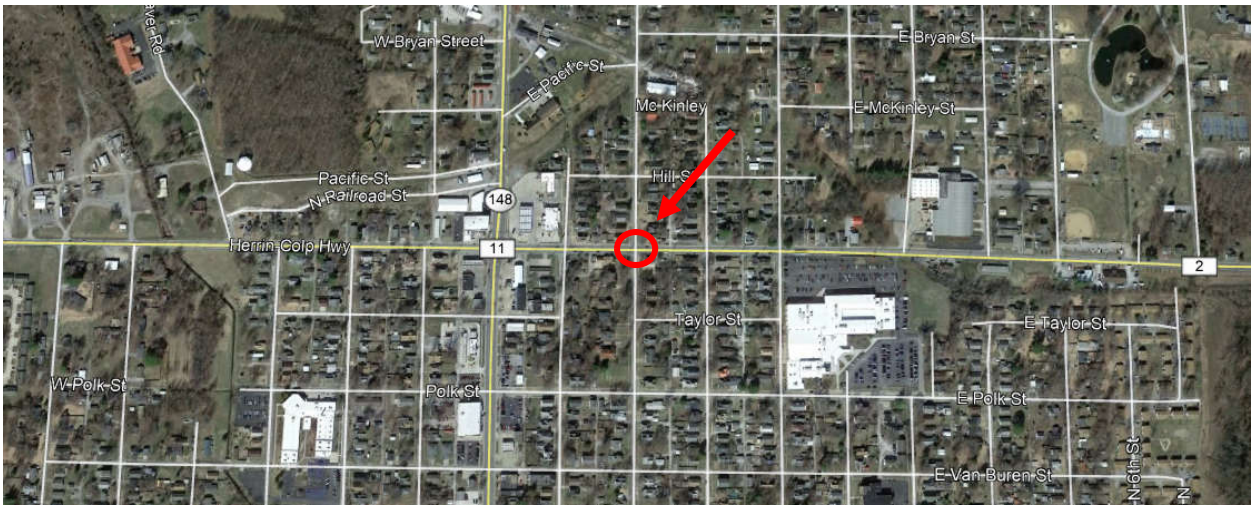


Figure 1: Study Area

Existing Conditions

Figure 2 and **3** includes a plan view and a street view of intersection. The intersection is a four-leg intersection generally at 90-degrees, as shown in **Figure 2**. Herrin Street consists of a three-lane cross section (one-lane in each direction plus a two-way left-turn lane). 13th Street is approximately 18-feet wide (9-foot lanes each direction) and has no pavement markings. Sidewalks are provided along the north side of Herrin Street and on both sides of 13th Street, but crosswalks are not marked across any legs of the intersection.

The adjacent land use is residential properties. A hospital is located 0.7 miles south of the intersection on 13th Street. There are hospital signs on Herrin Street including an arrow indicating the direction of the hospital and can be seen in **Figure 3**. Herrin High School is located about 700 feet east of the intersection. Herrin Street has a posted speed limit of 30 mph and 13th Street has a posted speed limit of 25 mph. Stop ahead warning signs are not provided.

Figure 2: The Intersection of Herrin Street and 13th Street (Plan View)

Figure 3: The Intersection of Herrin Street and 13th Street (Street View)

Safety Analysis

There was a total of 20 crashes from 2014 to 2018 at the intersection. The frequency of crashes by year is shown in **Figure 4**. The majority of crashes were recorded in 2015 and 2017, while the other years had few crashes (1 to 3 per year). The average number of crashes is four crashes per year.

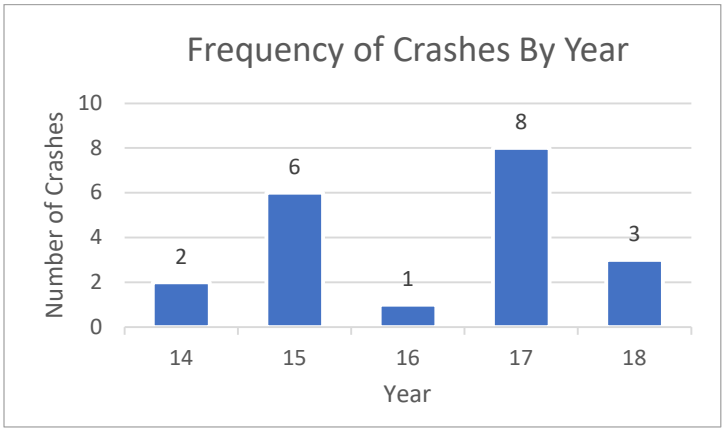


Figure 4: Frequency of Crashes by Year

Figure 5 displays the frequency of crashes by type. About 65 percent of crashes are angle crashes. The other 35 percent are turning crashes, read ends, and sideswipe crashes.

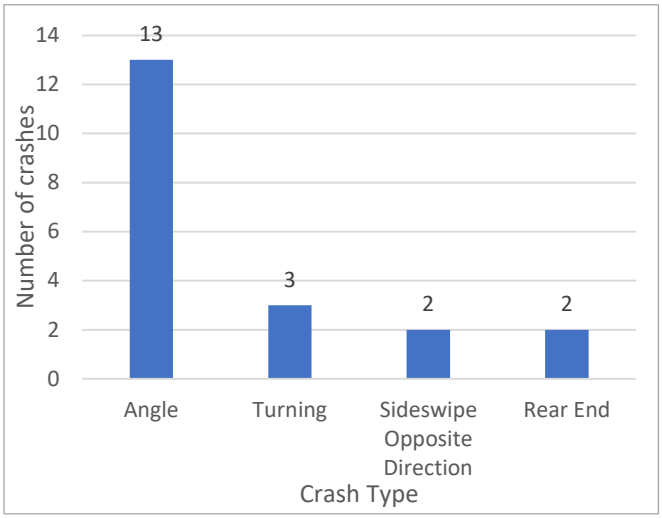


Figure 5: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 6**. Most of the crashes are property damage only crashes at 70 percent. The fatal crash was angle crash, and the A-injury and B-injury are turning crashes.

The fatal crash involved a northbound vehicle on 13th Street fleeing from police, disobeying a stop sign, and crashing into a vehicle crossing Herrin Road.

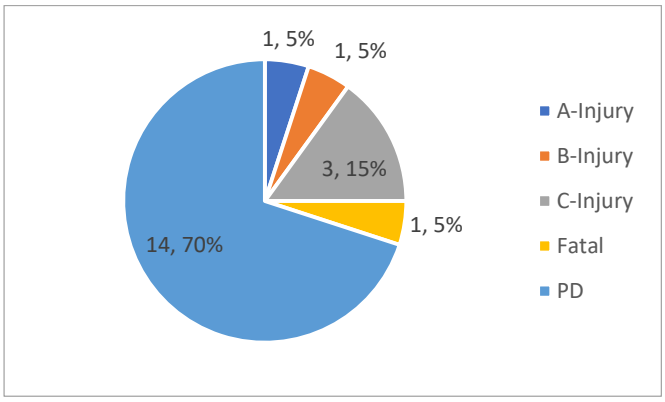


Figure 6: Frequency of Crashes by Severity

Figure 7 shows the frequency of crashes by direction and crash type. The westbound direction had the highest number of crashes overall but included only two angle crashes. The southbound direction was the second highest direction and included all angle crashes. There are angle crashes in each direction.

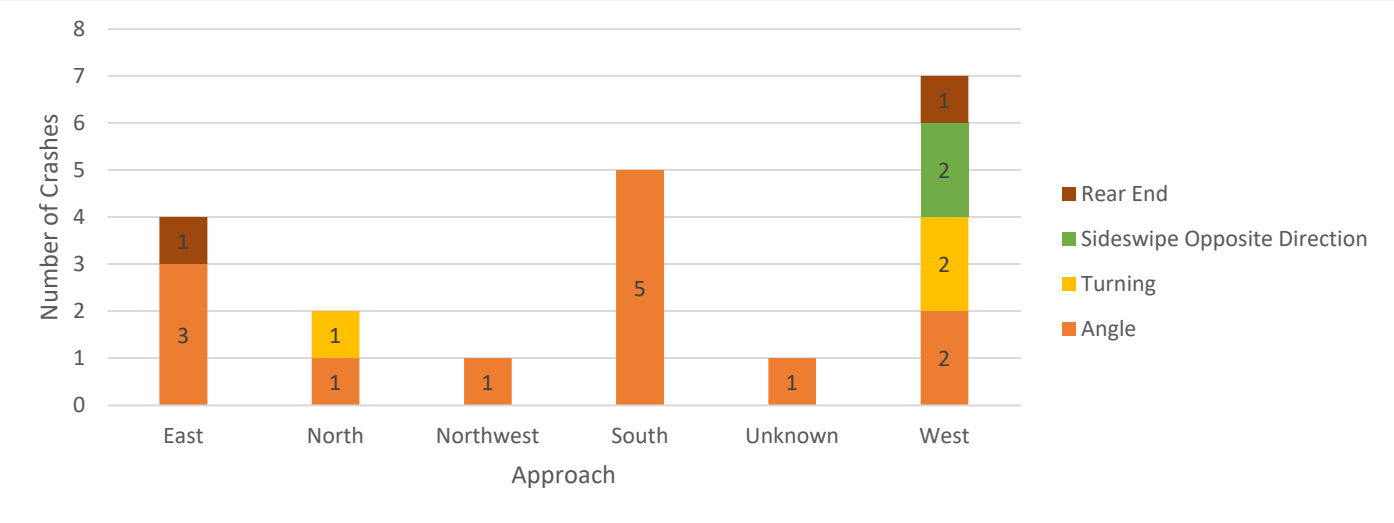


Figure 7: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown **Figure 8**. The frequency of crashes is distributed evenly throughout the day.

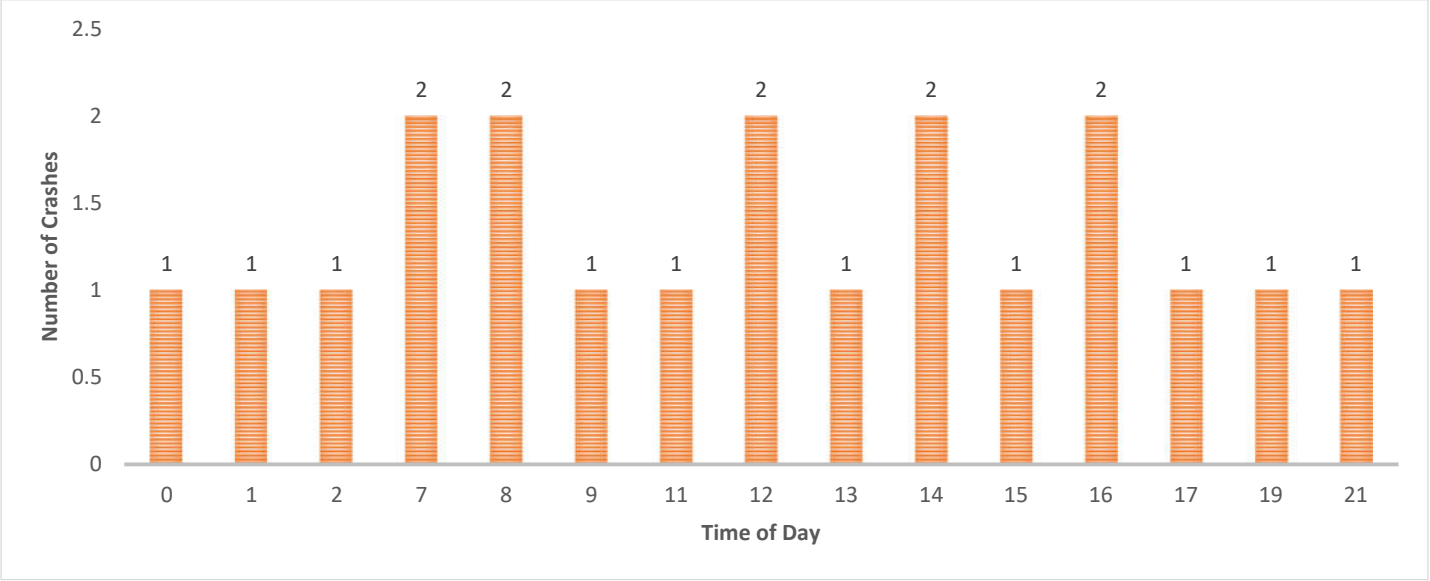


Figure 8: Frequency of Crashes by Hour

Figure 9 shows the frequency of crashes by weather. About 85 percent of crashes occurred in clear weather. All the injury crashes were in clear weather conditions.

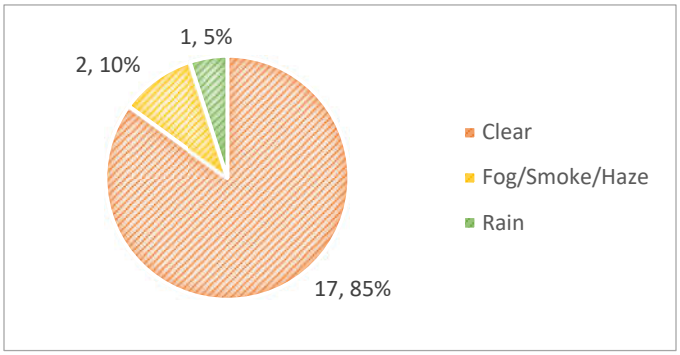


Figure 9: Frequency of Crashes by Weather

Figure 10 shows the frequency of crashes by lighting. Most of the crashes occurred in the daylight (70%). About half the fatal/injury crashes occurred in the daylight and half in dark-lighted conditions.

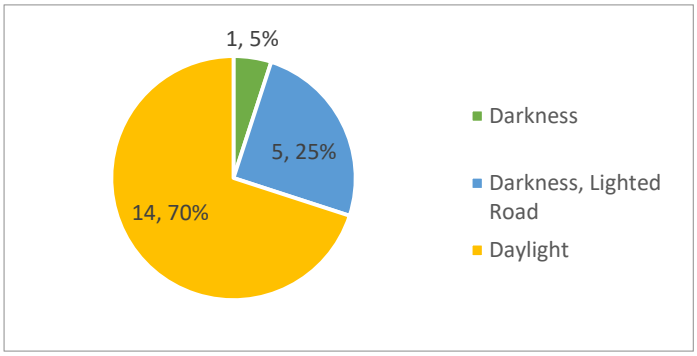


Figure 10: Frequency of Crashes by Lighting

Figure 11 shows the frequency of crashes by month. February had the highest number of crashes at five crashes, followed by December with four crashes.

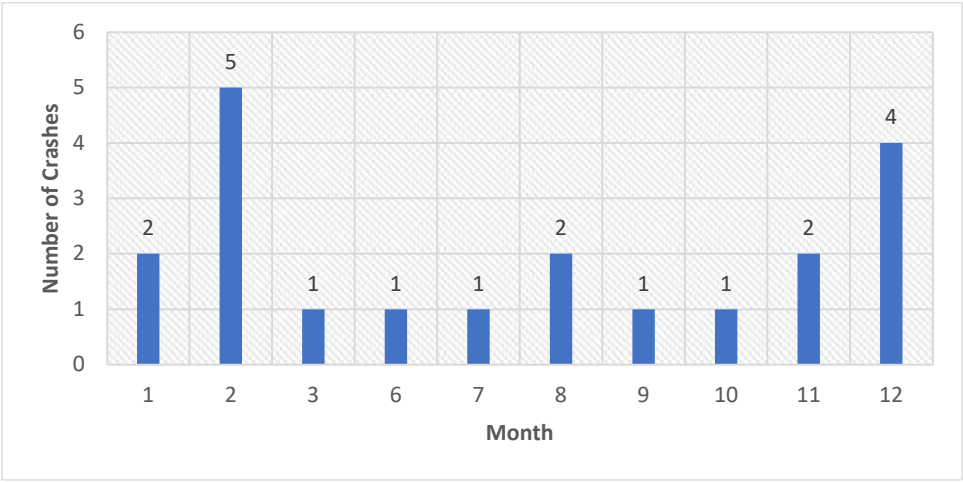


Figure 11: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures

Areas of Concern

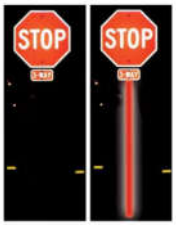
Herrin Road and 13th Street is an all-way stop intersection with a red flashing beacon overhead, in the middle of the intersection. Angle crashes are the most common type of crash, making up 65% of total crashes. There are no stop ahead warning signs in advance of the intersection or stop bars painted at the intersection.

Countermeasures

It is recommended to repaint the pavement markings on all approaches and provide stop bars at the intersection to provide visual cues leading up to the all-way stop. The markings would include crosswalks, stop bars, and lane lines. High visibility pavement markings could be used to provide better visibility of markings to drivers.

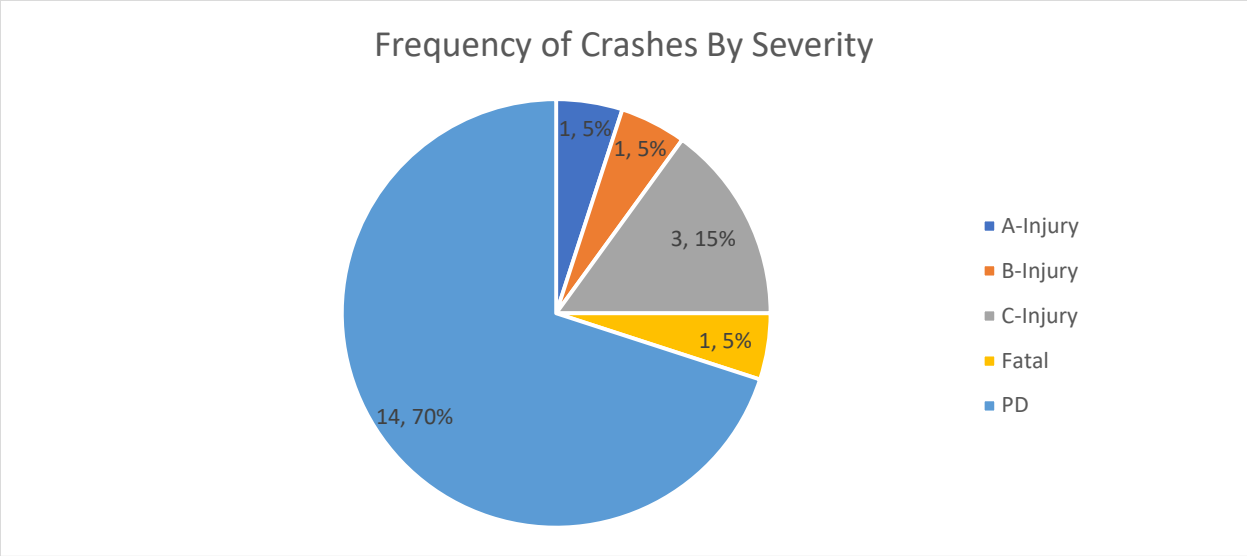
Installation of advance stop ahead warning signs (MUTCD W3-1) would provide advance notification to drivers regarding the stop condition. Another low-cost option is to install retroreflective strips on sign posts for the stop signs as well as any new advance warning device sign assembly installed as a part of any future project.

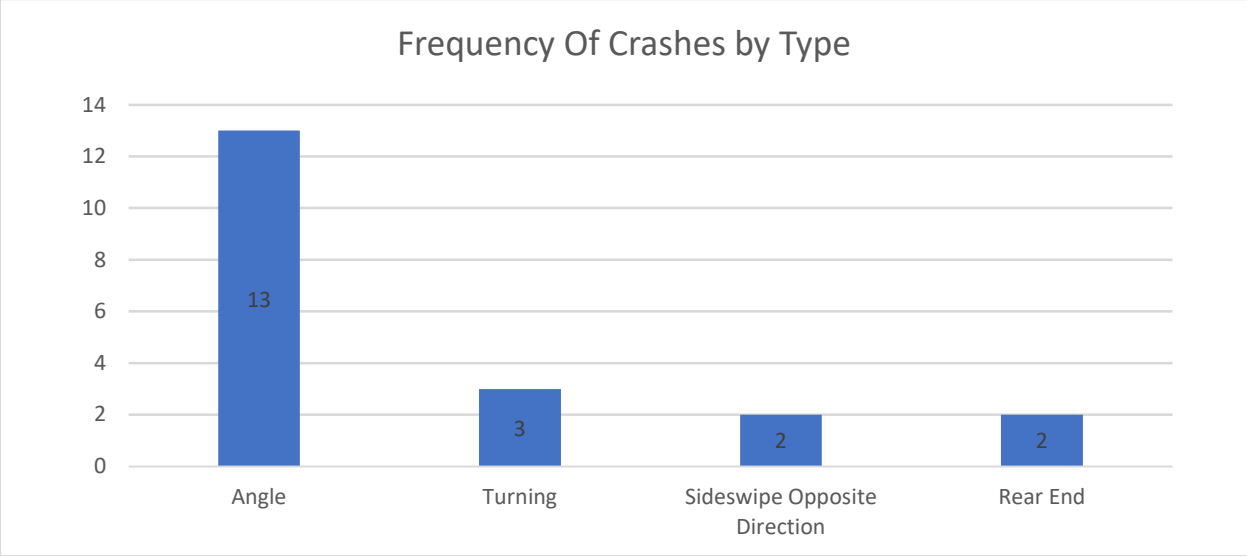

W3-1

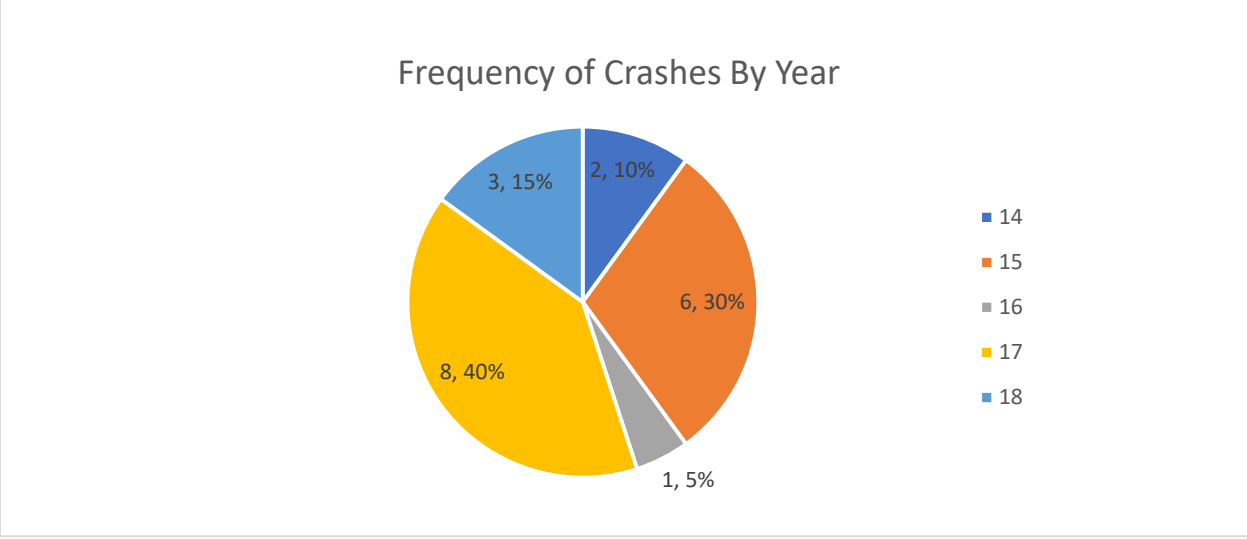


A mid-cost safety improvement could be to replace the existing stop signs with LED flashing stop signs on all approaches to get drivers to take notice of the All-Way stop condition. Consideration could also be given to adding a second stop sign on the left-side of the road to double up on the stop signs. However, the existing sidewalks and pedestrian facilities on many of the quadrants would likely make doubling up stop signs a difficult task, since there appears to be limited space in the right-of-way.

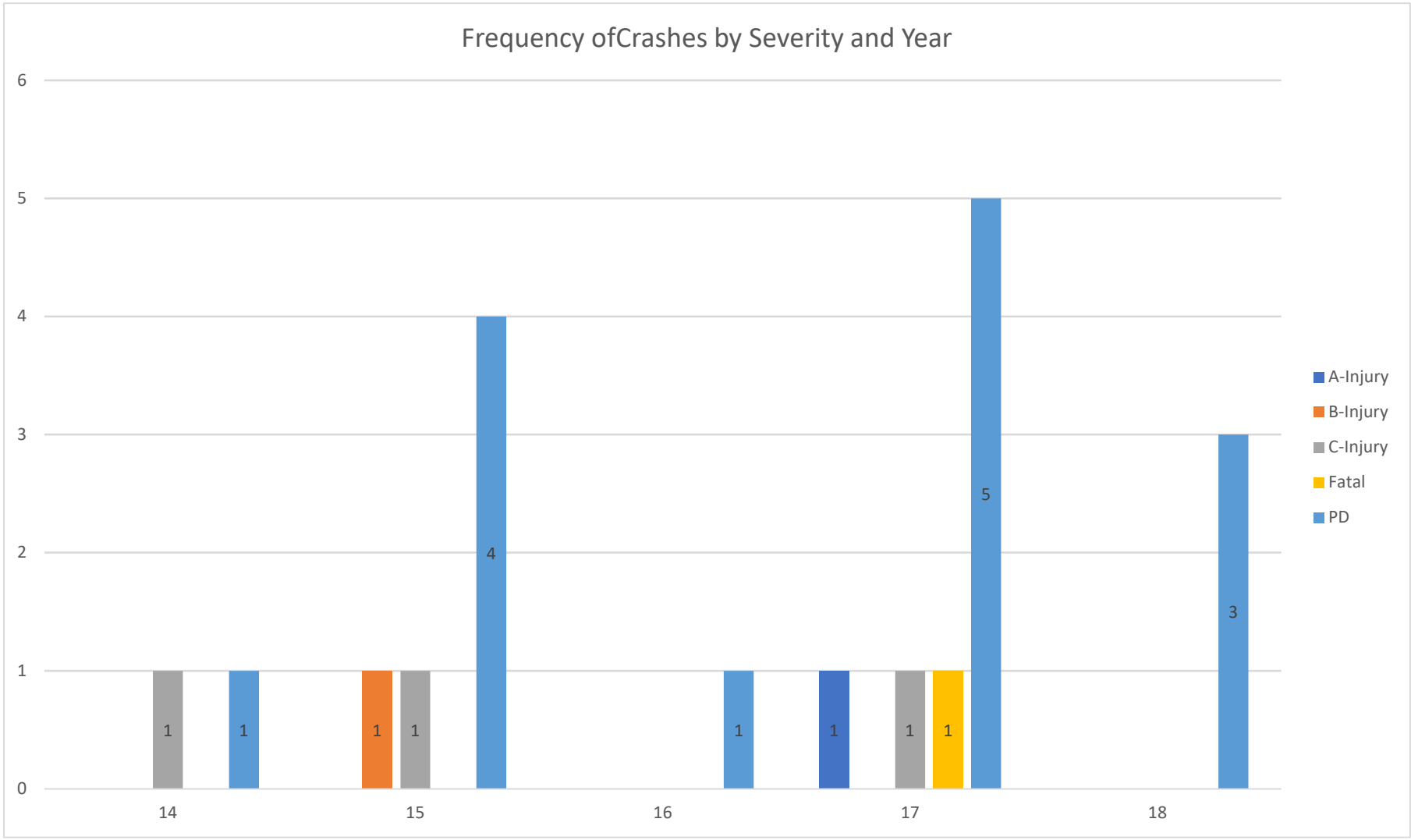
Intersection of Herrin Street and 13th Street (2014-2018)



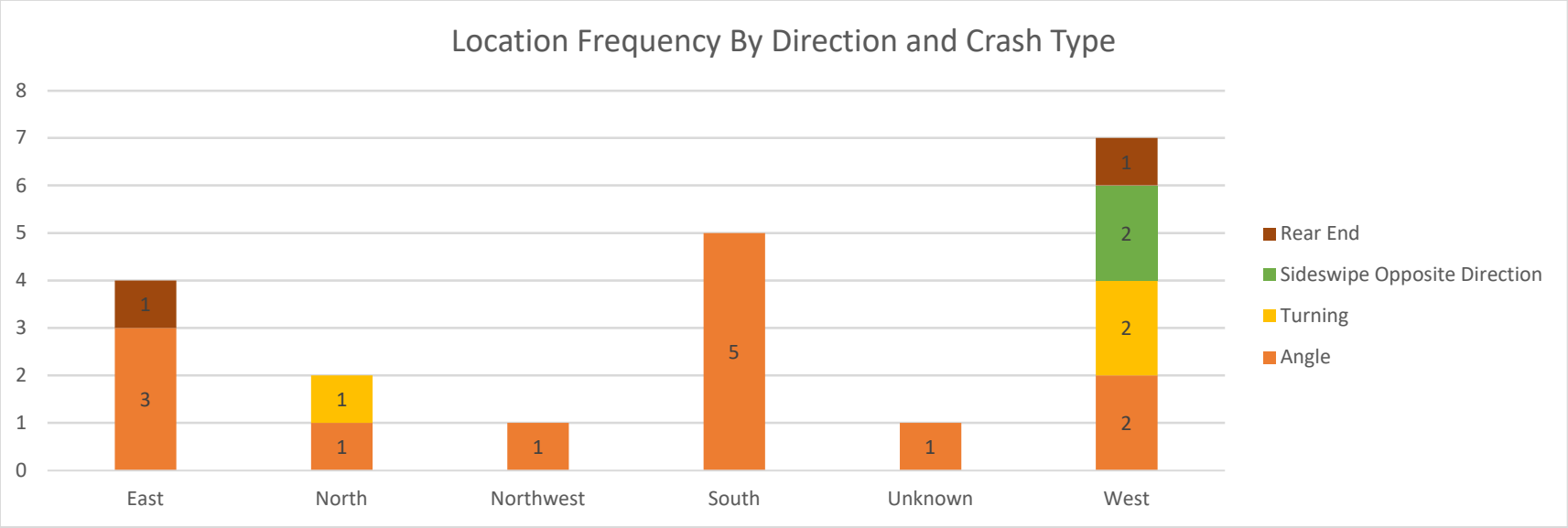


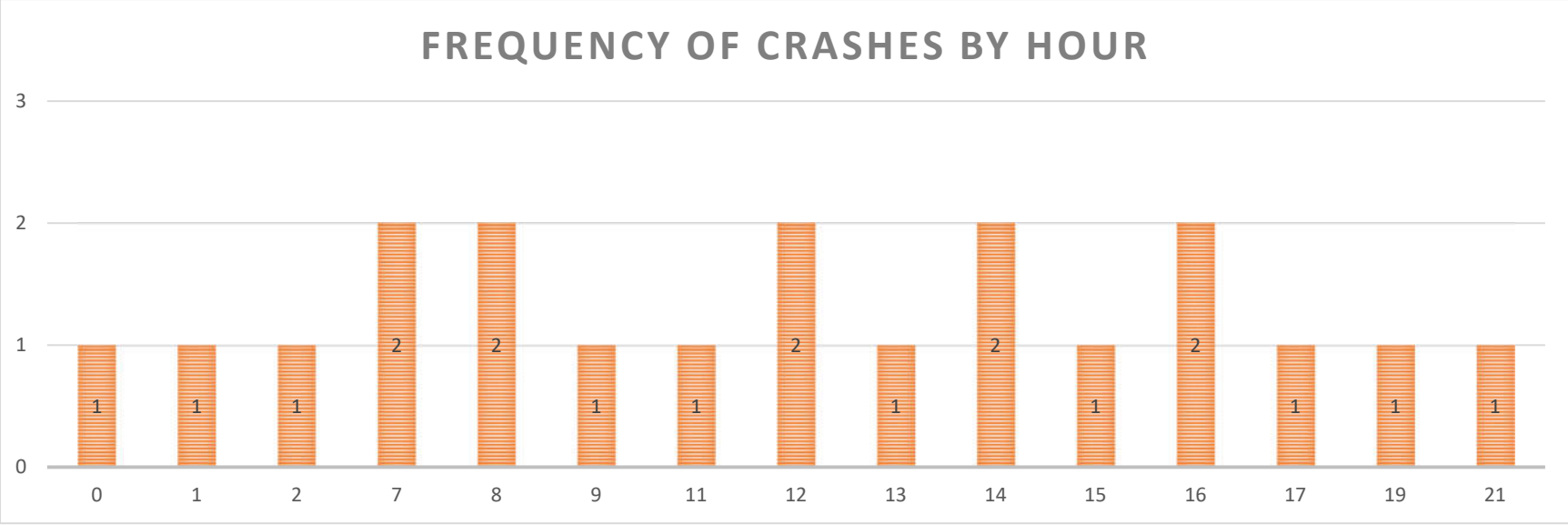


Intersection of Herrin Street and 13th Street (2014-2018)

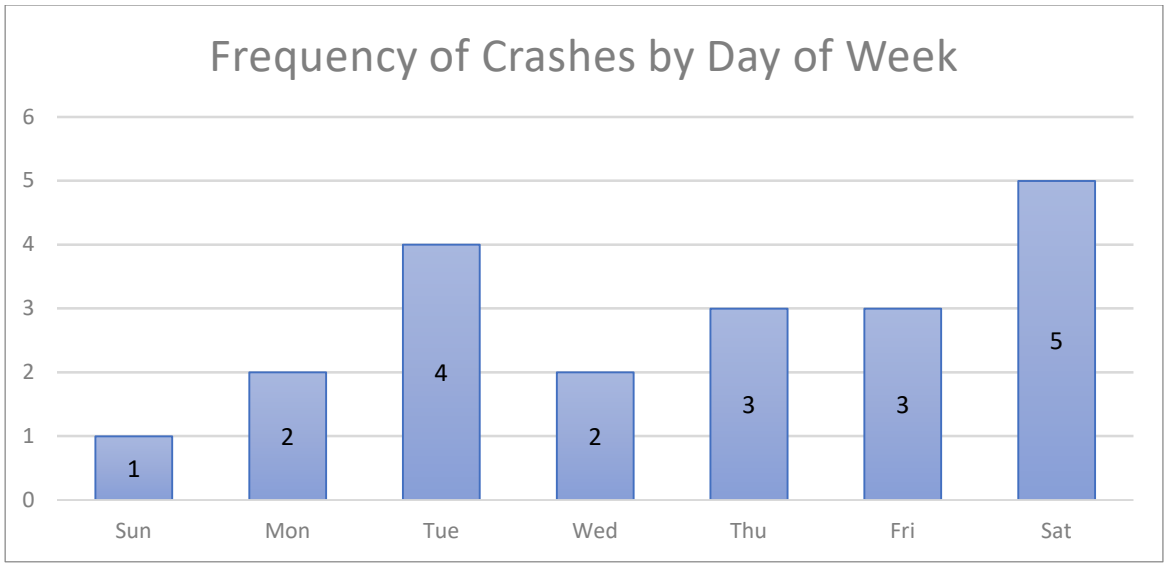


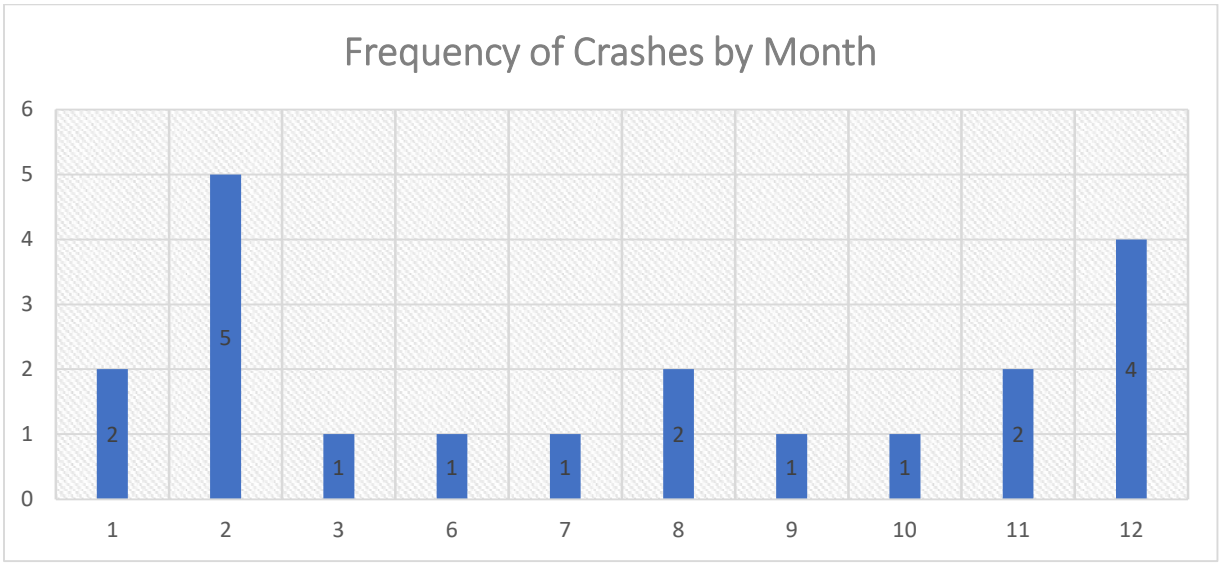
Intersection of Herrin Street and 13th Street (2014-2018)

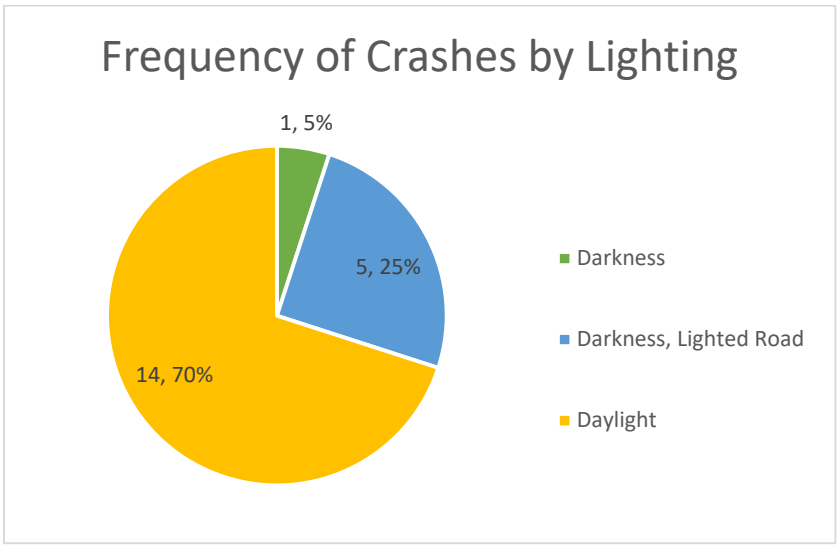




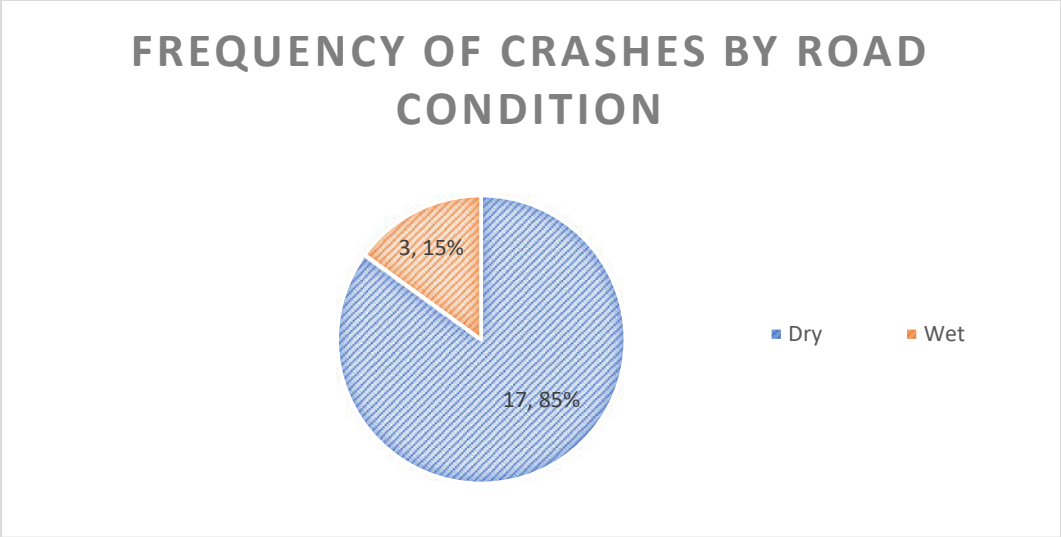
Intersection of Herrin Street and 13th Street (2014-2018)

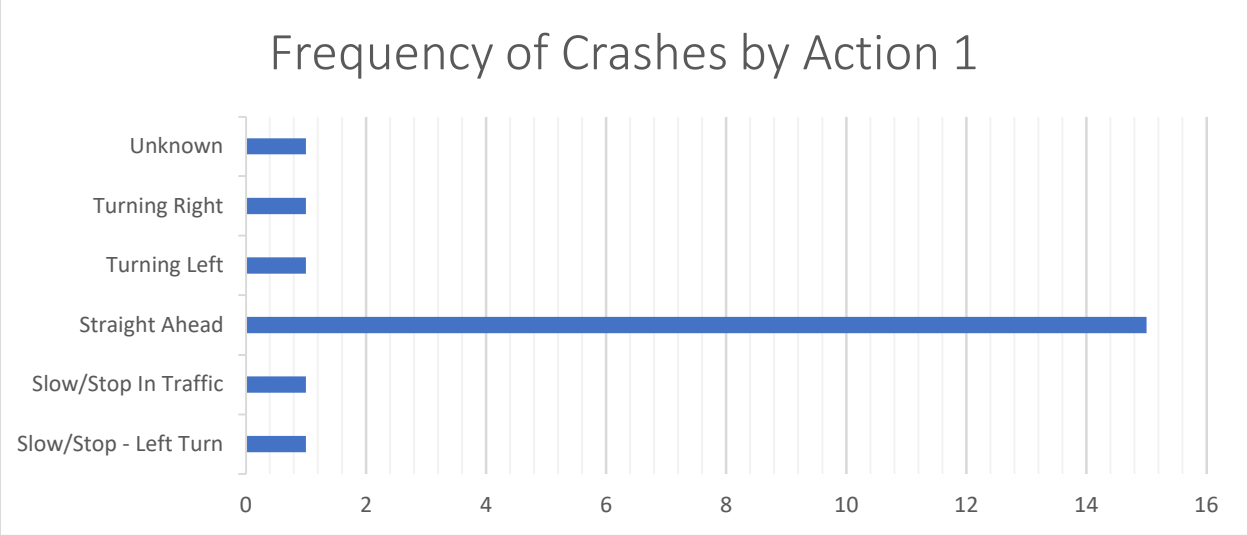


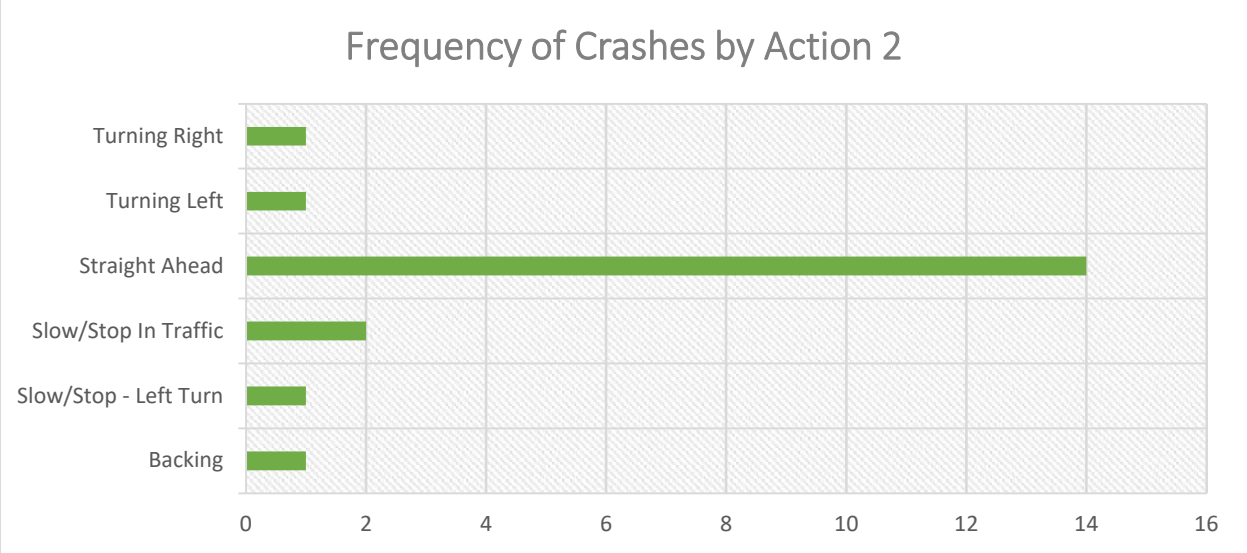




Intersection of Herrin Street and 13th Street (2014-2018)







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2.014E+11	14	6	20	16	Fri	3	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	C-Injury
2.014E+11	14	8	7	8	Thu	2	0	0	Sideswipe Opposite Direction	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	Pickup	West	Straight Ahead	Intersection	Other/Unknown	Pickup	East	Backing	Intersection	PD
2.01701E+11	17	12	30	1	Sat	2	1	2	Angle	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Herrin	Drug Impaired	SUV	North	Straight Ahead	Intersection	Drug Impaired	SUV	West	Straight Ahead	Intersection	Fatal
2.01701E+11	17	11	7	12	Tue	2	1	0	Angle	Clear	Daylight	Wet	Stop Sign/Flasher	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Tractor Without Semi-Trailer	West	Straight Ahead	On Pavement (Roadway)	C-Injury
2.01701E+11	17	2	28	8	Tue	3	0	0	Angle	Clear	Daylight	Wet	Stop Sign/Flasher	Herrin	Normal	SUV	East	Straight Ahead	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD
2.01701E+11	17	3	24	0	Fri	2	0	0	Angle	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD
2.01701E+11	17	7	12	9	Wed	2	1	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Other/Unknown	Pickup	West	Straight Ahead	Intersection	Normal	Passenger	Southwest	Turning Right	Intersection	A-Injury
2.01701E+11	17	9	7	7	Thu	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD
2.01701E+11	17	12	9	16	Sat	2	0	0	Rear End	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Other/Unknown	Unknown	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD
2.01701E+11	17	12	11	11	Mon	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	SUV	Northwest	Slow/Stop - Left Turn	On Pavement (Roadway)	Normal	Passenger	Northeast	Slow/Stop - Left Turn	Intersection	PD
2.01501E+11	15	1	16	14	Fri	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	SUV	West	Turning Left	On Pavement (Roadway)	Normal	SUV	West	Turning Left	On Pavement (Roadway)	PD
2.01501E+11	15	2	3	19	Tue	2	0	0	Angle	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Herrin	Other/Unknown	Unknown	Unknown	Unknown	Other	Normal	SUV	East	Straight Ahead	Other	PD
2.01501E+11	15	2	14	21	Sat	2	1	0	Angle	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	West	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	C-Injury
2.01501E+11	15	12	19	17	Sat	2	1	0	Turning	Clear	Darkness	Dry	Stop Sign/Flasher	Herrin	Normal	Pickup	North	Turning Right	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	B-Injury
2.01501E+11	15	8	15	14	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD
2.01501E+11	15	10	4	2	Sun	2	0	0	Sideswipe Opposite Direction	Fog/Smoke/Haze	Darkness, Lighted Road	Dry	No Passing	Herrin	Normal	SUV	West	Straight Ahead	On Pavement (Roadway)	Normal	Van/Mini-Van	East	Straight Ahead	On Pavement (Roadway)	PD
2.01601E+11	16	1	28	7	Thu	2	0	0	Rear End	Fog/Smoke/Haze	Daylight	Dry	No Passing	Herrin	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	East	Slow/Stop In Traffic	On Pavement (Roadway)	PD
2.01801E+11	18	11	27	13	Tue	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	PD
2.01801E+11	18	2	12	15	Mon	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Herrin	Normal	Passenger	South	Slow/Stop In Traffic	Intersection	Normal	Passenger	West	Slow/Stop In Traffic	Intersection	PD
2.01801E+11	18	2	21	12	Wed	2	0	0	Angle	Rain	Daylight	Wet	Stop Sign/Flasher	Herrin	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	PD

SIMPO SAFETY STUDY

Appendix : Intersection of Carbon Street at West Main Street

prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

The Intersection of South Carbon Street and West Main Street

(Local Priority 2013-2017)

Introduction

The intersection of South Carbon Street and West Main Street is located in Marion, Illinois. The intersection is a four-leg signalized intersection. The intersection's location is shown in **Figure 1**.

