

KENWOOD AREA SAFETY ACTION PLAN

2023



PREPARED BY:



Kenwood Area Safety Action Plan

Sycamore Township, Ohio

HAM-CR269-.76-3.91

HAM-CR22-10.826-10.987



PREPARED FOR:
Sycamore Township
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Sycamore Township, Ohio 45236

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Qualifications

TEC Engineering, Inc. is a consulting engineering firm established in 1992 specializing in the fields of Transportation Planning, Traffic Engineering, and Roadway and Highway Design, including all ancillary services. In its thirty year history, the firm has completed a variety of transportation improvement and enhancement projects across a wide spectrum, including: Traffic Signal Design, Intelligent Transportation Systems Planning, Design and Operations, Roadway/Highway Design, Engineering Studies, and Roadway/Highway and Parking Lighting Systems. TEC has conducted a wide variety of Traffic Studies throughout Ohio, Kentucky and Indiana.

"I certify that this ACTION PLAN has been prepared by me or under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering."

Edward Williams, PE, PTOE, RSP

OH Registration #69128

TEC Engineering, Inc.

1. Purpose and Need Statement

The purpose of this study is to evaluate the existing conditions of Sycamore Township in Hamilton County, Ohio, and identify “Hot Spots” of increased crashes, possible causes of crashes and countermeasures to mitigate those causes. The area of Kenwood Towne Center and specifically along the Kenwood Road corridor experience high crash volumes. Kenwood Road to the south of Montgomery Road had safety countermeasures implemented in 2014 and further examination of their efficacy should be examined alongside more recent crash data.

2. Township Focus Areas

TEC Engineering utilized GIS and crash information to create township wide heat maps that visualize where crashes occur within the Township. To provide further insight, a heatmap showing the location of only injury crashes was also created to highlight areas that are major safety concerns.

Figure 2.1a – Sycamore Township Crash Heat Map

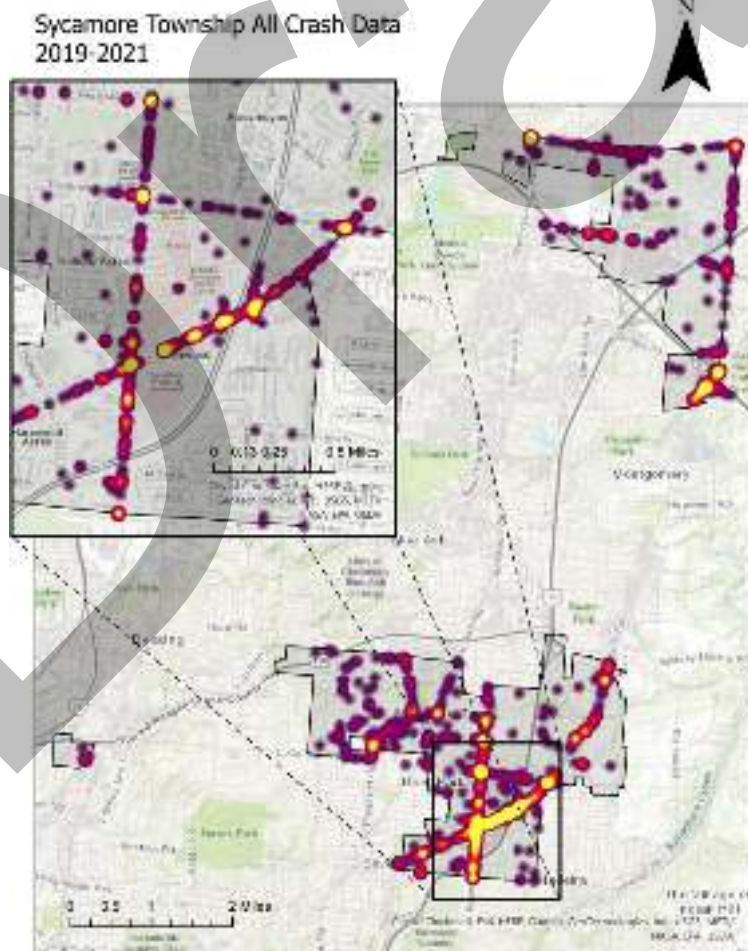
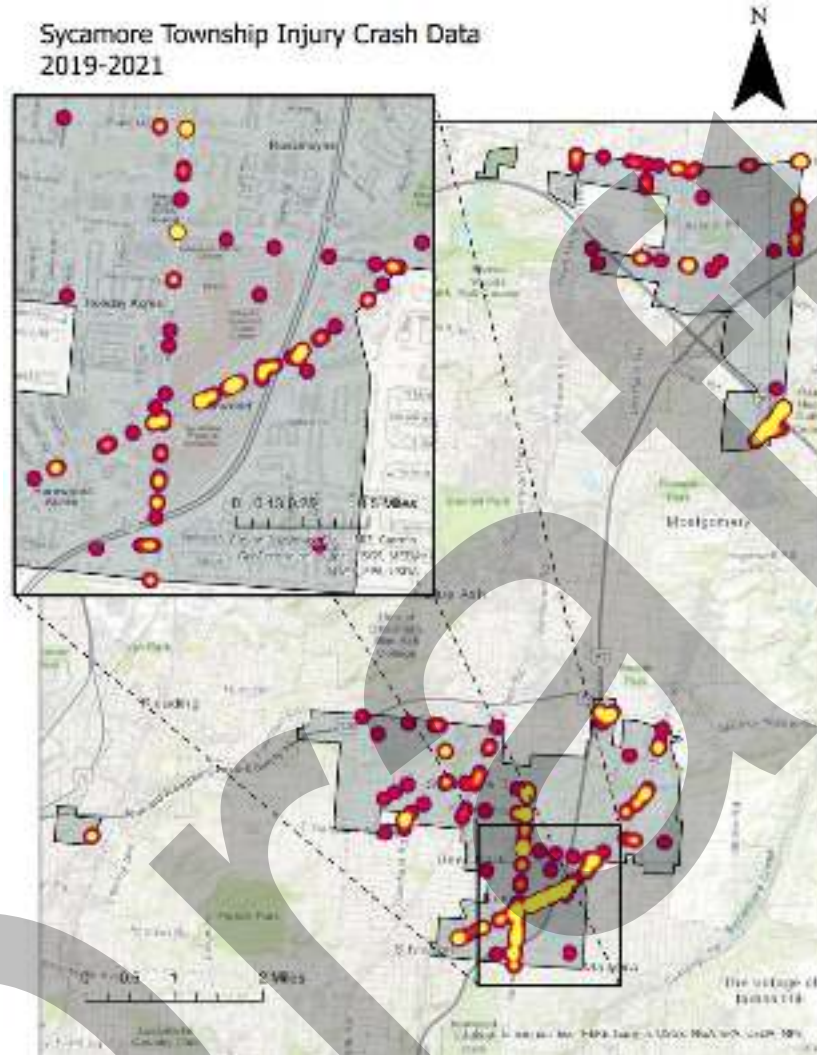