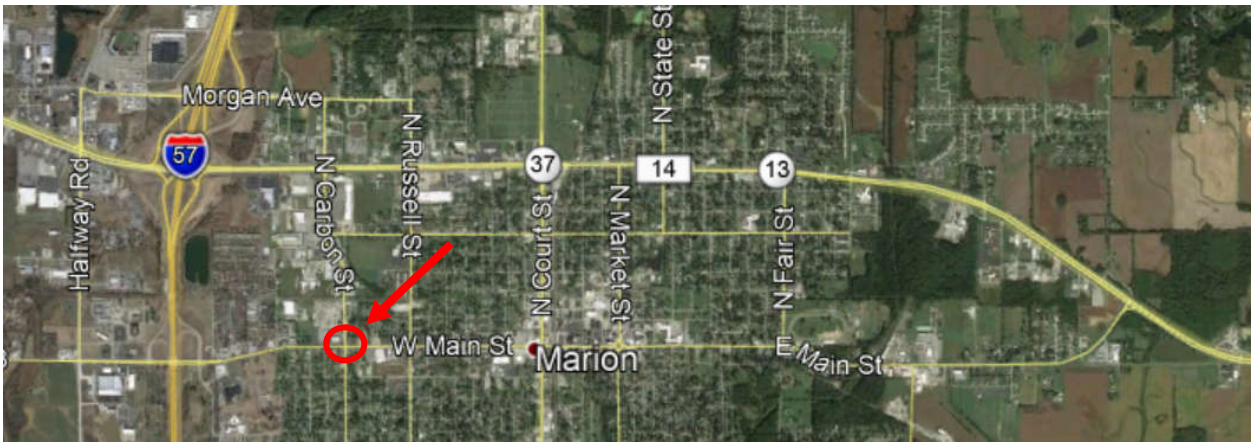


Figure 1: Study Area

Existing Conditions

An aerial view of the intersection is shown in the plan view, see **Figure 2**. The adjacent land uses are commercial and residential properties and the intersection is controlled by a traffic signal. South Carbon Street is a two-lane road that widens out at the intersection with Main Street to provide northbound and southbound left-turn lanes. Main Street generally consists of a three-lane cross section (one-lane in each direction plus a two-way left-turn lane). At the signalized intersection with South Carbon Street, Main Street is striped as a left-turn lane and shared through/right-turn lane.

Both South Carbon Street and Main Street have a posted speed limit of 30 miles per hour (mph). Approximately 280 feet east of the intersection, there is a 20-mph school zone when children are present along Main Street for Marion Junior High School. There are sidewalks along both South Carbon Street and Main Street. At the intersection, there are marked crosswalks on the east and west side of the intersection. It should be noted that radius improvements were made to the southwest quadrant of the intersection around 2018. **Figure 3** shows the street view of the intersection.

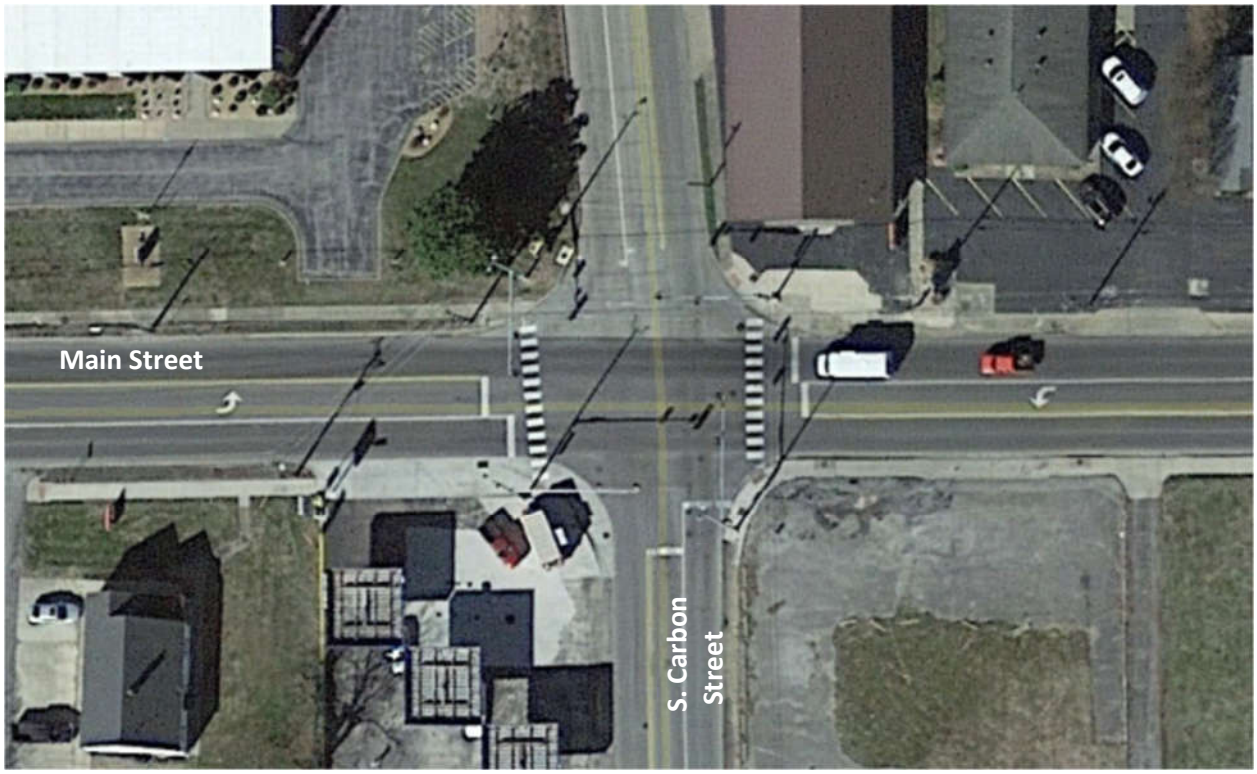


Figure 2: Intersection of South Carbon Street and West Main Street

Figure 3: Intersection of South Carbon Street and West Main Street (looking Northbound from South Carbon Street)

Safety Analysis

A total of 36 crashes occurred at the intersection from 2013 to 2017. The frequency of crashes by year is shown in **Figure 4**. The average number of crashes is 7.2 crashes per year. The year 2013 has the highest number of crashes. It should be noted 2013 to 2017 was evaluated since there were two A-injury crashes in those years. The crash data for 2014 to 2018 only included one A-injury.

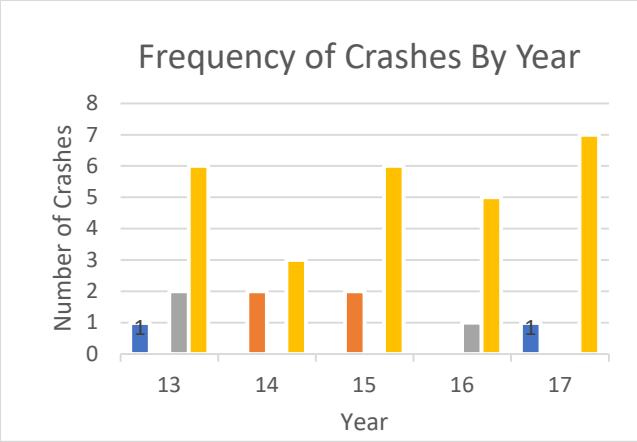


Figure 4: Frequency of Crashes by Year

Figure 5 shows the frequency of crashes by type. The majority of crashes are rear end crashes at about 61 percent. The combination of turning and angle crashes account for about 25 percent.

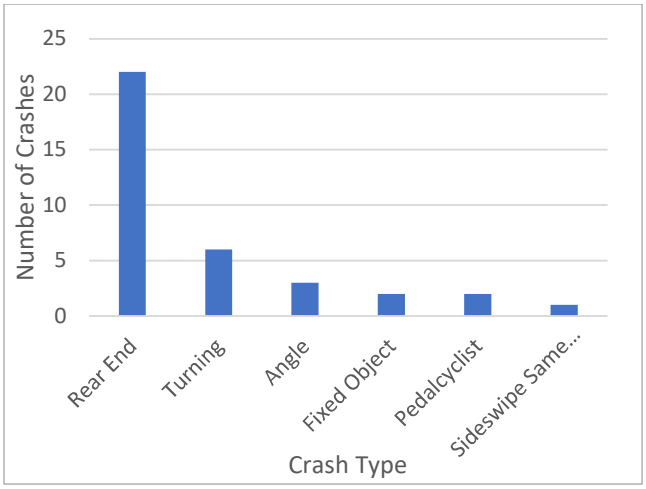


Figure 5: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 6**. The majority of crashes are property damage only at 75 percent. A-injury crashes consist of one (1) rear end and one (1) pedacycle (bike). B-injuries consist of three (3) rear ends and one (1) bicycle crash. C-injuries consist of two (2) rear ends and 1 turning crash.

As noted, radius improvements were completed in 2018. The crash data for 2018-2020 appears to be less severe with two (2) B-injuries (one pedacycle and one rear end) and one C-injury (sideswipe).

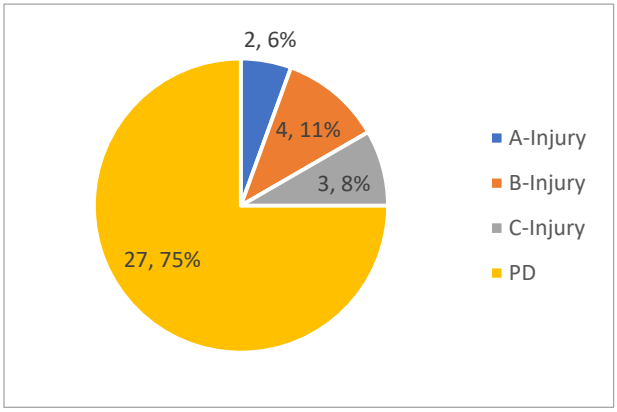


Figure 6: Frequency of Crashes by Severity

In **Figure 7**, the chart shows the frequency by direction and crash type. Most rear end crashes occurred in the eastbound direction with a few also occurring in the westbound, northbound and southbound directions.

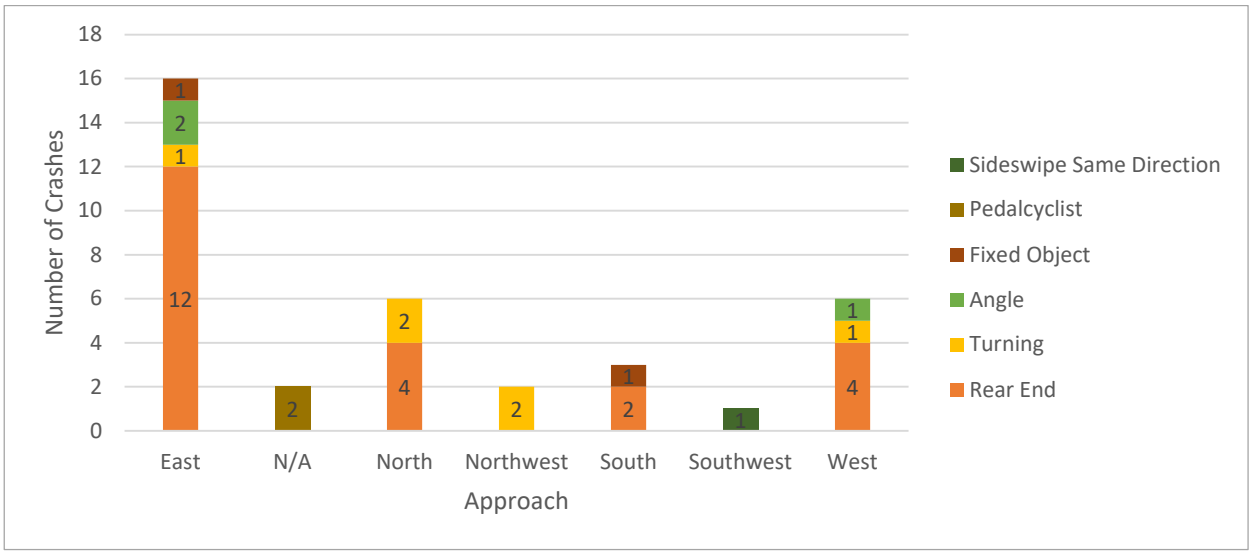


Figure 7: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 8** below. The crashes are heaviest from 4pm to 6pm and 12pm to 2 pm periods.

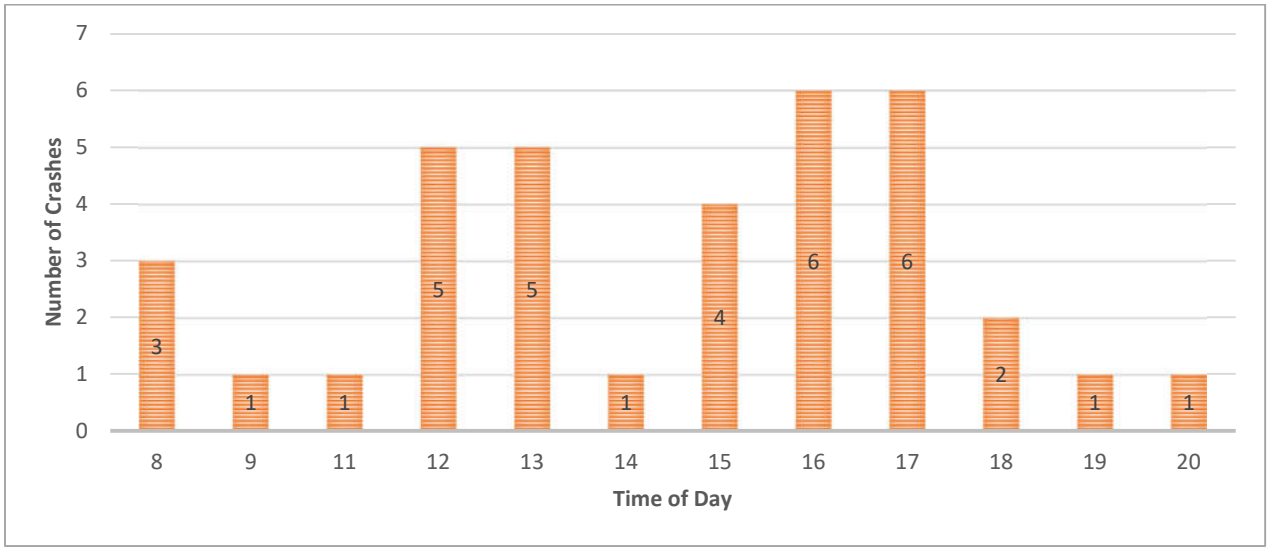


Figure 8: Frequency of Crashes by Hour

The frequency of weather crashes is shown in **Figure 9**. The majority of crashes occurred on clear days (80%)

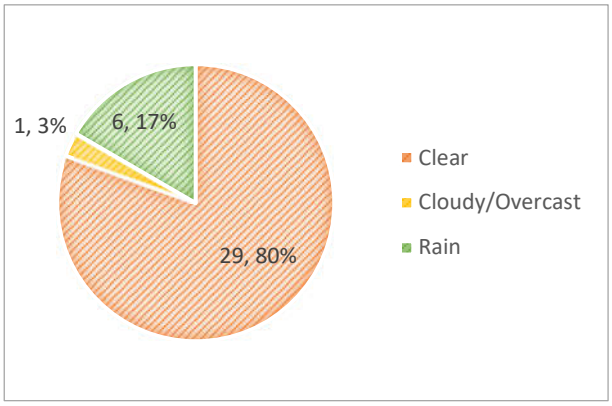


Figure 9: Frequency of Crashes by Weather

The frequency of crashes related to lighting conditions is shown in **Figure 10**. The majority of crashes occurred during daylight (81%).

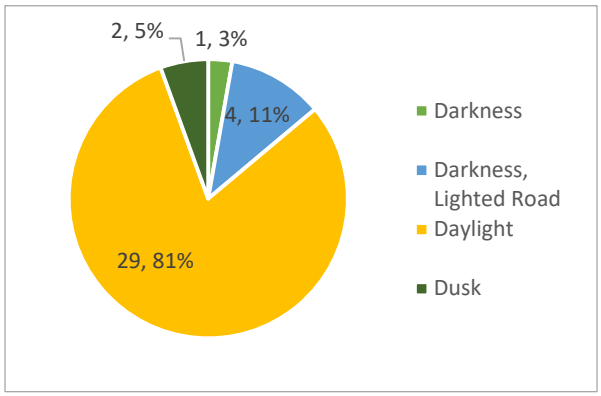


Figure 10: Frequency of Crashes by Lighting

The frequency of crashes related to the month is shown in **Figure 12** below. October and July have the highest number of crashes with eight and six crashes, respectively.

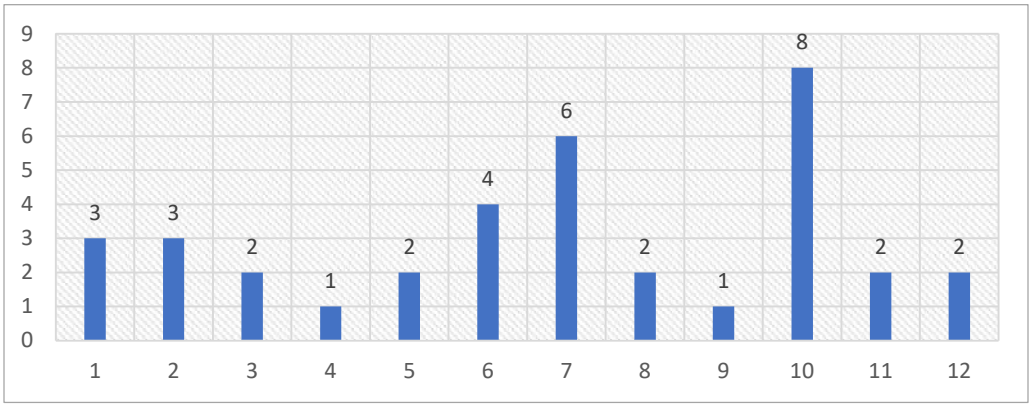


Figure 10: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures

Areas of Concern

S. Carbon Street and W. Main Street is a signalized intersection with separate left-turn lanes on all approaches and protected and permitted left-turn phasing. Two A-injury crashes occurred in the five-year period and there were two bike injury crashes at the intersection. Rear end crashes are the most common type of crash, specifically along the eastbound approach. 61 percent of the total crashes were rear end crashes.

As noted, radius improvements were completed in 2018 and resurfacing of Main Street was completed in 2018/2109. Further, a signal improvement project was also recently completed which added new vehicle detection as well as new traffic coordination plans. These recent improvements could have helped to reduce the occurrence of rear end crashes and/or the less severe 2018-2020 crash data.

The remaining area of concern include bicycle crashes at the intersection.

Countermeasures

To address concerns about bicycle and pedestrian safety, it is recommended to provide high visibility marking and signing. Restriping crosswalks, stop bars, and lane lines can provide better visibility of markings. Continental crosswalks are more noticeable to drivers than the standard transverse lines and may reduce pedestrian crashes. ADA accessible facilities are required where crosswalks are provided.

Due to the number of observed bike crashes, it is recommended that the City consider evaluating the Main Street corridor for bike facilities, which is beyond the scope of this study. Based on the crash data, the bike crashes at the intersection were westbound bikers on the south side of the intersection getting struck by northbound vehicles. In order to bring attention to pedestrians/bikes possibly at the corner, “Turning Vehicles Yield to pedestrians/bicycles” (MUTCD R10-15) signs could be installed on the mast arms to remind motorists to be on the lookout for pedestrians/bikes, see **Figure 11**.

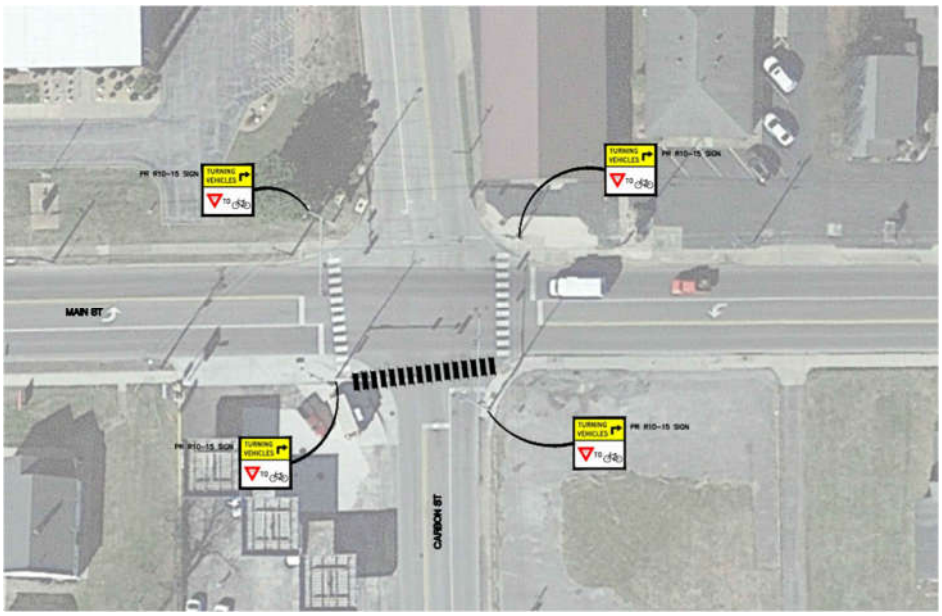
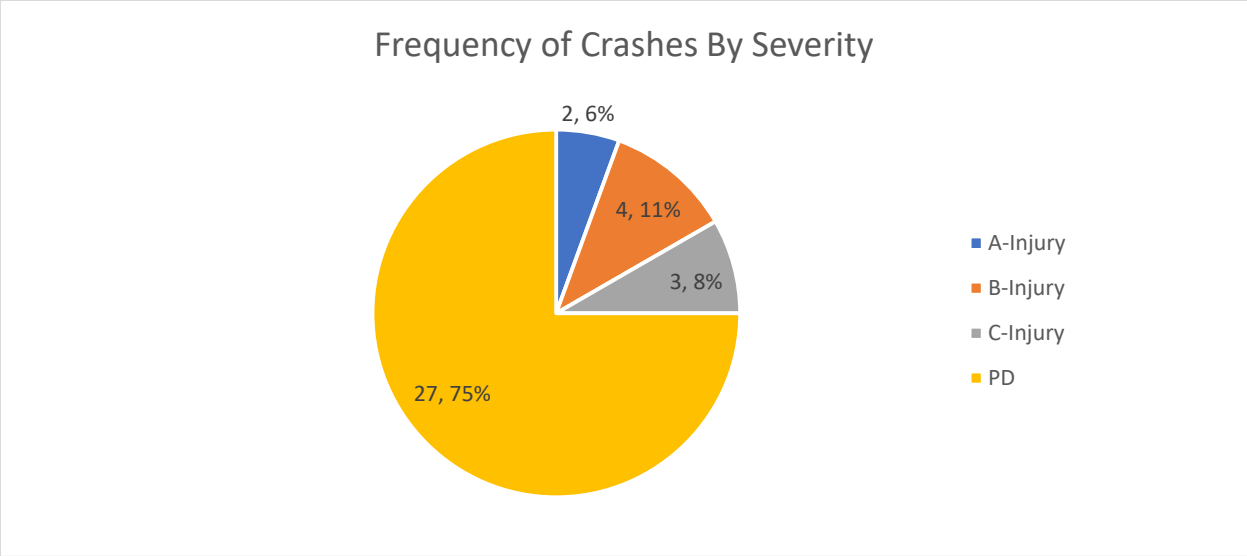


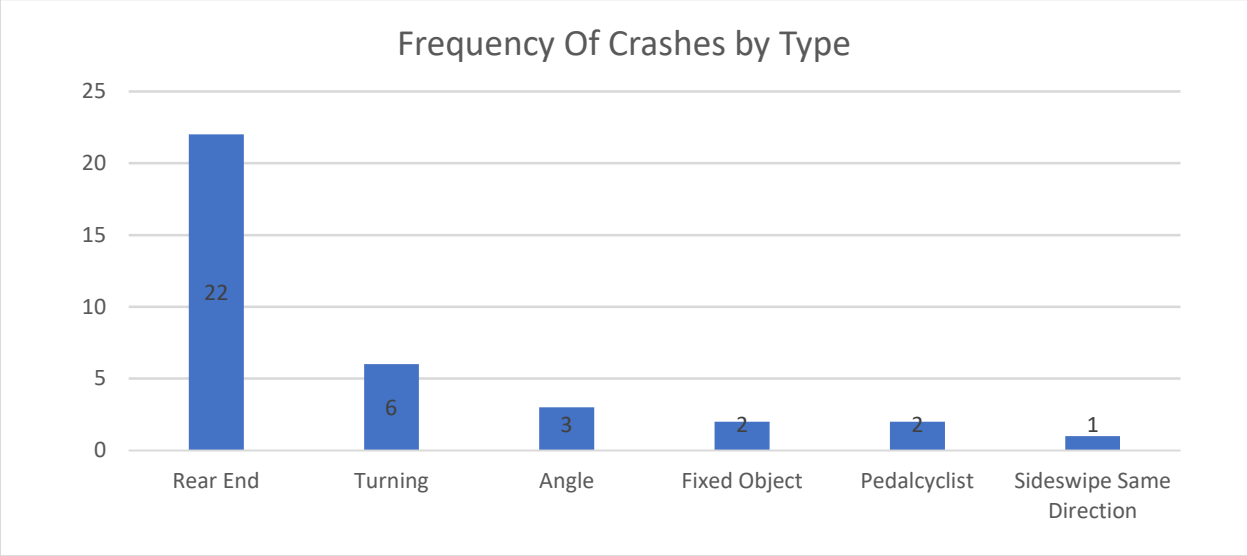
Figure 11: "Turning Vehicles Yield to Bicycles" signs on signals

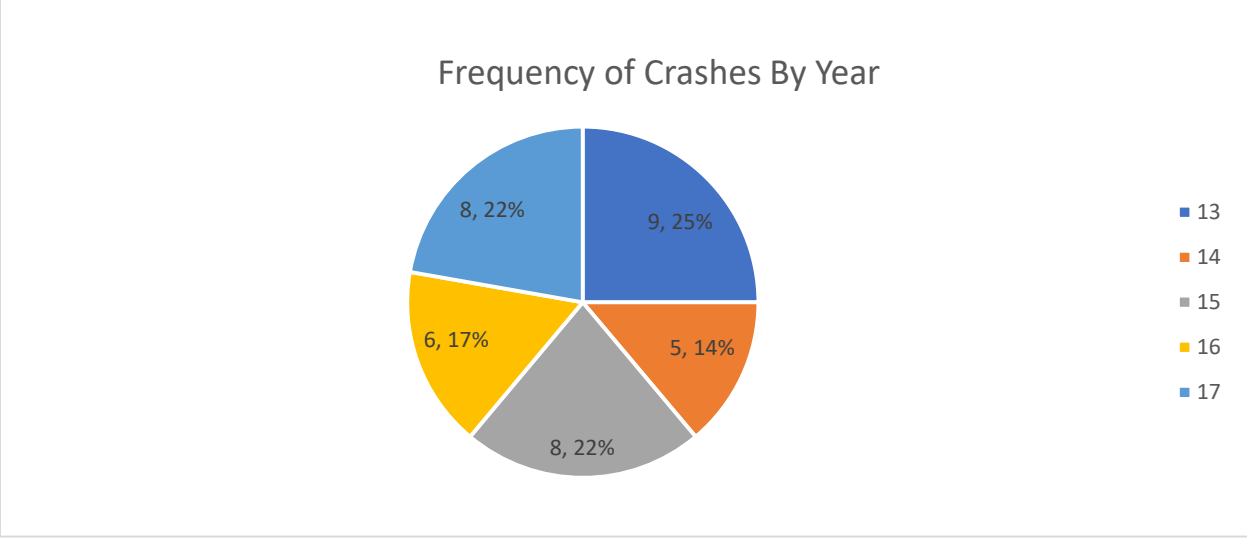
To aid in the crash mitigation at traffic signals, retroreflective back plates could be installed on the primary signal heads at the intersection to bring attention to the signa. According to the CMF Clearinghouse, retroreflective sheeting on back plates can reduce crashes by approximately 15 percent.

Additionally, a surface friction treatment such as High Friction Surface Treatment (HFST) could be considered for the eastbound approach of the intersection to reduce rear end crashes. However, the crash data does not indicate an overly large number of wet surface crashes (17%).

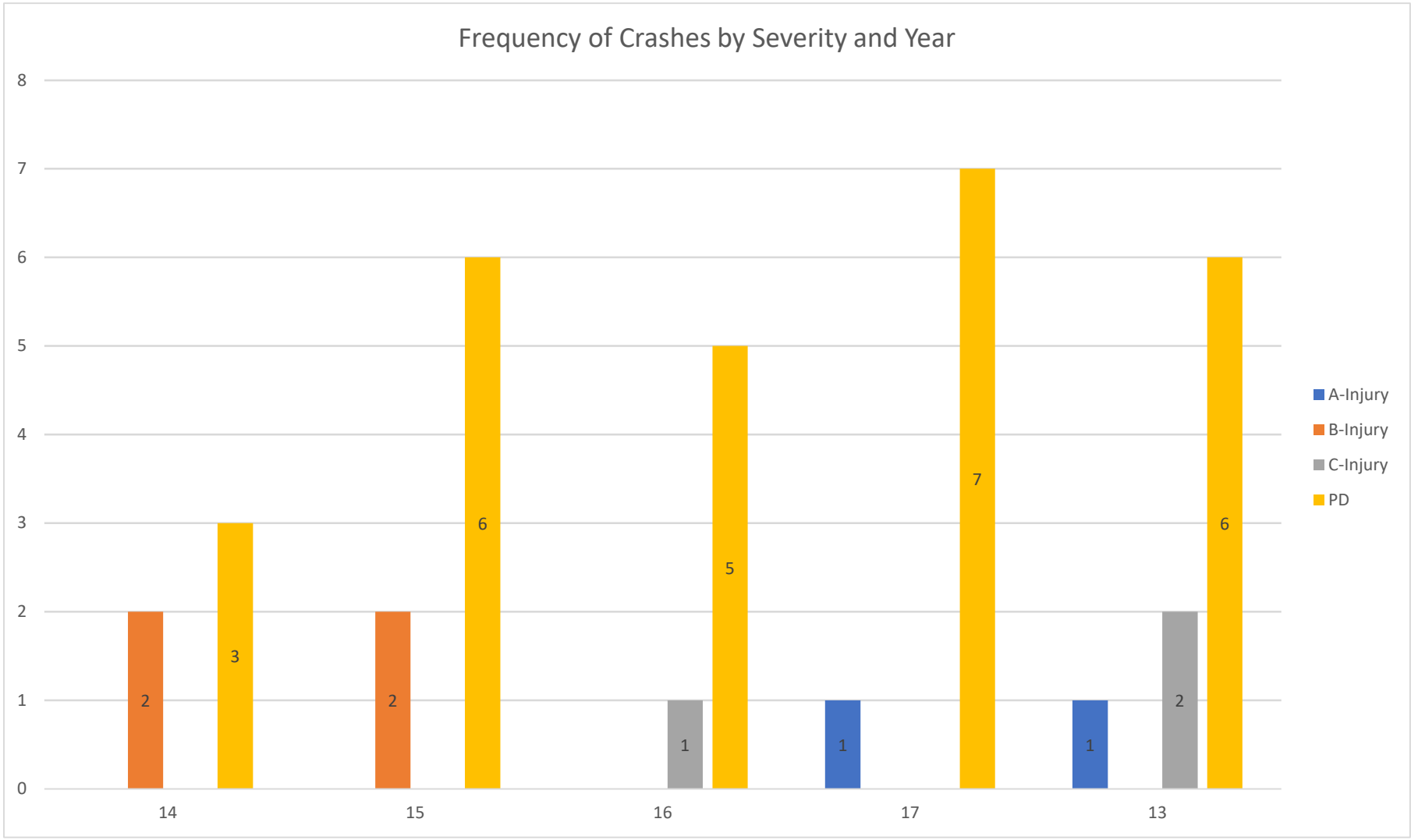
Intersection of Carbon Street and West Main Street (2013-2017)



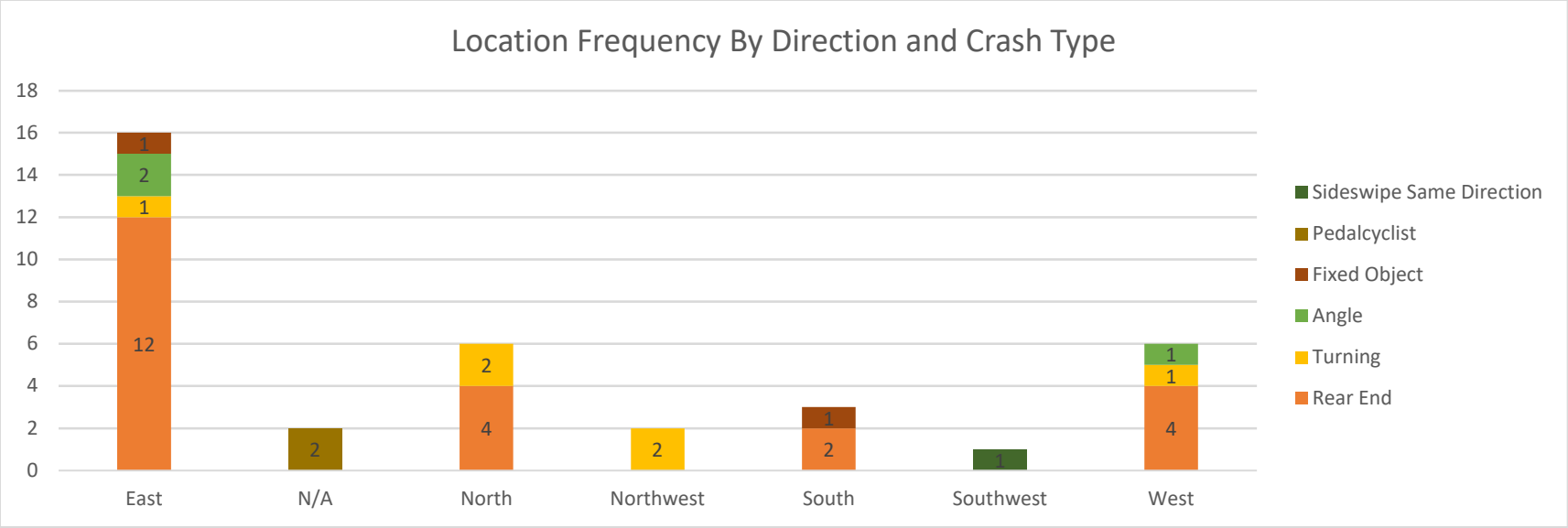


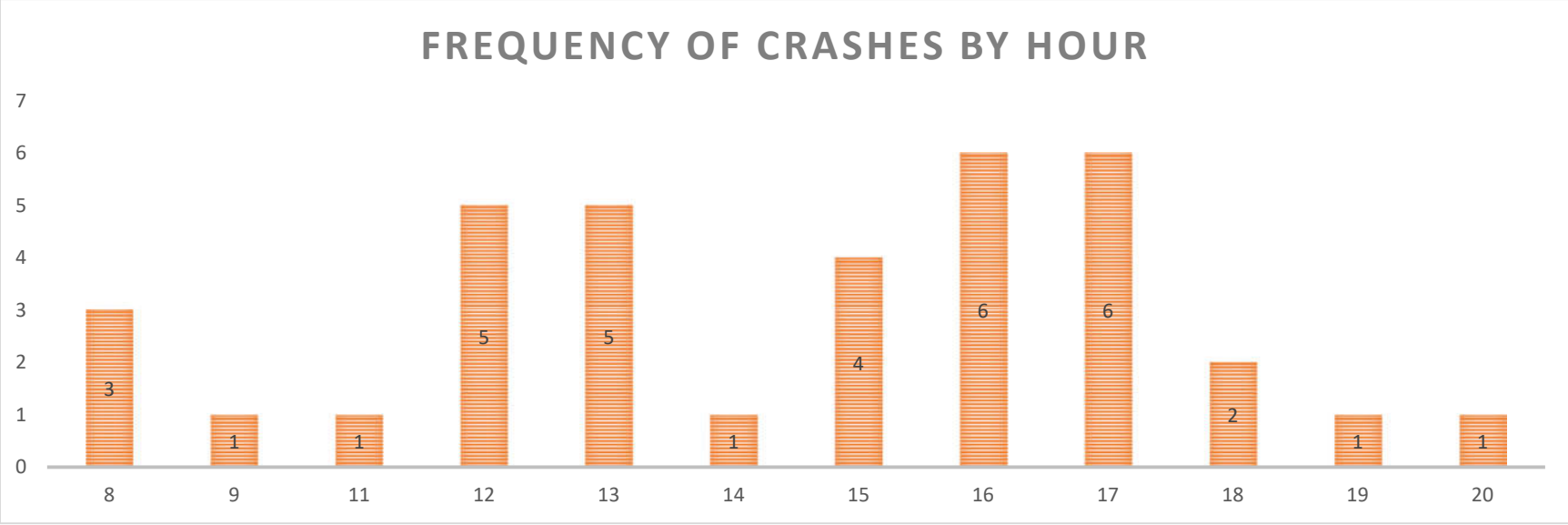


Intersection of Carbon Street and West Main Street (2013-2017)



Intersection of Carbon Street and West Main Street (2013-2017)





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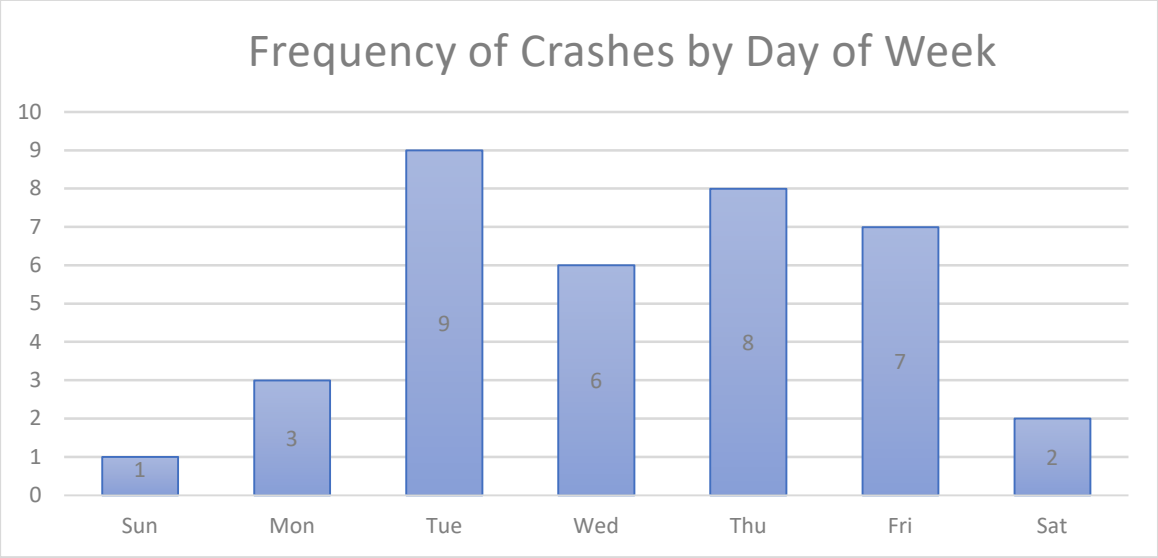

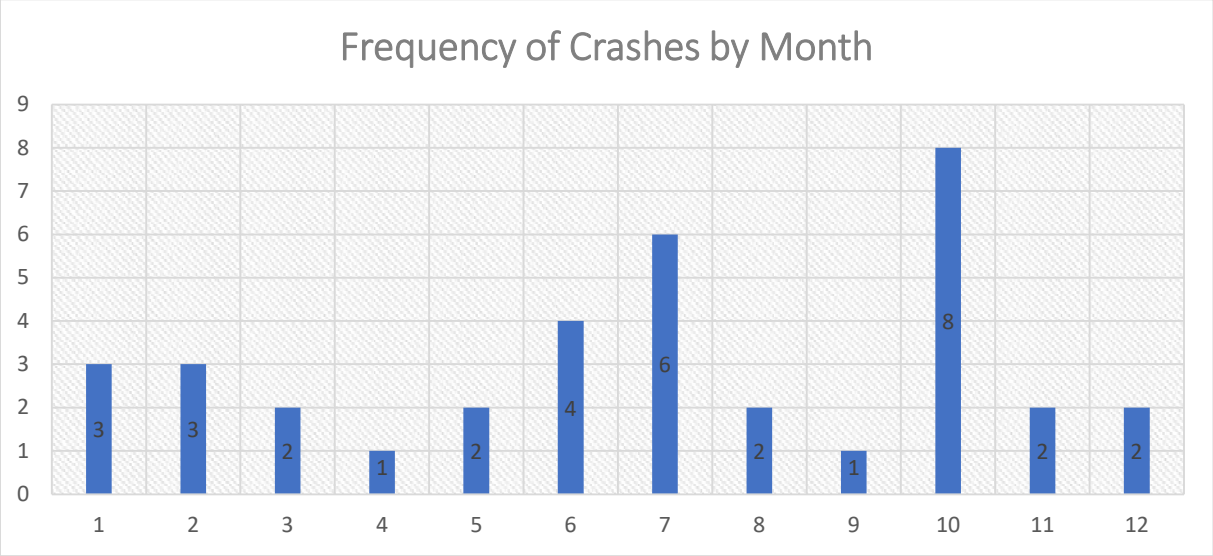

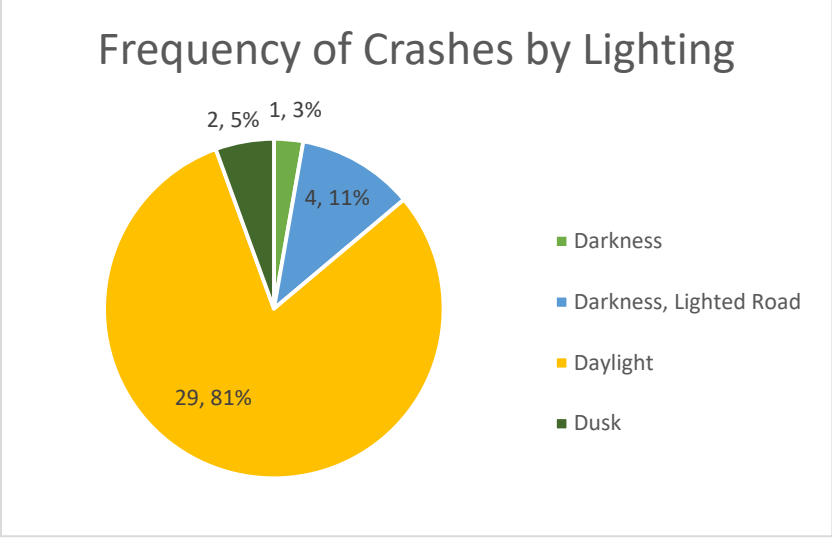

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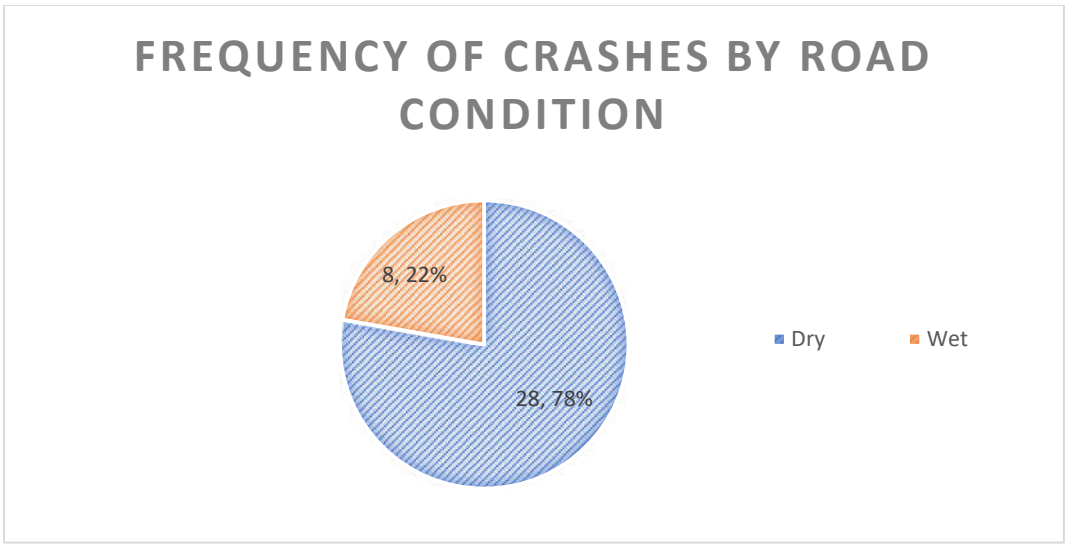
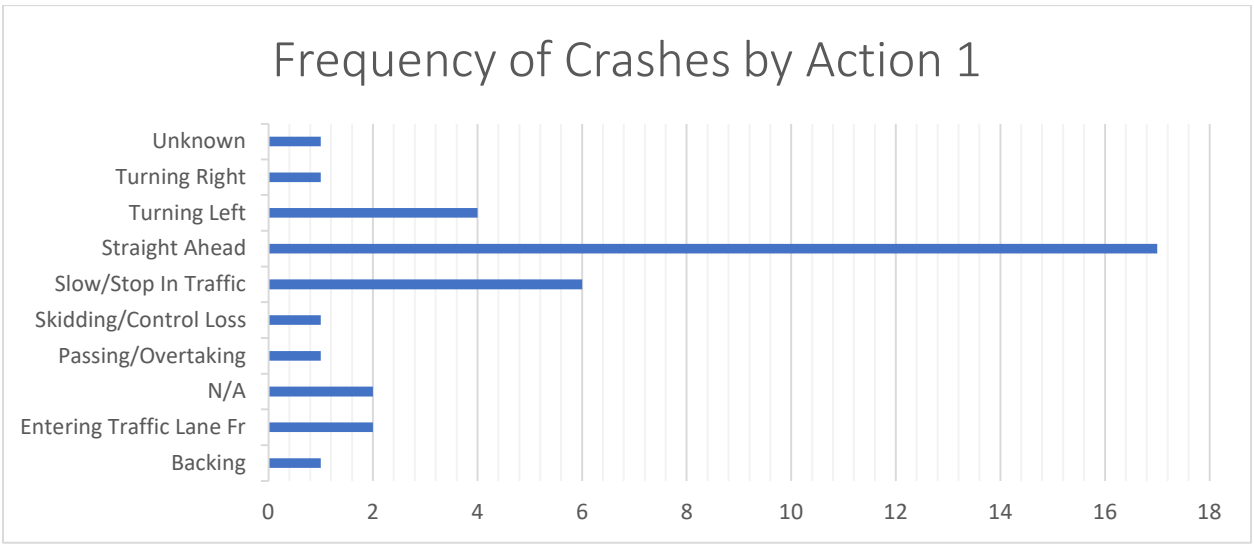
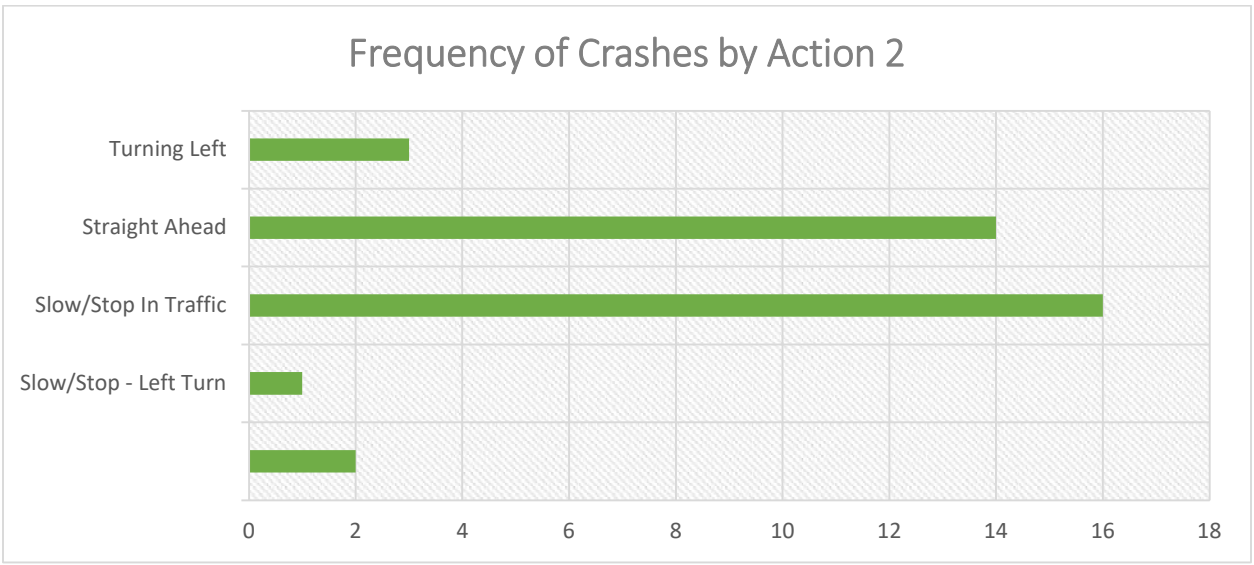


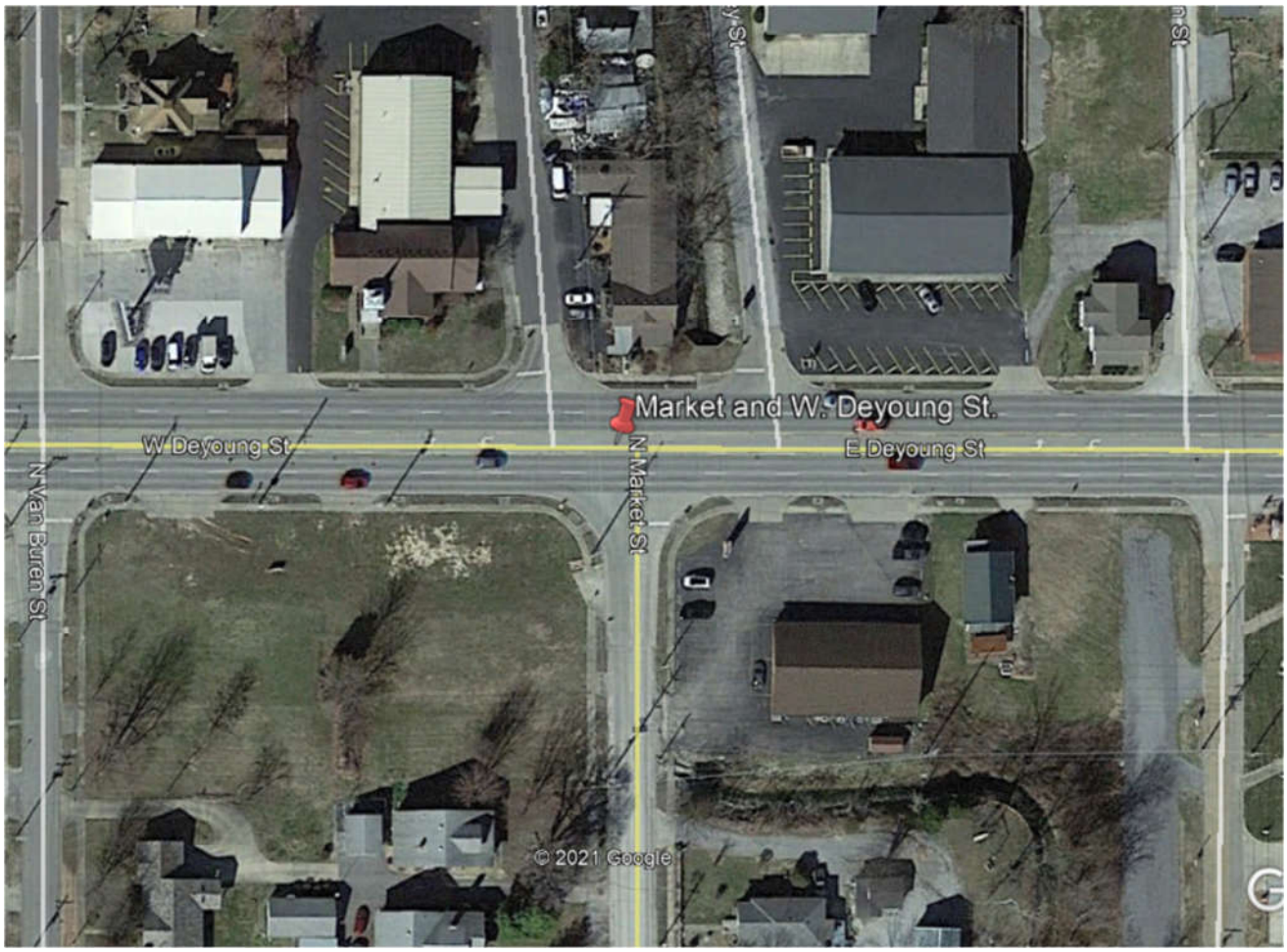




CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE
201301055736	13	1	23	13	Wed	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Pickup	Southwest	Passing/Overtaking	Intersection	Normal	SUV	South	Straight Ahead	Intersection	PD
201301094889	13	2	27	17	Wed	2	0	0	Rear End	Rain	Daylight	Wet	Lane Use Marking	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Van/Mini-Van	East	Straight Ahead	On Pavement (Roadway)	PD
201301097049	13	2	14	16	Thu	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Other/Unknown	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201301157118	13	8	8	12	Thu	4	3	0	Rear End	Rain	Darkness	Wet	Traffic Signal	Marion	Normal	Pickup	East	Slow/Stop In Traffic	Intersection	Normal	Van/Mini-Van	East	Slow/Stop In Traffic	Intersection	A-Injury
201301325317	13	9	11	16	Wed	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Van/Mini-Van	Northwest	Turning Left	Intersection	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD
201301350445	13	10	1	12	Tue	2	1	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Other/Unknown	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Slow/Stop In Traffic	On Pavement (Roadway)	C-Injury
201301362849	13	10	15	15	Tue	2	0	0	Rear End	Rain	Daylight	Wet	Traffic Signal	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201301377339	13	10	31	18	Thu	2	1	0	Rear End	Rain	Darkness, Lighted Road	Wet	Traffic Signal	Marion	Normal	Passenger	East	Skidding/Control Loss	Intersection	Normal	Passenger	East	Slow/Stop In Traffic	Intersection	C-Injury
201301398952	13	11	22	14	Fri	2	0	0	Turning	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	North	Turning Left	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD
201400060837	14	2	18	8	Tue	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Truck Single Unit	North	Backing	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201400210149	14	4	9	8	Wed	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201400240270	14	5	27	8	Tue	3	2	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Other/Unknown	Passenger	South	Unknown	On Pavement (Roadway)	Normal	Van/Mini-Van	South	Slow/Stop In Traffic	On Pavement (Roadway)	B-Injury
201400248696	14	5	27	15	Tue	2	0	0	Turning	Rain	Daylight	Wet	Traffic Signal	Marion	Normal	Passenger	North	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	Passenger	North	Turning Left	On Pavement (Roadway)	PD
201400353626	14	7	11	12	Fri	2	1	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	B-Injury
201501117705	15	6	12	16	Fri	1	1	0	Pedalcyclist	Clear	Daylight	Dry	No Controls	Marion	N/A	N/A	N/A	N/A	N/A	Normal	Passenger	North	Straight Ahead	Other	B-Injury
201501119814	15	6	19	12	Fri	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	SUV	West	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	Van/Mini-Van	West	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201501124275	15	6	25	17	Thu	3	1	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Pickup	East	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	SUV	East	Slow/Stop In Traffic	On Pavement (Roadway)	B-Injury
201501144959	15	7	22	16	Wed	2	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201501222201	15	10	20	20	Tue	2	0	0	Rear End	Clear	Darkness, Lighted Road	Dry	Traffic Signal	Marion	Normal	SUV	East	Slow/Stop In Traffic	Intersection	Normal	Van/Mini-Van	East	Slow/Stop In Traffic	Intersection	PD
201501237844	15	1	29	13	Thu	3	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD
201501243050	15	11	10	13	Tue	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Pickup	East	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	PD
201501412780	15	3	6	16	Fri	2	0	0	Rear End	Clear	Daylight	Wet	Stop Sign/Flasher	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201601016006	16	1	8	17	Fri	2	0	0	Turning	Clear	Dusk	Dry	Traffic Signal	Marion	Other/Unknown	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Pickup	East	Turning Left	On Pavement (Roadway)	PD
201601072734	16	3	21	15	Mon	4	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201601125175	16	6	2	9	Thu	1	0	0	Fixed Object	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Other	East	Turning Right	Off Pavement - Right						PD
201601152331	16	7	5	15	Tue	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	Northeast	Turning Left	On Pavement (Roadway)	PD
201601235554	16	10	3	17	Mon	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	SUV	West	Entering Traffic Lane Fr	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD
201601314725	16	12	21	17	Wed	2	1	0	Turning	Clear	Darkness, Lighted Road	Dry	Traffic Signal	Marion	Other/Unknown	Tractor With Semi-Trailer	Northwest	Turning Left	Intersection	Normal	SUV	East	Slow/Stop - Left Turn	Intersection	C-Injury
201701166157	17	7	1	17	Sat	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	East	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	PD
201701168470	17	7	6	13	Thu	2	0	0	Rear End	Cloudy/Overcast	Daylight	Wet	No Controls	Marion	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	PD
201701178438	17	7	17	13	Mon	1	1	0	Pedalcyclist	Clear	Daylight	Dry	Traffic Signal	Marion	N/A	N/A	N/A	N/A	N/A	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	A-Injury
201701208198	17	8	15	16	Tue	5	0	0	Rear End	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	East	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	Passenger	East	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201701257018	17	10	1	11	Sun	1	0	0	Fixed Object	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	South	Straight Ahead	Intersection						PD
201701266982	17	10	12	19	Thu	2	0	0	Rear End	Clear	Dusk	Dry	Traffic Signal	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)	PD
201701283320	17	10	27	12	Fri	2	0	0	Rear End	Rain	Daylight	Wet	Traffic Signal	Marion	Normal	Pickup	North	Slow/Stop In Traffic	Intersection	Normal	Pickup	North	Slow/Stop In Traffic	Intersection	PD
201701356168	17	12	30	18	Sat	2	0	0	Rear End	Clear	Darkness, Lighted Road	Dry	No Controls	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD

SIMPO SAFETY STUDY

Appendix : Intersection of Deyoung Street at North Market Street



prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

The Intersection of Deyoung Street and Market Street

(Local location of Concern)

Introduction

The Deyoung Street and Market Street intersection is located in Marion in Williamson County. The intersection is an unsignalized intersection with stop signs on Market Street. Market Street on the north side of Deyoung is offset approximately 50 feet to the west. **Figure 1** shows the location of the intersection.

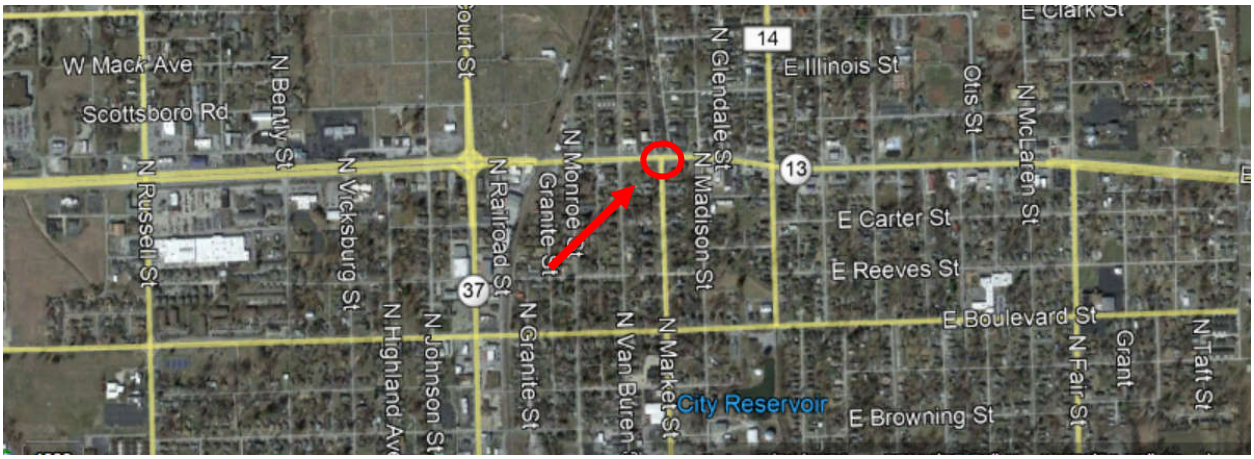


Figure 1: Study Area

Existing Conditions

Figure 2 and **Figure 3** includes a plan view and street view of the intersection. The intersection is located in a developed, residential area. The intersection is at a right-angle alignment as shown in the plan view. Market Street has one lane in each direction and has a speed limit of 25 miles per hour (mph). Deyoung Street has two 11-foot lanes in each direction and a 12-foot center lane and has a speed limit of 35 mph. There are sidewalks along both roads but no crosswalks at the intersection. The northbound approach is flared and has large radii.

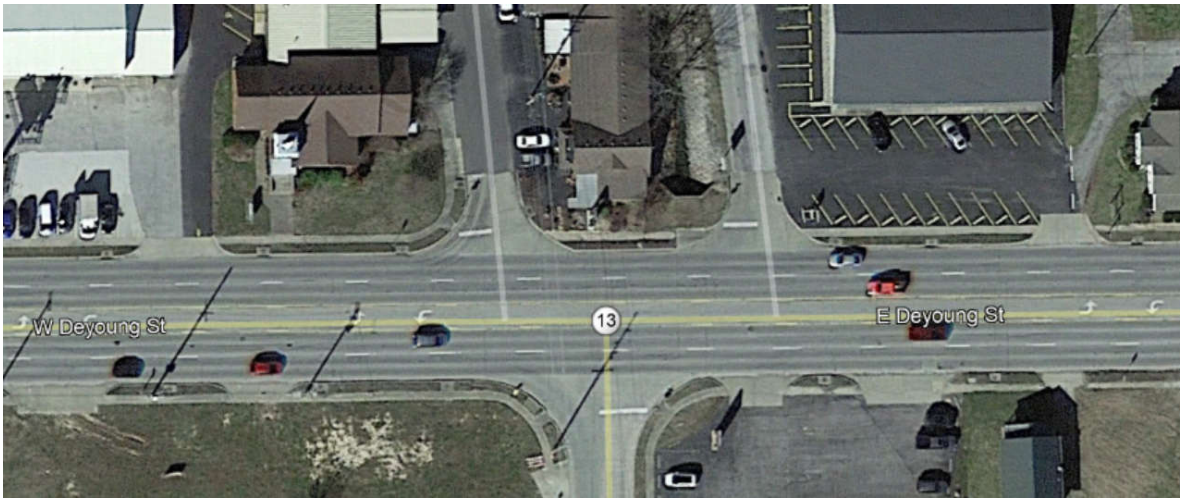


Figure 2: Intersection of Deyoung Street and Market Street (Plan View)

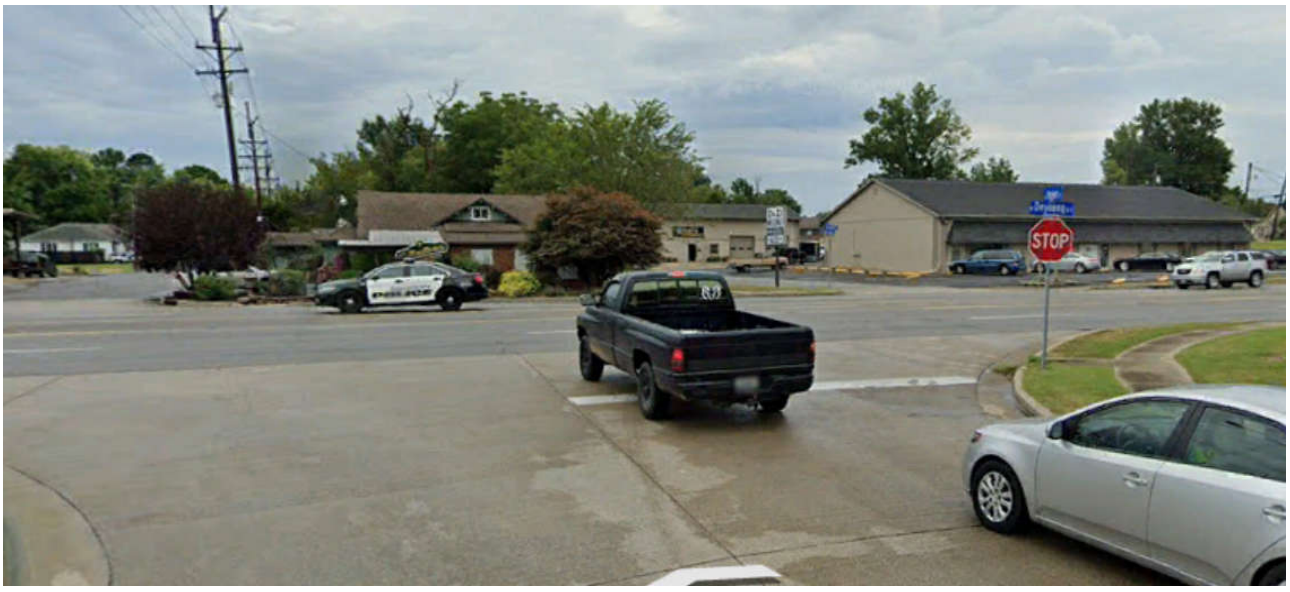


Figure 3: Intersection of Deyoung Street and Market Street (Street View)

Safety Analysis

A total of **13 crashes** occurred in the study corridor in **2015 to 2019**. The frequency of crashes by year is shown in **Figure 4**. The average number of crashes is 2.6 crashes per year with 2017 having a crash total above the average.

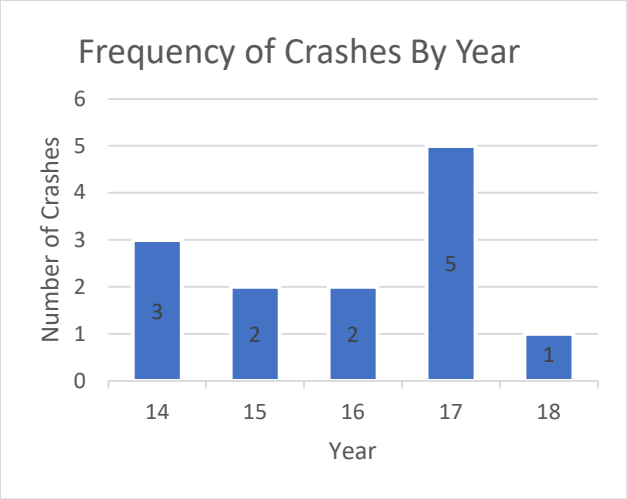


Figure 4: Frequency of Crashes by Year

Figure 5 shows the frequency of crashes by type with a nearly equal distribution of turning, angle and rear end crashes.

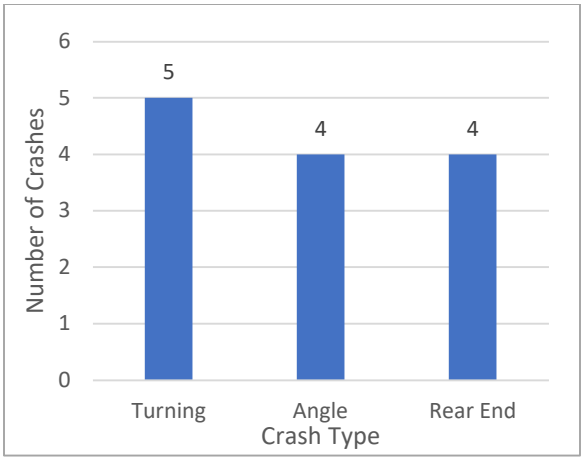


Figure 5: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 6**. Only one crash was an injury crash. The A-injury was a senior citizen that was rear ended while completing an eastbound right-turn from Deyoung to Market Street.

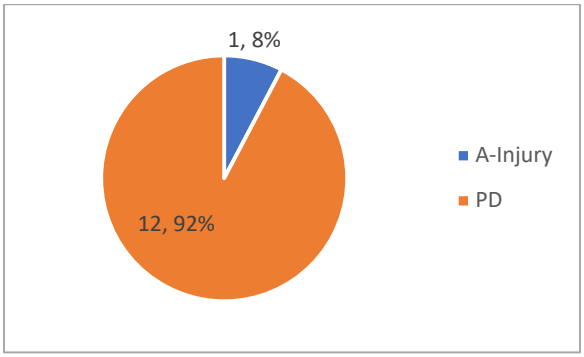


Figure 6: Frequency of Crashes by Severity

In **Figure 9**, the chart shows the frequency by direction and crash type. Most crashes involved northbound and southbound vehicles.

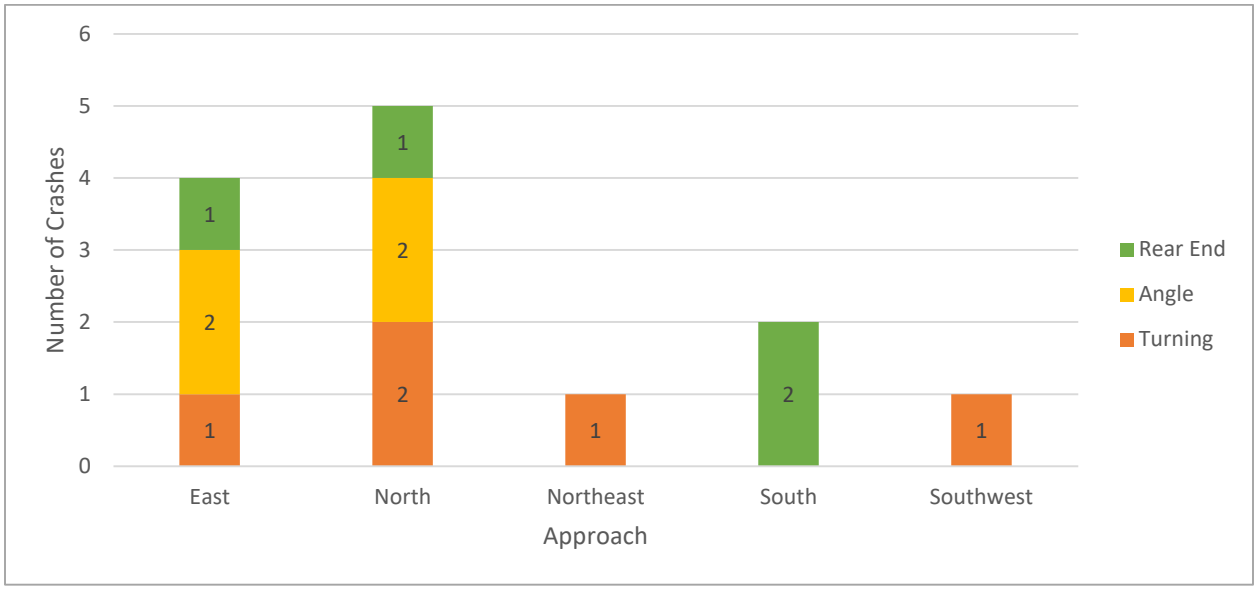


Figure 7: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 10**. There are minimal increases in crashes at any time of day. 9am and 4pm had 2 crashes compared to the rest of the hours that had zero or one crash.

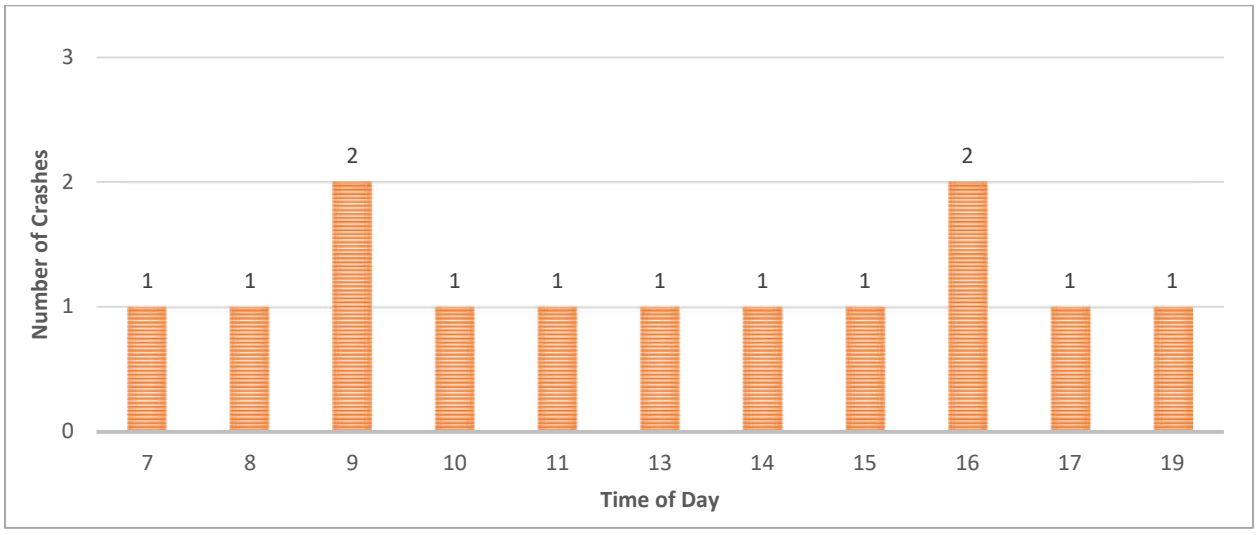


Figure 8: Frequency of Crashes by Hour

The frequency of crashes related to weather is shown in **Figure 9**. The majority of crashes occurred on clear days (100%)

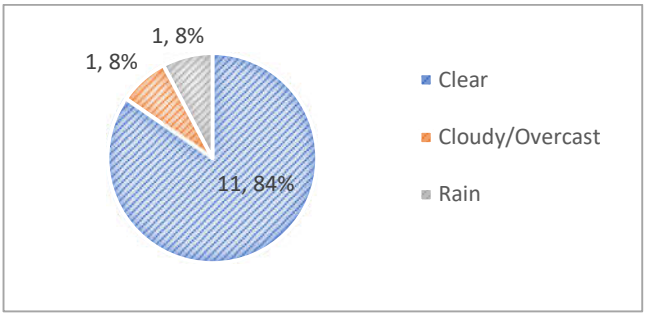


Figure 9: Frequency of Crashes by Weather

The frequency of crashes related to lighting conditions is shown in **Figure 10**. The majority of crashes occurred during daylight hours (93%).

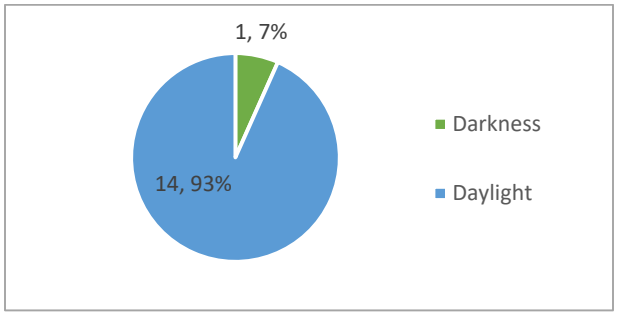


Figure 10: Frequency of Crashes by Lighting

The frequency of crashes related to the month is shown in **Figure 11**. July had the largest increase in crashes at three crashes total.

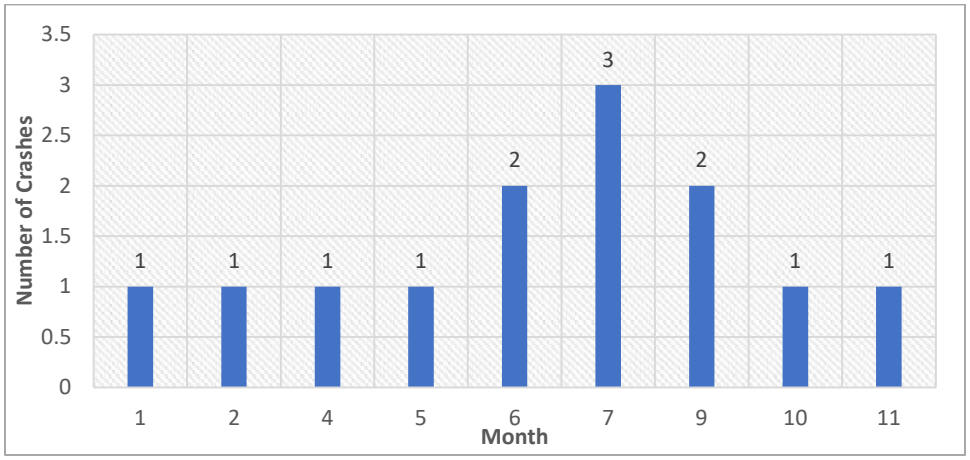


Figure 11: Frequency of Crashes by Month

Areas of Concern and Countermeasures

Areas of Concern

W. Deyoung Street and Market Street is an unsignalized intersection with the north side offset from the south side. The northbound approach is flared and has large radii. There are potential sight distance issues, as the southbound approach has vegetation and a retaining wall and the northbound approach has utility poles that can block the views of northbound drivers. Additionally, W. Deyoung Street is a five-lane road with many driveways in short distances.

There are 13 total crashes: 4 turning, 5 rear end, 3 angle, 3 peds, 2 bike, and 1 sideswipe. The only injury crash was a rear end crash between an eastbound through vehicle and an eastbound right-turning vehicle. The biggest area of concern is sight distance.

Countermeasures

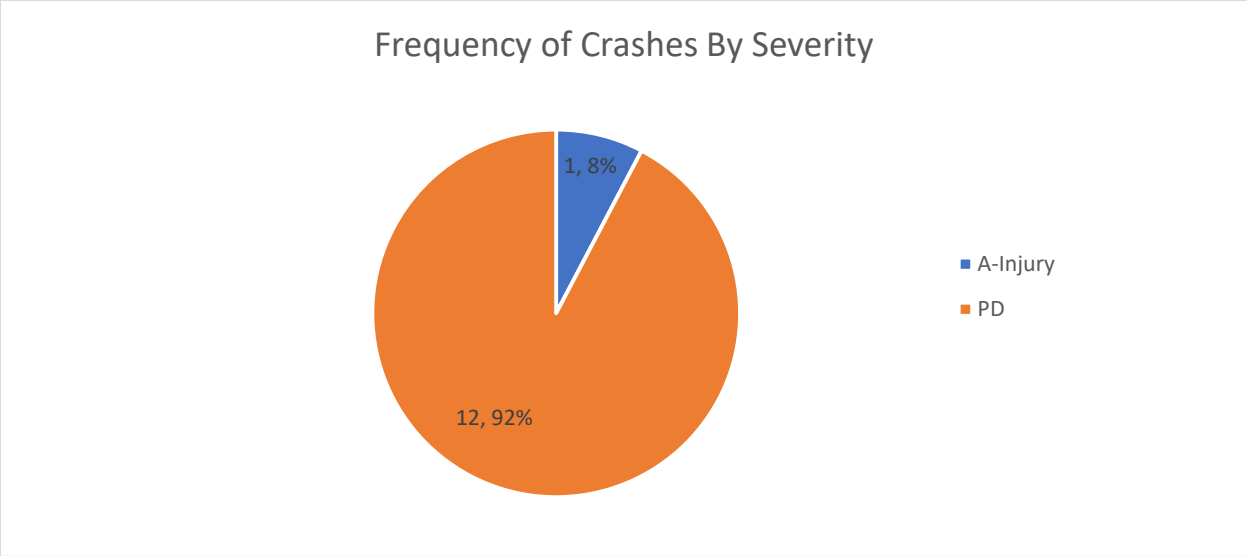
Sight distance improvements could help to mitigate turning, angle, and sideswipe crashes. Sight distance can be improved by removing or trimming trees and bushes or relocating utility poles outside of the sight triangle. The AASHTO intersection sight distance is 500 feet for left-turn vehicles on the side-street assuming a 40-mph design speed (35 mph posted speed limit + 5mph) along W. Deyoung Street and the five-lane cross section.

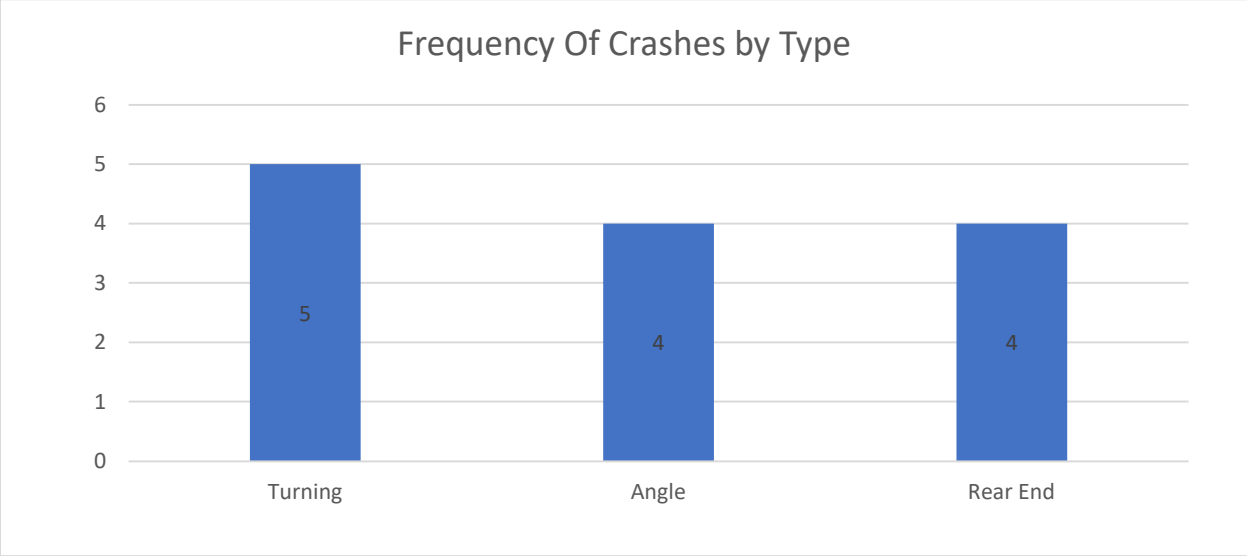
Speed feedback signs could be installed at strategic locations in attempt to keep vehicle speeds at the appropriate levels along W. Deyoung Street. At slower speeds, drivers have more time to react to an event and require shorter distances to come to a complete stop.

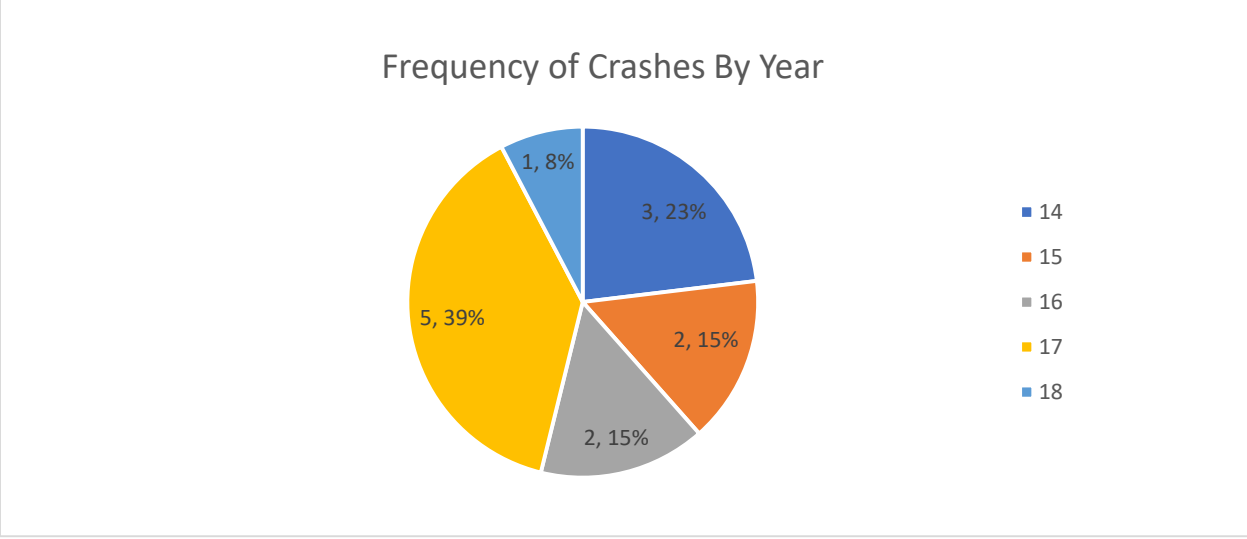
Access management strategies could be implemented over time as properties along the corridor redevelop. According to the Highway Safety Manual, increased driveway density is usually paired with a higher number of crashes.

Another way to improve safety and improve the ability of vehicles to stop is increased pavement friction, such as High Friction Surface Treatment. Increasing pavement friction is proven to decrease rear end crashes. However, the crash history indicates very few crashes during wet weather.