Figure 2.1b – Sycamore Township Injury Crash Heat Map



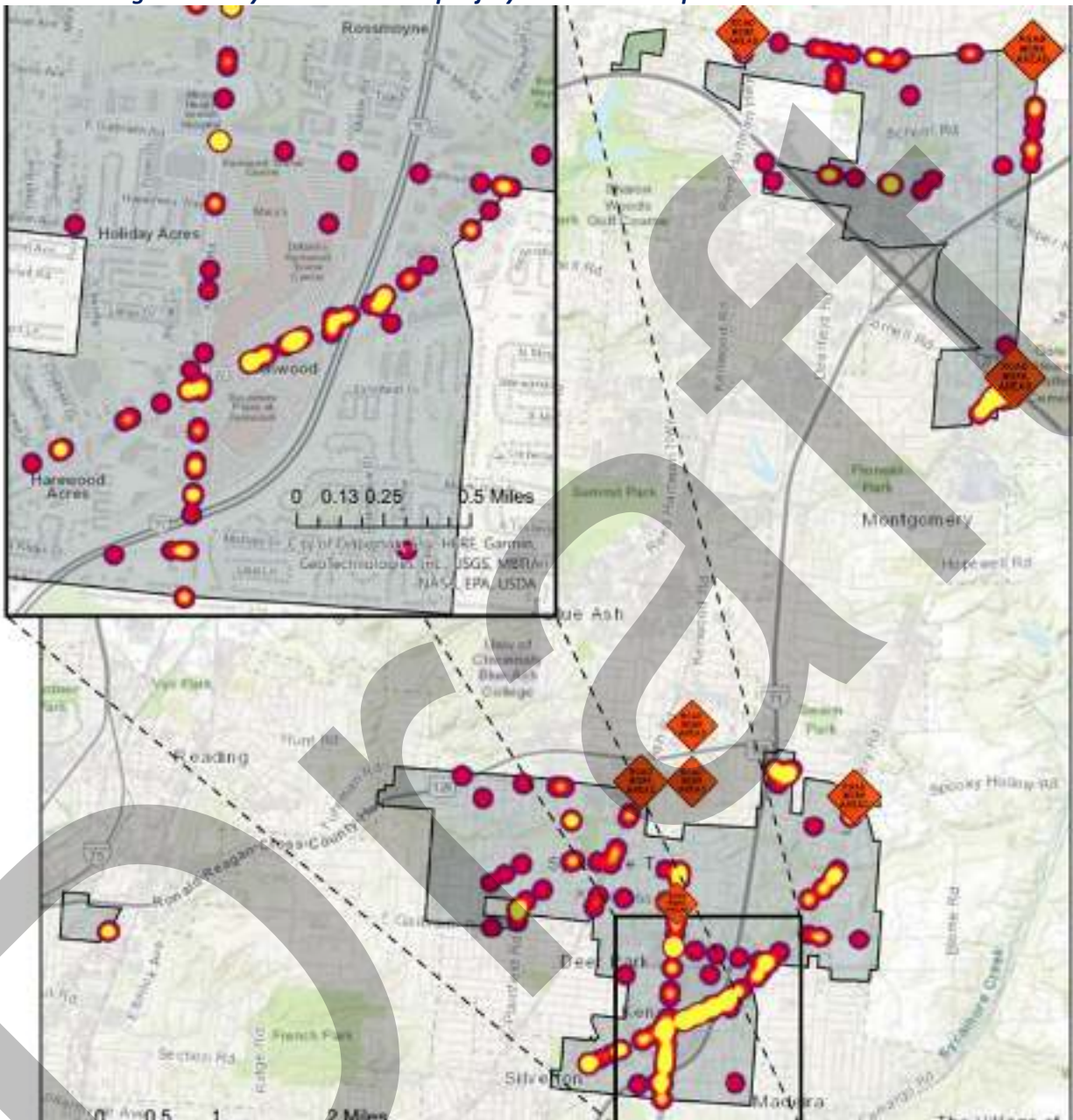
As TEC reviewed the crashes within the township, several “hot spots” became apparent. There are several ongoing and/or recent projects that address critical safety concerns within the township.

- Fields Ertel Road & Reed Hartman, Fields Ertel Road & Snider – There is a joint project between the Hamilton County Engineer, the City of Sharonville, the Butler County Engineer and the Warren County Engineer to improve the Fields Ertel Road Corridor. This project has moved into design, and includes intersection improvements at each of the intersections extending from Reed Hartman Highway, through Snider Road to Wilkens Blvd.
- Sycamore Road & Blue Ash Road and Kenwood Road & Sycamore Road– Improvements were made to the Sycamore Road corridor including the intersection of Sycamore Road & Blue Ash Road and Sycamore Road & Kenwood Road. Construction of these improvements was completed in the Fall of 2020 and included improved signage and striping, a new traffic signal (Kenwood Road) and an improved rail crossing. Improvements also included a new sidewalk for pedestrian access along Sycamore Road from the Township Building to Bechtold Park.

- Kugler Mill Road & Kenwood Road – In 2022, the Township began a construction project along Kugler Mill Road, which includes a sidewalk connection, as well as a new traffic signal at Kenwood Road & Kugler Mill.
- Myrtle Road & Plainfield Road – The township in coordination with the City of Deer Park is improving this intersection, including new signage and striping, a new traffic signal and better intersection alignment.
- I-71, I-275 Interchange Ramps – The Township is consistently working with the Ohio Department of Transportation to improve the safety and operation of the interchange ramps.
- Montgomery Road & Finley Lane – Recently the City of Montgomery (just north of Sycamore Township) installed a large roundabout just north of Montgomery Road & Finley Landing. This project was completed in the Fall of 2020. In recent year, the township has installed continuous sidewalk adjacent to this area; currently there is sidewalk from the City of Montgomery through to the Kenwood Towne Center. Given this intersections proximity to Moeller High School, the township is consistently reviewing to improve its safety, especially after the construction of the adjacent roundabout. However, given that the roundabout opened just a year ago, the necessary improvements are still being reviewed to get a full understanding of the potential impacts.

An updated heat map with these project locations is provided in *Figure 2.2*.

Figure 2.2– Sycamore Township Injury Crash Heat Map with Construction Zones



Based on these existing projects and heatmap locations, this Action Plan will focus on the Kenwood Road corridor.