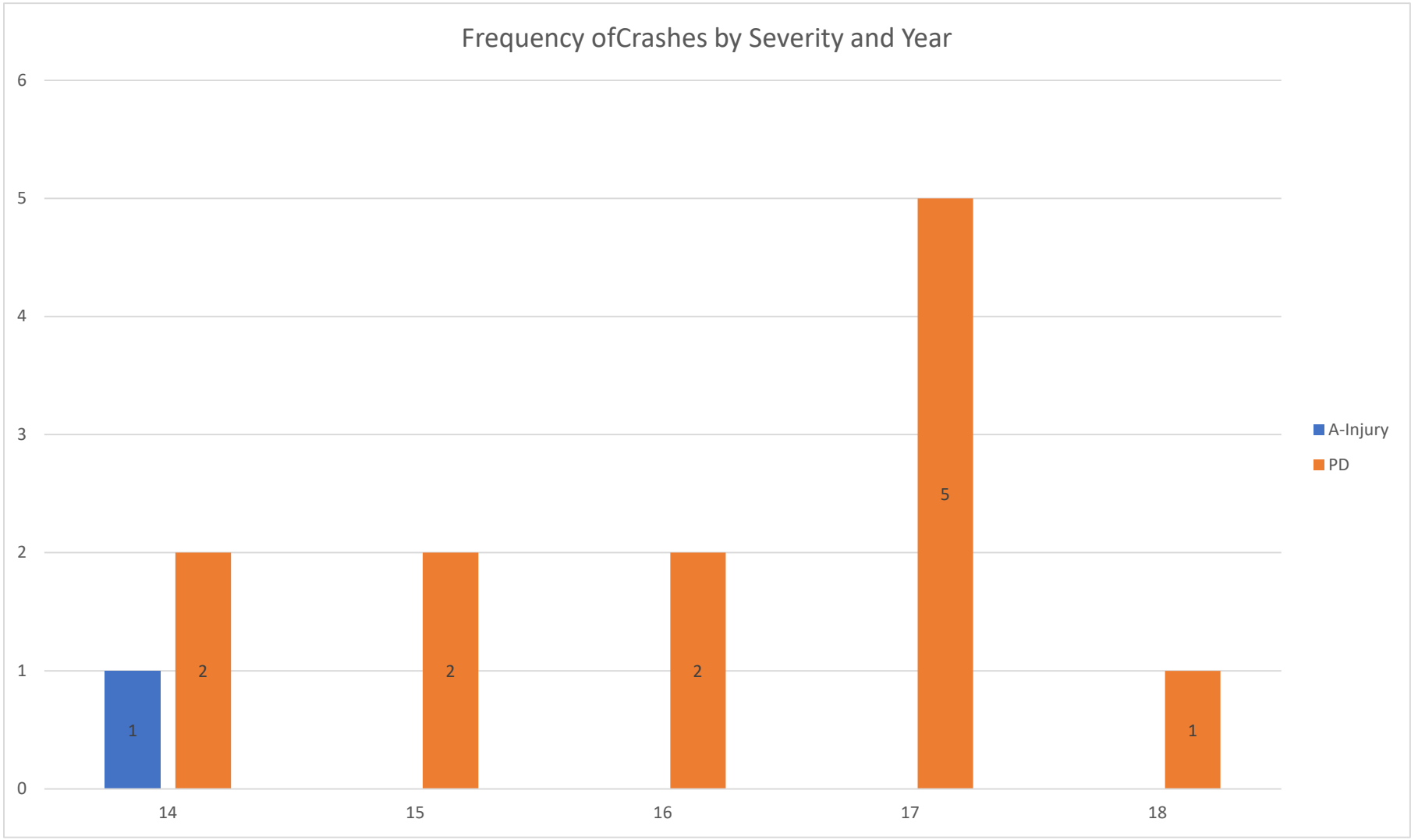
Intersection of Deyoung Street and Market Street (2014-2018)



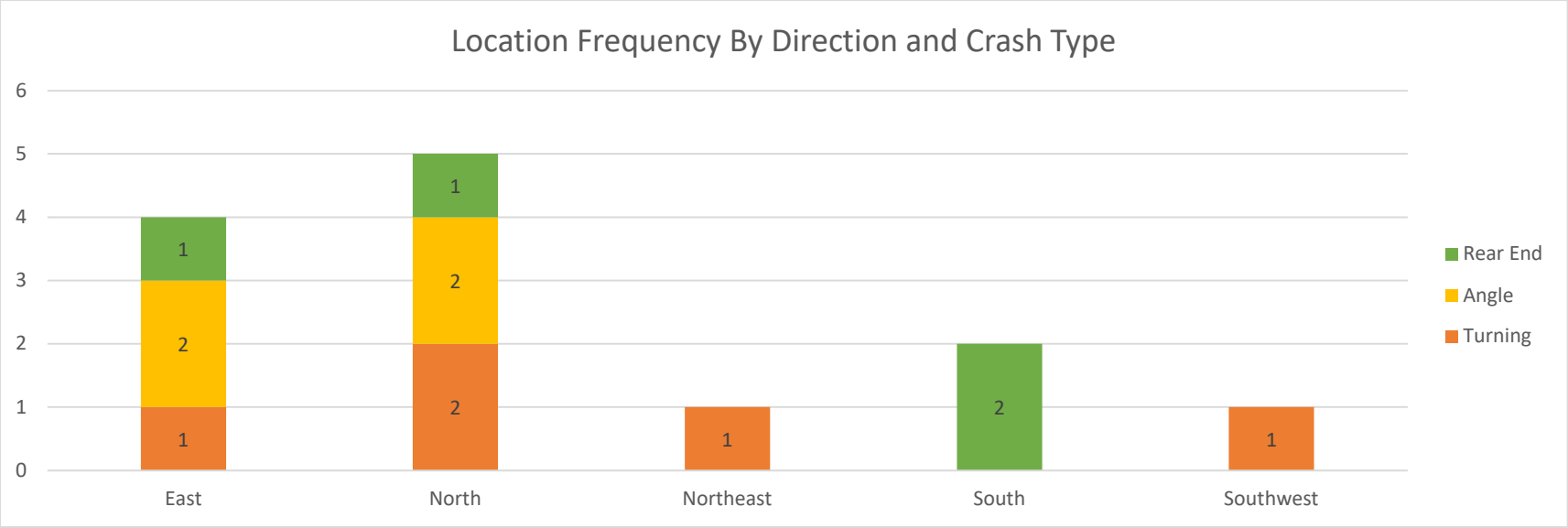


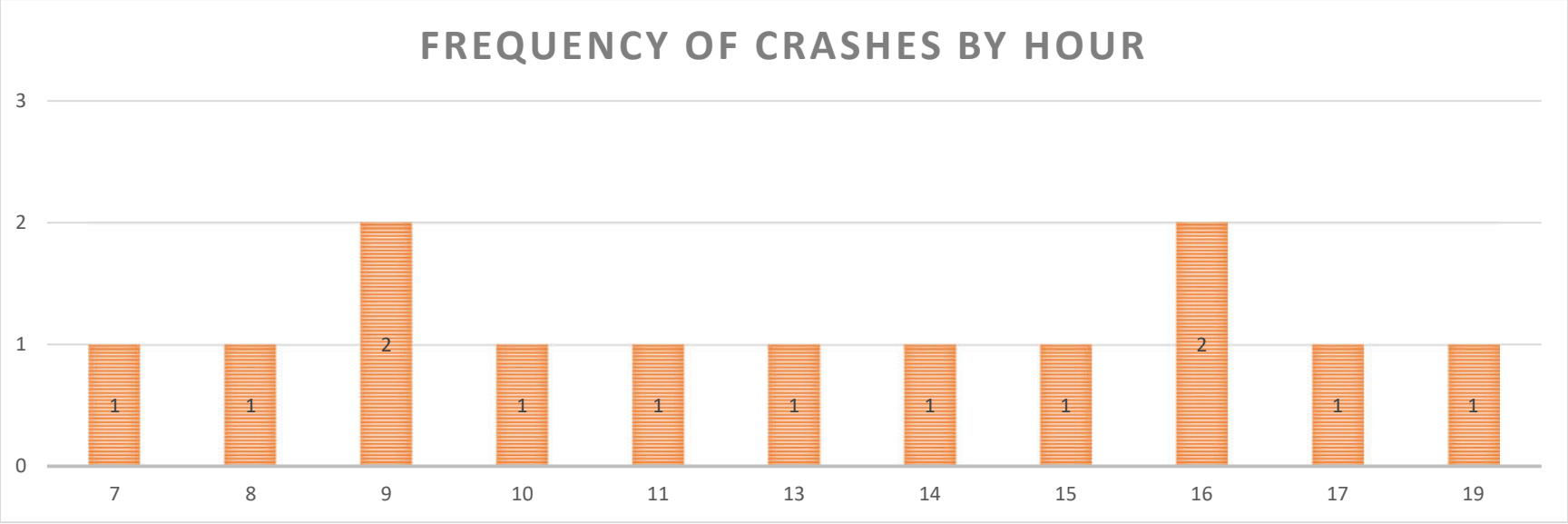


Intersection of Deyoung Street and Market Street (2014-2018)

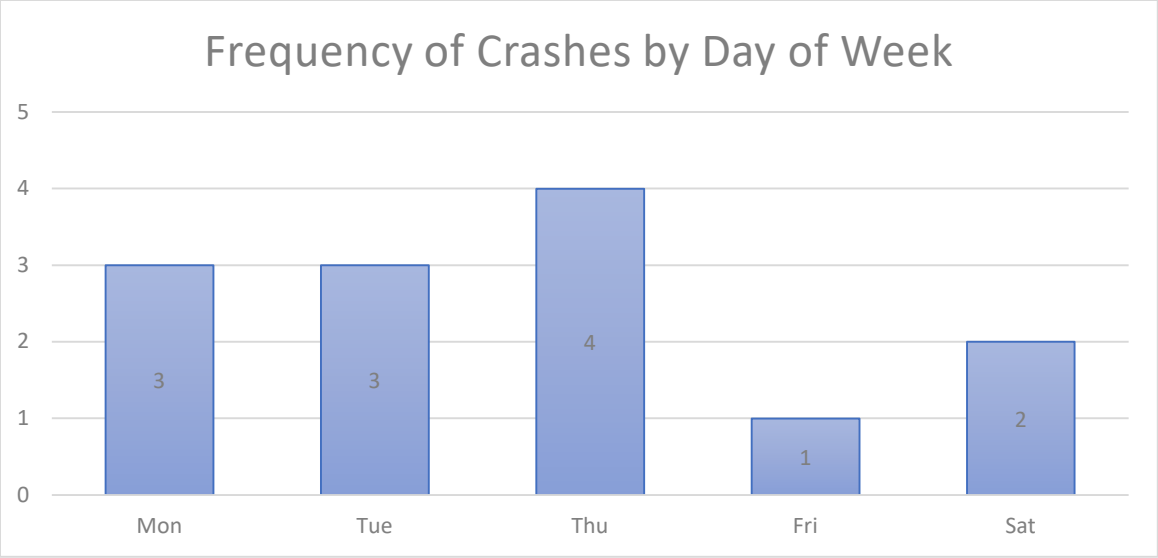


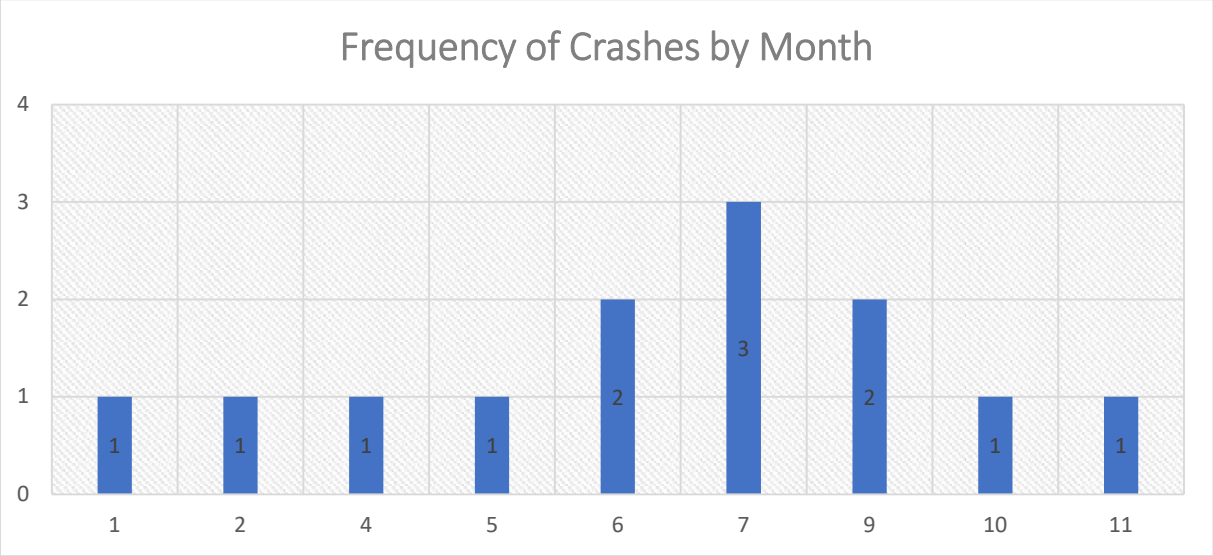
Intersection of Deyoung Street and Market Street (2014-2018)

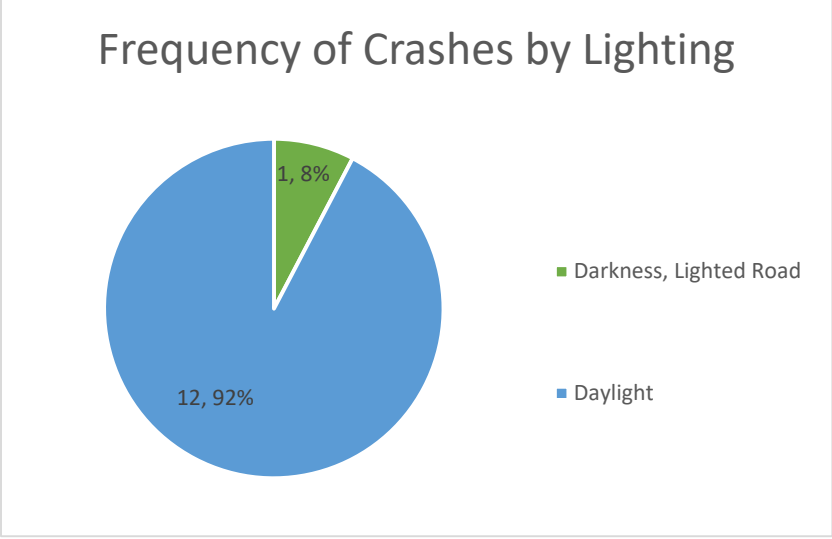




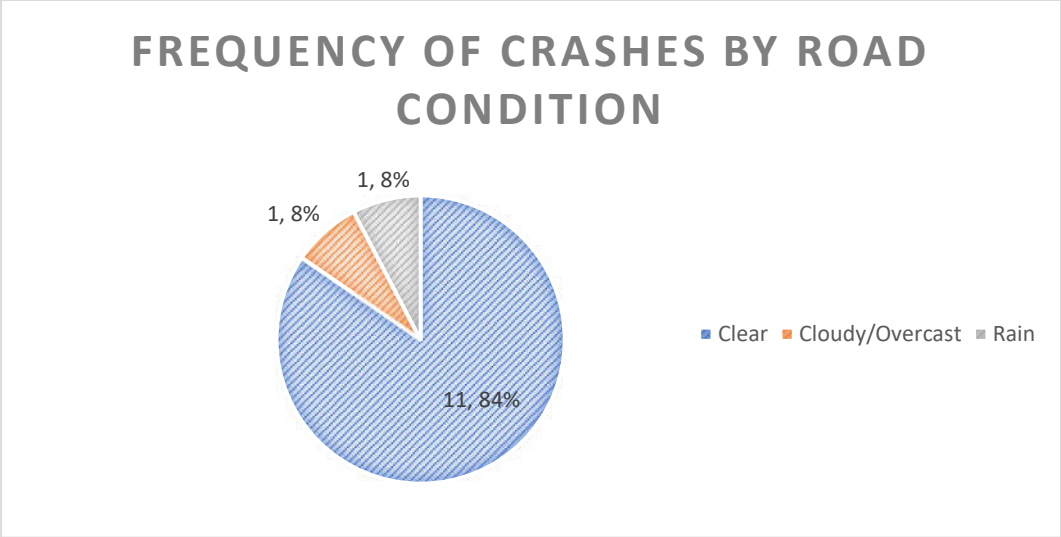
Intersection of Deyoung Street and Market Street (2014-2018)

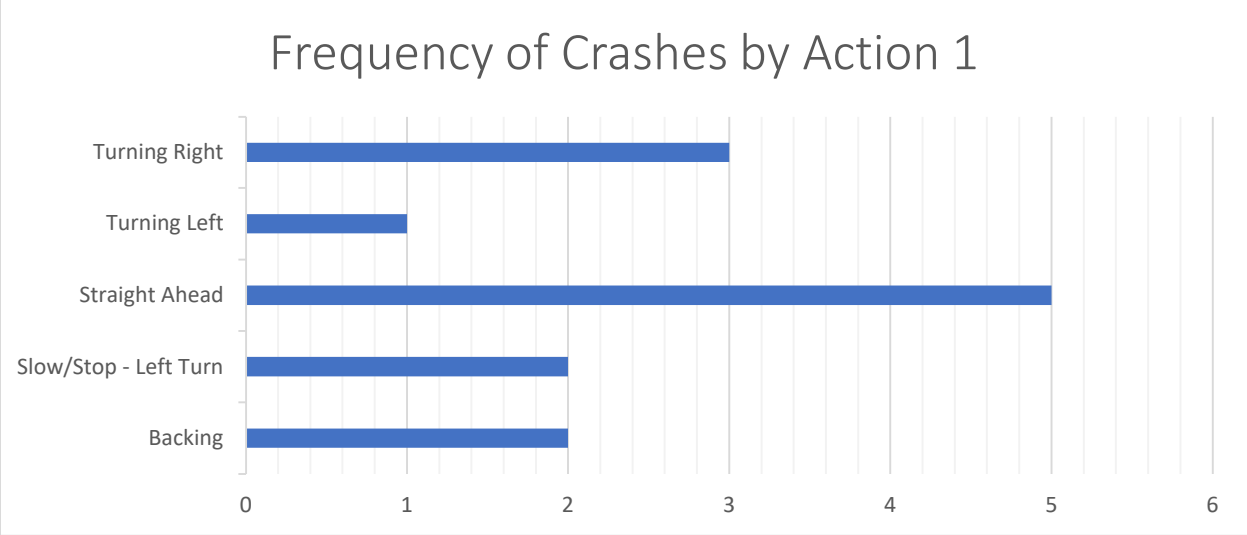


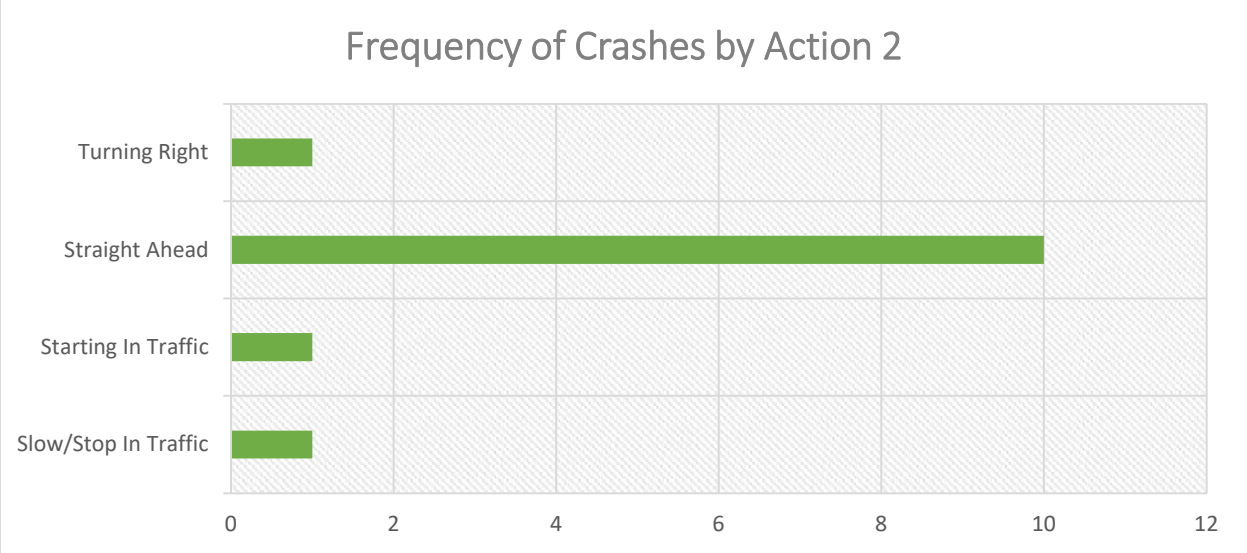




Intersection of Deyoung Street and Market Street (2014-2018)







CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE
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201400351381	14	7	8	10	Tue	2	1	0	Turning	Clear	Daylight	Dry	No Controls	Marion	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	Southeast	Turning Right	On Pavement (Roadway)	A-Injury
201400392614	14	9	15	7	Mon	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Passenger	Southwest	Turning Right	Intersection	Normal	Passenger	West	Straight Ahead	Intersection	PD
201501183424	15	9	12	14	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Passenger	North	Slow/Stop - Left Turn	Intersection	Normal	Passenger	East	Straight Ahead	Intersection	PD
201501196456	15	1	20	9	Tue	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Passenger	North	Straight Ahead	Intersection	Normal	Van/Mini-Van	West	Straight Ahead	Intersection	PD
201601160284	16	7	14	11	Thu	2	0	0	Angle	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD
201601250827	16	10	24	19	Mon	2	0	0	Rear End	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Marion	Normal	Pickup	North	Slow/Stop - Left Turn	Intersection	Normal	Passenger	North	Starting In Traffic	Intersection	PD
201701039821	17	2	13	16	Mon	2	0	0	Rear End	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	SUV	South	Backing	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD
201701143594	17	6	10	9	Sat	2	0	0	Rear End	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Pickup	South	Backing	On Pavement (Roadway)	Normal	Pickup	South	Slow/Stop In Traffic	On Pavement (Roadway)	PD
201701149451	17	6	15	16	Thu	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Passenger	North	Turning Right	On Pavement (Roadway)	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	PD
201701181490	17	7	20	13	Thu	2	0	0	Angle	Clear	Daylight	Dry	Traffic Signal	Marion	Normal	Passenger	East	Straight Ahead	Intersection	Normal	Pickup	South	Straight Ahead	Intersection	PD
201701293699	17	11	3	17	Fri	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Pickup	Northeast	Turning Right	On Pavement (Roadway)	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	PD
201801119155	18	4	19	8	Thu	2	0	0	Rear End	Cloudy/Overcast	Daylight	Dry	Traffic Signal	Marion	Normal	Pickup	East	Straight Ahead	Intersection	Normal	Van/Mini-Van	East	Straight Ahead	Intersection	PD

SIMPO SAFETY STUDY

Appendix : Intersection of Williamson Parkway/Walton Way/Joseph Cannon Way

prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

Intersection of Williamson County Parkway and Walton Way

(Local location of Concern)

Introduction

The Williamson County Parkway and Walton Way intersection is located within the city of Marion, Illinois. The intersection is a "T" intersection in which the eastbound approach of Joseph Cannon Way and the westbound approach of Walton Way stop at the intersection with Williamson County Parkway. The intersection location is shown in **Figure 1**.

Figure 1: Study Location

Existing Conditions

Figure 2 and **3** includes a plan view and a street view of intersection. The intersection is located 400 feet south of the intersection of Deyoung Street (Illinois 13) and Williamson County Parkway. The adjacent land use to the west and directly south of the intersection is undeveloped and commercial uses are east of the intersection. About 150 feet east of the intersection, there is an entrance to a Starbucks as well as additional access to other businesses along Walton Way.

Walton Way, between Williamson County Parkway and Starbucks consists of one eastbound through lane, one westbound through lane, a short eastbound left-turn lane into Starbucks, which develops into a two-way left-turn lane, and a westbound right-turn lane to Williamson County Parkway. West of the intersection, Joseph Cannon Way consists of one westbound lane, one eastbound left turn lane and a wide eastbound through lane. Williamson County Parkway, north of Walton Way has five northbound lanes including two left-turn lanes, two through lanes, and one northbound right-turn lane extending from the approach to Illinois 13. The southbound direction is separated by a median and is striped for two lanes close to Illinois 13 (to accept the dual westbound left-turns) then tapers to one lane before Walton Way.

Pavement markings still remain that guide motorists to the east when there was originally no west leg to the intersection. There are no sidewalks or crosswalks at the intersection.

Figure 2: The Intersection of Williamson County Parkway and Walton Way (Plan View)

Figure 3: The Intersection of Williamson County Parkway and Walton Way/Joseph Cannon Way (Street View looking westbound)

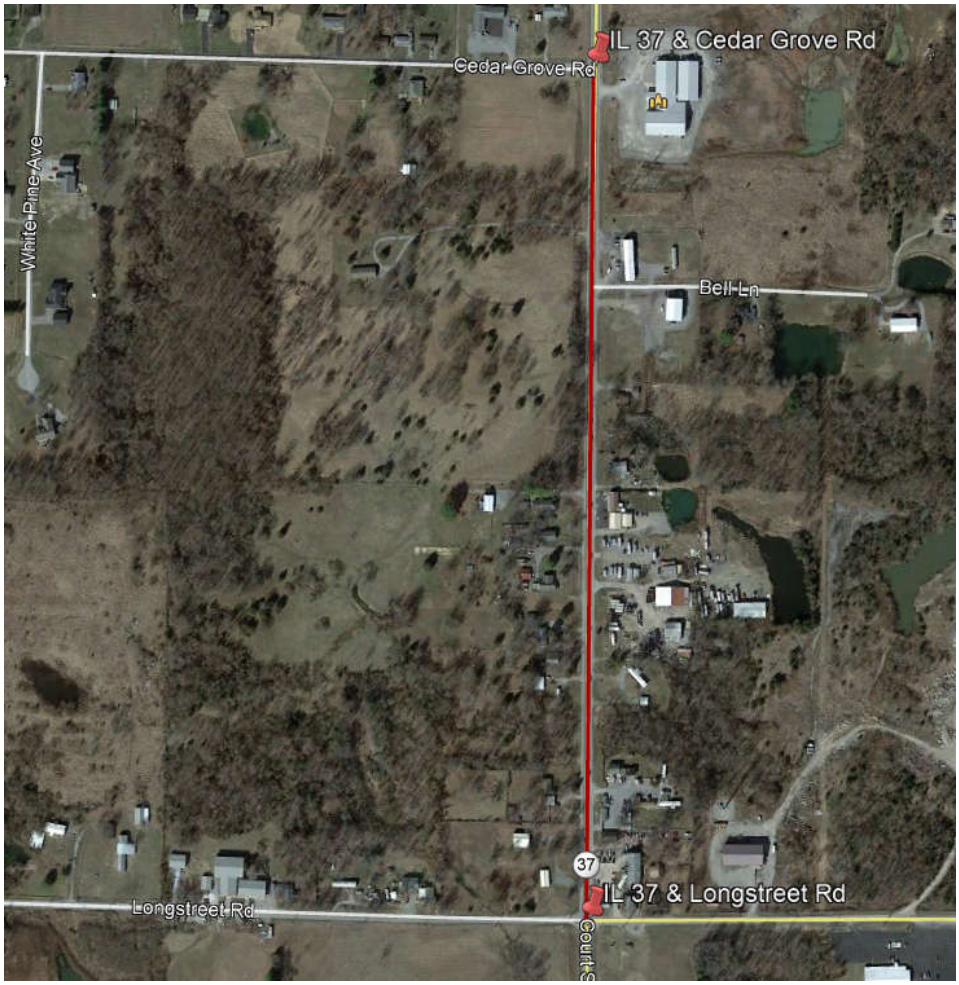
Safety Analysis

Although the intersection is very large and unconventional, ZERO crashes have been recorded at this intersection. As development occurs in the future in this area, this intersection should be monitored.

This intersection would not score well on HSIP application due to zero crashes.

SIMPO SAFETY STUDY

Appendix : Illinois 37 (Court Street) Corridor – Cedar Grove Road to Long Street Road



prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

Illinois Route 37 Corridor - Longstreet Road to Cedar Grove Road

Introduction

The Illinois Route 37 corridor extends from Longstreet Road to Cedar Grove Road and includes the intersections with Cedar Grove Road and Longstreet Road. The segment is about 0.5 miles long. **Figure 1** shows the study area and includes markers at the two intersections.

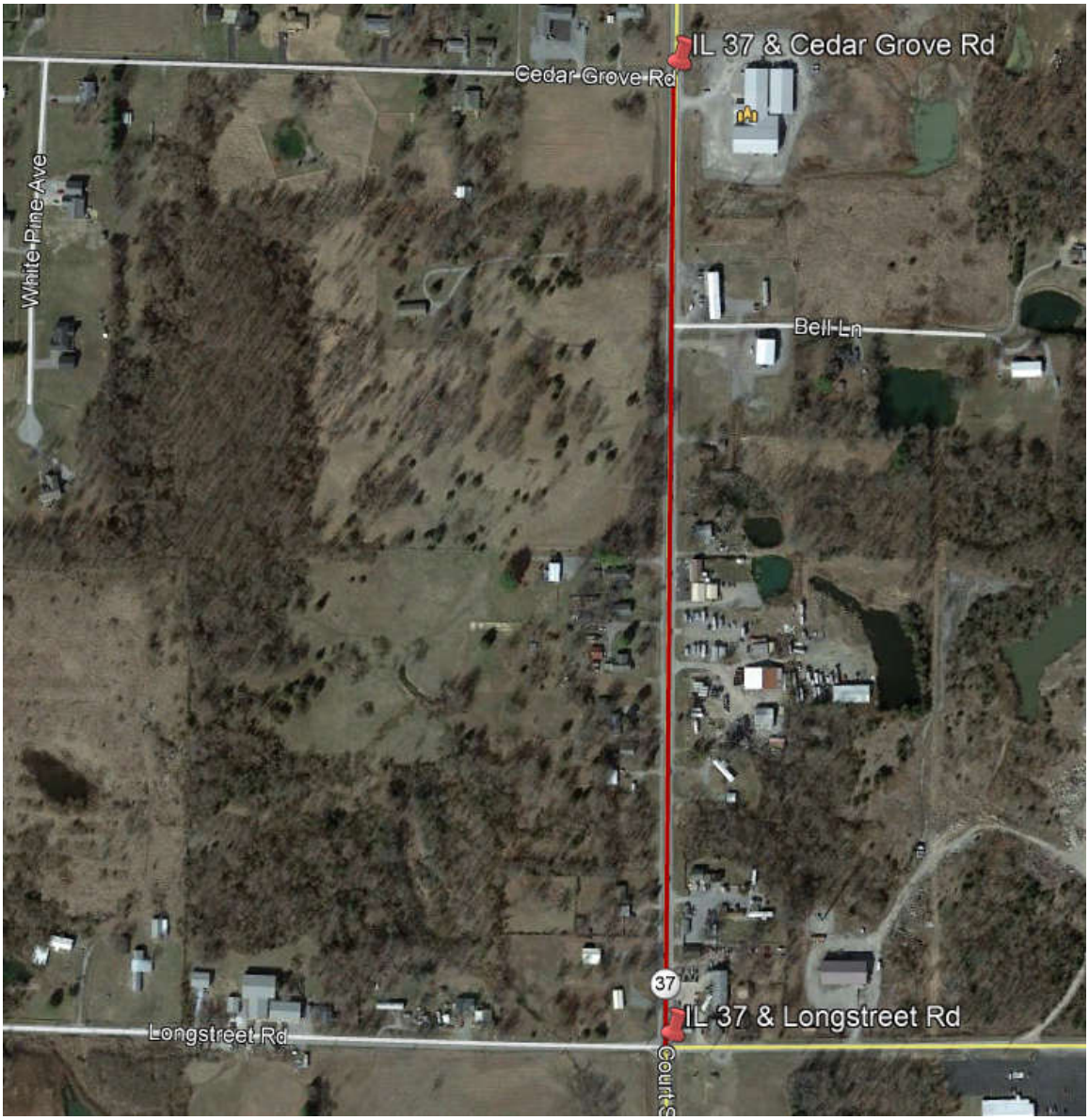


Figure 1: Study Area

Existing Conditions

Illinois 37 is located in Williamson County, Illinois. The corridor is in a mostly rural area and provides a parallel route to Interstate 57 between Marion and Johnston City. It also provides access to some residential properties and businesses along the corridor. The segment has one lane in each direction (generally 11 to 12-foot lanes in each direction) and paved shoulders on both sides (generally 4 to 8-foot wide). White edgelines and yellow skip pavement markings are provided. There are three no passing zones in the study area. One no passing zone extends from Longstreet Road to approximately 0.1 mile south of the intersection and another no passing zone starts approximately 0.1 mile north of Longstreet Road for about 0.1 mile further north. The final no passing zone starts about 0.05 mile south of Cedar Grove Road and extends approximately 0.08 mile north of Cedar Grove Road. **Figure 2** shows the no passing zone near Cedar Grove Road. There are no sidewalks or crosswalks, and the speed limit is 45 miles per hour (mph).

Figure 2: No Passing Zone

Both intersections of Longstreet Road and Cedar Grove Road are required to stop at the intersection with Illinois 37. The intersection of Illinois 37 and Cedar Grove Road is a three-legged intersection, but there is a private drive offset a short distance to the south (approximately 70 feet). Cedar Grove Road provides access to mainly residential land uses west of Illinois 37. The intersection of Illinois 37 and Cedar Grove Road is shown in **Figure 3**. No pavement markings are provided on Cedar Grove Road.

Figure 3: The Intersection of Illinois 37 and Cedar Grove Road

The intersection of Illinois 37 and Longstreet Road is a four-legged intersection with stop signs on Longstreet Road and also provides access to several residental properties. The intersection is shown in **Figure 4**. No pavement markings are provided on either approach of Longstreet Road.

Figure 4: The Intersection of Illinois 37 and Longstreet Road

Safety Analysis

The Illinois 37 corridor had a total of 59 crashes from 2014 to 2018. The frequency of crashes by year is shown in **Figure 5**. The average number of crashes is 11.8 crashes per year. Year 2015 has the highest number of crashes with 15. The general trend is increasing over the five years.

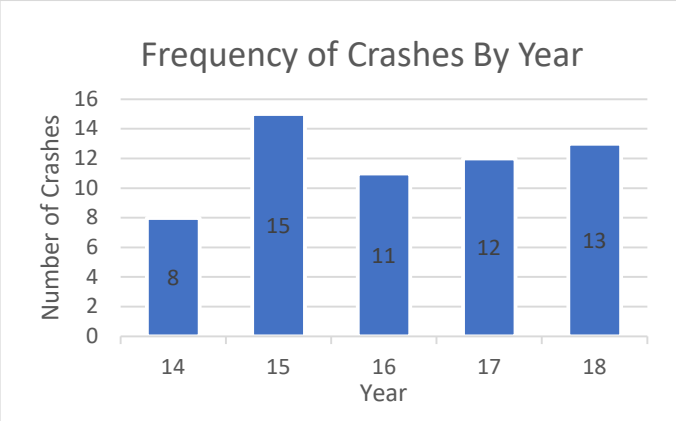


Figure 5: Frequency of Crashes by Year

Figure 6 shows the frequency of crashes by type. The majority of crashes are rear end crashes, of which about 56 percent of the rear end crashes are property damage only. The other 43 percent of crashes are a combination of A-Injury (1), B-Injury (10), and C-Injury (3) crashes. The second most frequent crash type is animal crashes (9), which were all deer and property damage only.

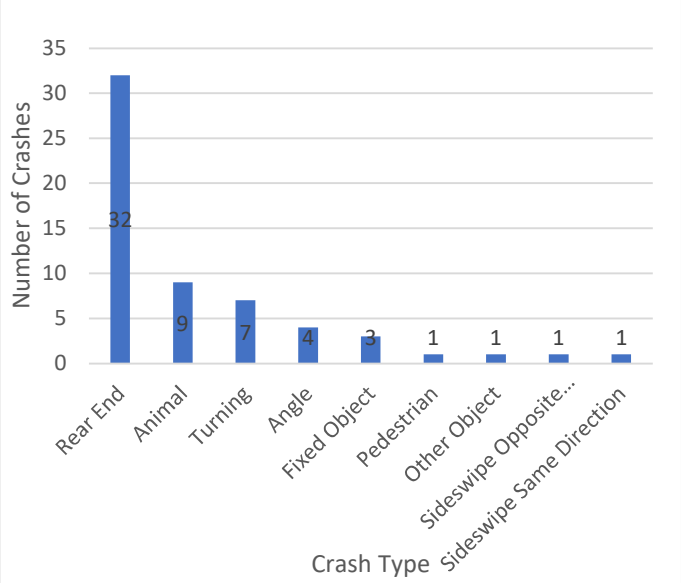


Figure 6: Frequency of Crashes by Type

The breakdown of the frequency of crashes by severity is displayed in **Figure 7**. The one fatal crash along the corridor is the one pedestrian crash. The pedestrian was stuck at night in foggy weather, near Bell Lane. The three A-injury crashes were a turning (1), angle (1), and rear end (1) crash. The 12 B-injury crashes consisted of a majority of rear end (10) and angle (2) crashes. All three C-injury crashes were rear ends.

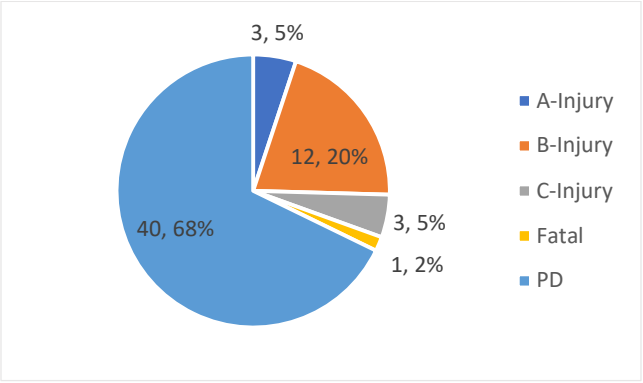


Figure 7: Frequency of Crashes by Severity

The majority of crashes occur with vehicles traveling northbound and southbound on Illinois 37. A significant number of these crashes are rear end crashes in afternoon and evening peak hours. **Figure 8** displays the frequency of crashes by direction and crash type.

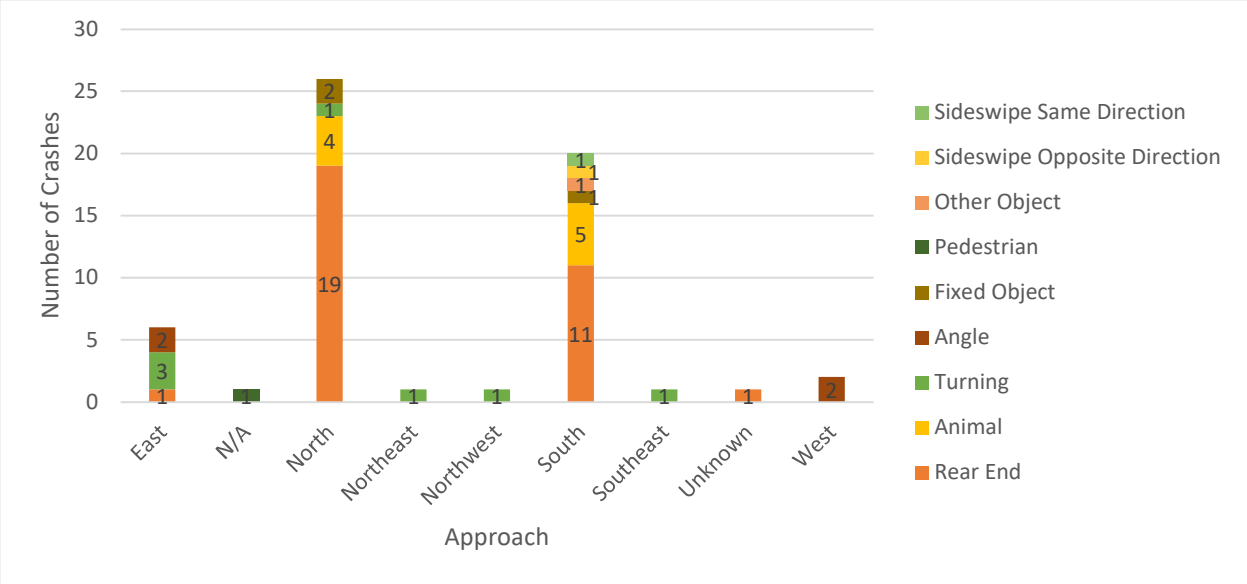


Figure 8: Frequency of Crashes by Direction and Crash Type

Figure 9 displays the frequency of crashes by hour. All animal crashes on the corridor occurred in the dark. The 7am and 7pm hours had the highest number of crashes.

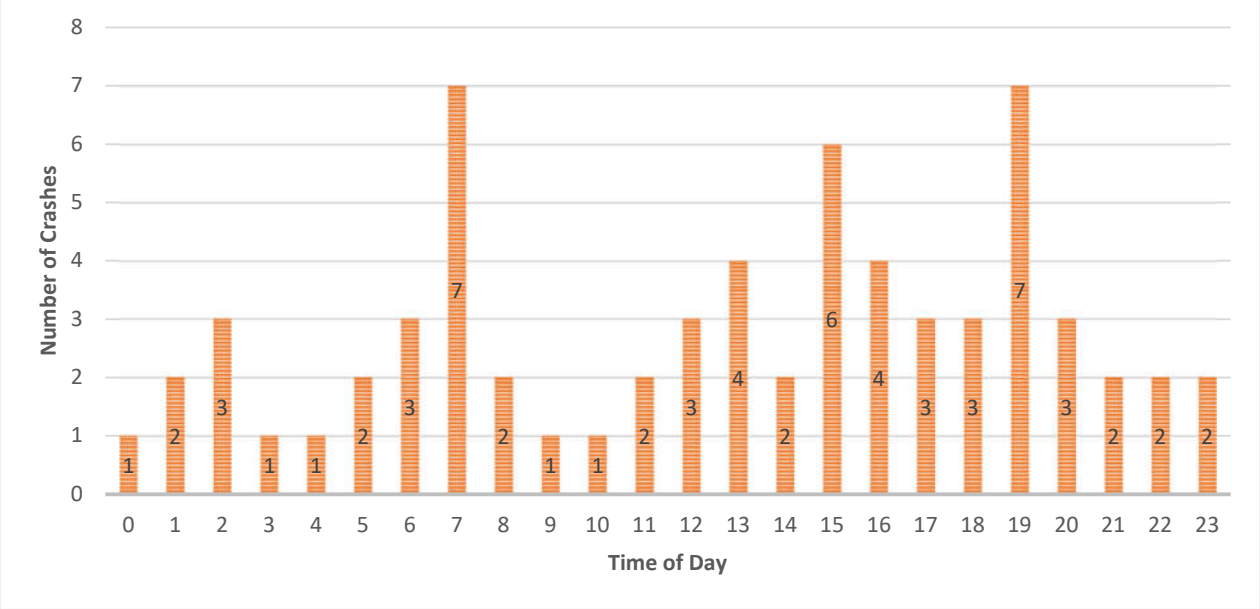


Figure 9: Frequency of Crashes by Hour

The frequency of crashes by month is shown in **Figure 10**. The months of May, November and December had the highest number of crashes.

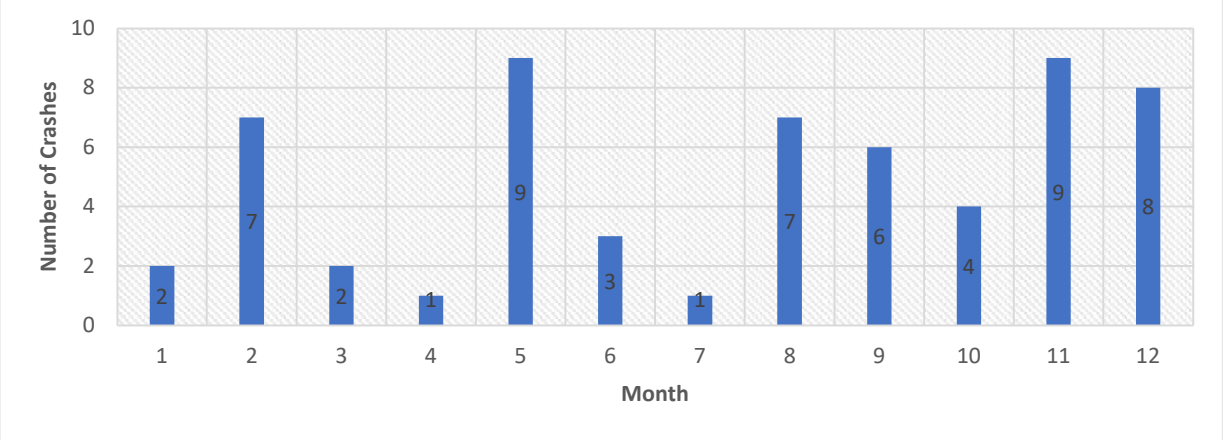


Figure 10: Frequency of Crashes by Month

The weather condition is shown in **Figure 11**. The majority of crashes occurred on clear days (80%).

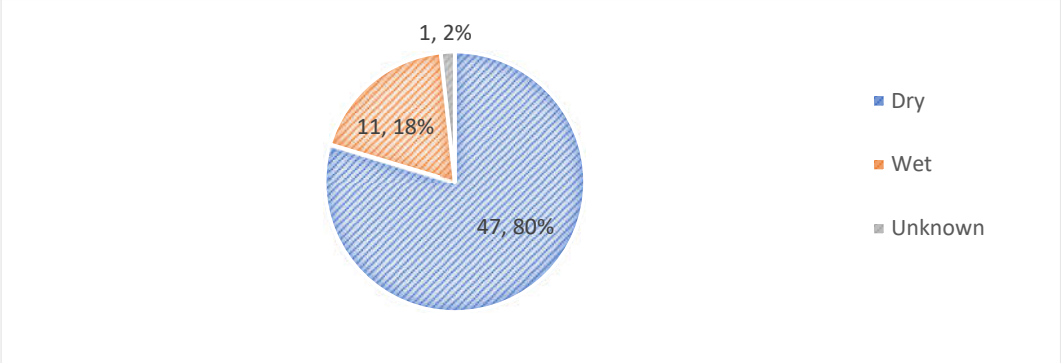


Figure 11: Frequency of Crashes by Weather

The lighting condition is shown in **Figure 12**. Most of the crashes occurred in the daylight hours (69%), while about 31 percent occurred in the dark or during the dusk/dawn hours. A large portion of the dark crashes involved animals.

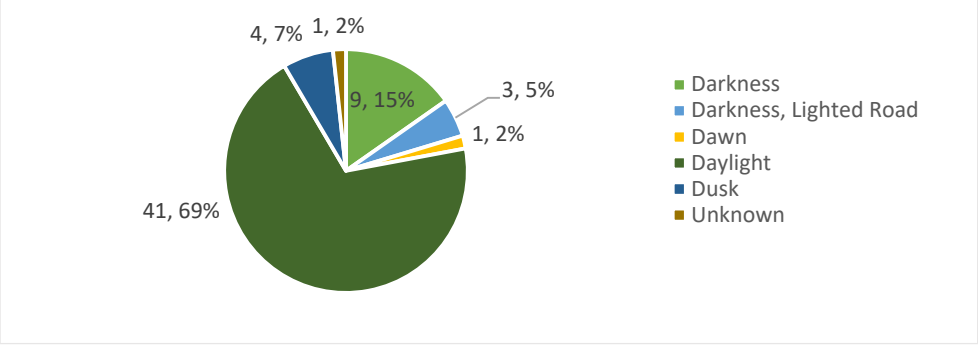


Figure 12: Frequency of Crashes by Lighting

Areas of Concern

Based on the crash evaluation, the biggest issue along Illinois 37 are rear ends due to vehicles turning at Cedar Grove Road and Longstreet Road.

Although there were more crashes reported at Cedar Grove Road (26 crashes) the crashes were less severe with 7 B-injury crashes and one C injury, all rear ends.

There were 20 crashes reported at Illinois 37 and Longstreet Road, with three resulting in A injuries, one angle (eastbound and southbound), one rear end (northbound) and one turning (northbound left-turn and southbound thru). The B injuries consisted of two more rear ends (one southbound and one northbound) and two more angle crashes (one westbound and southbound ad one westbound and northbound).

Besides the pedestrian fatality near Bell Lane, the segment related crashes were less severe with one B Injury and one C-injury, both rear ends.

Countermeasures

Since more than two A-injuries were recorded at Illinois 37 and Longstreet Road, the countermeasures in this section are focused at the Illinois 37 and Longstreet Road intersection.

Low-cost Countermeasures: Provide stop bars on the side-street and install an LED flashing stop sign on the side-street. The improvements will bring attention to the need for side street vehicles to stop at Illinois 37. Based on a review of some of the crash reports, it does not appear that many of the motorists on Longstreet Road are not seeing the stop signs, so this solution may not be very effective.

A moderate cost countermeasure to reduce turning and angle crashes in rural areas is to install an Intersection Conflict Warning System (ICWS) or "Vehicles Entering When Flashing" (VEWF) system. The ICWS reduces crashes by informing the mainline vehicles that there are vehicles on the side-street. These dynamic systems warn mainline traffic of possible side-street conflicts at nearby intersections. These systems consist of post mounted signs and flashers on the mainline and vehicle detection (loops) on the cross streets. When a vehicle is detected on the side-street, the flashers activate along the mainline to alert drivers along the mainline that there is a vehicle on the side-street.

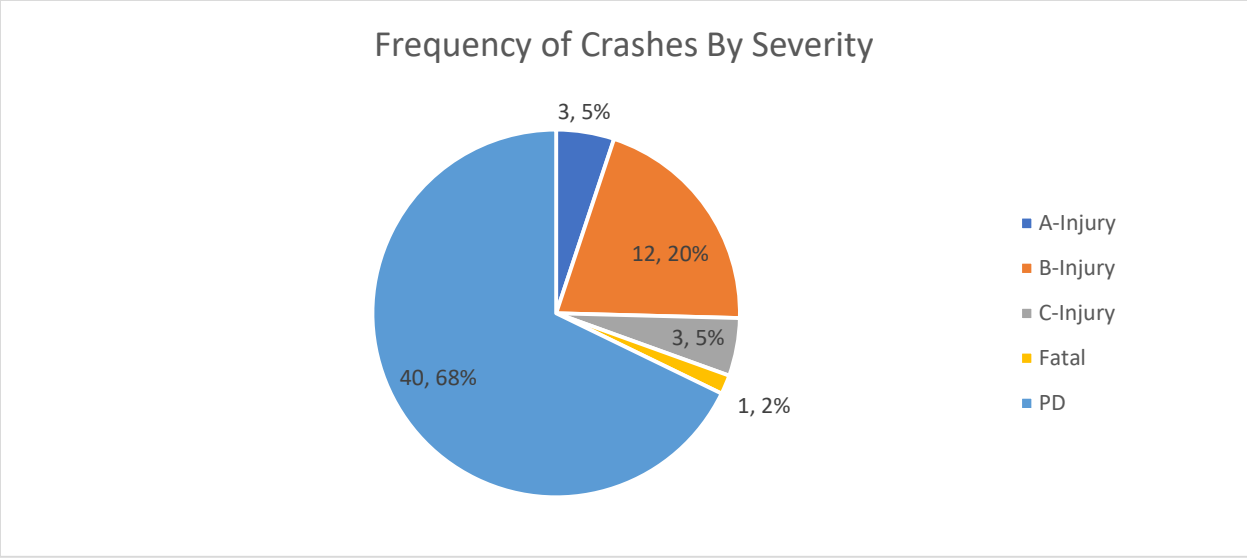
A higher cost alternative is to construct left-turn lanes along Illinois 37 at Longstreet Road to remove the left-turn vehicles from the through lane, greatly reducing the rear ends. An conceptual example of left-turn lanes are shown in **Figure 13** below.

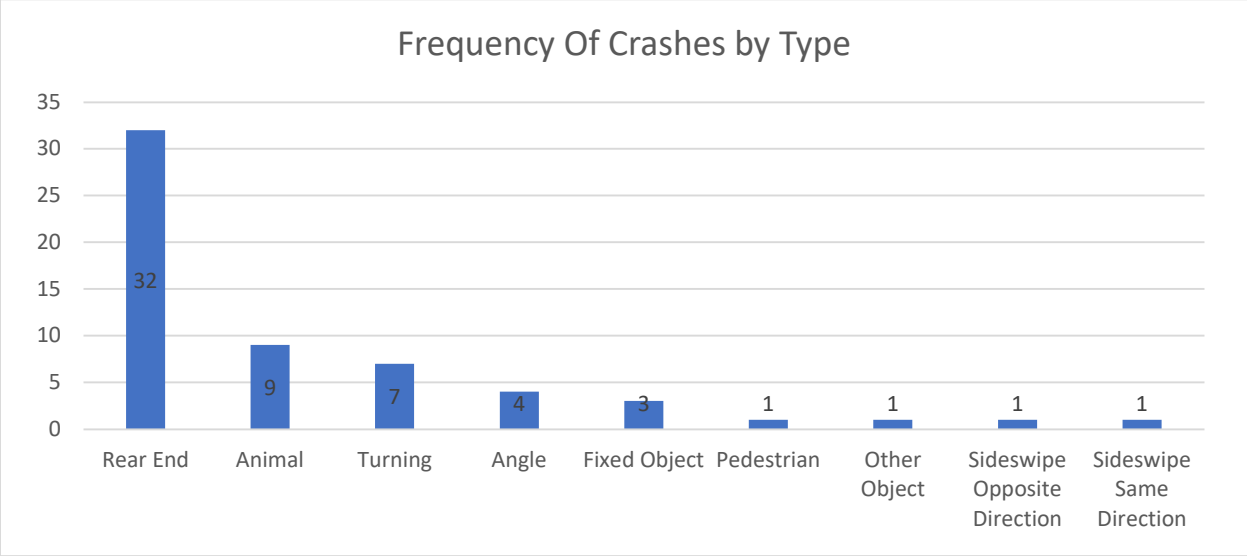
Figure 13: Separate Northbound and Southbound Left-Turn Lanes along IL 37 at Longstreet Road

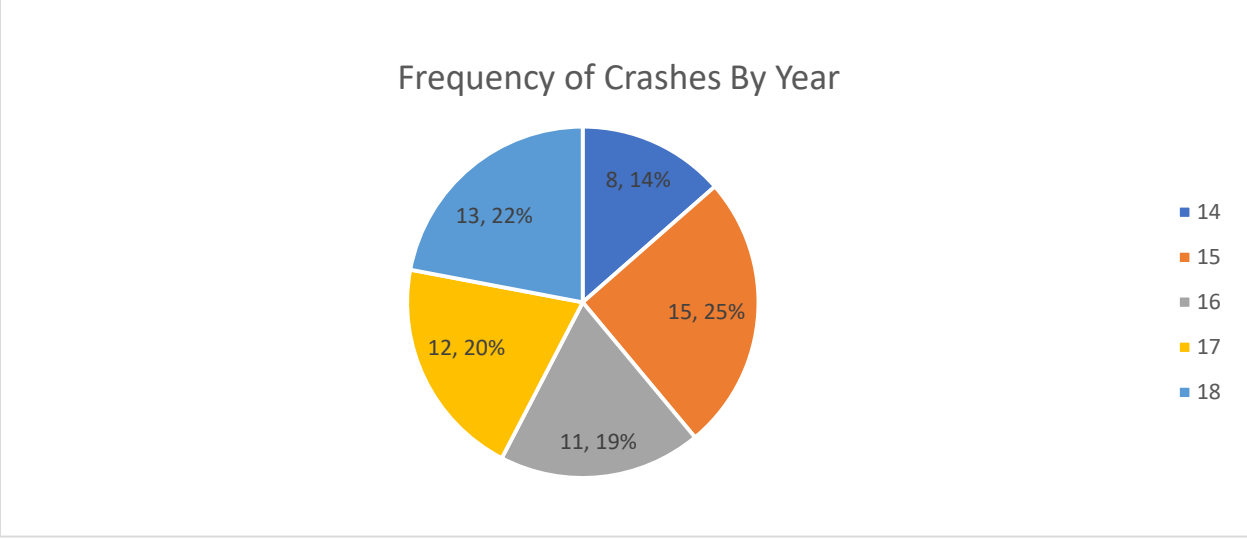
Finally, the best overall alternative is to construct a roundabout at Illinois 37 at Longstreet Road. The roundabout would address all the crash types experienced at the intersection including turning, rear ends and angle crashes. A conceptual example of a roundabout layout is shown in **Figure 14** below.

Figure 14: Conceptual Layout of a Roundabout at IL 37 and Longstreet Road

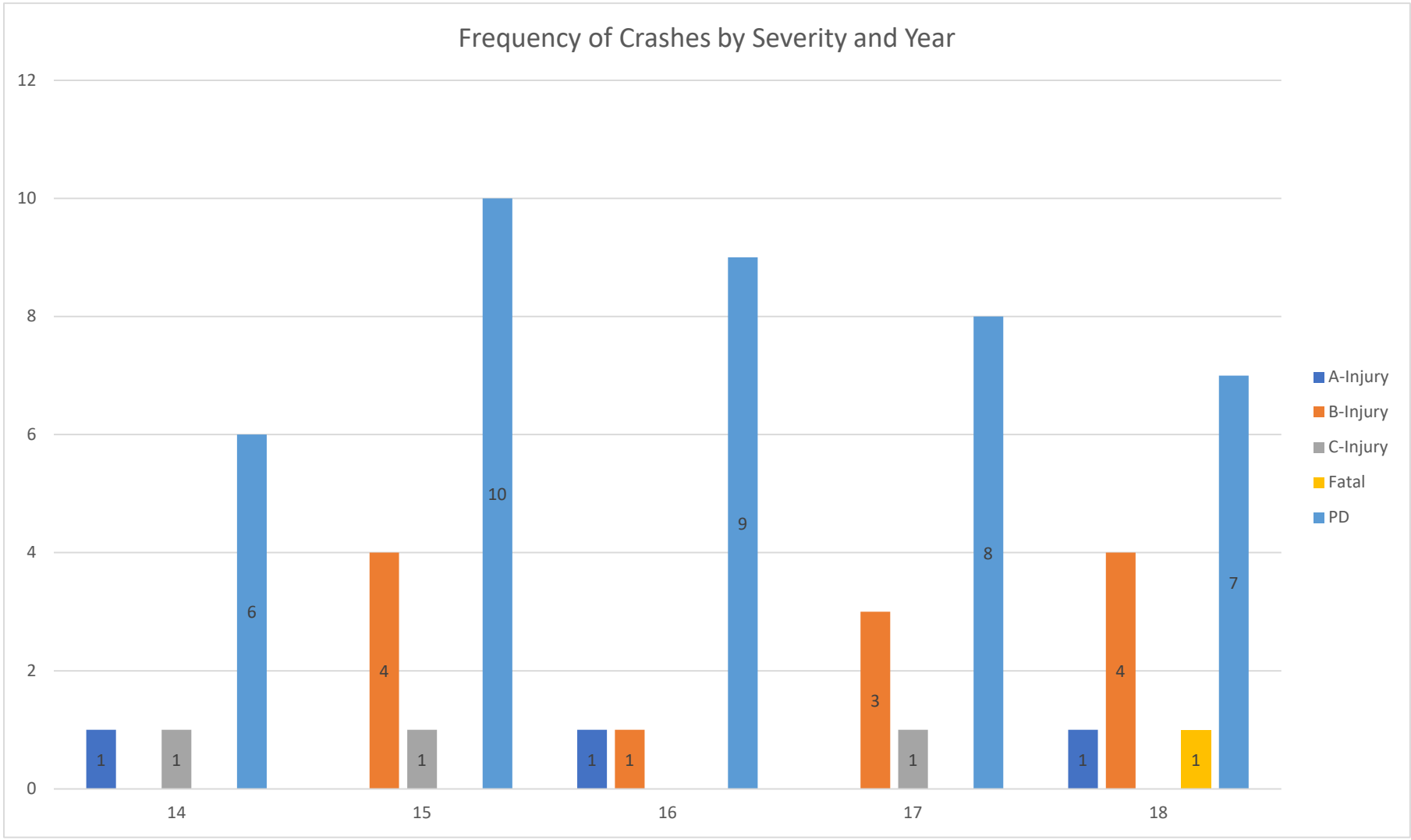
IL 37 Corridor Crashes - Cedar Grove Road to Longstreet Road (2014-2018)



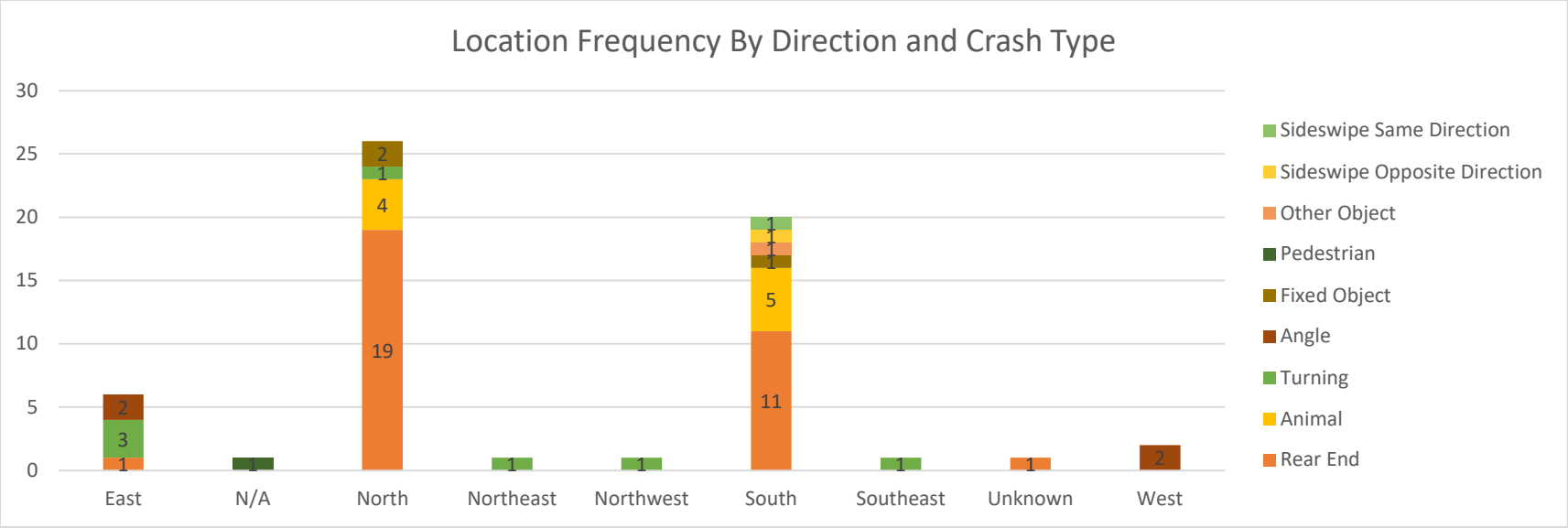


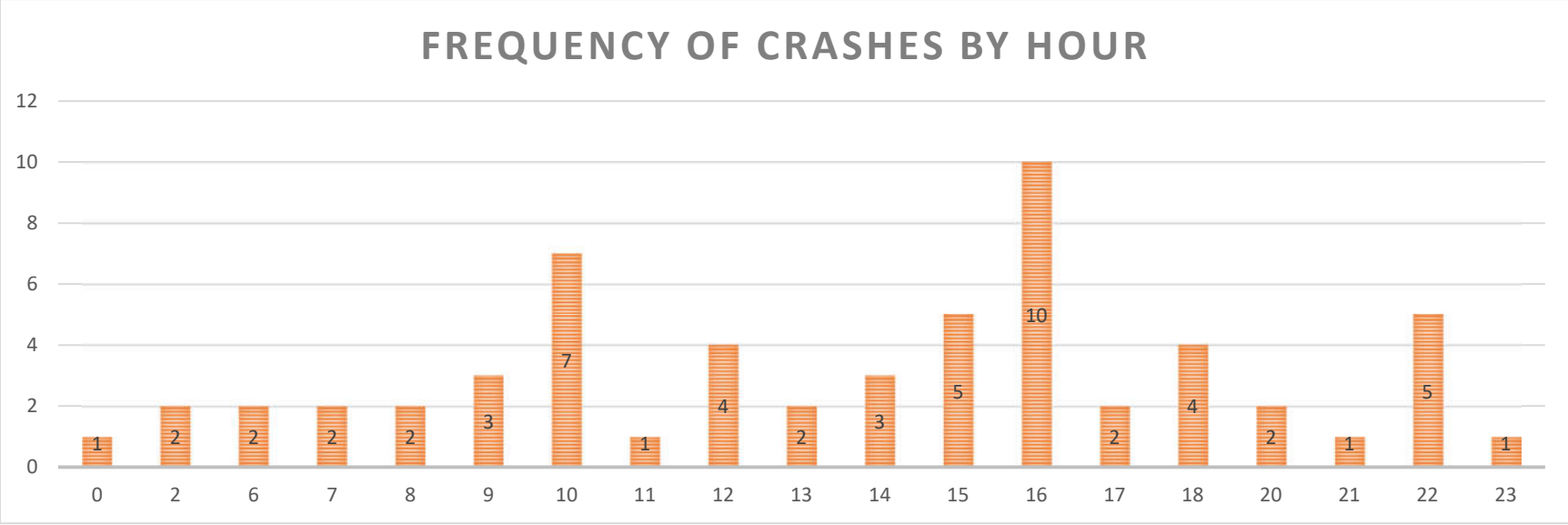


IL 37 Corridor Crashes - Cedar Grove Road to Longstreet Road (2014-2018)



IL 37 Corridor Crashes - Cedar Grove Road to Longstreet Road (2014-2018)





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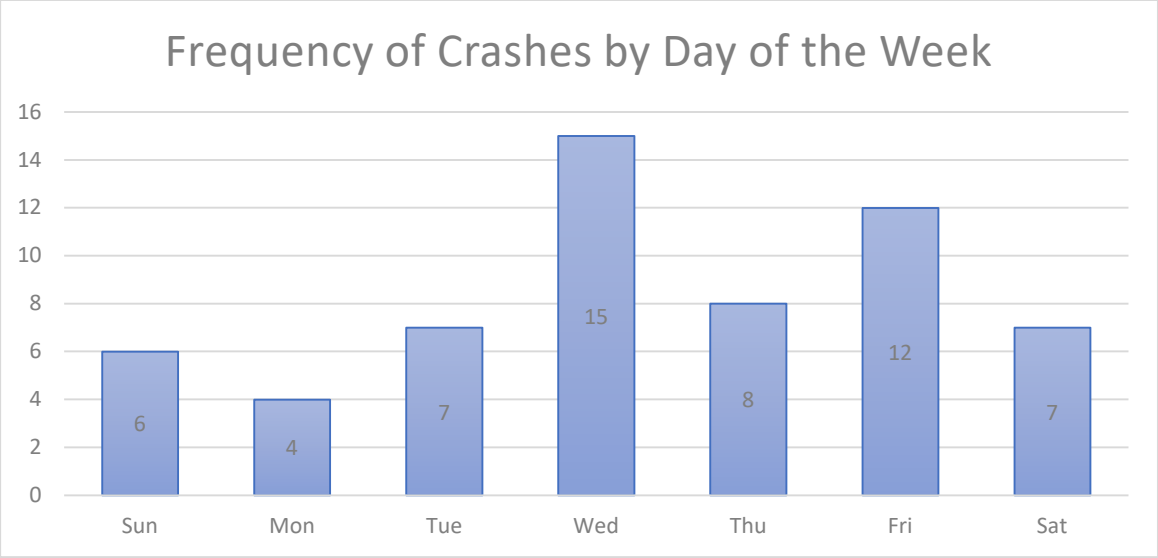

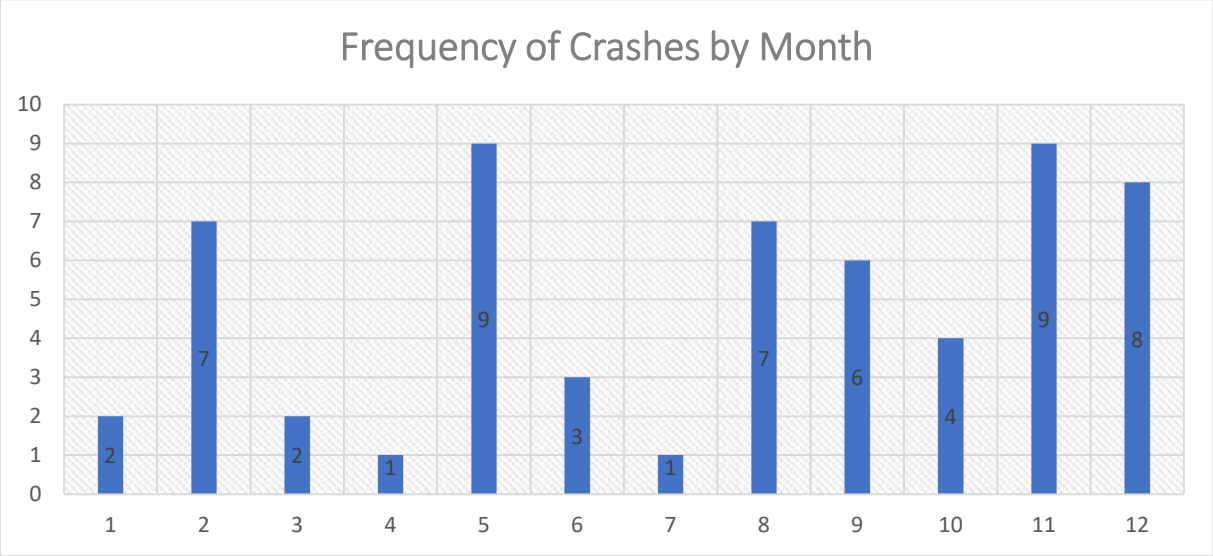

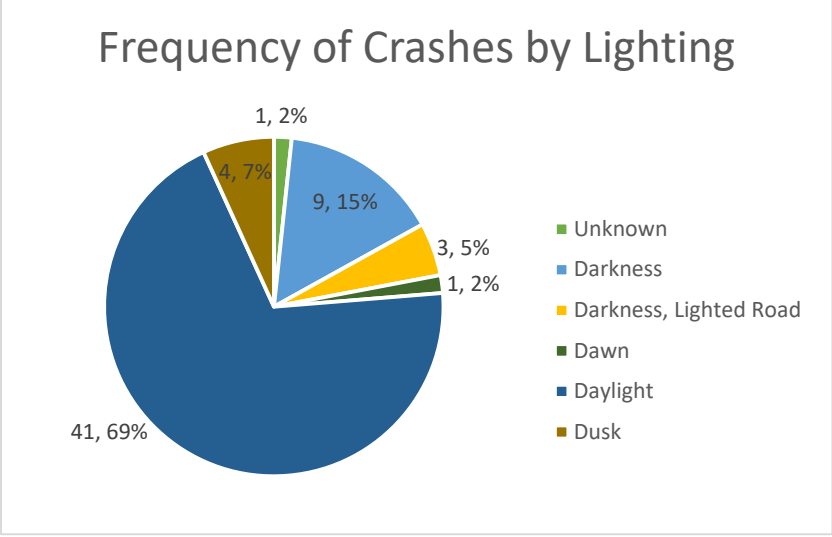

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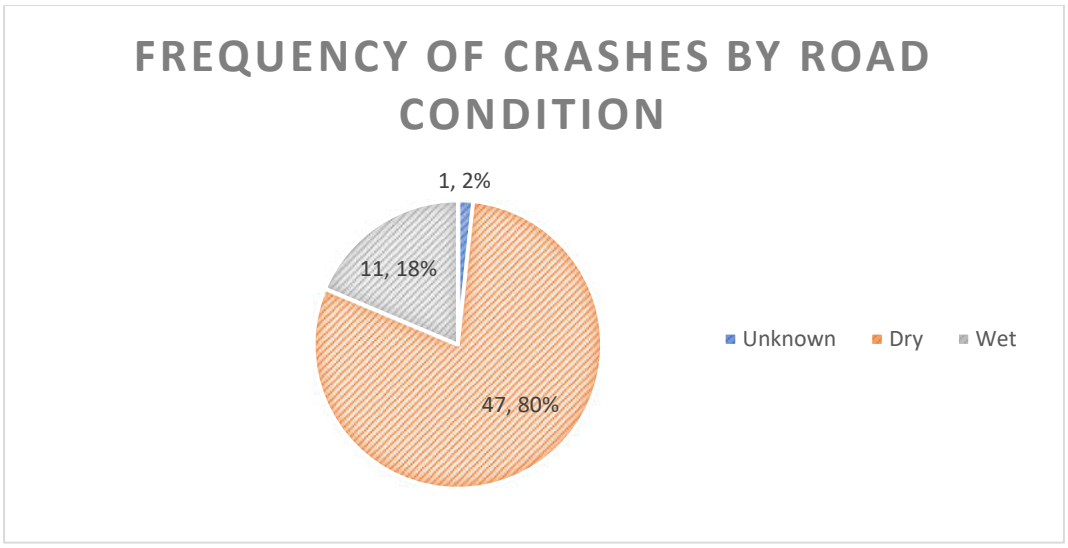
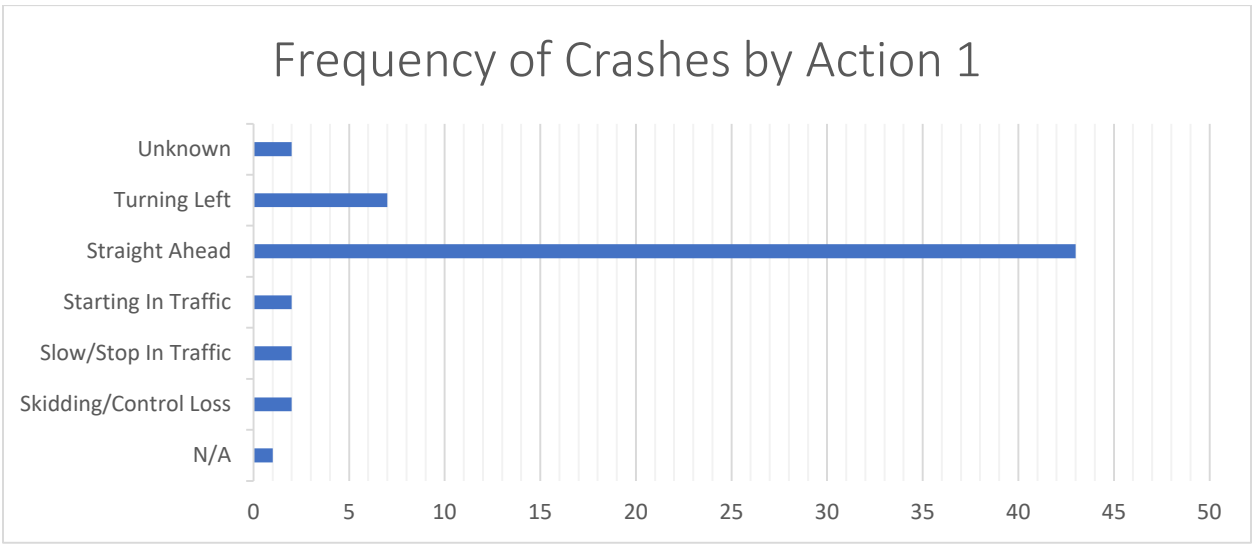
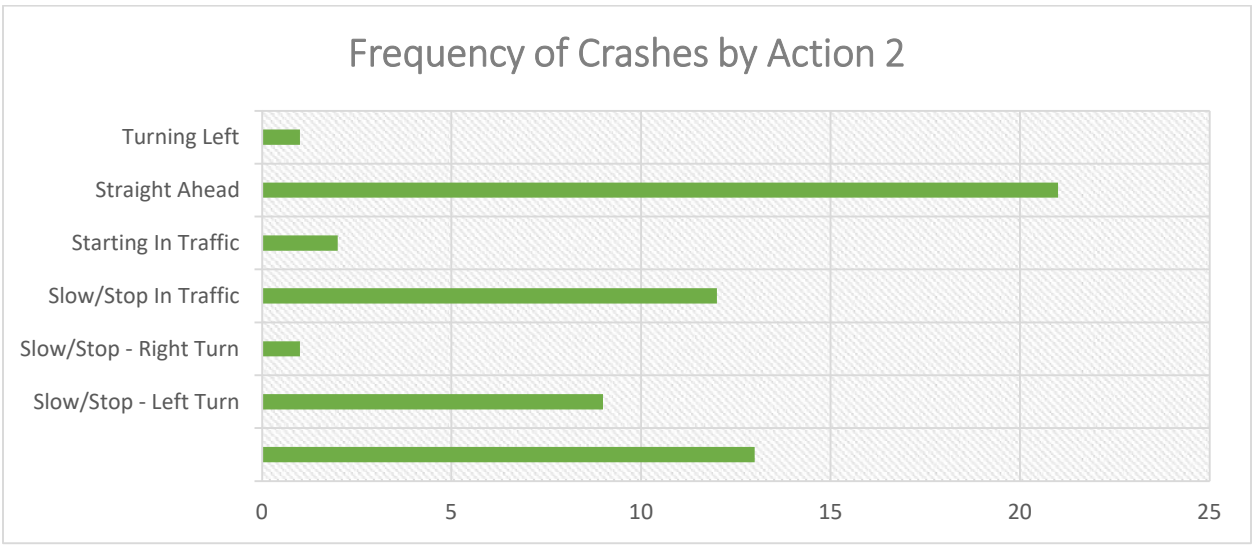
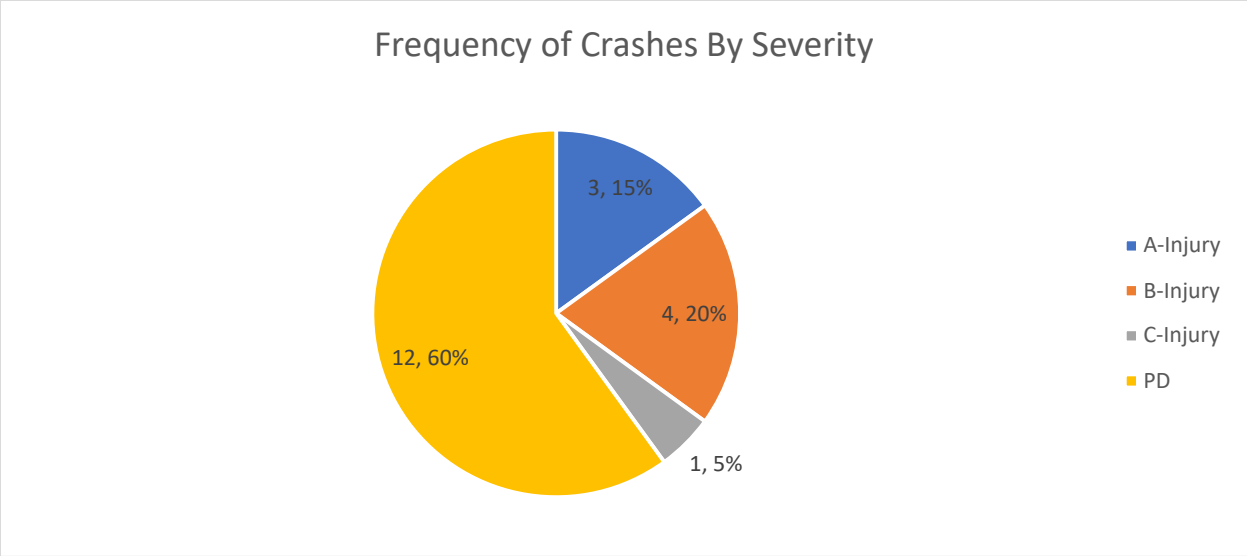
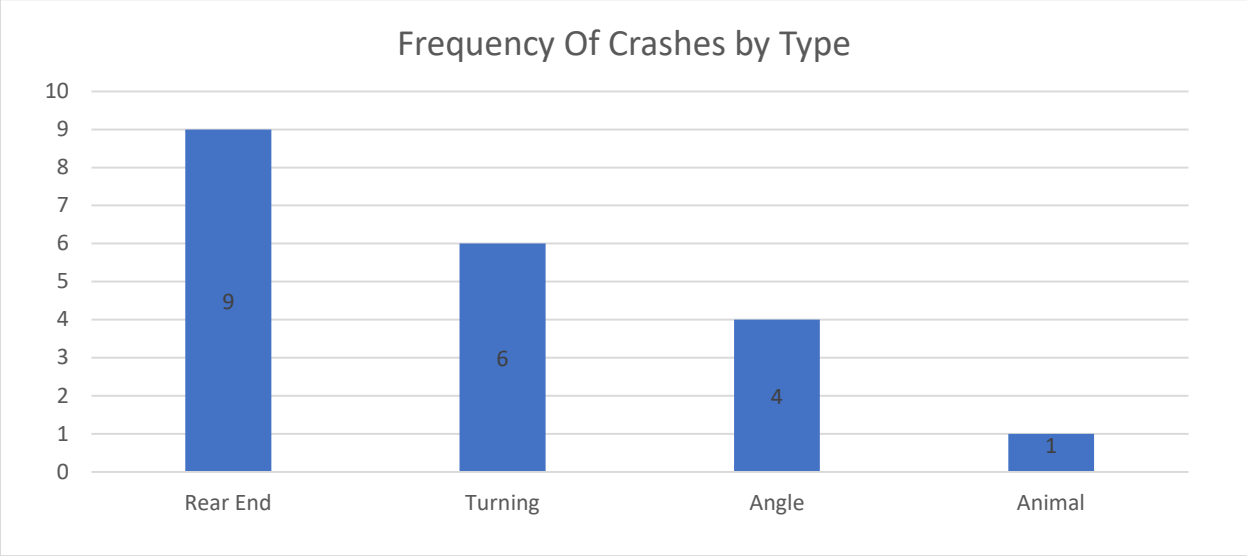


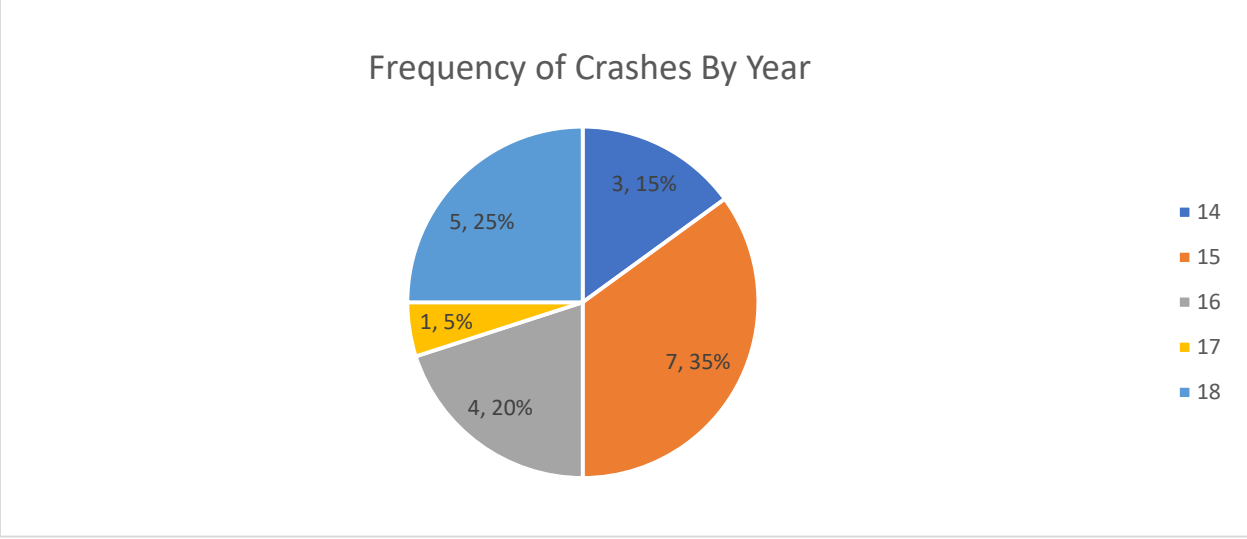




Intersection of IL 37 and Longstreet Road (2014-2018)







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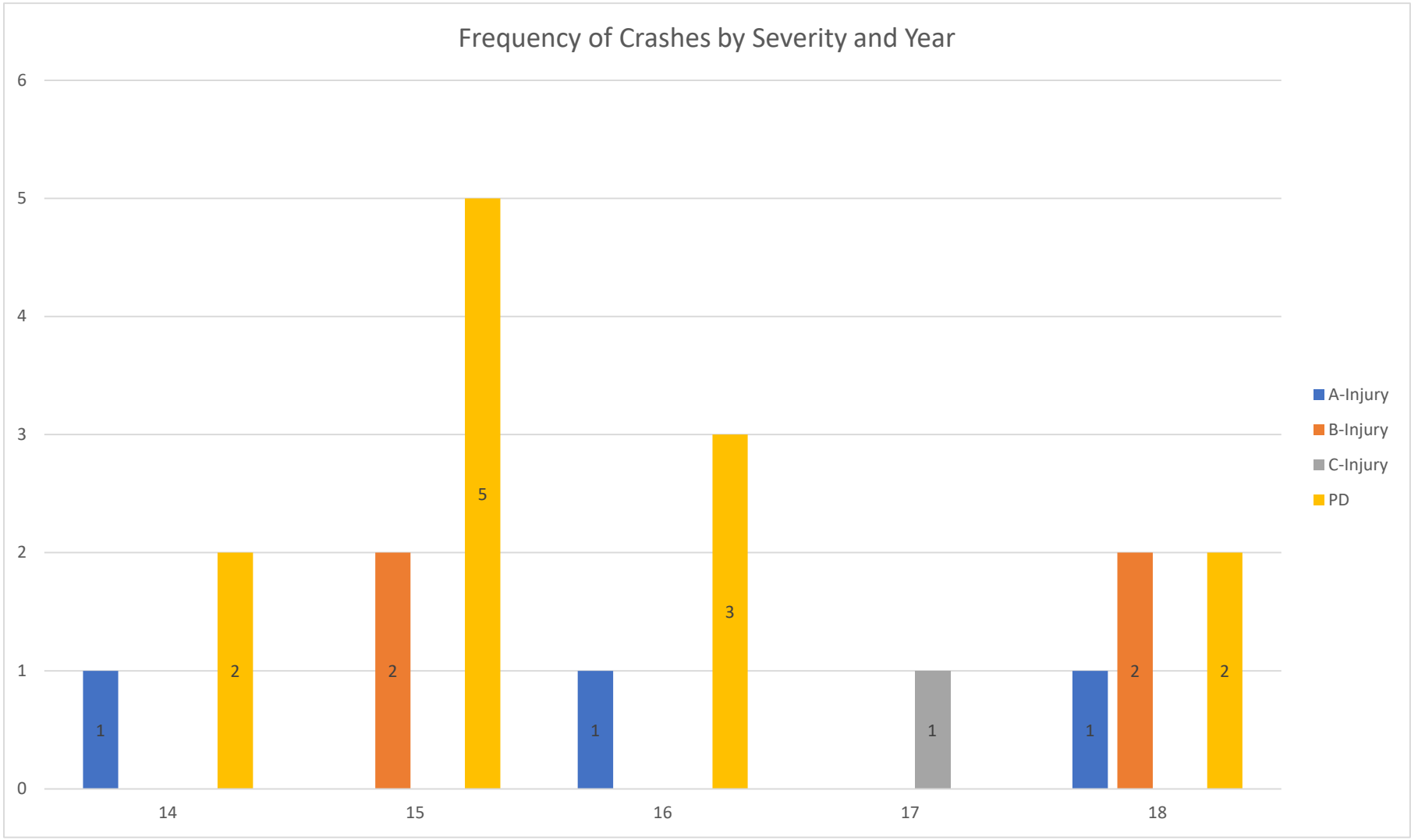

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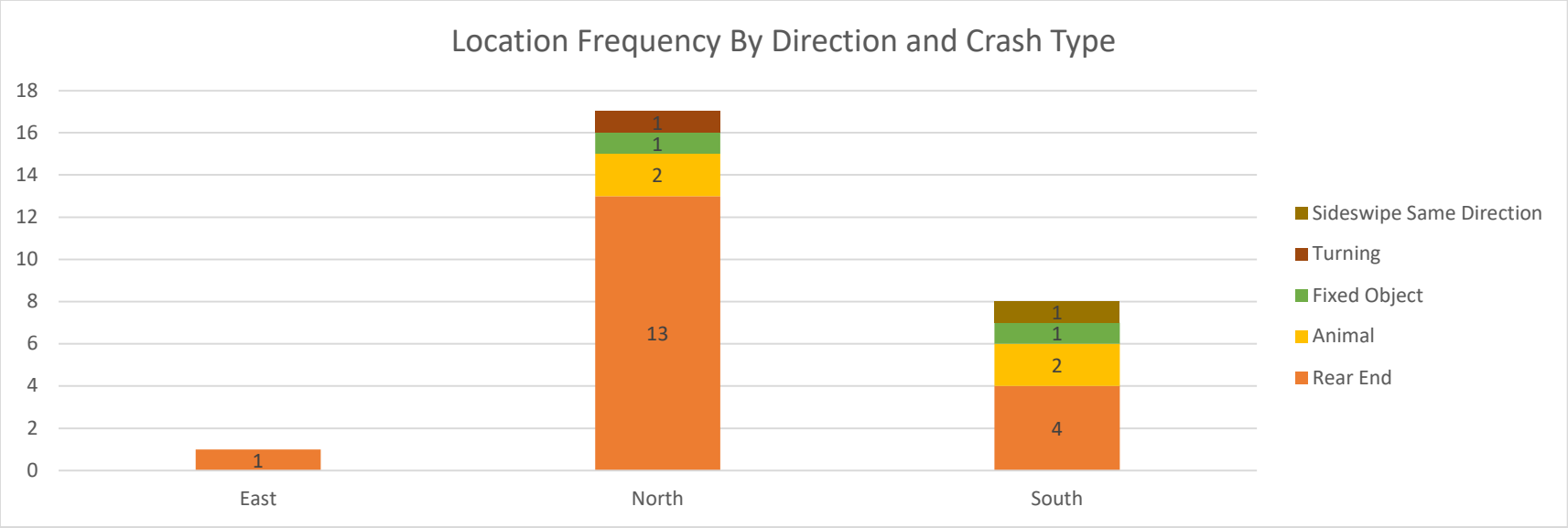

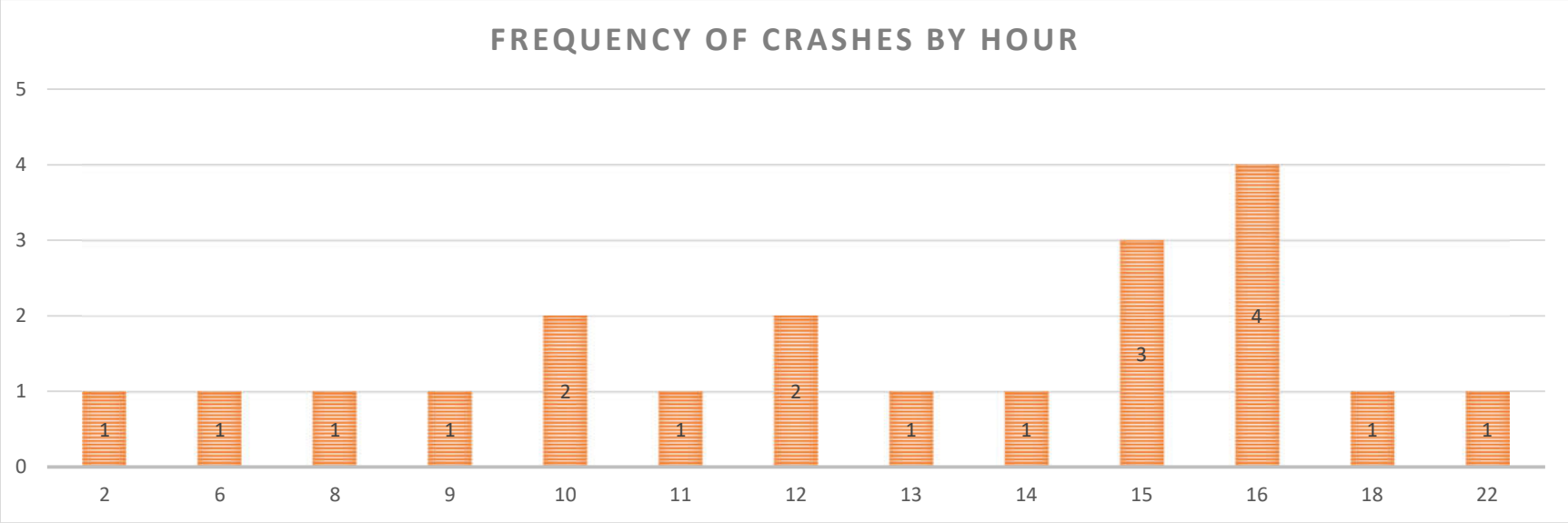

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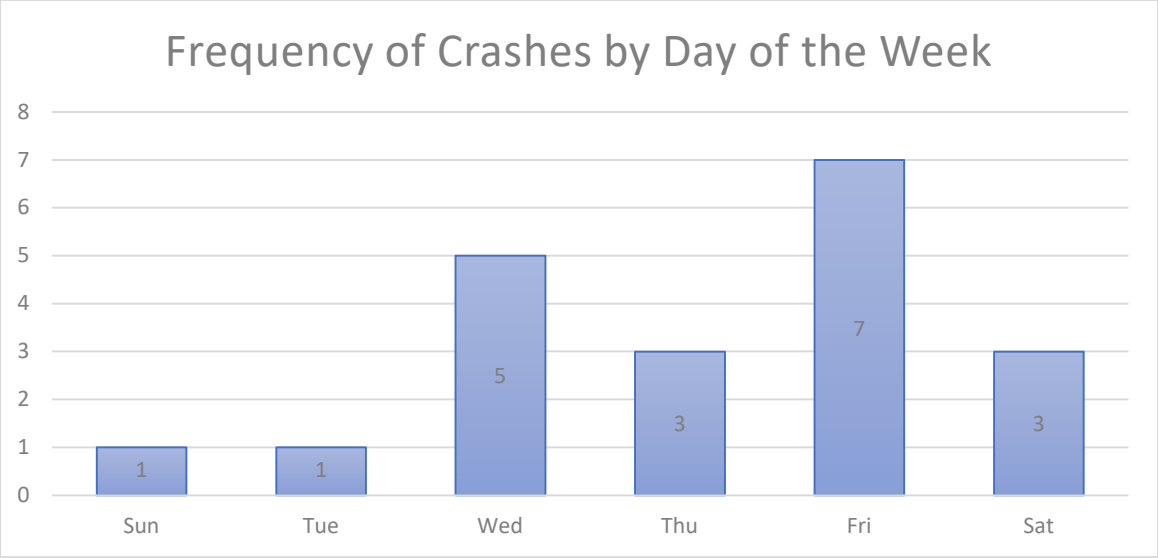

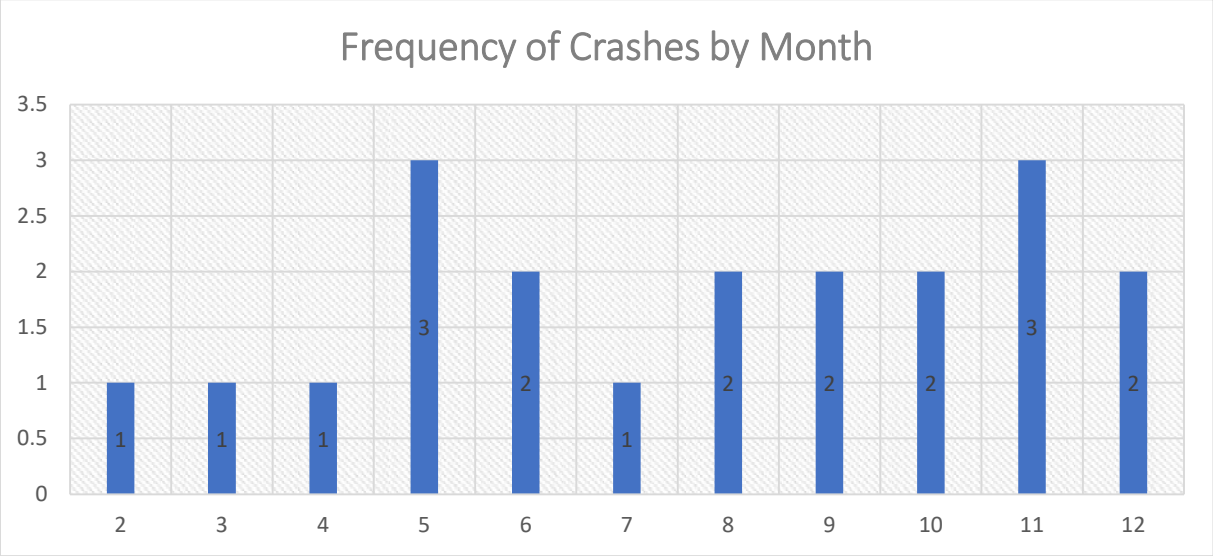

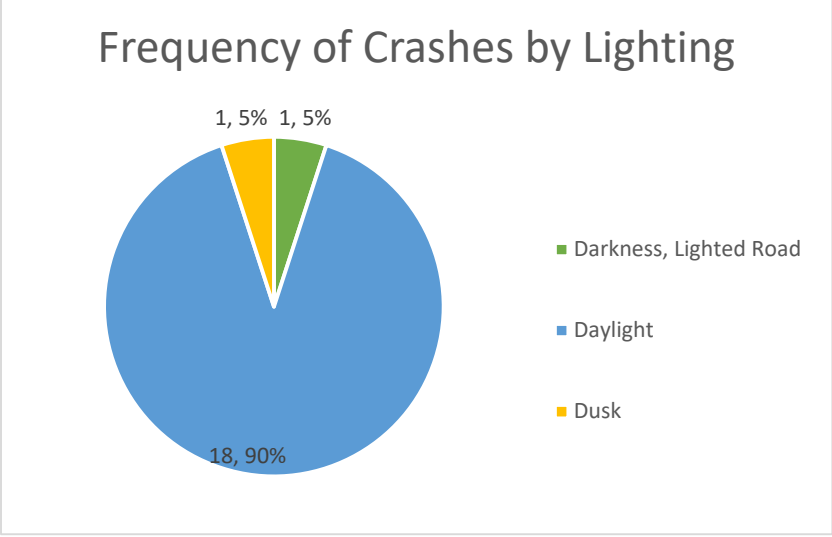

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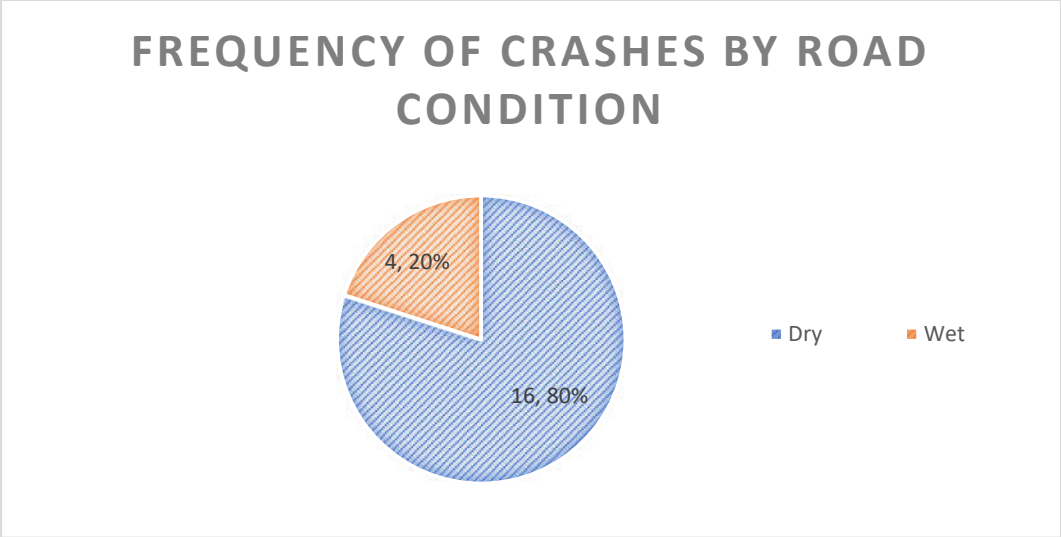

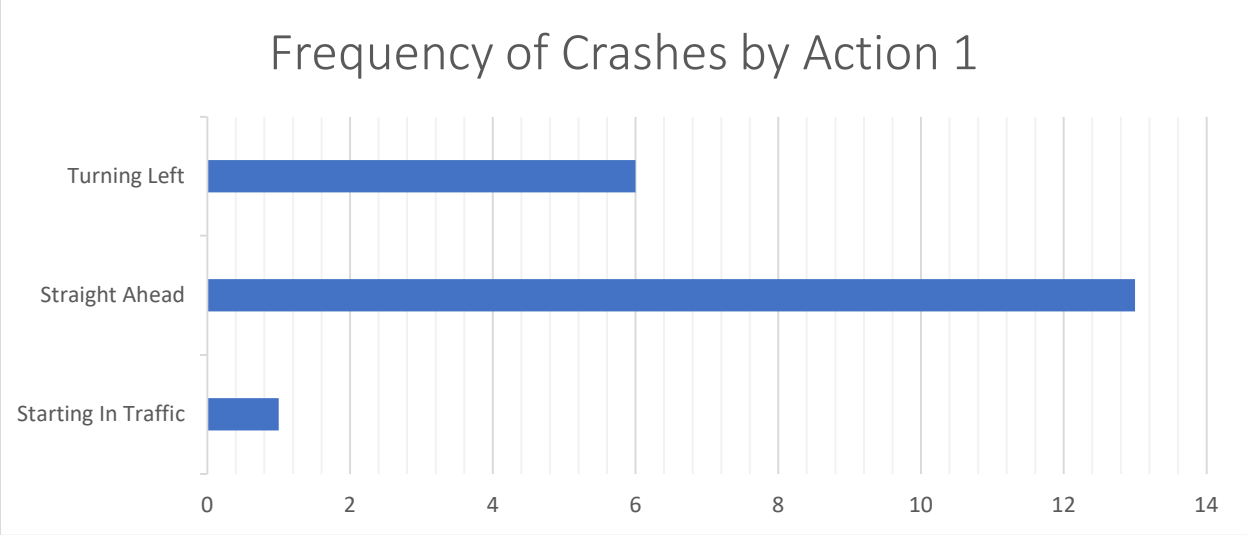

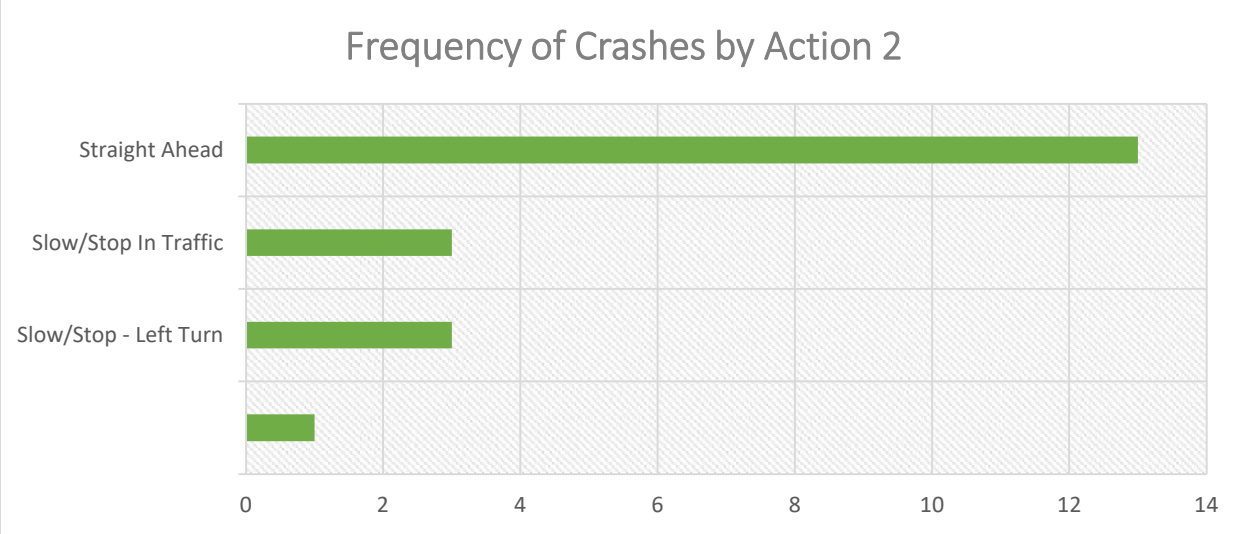

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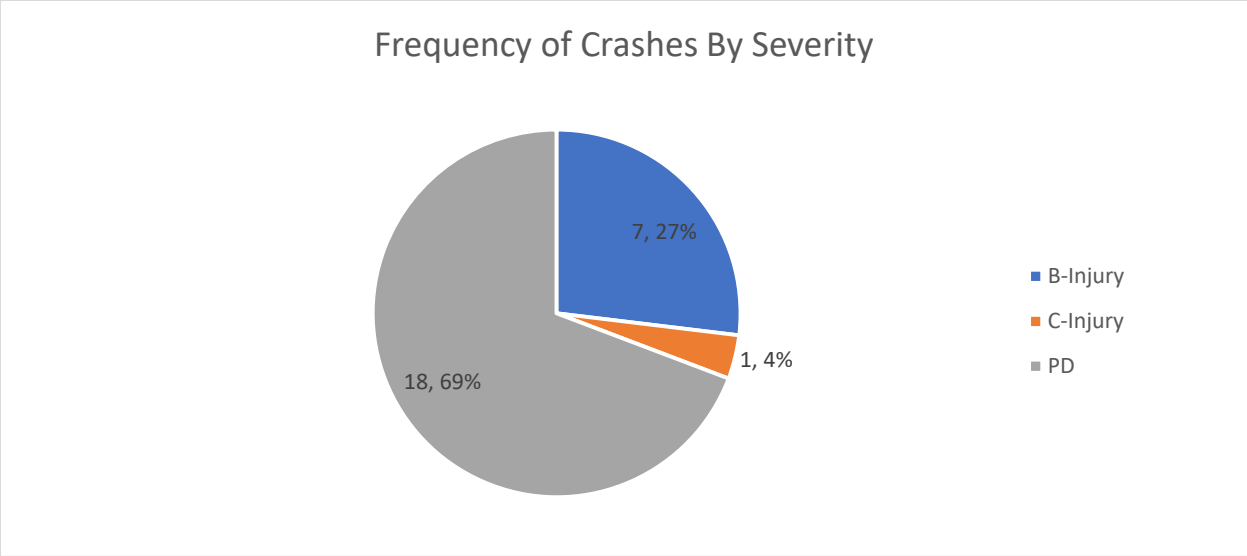

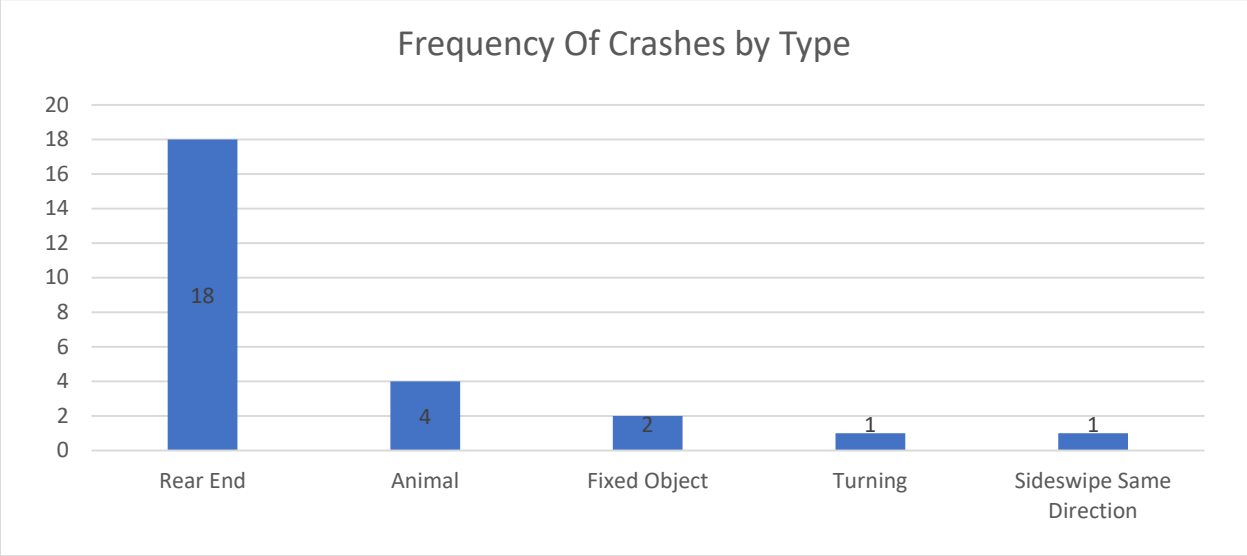

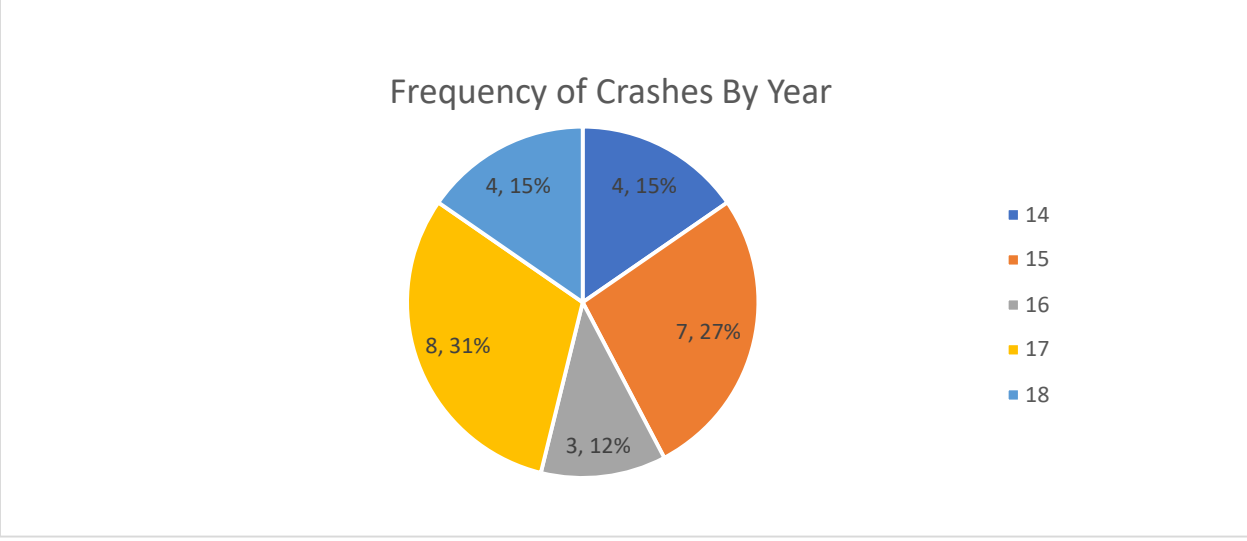

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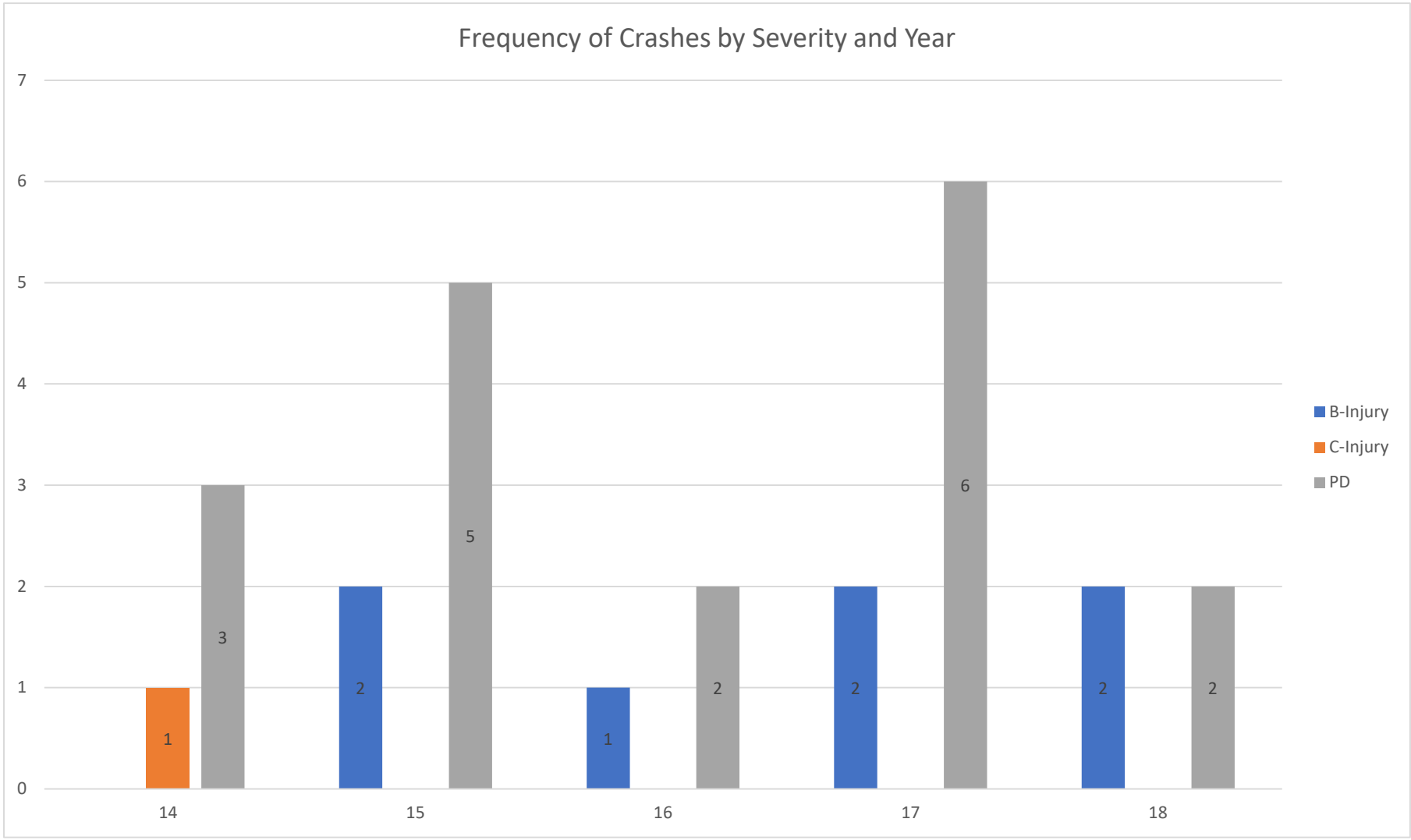

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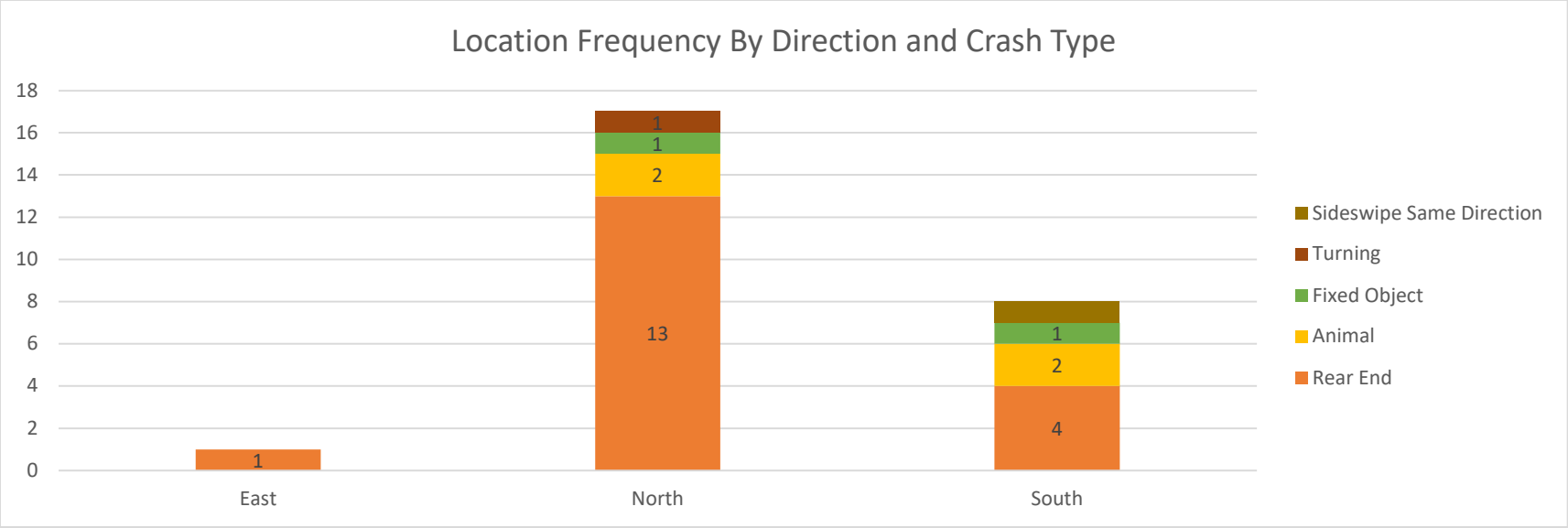

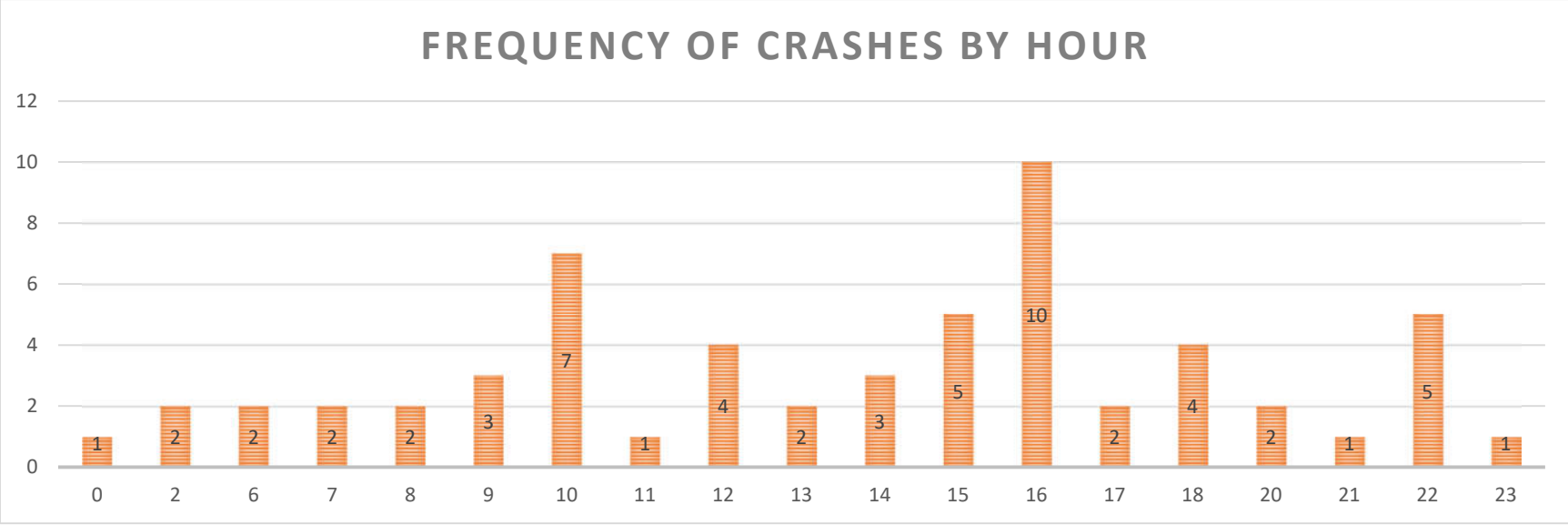

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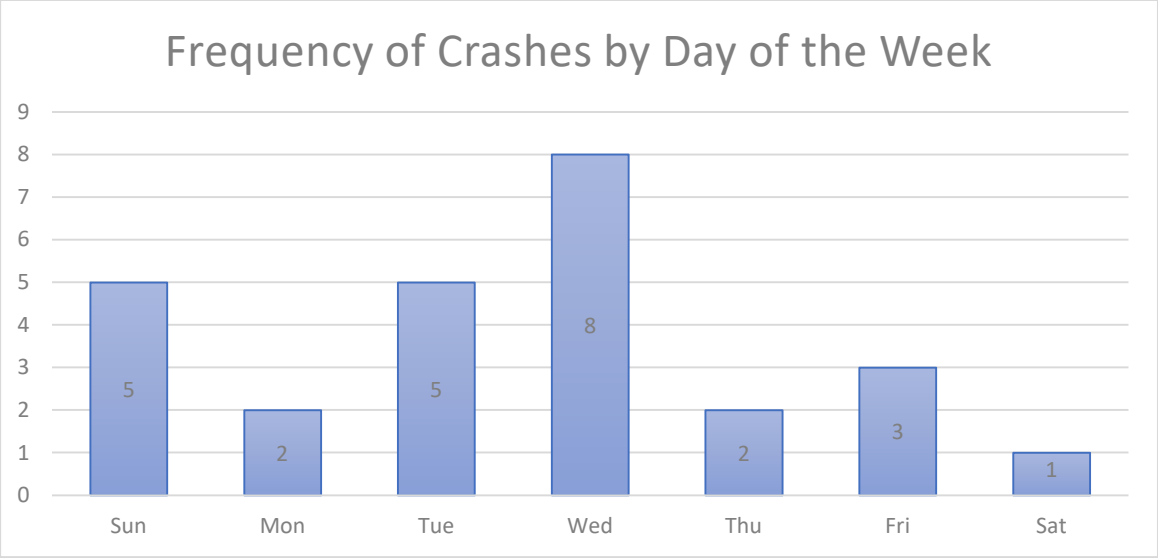
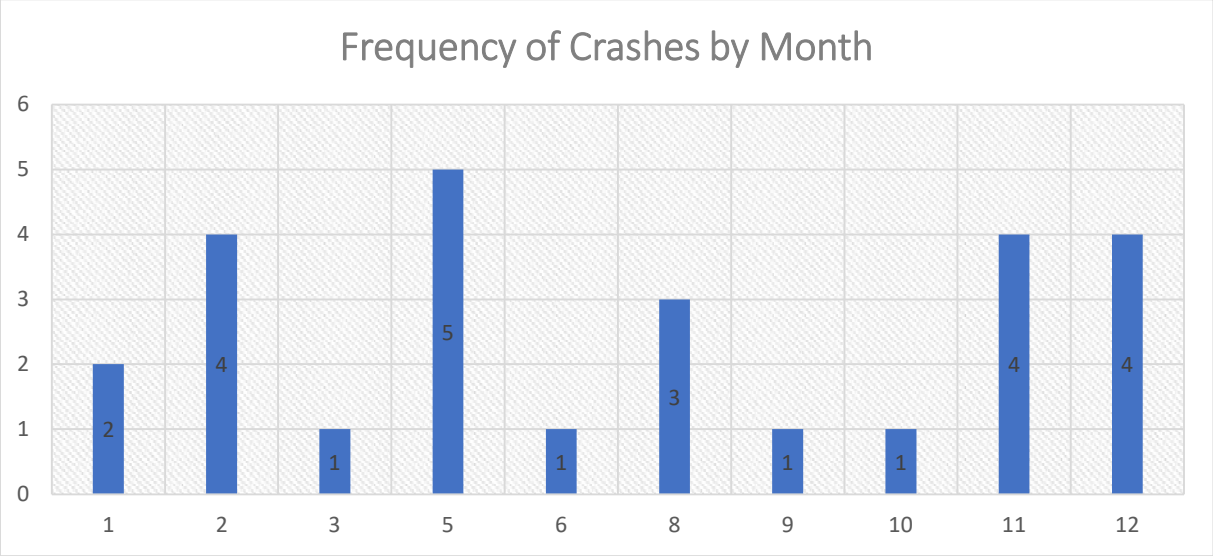
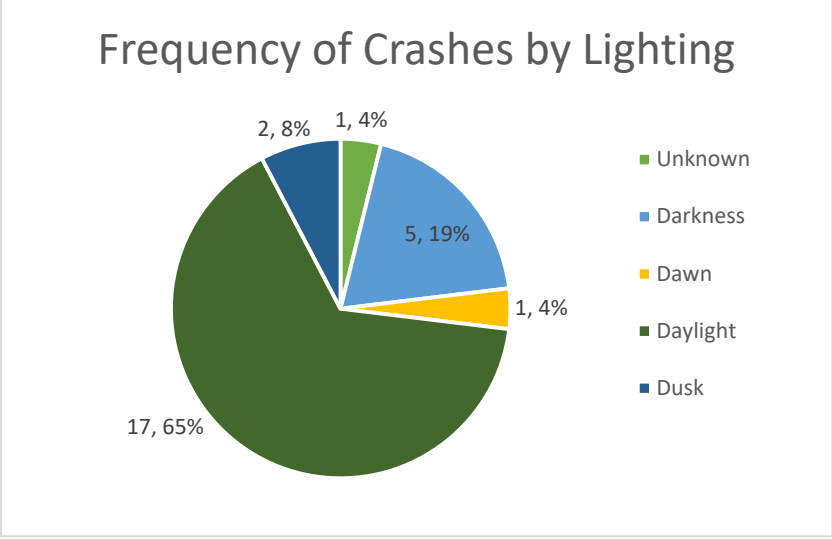
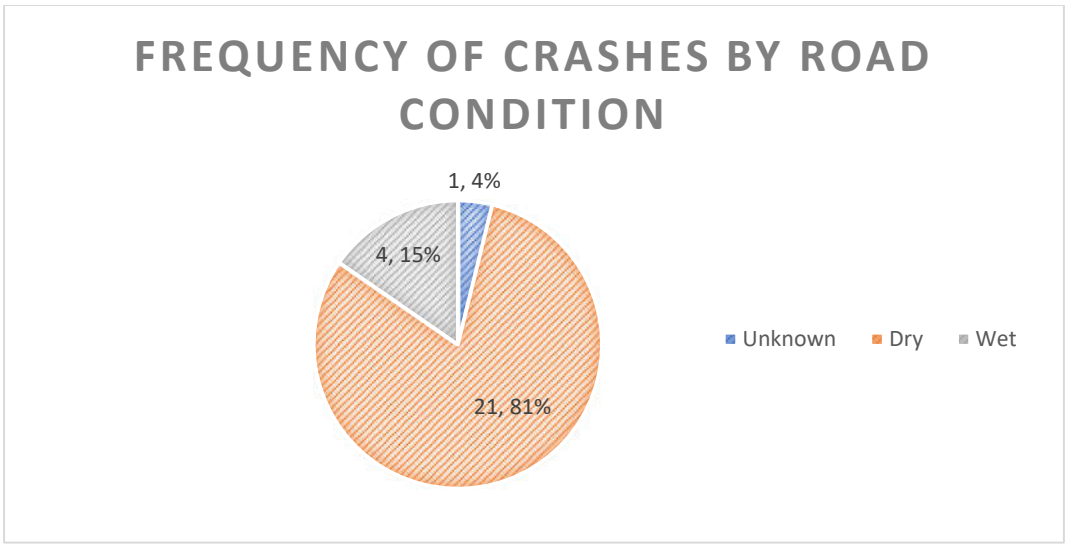
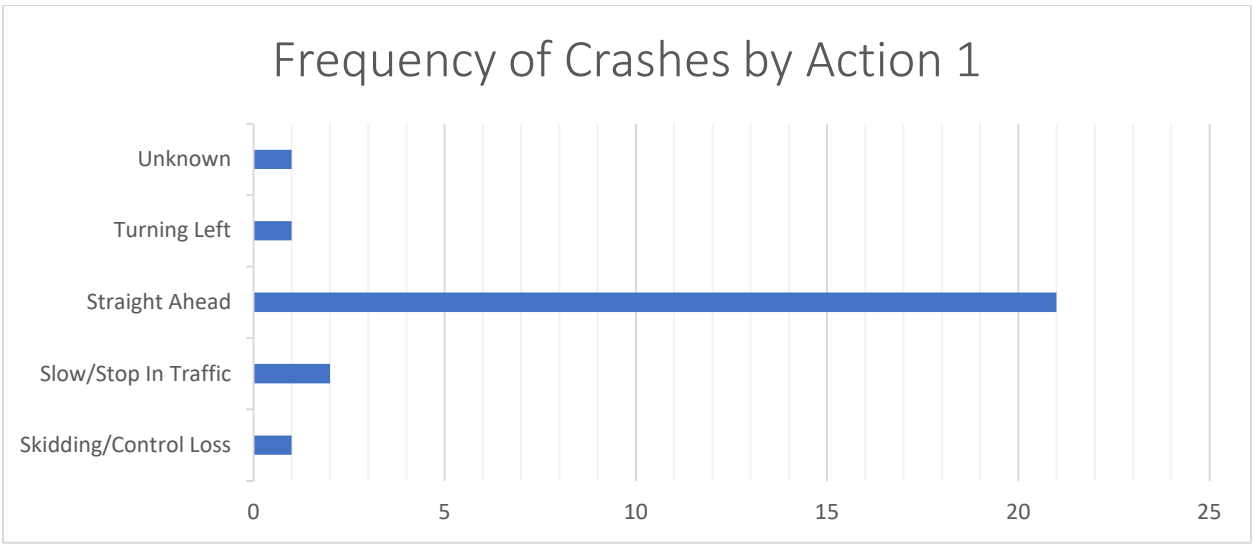


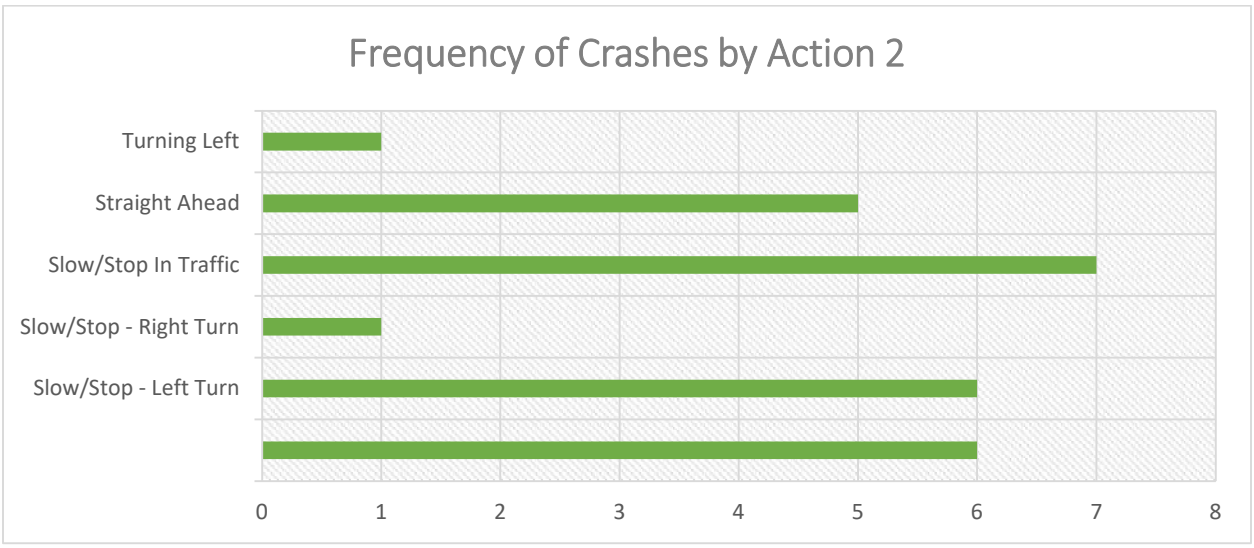




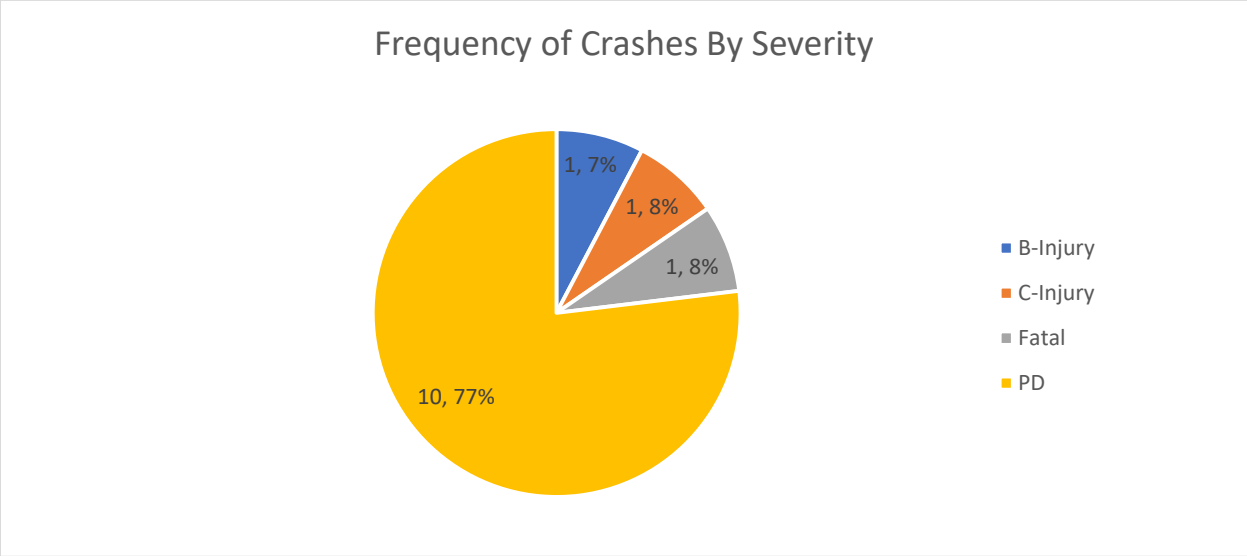
Intersection of IL 37 and Cedar Grove Road (2014-2018)

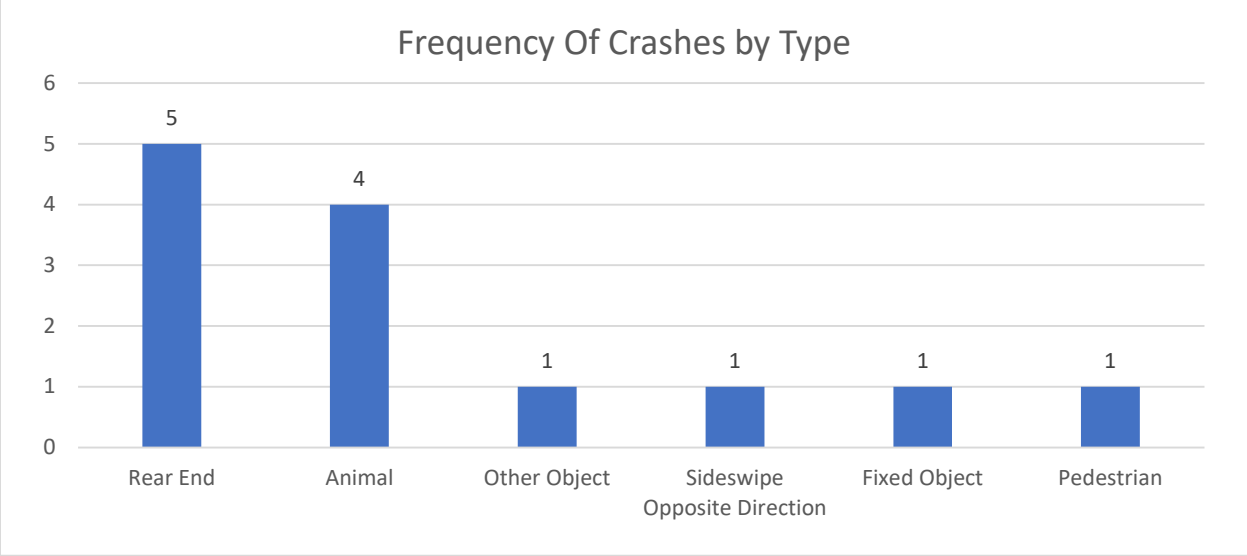


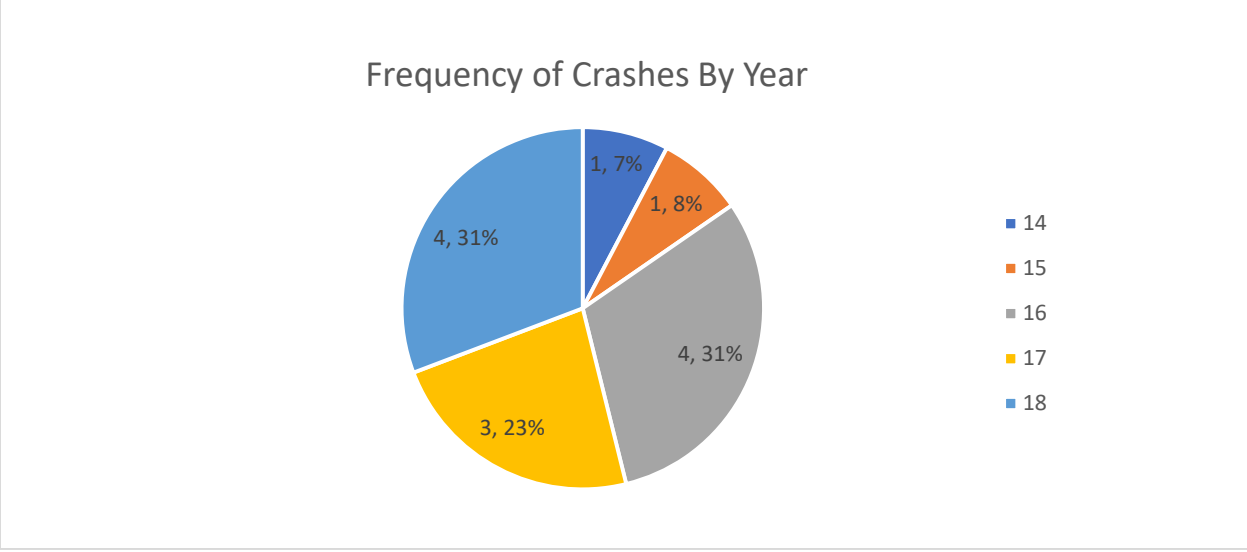




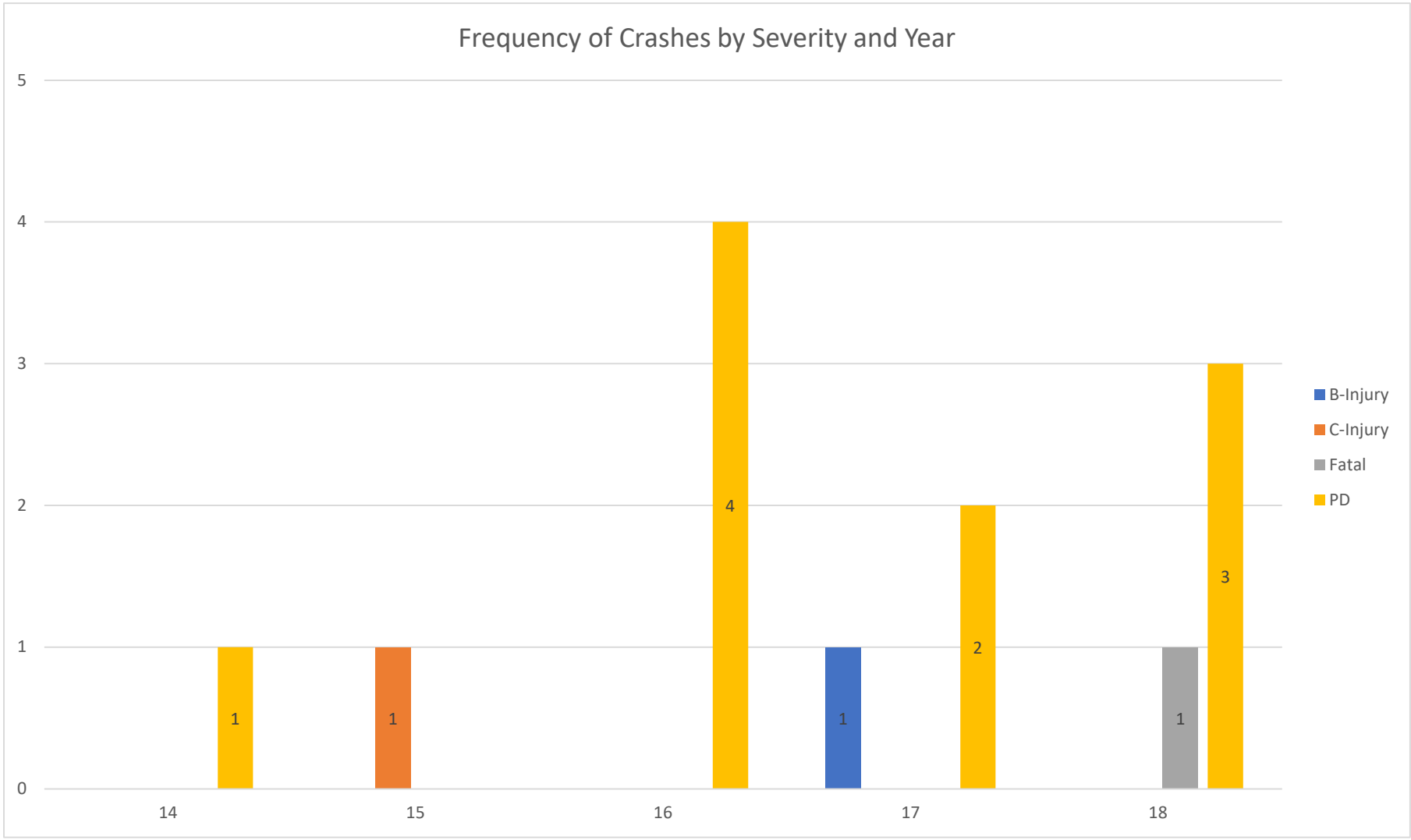
Segment Crashes along IL 37 from Cedar Grove Rd to Longstreet Road (2014-2018)



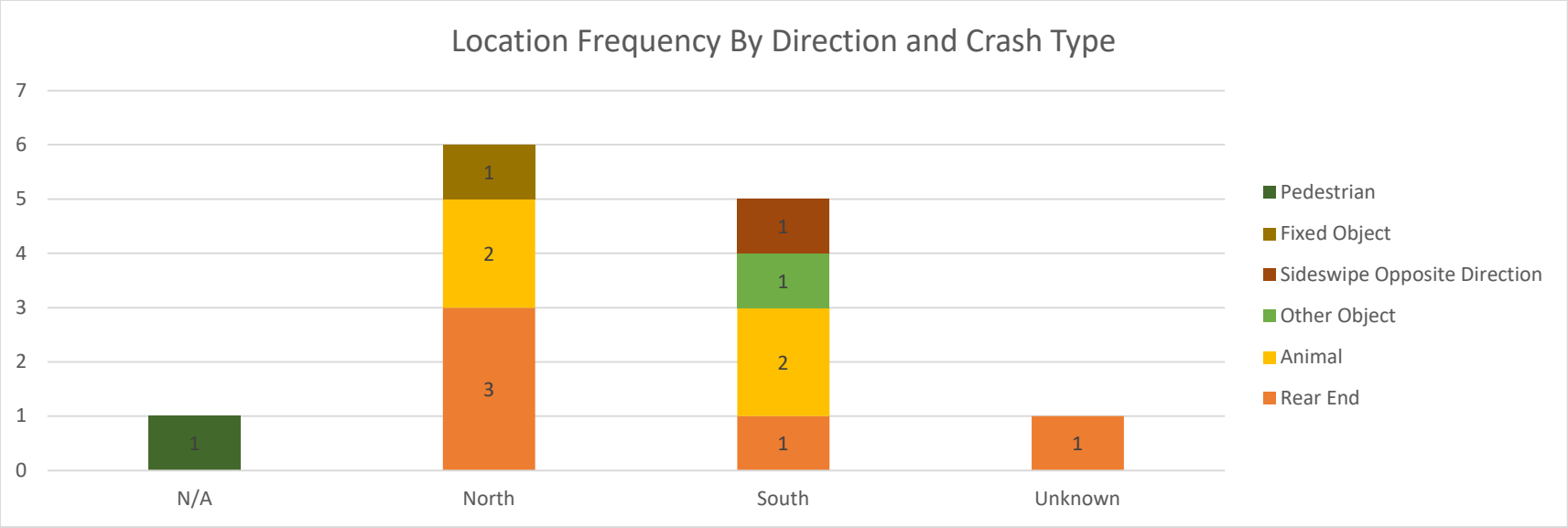


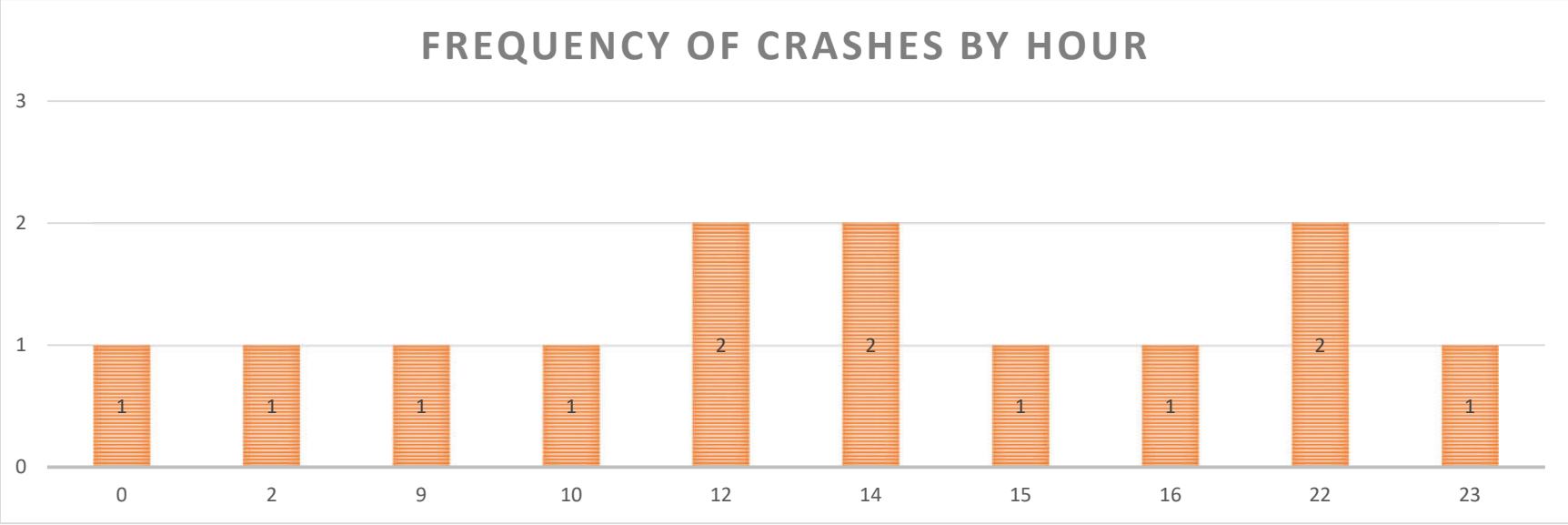


Segment Crashes along IL 37 from Cedar Grove Rd to Longstreet Road (2014-2018)

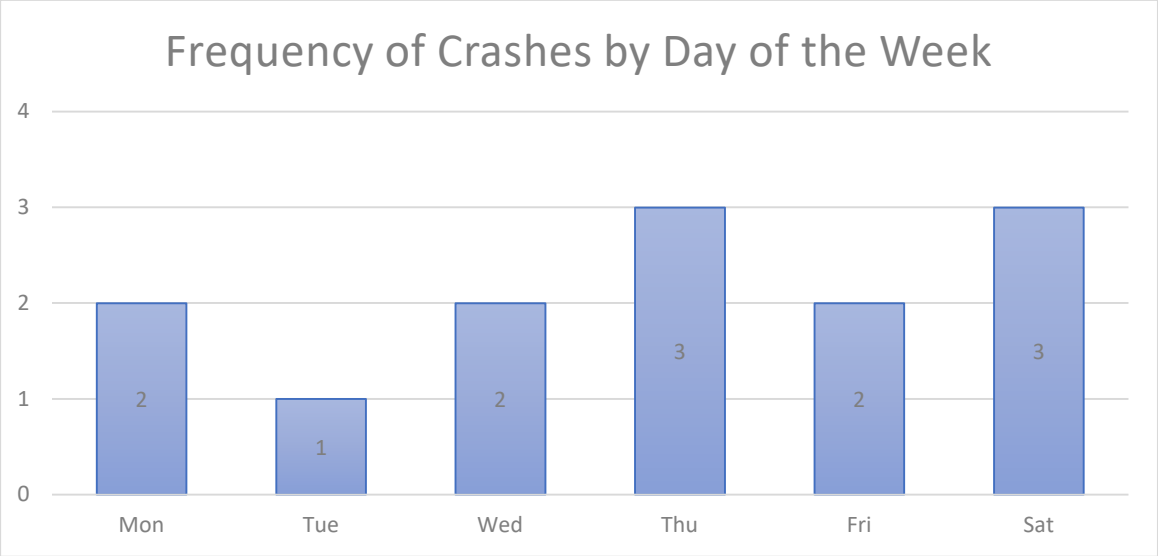


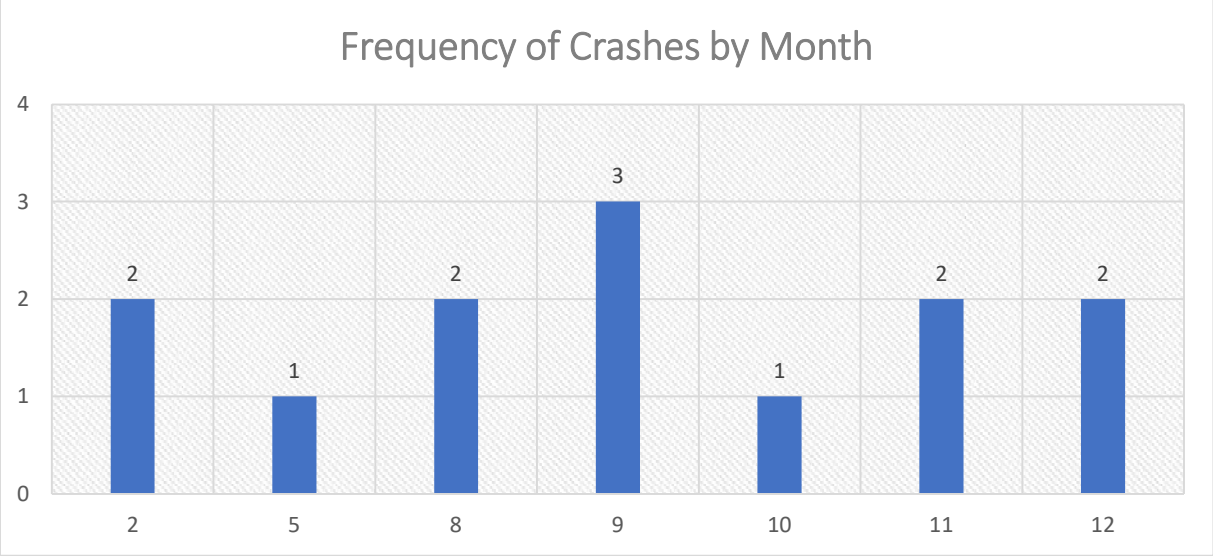
Segment Crashes along IL 37 from Cedar Grove Rd to Longstreet Road (2014-2018)

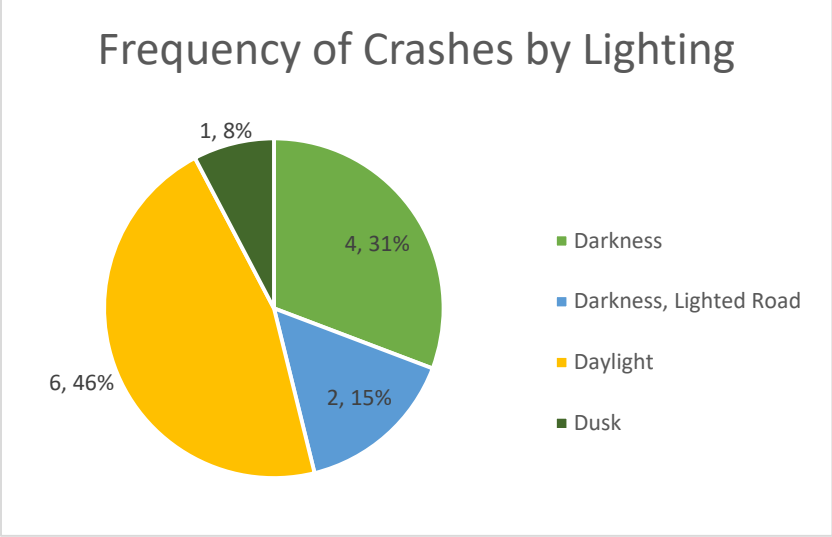




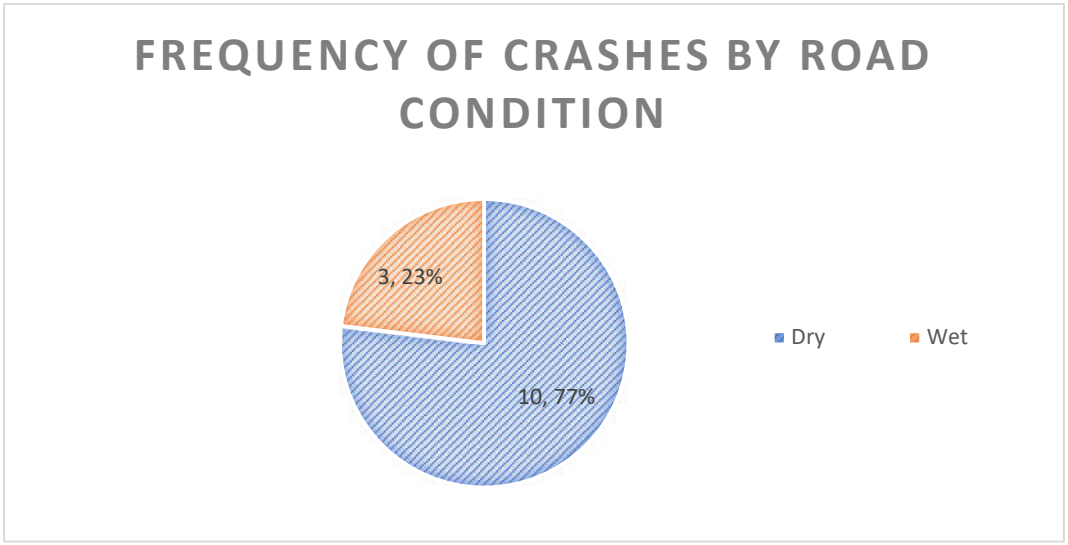
Segment Crashes along IL 37 from Cedar Grove Rd to Longstreet Road (2014-2018)

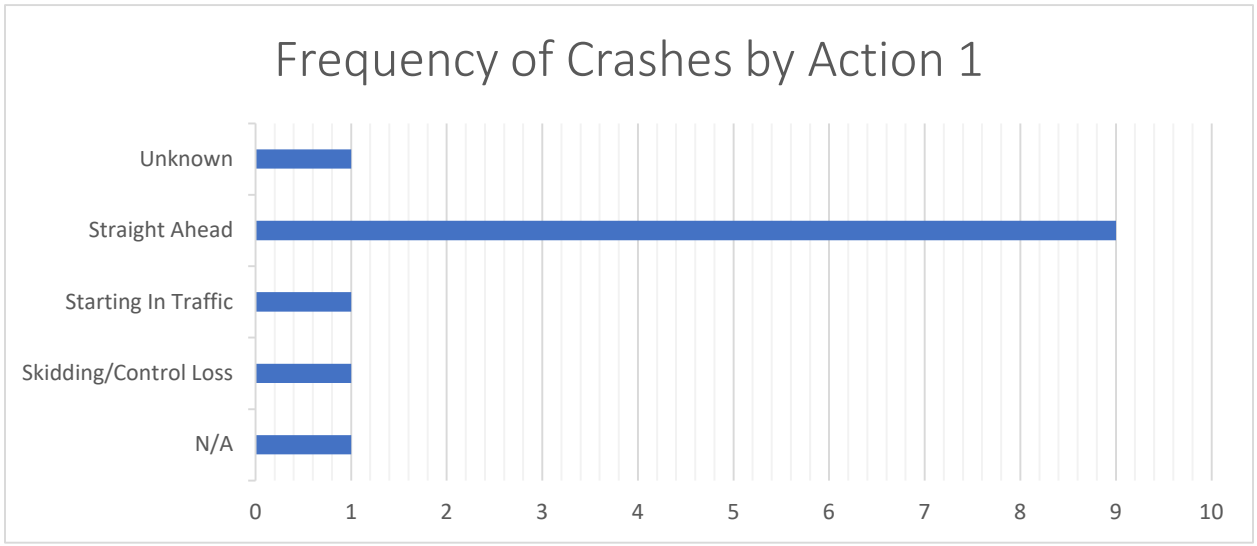


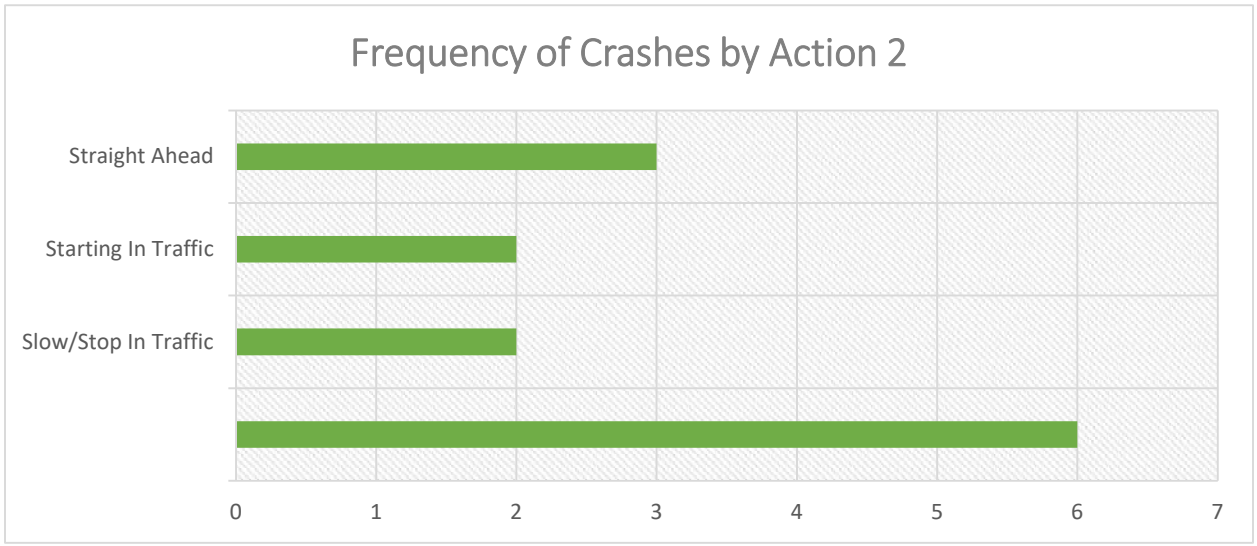




Segment Crashes along IL 37 from Cedar Grove Rd to Longstreet Road (2014-2018)







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201400102291	14	2	7	17	Fri	2	0	0	Rear End	Clear	Dusk	Dry	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	PD	Cedar Grove
201400233207	14	5	2	15	Fri	3	2	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Truck Single Unit	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	A-Injury	Longstreet
201400247114	14	5	14	10	Wed	2	1	0	Rear End	Rain	Daylight	Wet	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop - Left Turn	On Pavement (Roadway)	C-Injury	Cedar Grove
201400295701	14	10	25	0	Sat	1	0	0	Animal	Clear	Darkness	Dry	Lane Use Marking	Unincorporated	Normal	Pickup	North	Straight Ahead	Off Pavement - Right						PD	Segment
201400316353	14	11	12	6	Wed	1	0	0	Animal	Clear	Dusk	Dry	No Controls	Marion	Normal	SUV	South	Straight Ahead	On Pavement (Roadway)						PD	Longstreet
201400336893	14	11	14	20	Fri	1	0	0	Animal	Clear	Darkness	Dry	Lane Use Marking	Unincorporated	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)						PD	Cedar Grove
201400369097	14	8	7	16	Thu	2	0	0	Turning	Rain	Daylight	Wet	Stop Sign/Flasher	Marion	Normal	SUV	Northeast	Turning Left	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD	Longstreet
201501026585	15	2	3	7	Tue	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	North	Skidding/Control Loss	On Pavement (Roadway)	Normal	Van/Mini-Van	North	Straight Ahead	On Pavement (Roadway)	PD	Cedar Grove
201501045966	15	3	8	16	Sun	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	Longstreet
201501062548	15	1	13	16	Tue	2	0	0	Rear End	Clear	Daylight	Dry	Lane Use Marking	Unincorporated	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Cedar Grove
201501075840	15	2	1	13	Sun	2	1	0	Rear End	Rain	Daylight	Wet	Lane Use Marking	Unincorporated	Normal	Passenger	South	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	Passenger	South	Slow/Stop In Traffic	On Pavement (Roadway)	B-Injury	Cedar Grove
201501090517	15	4	25	2	Sat	2	1	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	South	Straight Ahead	Intersection	Normal	Passenger	South	Slow/Stop - Left Turn	Intersection	B-Injury	Longstreet
201501105136	15	5	30	13	Sat	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	Longstreet
201501115195	15	6	11	17	Thu	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	SUV	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Cedar Grove
201501152792	15	8	8	18	Sat	2	1	0	Rear End	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)	Normal	Van/Mini-Van	East	Straight Ahead	On Pavement (Roadway)	B-Injury	Cedar Grove
201501197058	15	9	19	11	Sat	2	3	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Van/Mini-Van	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury	Longstreet
201501259317	15	11	24	22	Tue	2	0	0	Turning	Clear	Darkness, Lighted Road	Dry	Stop Sign/Flasher	Marion	Alcohol Impaired	Passenger	East	Turning Left	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD	Longstreet
201501263811	15	11	22	10	Sun	3	0	0	Rear End	Clear	Daylight	Dry	Lane Use Marking	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Cedar Grove
201501274393	15	12	9	16	Wed	3	0	0	Turning	Clear	Daylight	Dry	Lane Use Marking	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Turning Left	On Pavement (Roadway)	PD	Cedar Grove
201501285170	15	12	18	14	Fri	2	2	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	C-Injury	Segment
201501288009	15	12	23	10	Wed	2	0	0	Turning	Cloudy/Overcast	Daylight	Wet	Stop Sign/Flasher	Marion	Normal	Passenger	East	Turning Left	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Longstreet
201501294992	15	12	30	15	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	PD	Longstreet
201601035951	16	2	6	10	Sat	1	0	0	Animal	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)						PD	Segment
201601040181	16	2	12	10	Fri	2	2	0	Turning	Clear	Daylight	Dry	No Controls	Marion	Normal	SUV	Northwest	Turning Left	Intersection	Normal	Van/Mini-Van	South	Straight Ahead	Intersection	A-Injury	Longstreet
201601114074	16	5	12	12	Thu	2	0	0	Rear End	Rain	Daylight	Wet	No Controls	Marion	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	Normal	SUV	South	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Longstreet
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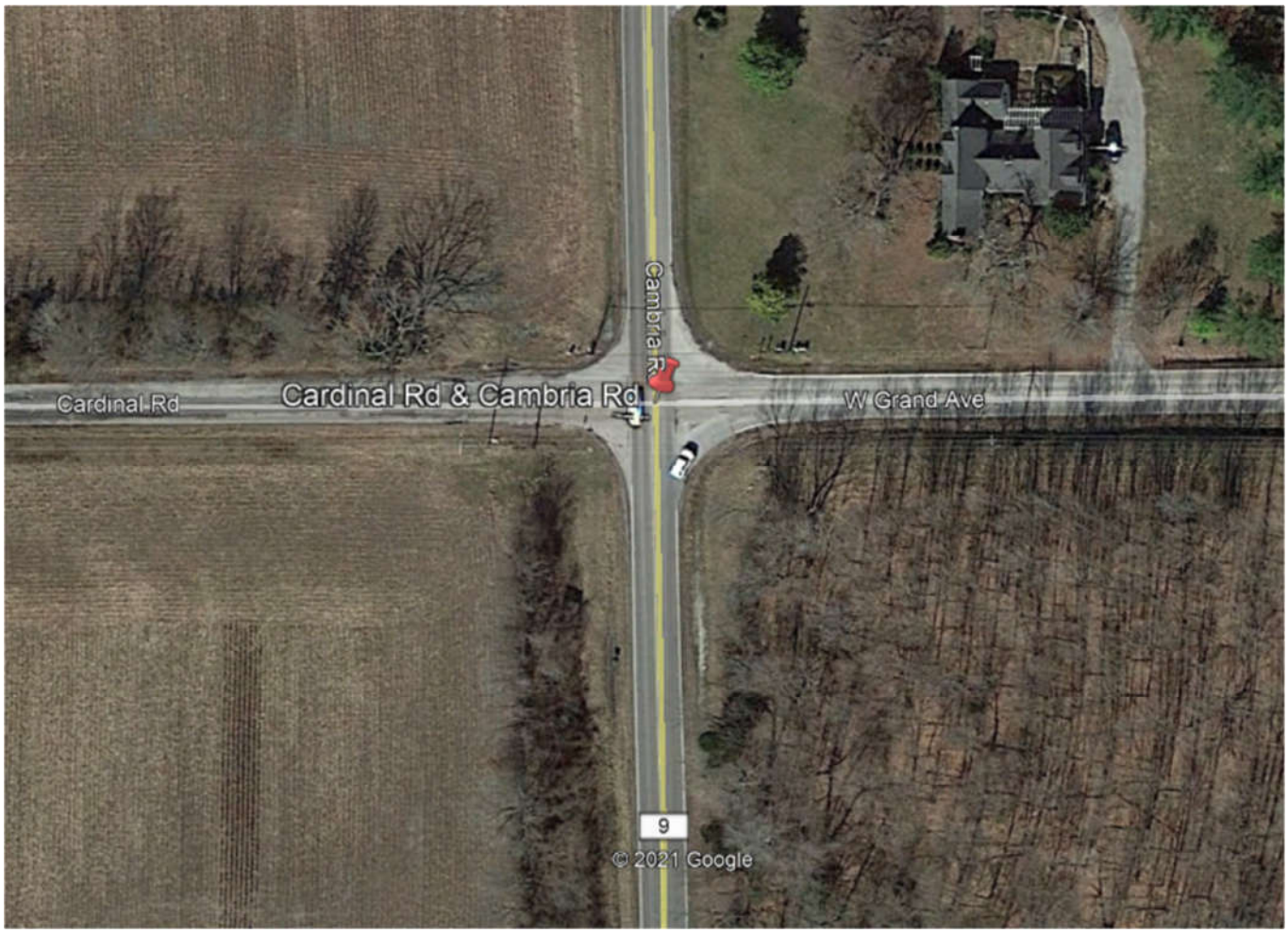
201601186401	16	8	13	12	Sat	1	0	0	Fixed Object	Rain	Daylight	Wet	No Controls	Whiteash	Normal	Pickup	North	Skidding/Control Loss	Off Pavement - Right						PD	Segment
201601223018	16	9	8	14	Thu	3	0	0	Rear End	Rain	Daylight	Wet	Lane Use Marking	Unincorporated	Other/Unknown	Unknown	Unknown	Unknown	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Segment
201601243531	16	10	5	15	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD	Cedar Grove
201601255303	16	10	28	14	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	Southeast	Turning Left	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	PD	Longstreet
201601276678	16	11	20	10	Sun	2	1	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	North	Slow/Stop - Left Turn	On Pavement (Roadway)	B-Injury	Cedar Grove
201601280421	16	11	17	9	Thu	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Tractor With Semi-Trailer	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Starting In Traffic	On Pavement (Roadway)	PD	Segment
201601282703	16	11	23	18	Wed	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)						PD	Cedar Grove
201701017138	17	1	11	16	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	Normal	SUV	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Cedar Grove
201701034911	17	2	6	16	Mon	3	0	0	Rear End	Rain	Darkness	Wet	No Controls	Unincorporated	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Segment
201701067860	17	3	16	18	Thu	2	3	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	North	Slow/Stop In Traffic	On Pavement (Roadway)	B-Injury	Cedar Grove
201701111782	17	5	10	20	Wed	1	0	0	Fixed Object	Clear	Darkness	Dry	Lane Use Marking	Unincorporated	Normal	Passenger	North	Turning Left	Off Pavement - Left						PD	Cedar Grove
201701128133	17	5	24	8	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Cedar Grove
201701133202	17	5	30	9	Tue	2	2	0	Rear End	Clear	Daylight	Dry	Lane Use Marking	Unincorporated	Normal	Van/Mini-Van	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop - Left Turn	On Pavement (Roadway)	B-Injury	Cedar Grove
201701207631	17	8	16	7	Wed	1	0	0	Fixed Object	Rain	Daylight	Wet	Lane Use Marking	Unincorporated	Other/Unknown	Passenger	South	Straight Ahead	Off Pavement - Right						PD	Cedar Grove
201701218797	17	8	24	15	Thu	3	1	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Slow/Stop In Traffic	On Pavement (Roadway)	C-Injury	Longstreet
201701250959	17	9	27	12	Wed	2	2	0	Rear End	Clear	Daylight	Dry	Lane Use Marking	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	B-Injury	Segment
201701297836	17	11	8	15	Wed	1	0	0	Other Object	Clear	Dusk	Dry	No Controls	Unincorporated	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)						PD	Segment
201701334287	17	12	11	6	Mon	1	0	0	Animal	Clear	Dawn	Dry	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)						PD	Cedar Grove
201701356780	17	12	19	22	Tue	1	0	0	Animal					Unincorporated	Other/Unknown	Passenger	South	Unknown	On Pavement (Roadway)						PD	Cedar Grove
201801135916	18	5	4	22	Fri	2	1	0	Rear End	Clear	Darkness	Wet	No Controls	Unincorporated	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop - Left Turn	On Pavement (Roadway)	B-Injury	Cedar Grove
201801135952	18	5	1	23	Tue	1	0	0	Animal	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)						PD	Segment
201801195761	18	6	27	16	Wed	2	0	0	Rear End	Clear	Daylight	Dry	No Controls	Marion	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	PD	Longstreet
201801195784	18	6	29	8	Fri	2	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Passenger	East	Straight Ahead	On Pavement (Roadway)	Other/Unknown	Pickup	South	Straight Ahead	On Pavement (Roadway)	A-Injury	Longstreet
201801270250	18	8	27	22	Mon	2	0	0	Sideswipe Opposite Direction	Clear	Darkness	Dry	Police/Flagman	Unincorporated	Normal	Passenger	South	Starting In Traffic	On Pavement (Roadway)	Normal	Passenger	North	Starting In Traffic	On Pavement (Roadway)	PD	Segment
201801271075	18	8	27	21	Mon	2	2	0	Rear End	Clear	Darkness	Dry	No Controls	Unincorporated	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	South	Slow/Stop - Right Turn	On Pavement (Roadway)	B-Injury	Cedar Grove
201801290586	18	9	21	18	Fri	2	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Pickup	West	Starting In Traffic	Intersection	Normal	Passenger	North	Straight Ahead	Off Pavement - Right	B-Injury	Longstreet
201801299895	18	9	30	16	Sun	2	0	0	Sideswipe Same Direction	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Pickup	South	Straight Ahead	On Pavement (Roadway)	Emotional	SUV	South	Slow/Stop - Left Turn	On Pavement (Roadway)	PD	Cedar Grove
201801310394	18	9	27	22	Thu	1	0	1	Pedestrian	Fog/Smoke/Haze	Darkness, Lighted Road	Dry	Lane Use Marking	Unincorporated	N/A	N/A	N/A	N/A	N/A	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	Fatal	Segment near Bell Ln
201801321533	18	10	19	16	Fri	2	1	0	Rear End	Rain	Daylight	Wet	No Controls	Marion	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	Normal	SUV	North	Slow/Stop In Traffic	On Pavement (Roadway)	B-Injury	Longstreet
201801362347	18	11	21	9	Wed	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Marion	Normal	Passenger	East	Straight Ahead	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	PD	Longstreet
201801399884	18	12	7	2	Fri	1	0	0	Animal	Clear	Darkness, Lighted Road	Dry	No Controls	Unincorporated	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)						PD	Segment
201801399901	18	12	18	16	Tue	3	0	0	Rear End	Clear	Dusk	Dry	No Controls	Unincorporated	Normal	Motorcycle (Over 150cc)	North	Slow/Stop In Traffic	On Pavement (Roadway)	Normal	Passenger	North	Slow/Stop In Traffic	On Pavement (Roadway)	PD	Cedar Grove

SIMPO SAFETY STUDY

Appendix : Intersection of Cambria Road at Cardinal Road/Grand Avenue



prepared by:

CBB TRANSPORTATION ENGINEERS+PLANNERS

CBB Job No. 39-20

prepared for:

SIMPO SOUTHERN ILLINOIS Metropolitan Planning Organization

The Intersection of Cambria Road and Cardinal Road/Grand Avenue

Introduction

The intersection of Cambria Road and Cardinal Road/Grand Avenue and is located in Williamson County. Cardinal Road is on the west side of the intersection and Grand Avenue is on the east of the intersection. The intersection is unsignalized with stops signs on Cardinal Road and Grand Avenue. The intersection location is shown in **Figure 1**.

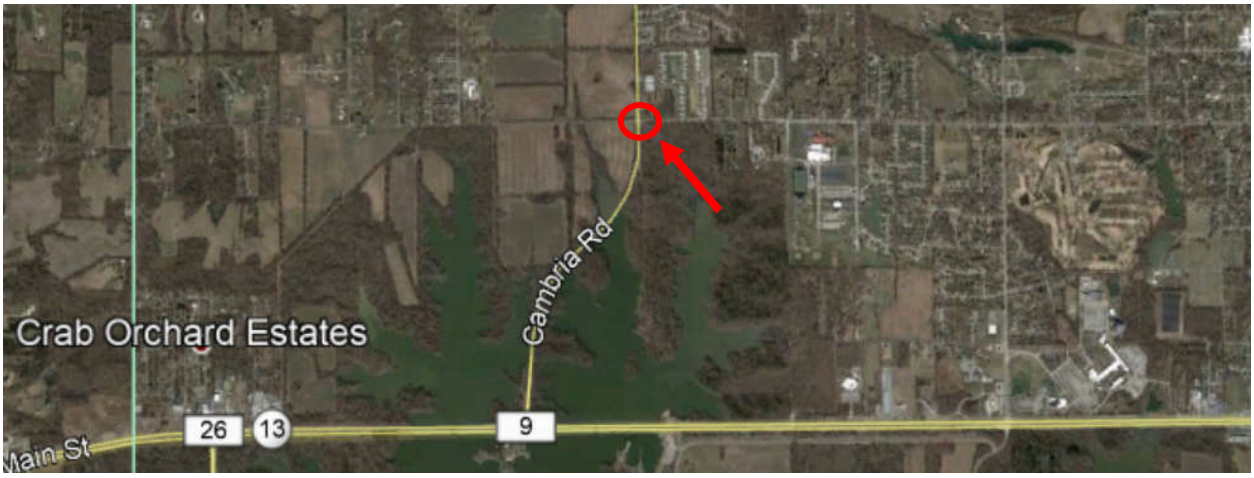


Figure 1: Study Area

Existing Conditions

The intersection is at a right-angle alignment as shown in the intersection plan view in **Figure 2**. Cambria Road has one 11-foot lane in each direction. Cardinal Road has one 9-foot in each direction and the road expands to 11-foot lanes east of the intersection on Grand Avenue. The intersection is a rural area and provides access to some residential properties north and east of the intersection. Carterville High School is about 0.65 mile east of the intersection. Also, the Carb Orchard Wildlife Refuge is located to the south. There are no sidewalks along the roads or marked crosswalks at the intersection as seen in the street view in **Figure 3**. Cardinal Road/Grand Avenue as well as Cambria Road have posted speed limit of 45 miles per hour (mph). However, Cambria Road speed limit increases to 55 mph approximately 465' south of the Cardinal/Grand intersection.

The westbound approach of Grand Avenue currently has a flashing LED stop sign for westbound vehicles, see **Figure 4**.

There appears to be less than optimal sight distance from the Cardinal Road approach to the south into due to vegetation along the road and the road curves to the west, see **Figure 5**.

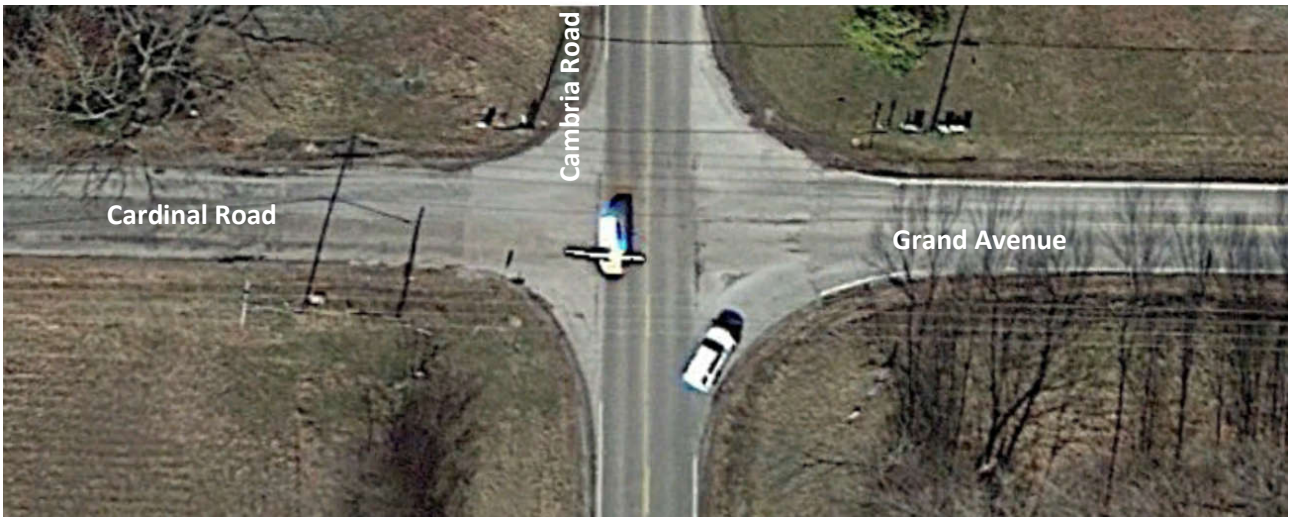


Figure 2: Intersection of Cardinal Road/Grand Avenue and Cambria Road (Plan View)

Figure 3: Intersection of Cardinal Rd/Grand Ave and Cambria Rd (Street View looking east from Cardinal)

Figure 4: Intersection of Cardinal Rd/Grand Ave and Cambria Rd (Street View looking west from Grand Ave)

Figure 5: Sight Distance from Cardinal Rd looking South (Street view)

Safety Analysis

A total of **15 crashes** occurred at the study intersection from **2015 to 2019**. The frequency of crashes by year is shown in **Figure 4**. The frequency is about the same except 2019 is slightly higher.

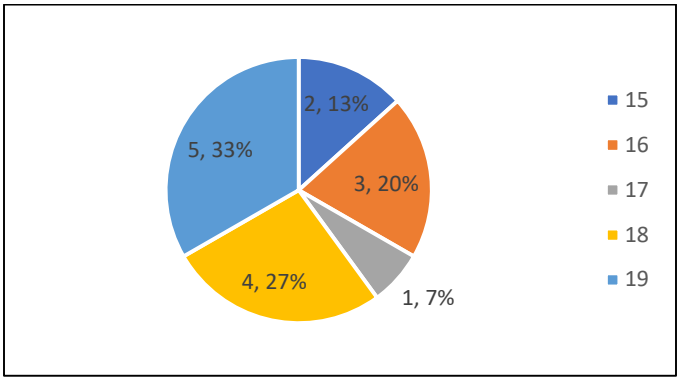


Figure 6: Frequency of Crashes by Year

In **Figure 5** it shows the frequency of crashes by type. The majority of crashes are angle and turning crashes.

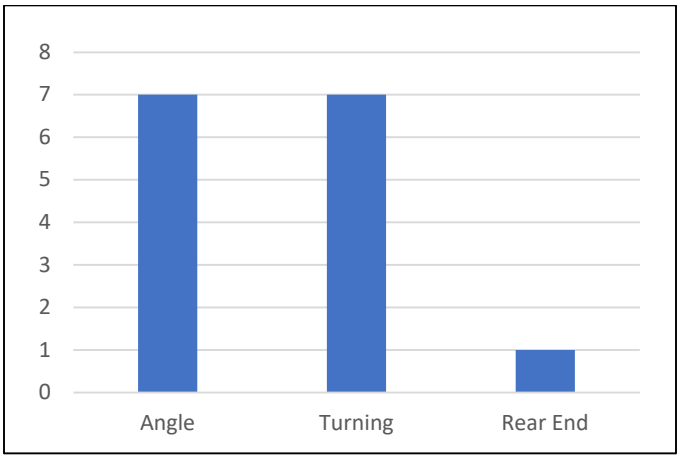


Figure 7: Frequency of Crashes by Type

The frequency of crashes by severity is shown in **Figure 6**. 40 percent of the crashes were property damage only and 60% were injury. All three A injuries were turning crashes. One was eastbound straight with northbound right, the second was a southbound left-turn and a northbound through and the third was northbound right and a northbound through.

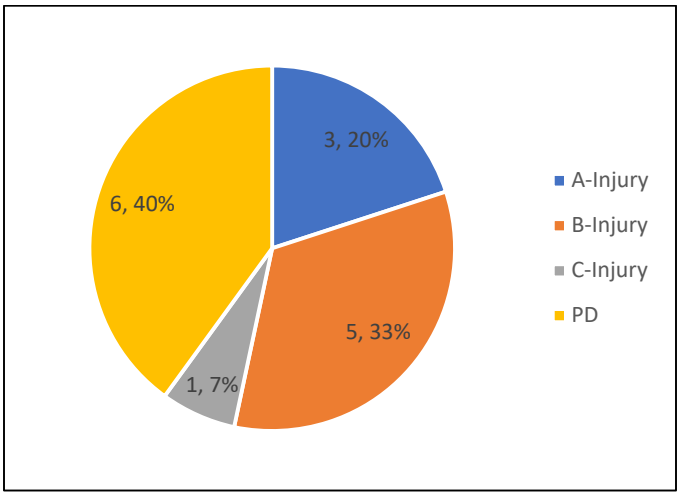


Figure 8: Frequency of Crashes by Severity

In **Figure 9** the chart shows the frequency by direction and crash type. Most crashes occurred on the southbound and eastbound approaches. The majority of angle from east and west approaches.

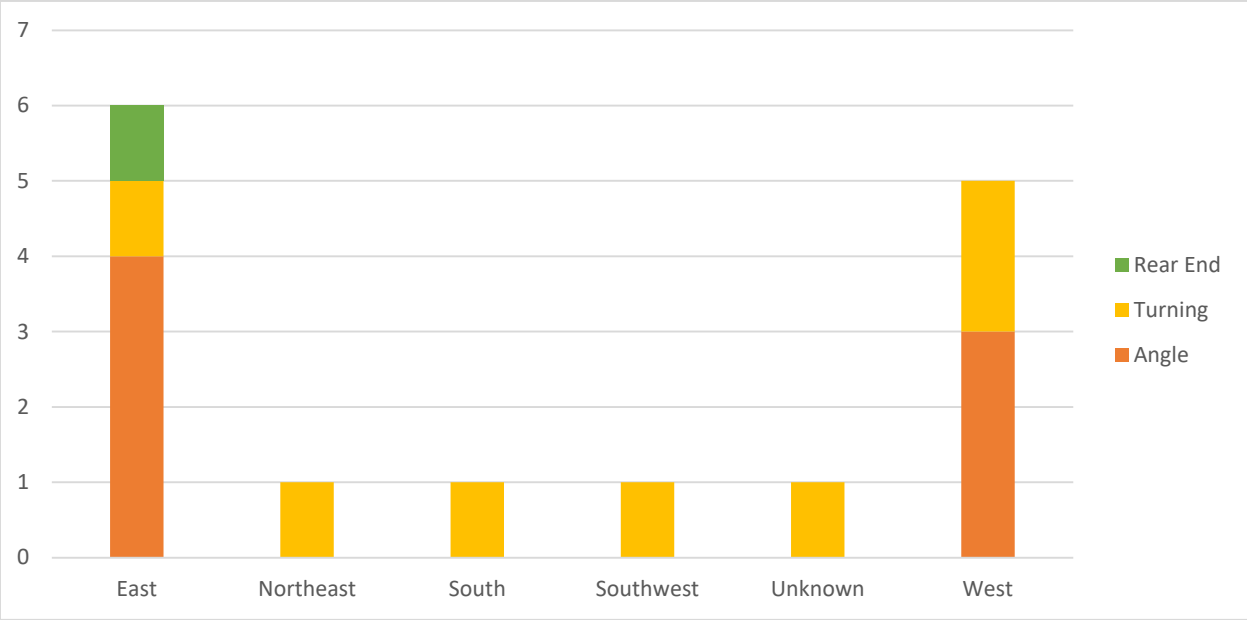


Figure 9: Frequency of Crashes by Direction and Crash Type

The frequency of crashes by hour is shown in **Figure 10** below. The crashes increase at 7am and 1 to 10PM.

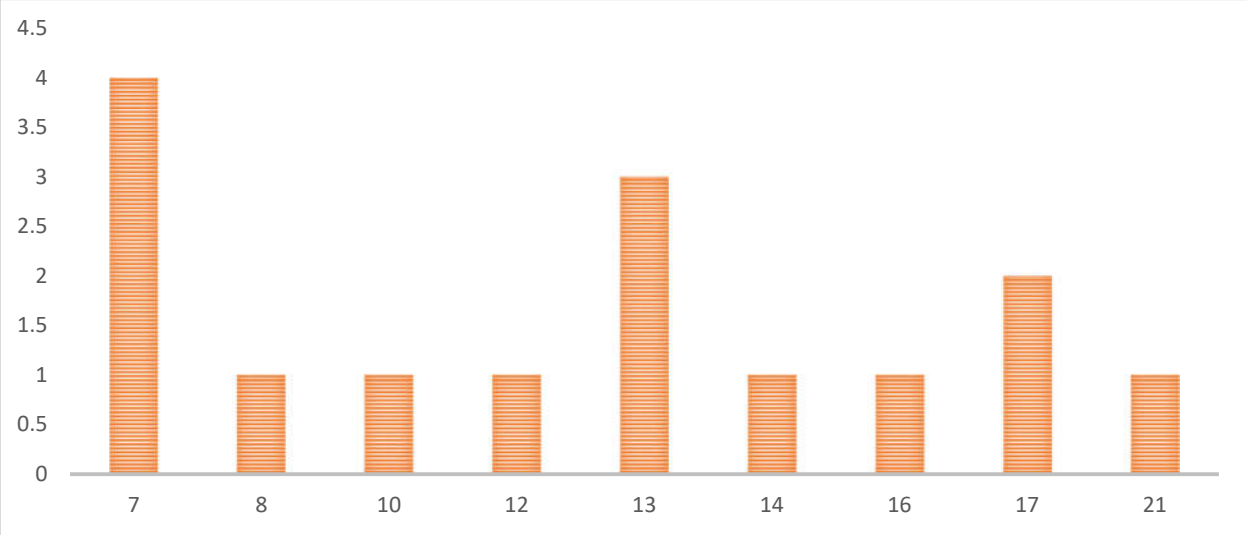


Figure 10: Frequency of Crashes by Hour

The frequency of weather crashes is shown in **Figure 11** below. The majority of crashes occurred on clear days (100%)

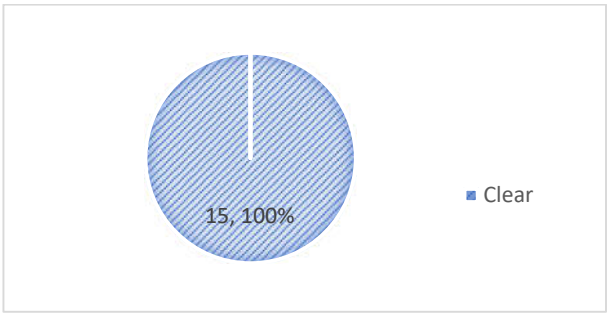


Figure 11: Frequency of Crashes by Weather

The frequency of crashes related to lighting conditions is shown in **Figure 12** below. The majority of crashes occurred during daylight hours (64%).

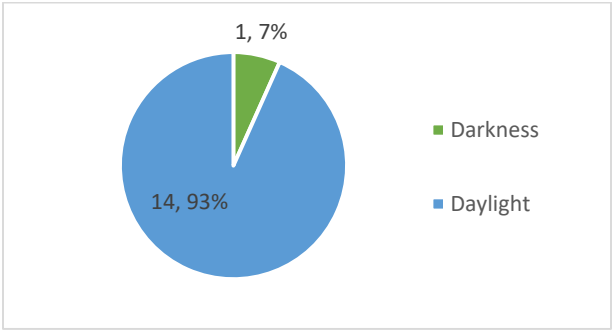


Figure 12: Frequency of Crashes by Lighting

The frequency of crashes related to the Month is shown in **Figure 13** below. March and September have the highest number of crashes at three crashes.

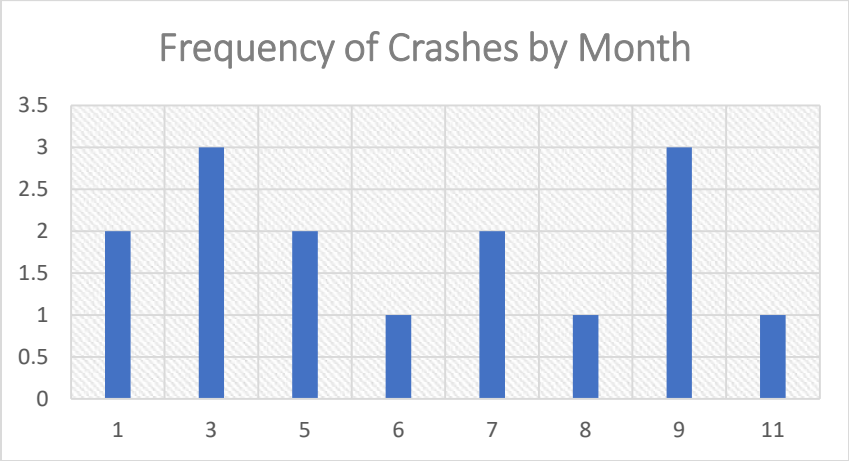


Figure 13: Frequency of Crashes by Month

Areas of Concern & Possible Countermeasures

Areas of Concern

Cambria at Cardinal Road/Grand Avenue is a side-street stop intersection along a high-speed road without turn lanes. Sight distance is poor for northbound and southbound due to vegetation and roadway curvature to the south. The westbound approach has a flashing LED stop sign where the sign height does not meet MUTCD standards. The speed limit on Cambria Road is 45 miles per hour (mph) at the intersection but increased to 55 mph just 465 feet south of the intersection. A third of the crashes involved conflict between eastbound and northbound vehicles and an additional one third of crashes occurred between westbound and northbound vehicles. The main areas of concern are sight distance and speed.

Countermeasures

Any improvements to sight distance, clearing of vegetation to the north and south, could help to provide more perception reaction time for motorists on the side-street.

Low-cost improvements could include improvements to signing, striping and radius improvements. Painted stop bars can be striped to provide visual cues for vehicles stopping on the side street. A supplemental plaque could also be added to the stop signs saying, “Cross Traffic Does Not Stop”. Further, reflective post strips could be installed on the sign posts to make signs more visible to drivers at night. Transverse rumble strips could also be considered to provide an audible cue for a stop ahead on the side-streets.

A moderate cost countermeasure to reduce turning and angle crashes in rural areas is to install an Intersection Conflict Warning System (ICWS) or "Vehicles Entering When Flashing" (VEWF) system. The ICWS reduces crashes by informing the mainline vehicles when vehicles are on the side-street. These dynamic systems warn mainline traffic of possible side-street conflicts at nearby intersections. These systems consist of post mounted signs and flashers on the mainline and vehicle detection (loops) on the cross streets. When a vehicle is detected on the side-street, the flashers activate along the mainline to alert drivers along the mainline that there is a vehicle on the side-street.

Since the speed changes from 55 mph to 45 mph a short distance south of this intersection, it is likely that vehicles have not fully reduced their speed when approaching the intersection. A speed feedback sign could be located between the intersection and where the speed limit changes from 55 mph to 45 mph. The speed feedback sign informs drivers of their speed and a visual cue to slow down when exceeding the speed limit.

The crash data indicates a large amount of turning crashes. Consideration could be given to providing sperate left and/or right-turn lanes. A traffic count was not performed for this specific project, but traffic volumes could be compared to IDOT's BDE manual to determine if there are sufficient turning volumes to warrant separate turn lanes at the intersection. This addition of turn lanes along the mainline (Cambria Road) would remove turning vehicles out of the paths of through vehicles, reducing rear end and turning crashes.

Lastly, constructing a roundabout at the intersection would be a more expensive option, but would significantly reduce the severity of crashes as well as slow vehicles through the intersection. A layout of a roundabout is shown in **Figure 13.** Since the roundabout would be in close proximity to Carterville high school, a public awareness campaign could be considered, especially for the young drivers, to help with the proper use of a new roundabout.

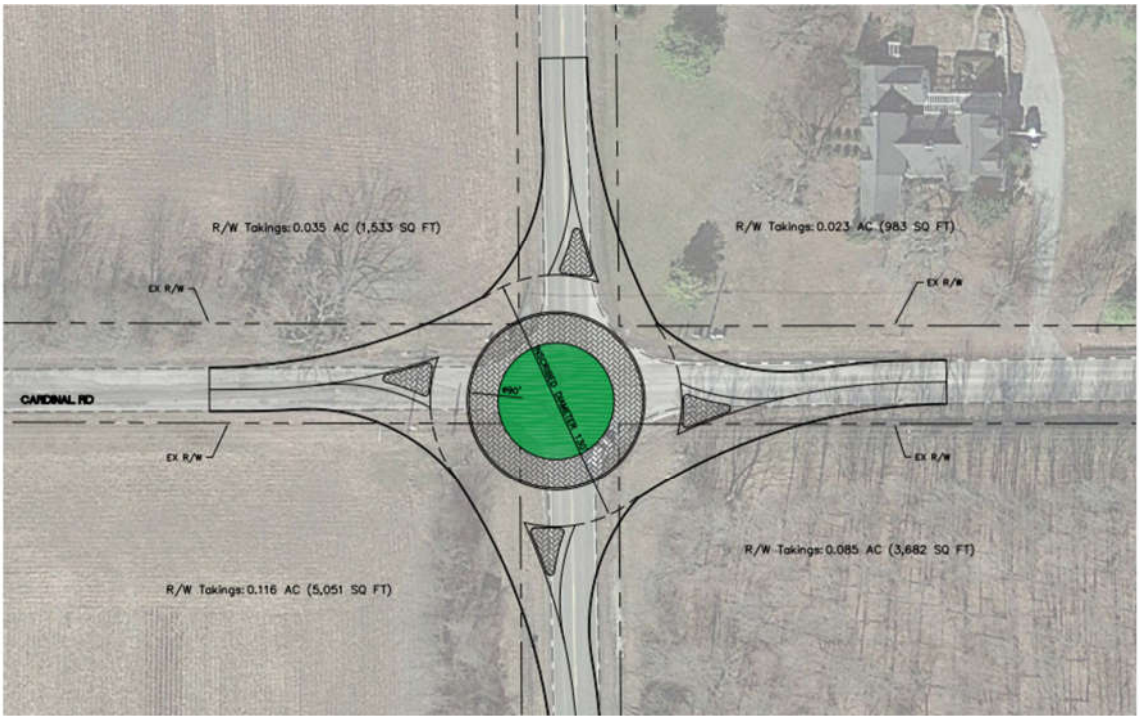
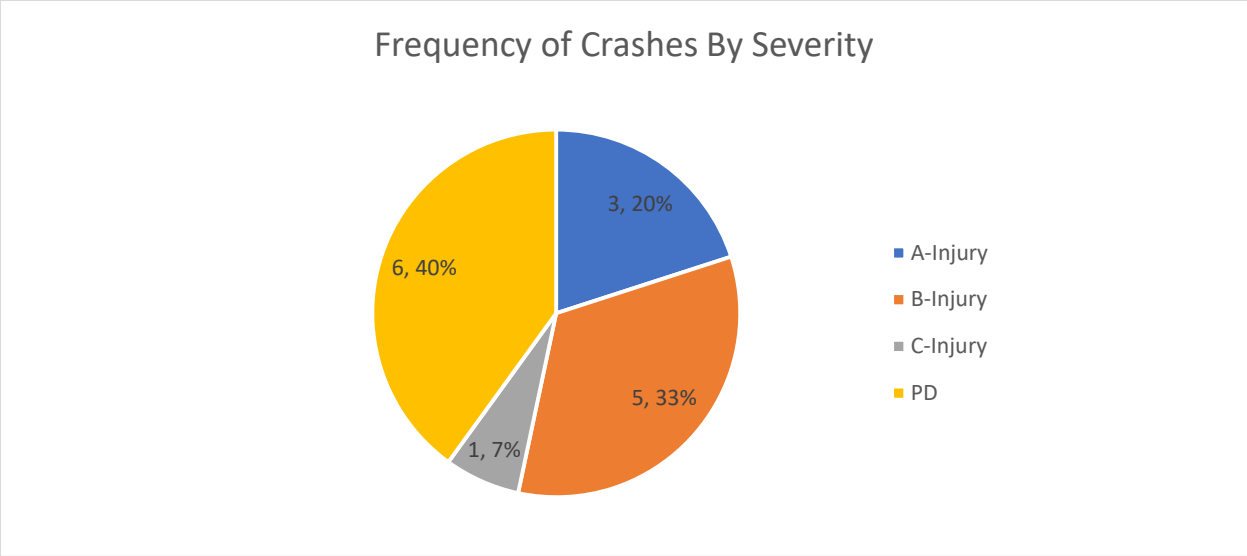
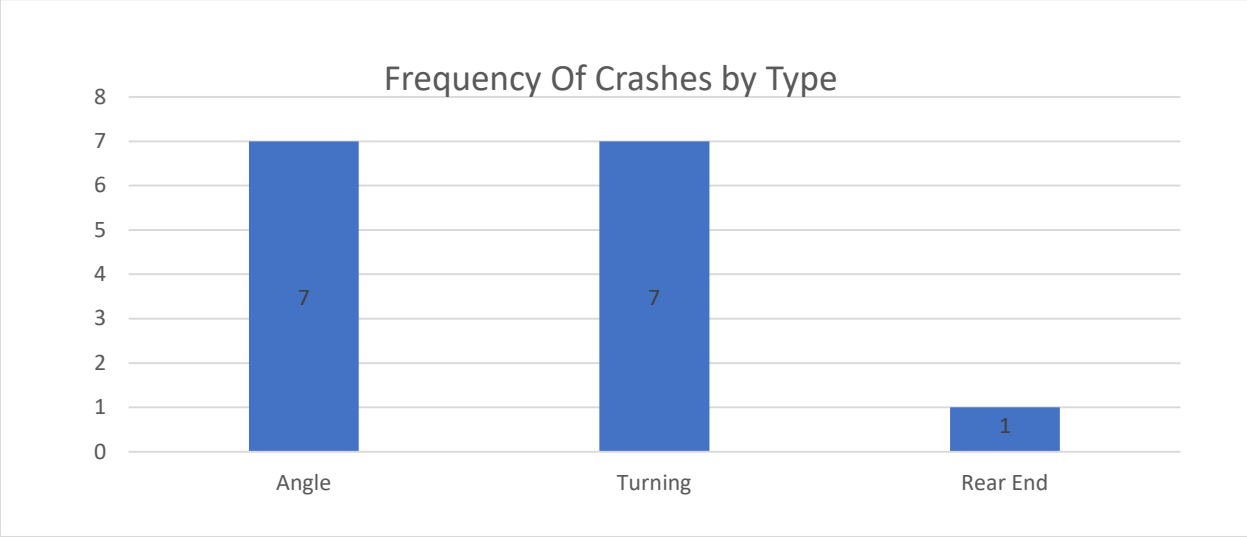
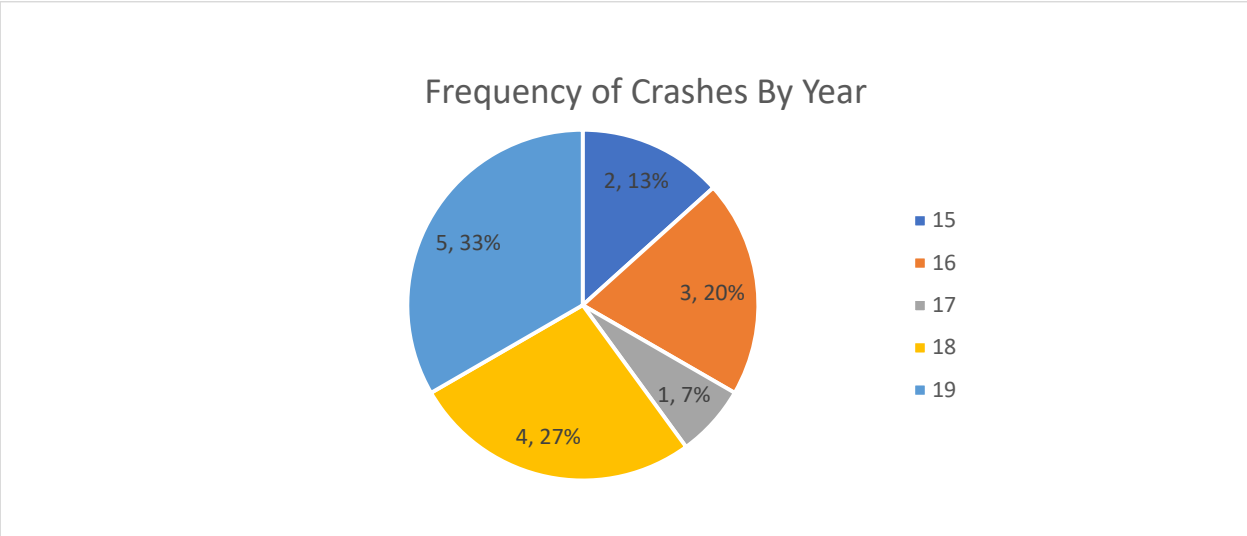


Figure 13: Layout of a roundabout at the intersection of Cambria Rad and Cardinal Road/Grand Avenue

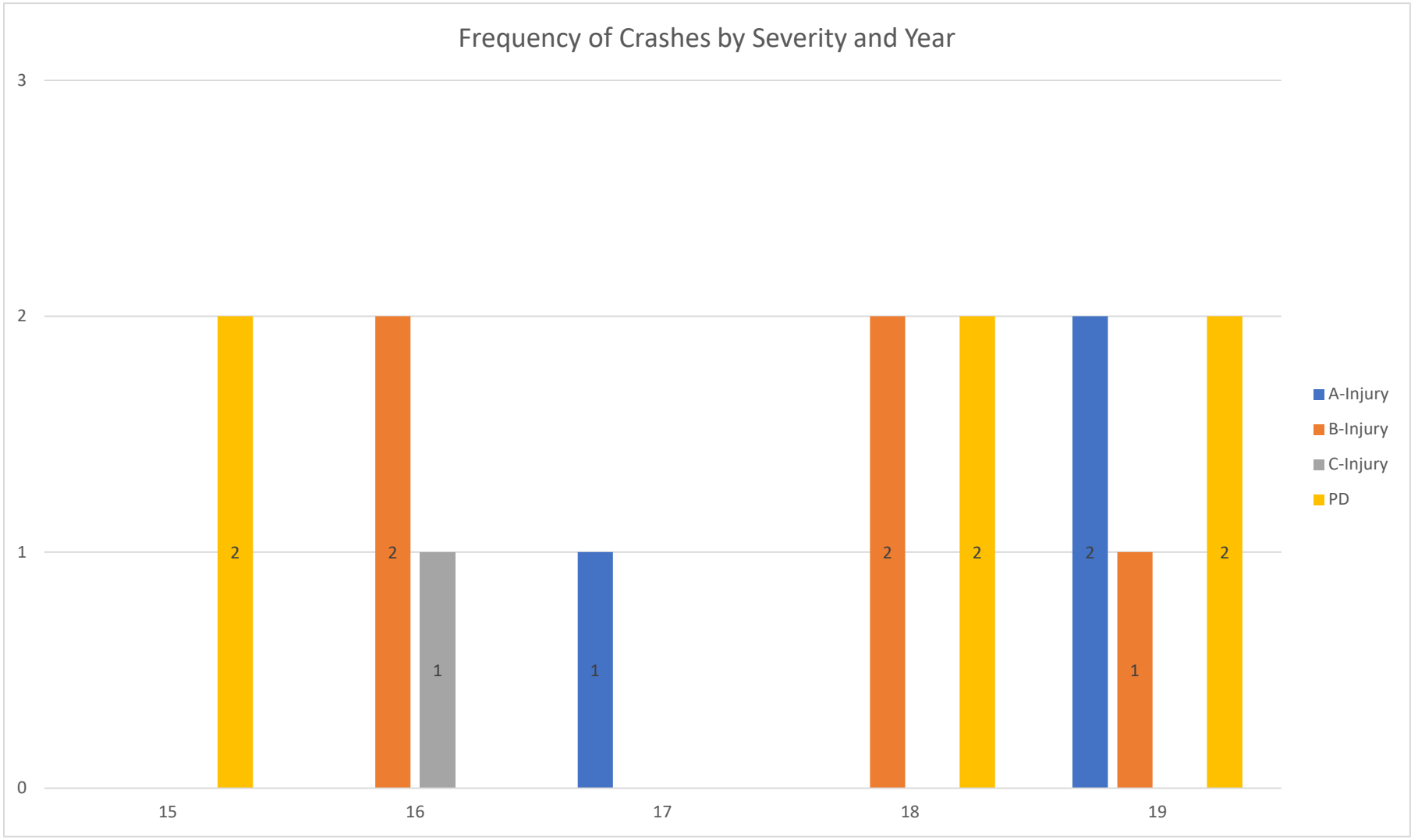
Intersection of Cambria Road at Cardinal Road/Grand Avenue (2015-2019)



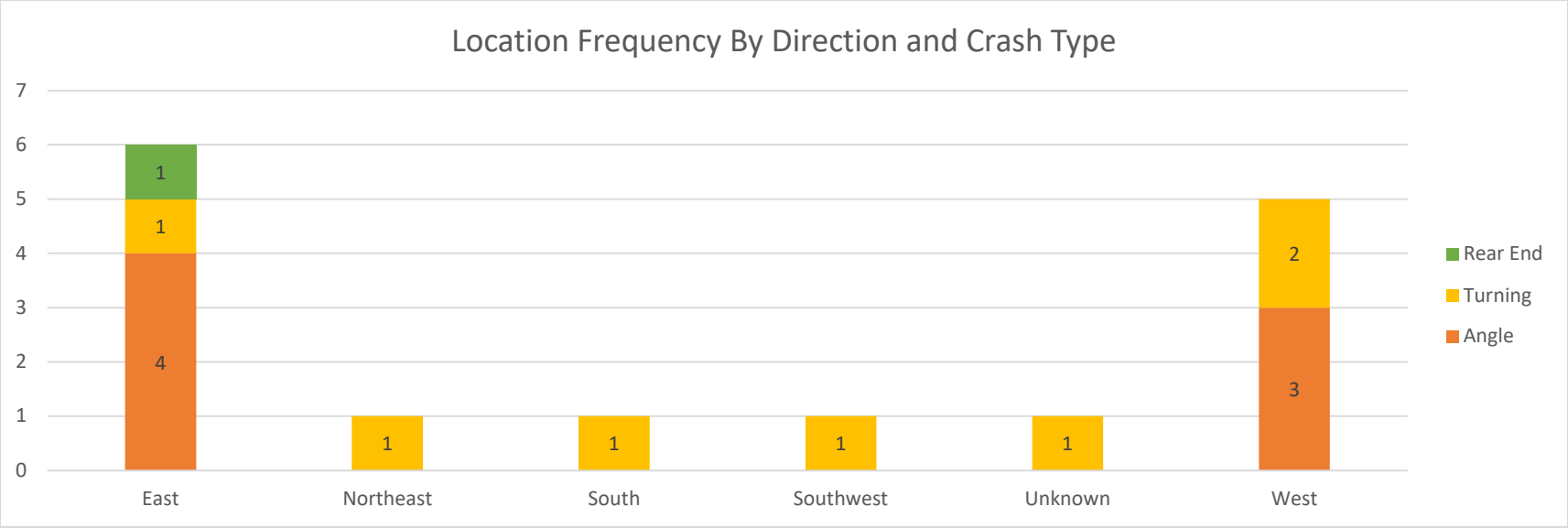


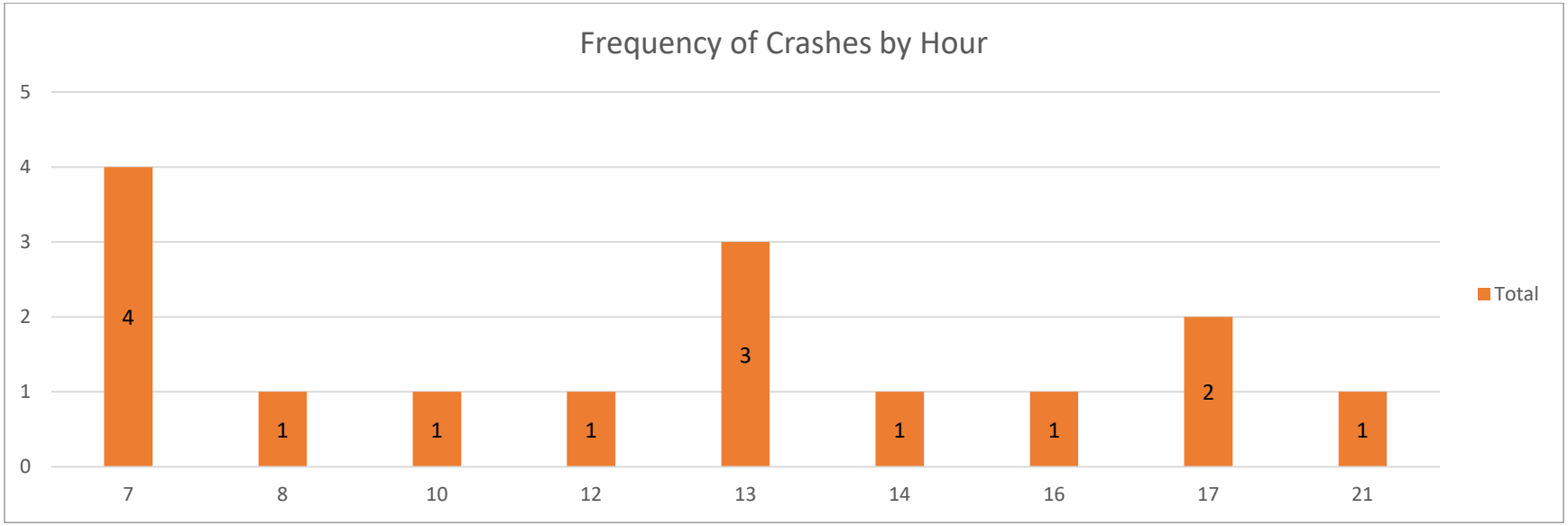


Intersection of Cambria Road at Cardinal Road/Grand Avenue (2015-2019)

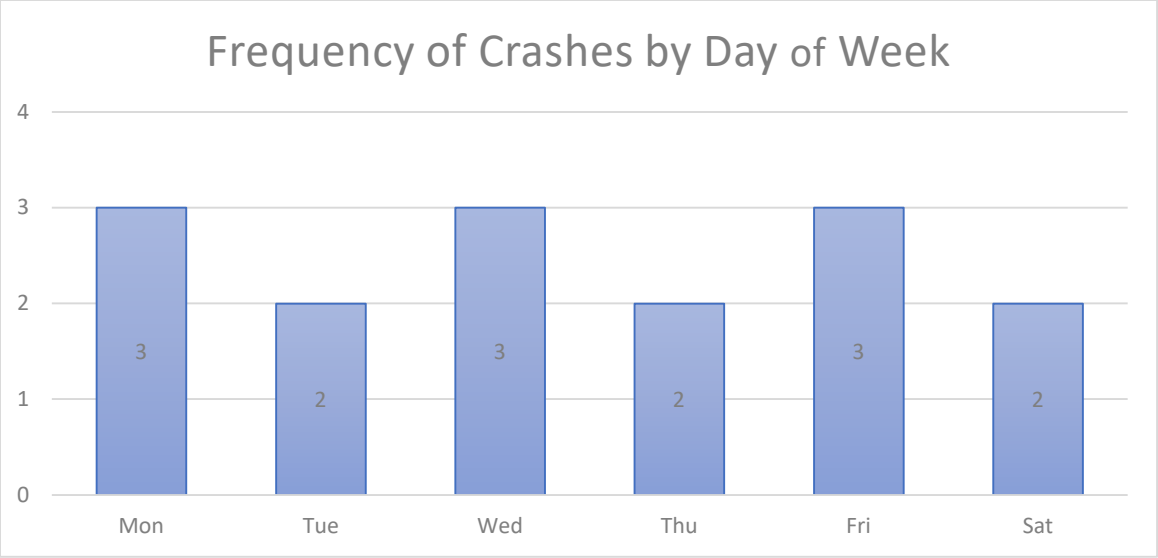


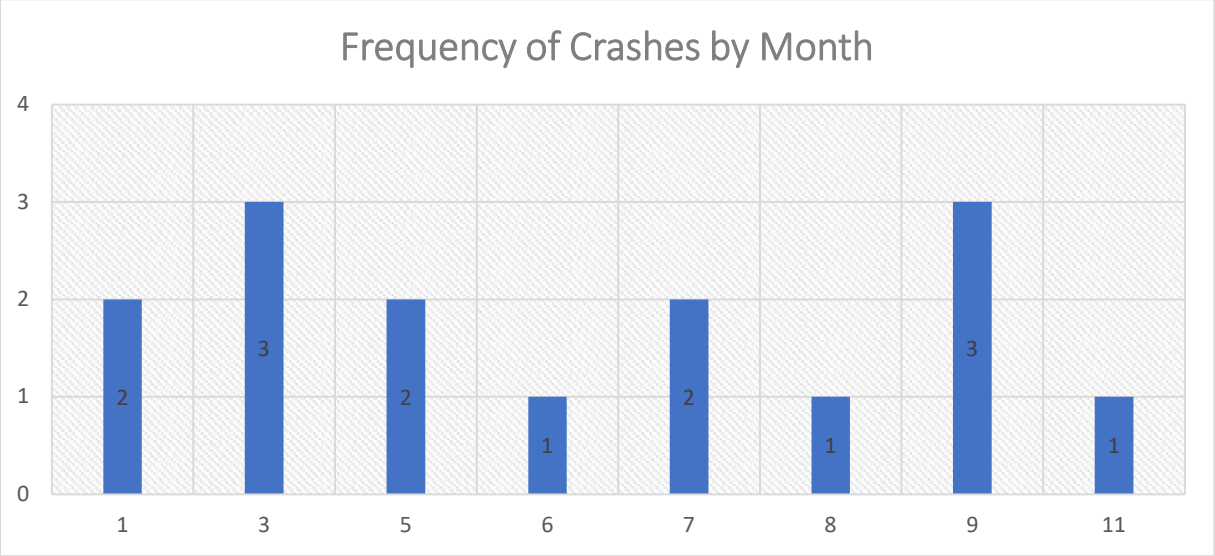
Intersection of Cambria Road at Cardinal Road/Grand Avenue (2015-2019)

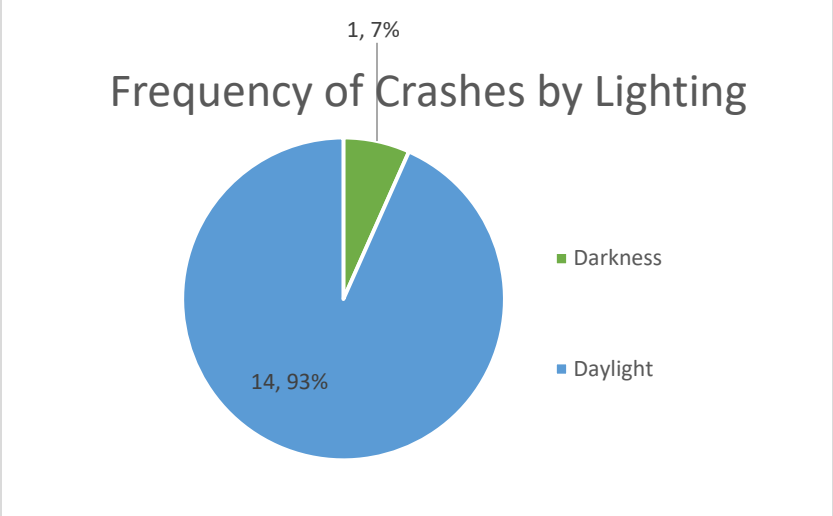




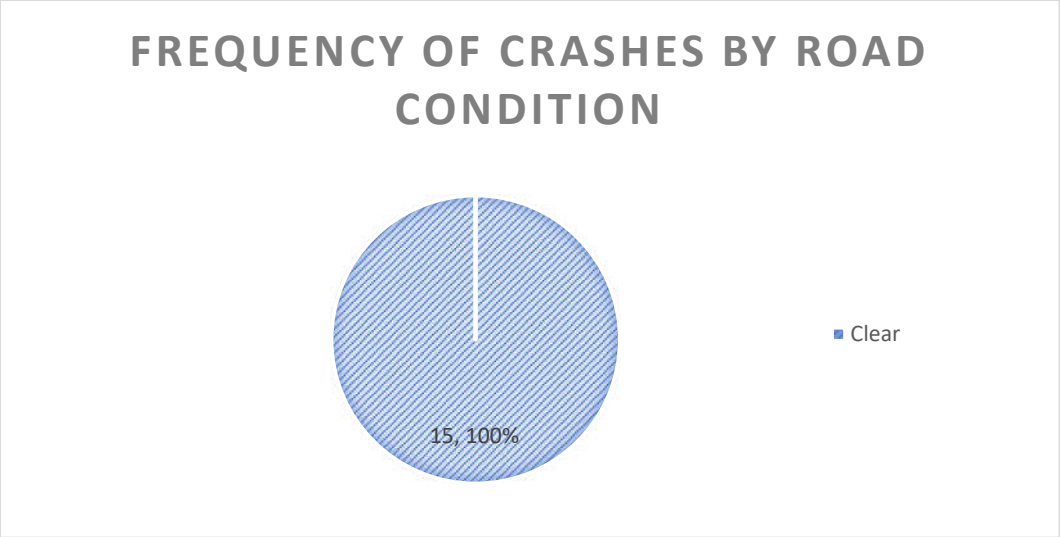
Intersection of Cambria Road at Cardinal Road/Grand Avenue (2015-2019)

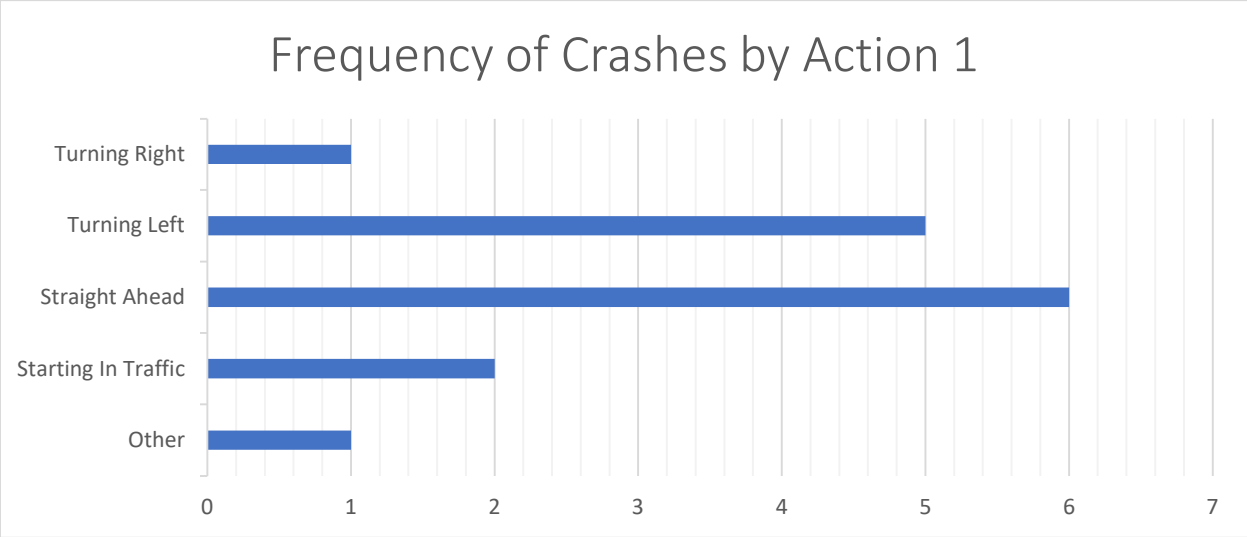


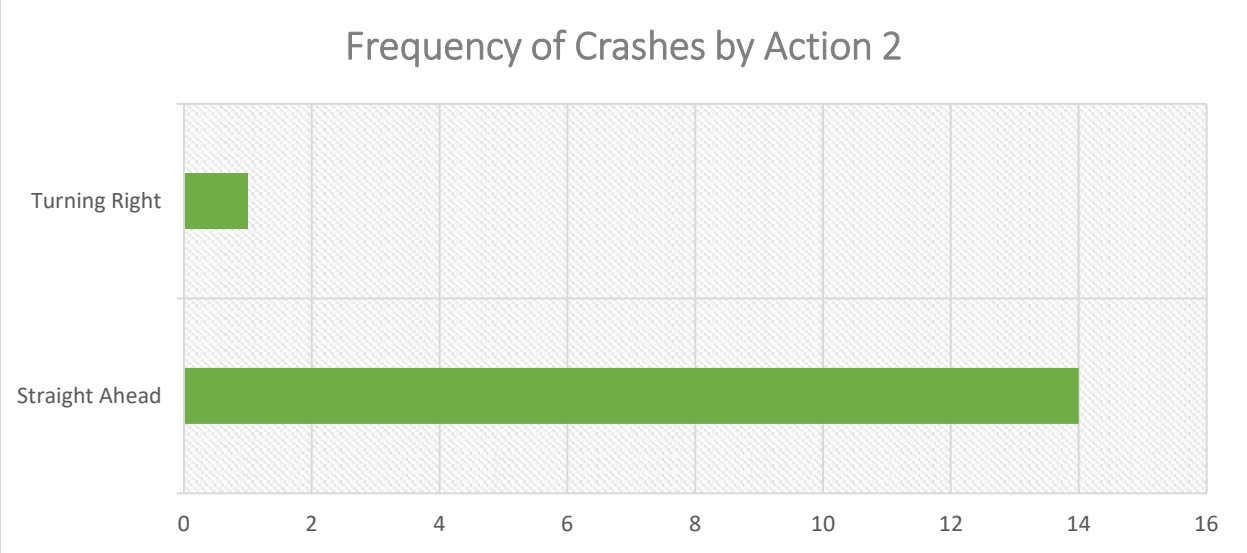




Intersection of Cambria Road at Cardinal Road/Grand Avenue (2015-2019)







CASE_ID	YEAR	MONTH	DAY	HOUR	DOW	NUM_VEH	INJURIES	FATALITIES	COLL_TYPE	WEATHER	LIGHTING	SURF_COND	TRAF_CNTRL	CITY	DRIVER_1	VEH1_TYPE	VEH1_DIR	VEH1_MANUV	VEH1_LOC1	DRIVER_2	VEH2_TYPE	VEH2_DIR	VEH2_MANUV	VEH2_LOC1	REC_TYPE
201501019542	15	1	10	12	Sat	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	East	Straight Ahead	Intersection	Normal	Passenger	South	Straight Ahead	Intersection	PD
201501200118	15	9	25	7	Fri	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD
201601059040	16	3	5	13	Sat	2	3	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	SUV	West	Turning Left	On Pavement (Roadway)	Normal	SUV	North	Straight Ahead	On Pavement (Roadway)	B-Injury
201601212511	16	9	12	7	Mon	2	1	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	Southwest	Turning Left	Intersection	Normal	Passenger	North	Straight Ahead	Intersection	C-Injury
201601215643	16	9	15	21	Thu	2	1	0	Angle	Clear	Darkness	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	West	Other	On Pavement (Roadway)	Normal	Passenger	South	Straight Ahead	On Pavement (Roadway)	B-Injury
201701214517	17	8	18	13	Fri	4	2	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Other	Passenger	East	Straight Ahead	Intersection	Normal	Passenger	Northeast	Turning Right	Intersection	A-Injury
201801152109	18	5	15	7	Tue	2	2	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	East	Starting In Traffic	Intersection	Normal	SUV	North	Straight Ahead	Intersection	B-Injury
201801166941	18	5	29	13	Tue	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Van/Mini-Van	East	Starting In Traffic	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD
201801180217	18	6	6	17	Wed	2	0	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	SUV	West	Turning Left	On Pavement (Roadway)	Normal	Pickup	North	Straight Ahead	On Pavement (Roadway)	PD
201901248243	19	7	8	14	Mon	2	3	0	Turning	Clear	Daylight	Dry	No Controls	Unincorporated	Other	Passenger	South	Turning Left	On Pavement (Roadway)	Removed By EMS	Passenger	North	Straight Ahead	On Pavement (Roadway)	A-Injury
201901254239	19	7	31	7	Wed	2	0	0	Angle	Clear	Daylight	Dry	Stop Sign	Carterville	Normal	Passenger	West	Straight Ahead	On Pavement (Roadway)	Normal	Passenger	North	Straight Ahead	On Pavement (Roadway)	PD
201801406918	18	11	29	10	Thu	2	1	0	Angle	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Van/Mini-Van	West	Straight Ahead	Intersection	Normal	Pickup	North	Straight Ahead	Intersection	B-Injury
201901167055	19	1	18	8	Fri	2	0	0	Turning	Clear	Daylight	Dry	No Controls	Unincorporated	Normal	Passenger	Unknown	Turning Left	On Pavement (Roadway)	Normal	Passenger	Unknown	Straight Ahead	On Pavement (Roadway)	PD
201901232780	19	3	6	16	Wed	2	2	0	Rear End	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	SUV	East	Straight Ahead	On Pavement (Roadway)	Normal	Pickup	East	Straight Ahead	On Pavement (Roadway)	B-Injury
201901361636	19	3	18	17	Mon	2	2	0	Turning	Clear	Daylight	Dry	Stop Sign/Flasher	Unincorporated	Normal	Passenger	Northeast	Turning Right	Intersection	Normal	Pickup	North	Straight Ahead	Intersection	A-Injury