3. Project Stakeholder Meetings

This project area has been studied over several years. In a 2011 study, analysis of this area was completed along with several stakeholder meetings and one public meeting. Stakeholder meetings included several business owners in the area. The public meeting, conducted on June 21, 2011, included all adjacent property owners to the Kenwood Road Corridor between Montgomery Road and I-71. This study resulted in the installation of a center median along Kenwood Road to improve traffic flow and reduce angle crashes from the driveways. To provide better access management, a rearage road was installed along the back property lines of the western most properties.

Over the next several years, the Township worked to develop and construct several other recommended improvements. This led to several meeting with adjacent property owners, including the Kenwood Plaza, 7292 Kenwood Road and the Kenwood Square. Better access to these properties were key in these later discussions.

In 2020, the Township wanted to pursue the potential development of several Township owned properties along Montgomery Road near Kenwood Road. On March 11, 2021, the Township conducted a Residential Neighborhood Stakeholder focus group; on March 25, 2021, the Township conducted a Township Business & Institutional Stakeholder Focus Group; on April 8, 2021, the Township conducted a Developer Stakeholder Focus Group; and on July 21, 2021, the Township conducted a Master Plan Design Charrette Session. This work was incorporated into and resulted in the Montgomery Road Properties Concept Plan and Land Use Study.

In late 2021, the Township decided to revisit the Kenwood Road Corridor. This project has resulted in the Kenwood Road Safety Action Plan presented within. Through this study, the Township has continued to coordinate with project stakeholders and business owners. Recommendations within the Action Plan are geared at improving the safety of Sycamore Township, while building upon the recommendations and goals of the 2011 study.

Through this timeline, the Township has maintained discussions with key stakeholders including the Kenwood Towne Center and the Jewish Hospital.

4. Background Information

The project area in this report is a result of years of work and study within the Sycamore Township area. The Kenwood Road corridor in particular has long been reviewed due to its high congestion and crash rates. As a result of improvements designed and built in 2014, the crashes on Kenwood Road between Montgomery Road and I-71SB were decreased by half. This improvement was the installation of a center median to control access on Kenwood Road from Montgomery Road to I-71. To address the access management, the Township built a rearage road to serve the properties to the west. Attempts to serve the properties to the east have not come to fruition. At this time, the Township is looking to provide

connectivity to the properties on the east side of Kenwood Road between I-71 and Montgomery Road. To further improve safety and congestion at Kenwood Road and Montgomery Road, the Township is looking to control access and improve traffic flow.

5. Existing Conditions

Existing Road Conditions

Kenwood Road north of Montgomery Road is a 5-lane minor arterial road that travels north/south through Sycamore Township. The road has a posted speed of 35MPH and experiences an Annual Average Daily Traffic (AADT) of 22,631 vehicles per day. This action plan's northern boundary is Galbraith Road. Galbraith Road is a 2-lane minor arterial road that intersection Kenwood Road north of the Kenwood Towne Center. Galbraith Road has a posted speed of 35MPH and experiences an AADT of 8,738 vehicles per day. Between the intersections of Galbraith Road and Montgomery Road, there are three other signalized intersections: Orchard Lane, Kenwood Place, and Happiness Way. A design project has just been completed at Happiness Way in the past year to signalize the intersection and modify access to Jewish Hospital on the north side of the Road. The intersection of Orchard Lane is 375' to the north of the Kenwood Road & Montgomery Road intersection.

Montgomery Road is a 5-lane major arterial road with a Two Way Left Turn median that travels east/west south of the Kenwood Towne Center. The Road has a posted speed of 40mph and an AADT of 20,836 vehicles per day.

Kenwood Road between Montgomery Road and I-71 SB is 4-lanes divided by a raised median and a single signalized intersection at American Way. Access to I-71 SB is unsignalized with channelized right turn in the southbound direction. A map showing the study area and these intersections is provided in *Figure 5.1*.

Figure 5.1– Sycamore Township Injury Crash Heat Map with Construction Zones



6. Crash Data

Focus Areas

Kenwood Road & Montgomery Road

Crash reports for the years 2017-2021 were obtained from the ODOT GIS Crash Analysis Tool (GCAT) and the Ohio Department of Public Services (ODPS) to determine crash trends around Montgomery Road & Kenwood Road. Five years of crash data were taken to observe pre and post COVID crash trends. All information regarding the crashes was taken directly from GCAT and the OH-1 crash reports and has not been altered in anyway. There were 34 crashes in 2017, 15 in 2018, 14 in 2019, 8 in 2020, and 22 in 2021. There were 13 (14%) injury crashes, 80 (86%) property damage only crashes, and no fatal crashes during the study period.

The two largest crash types were rear end and sideswipe-passing with a total of 48 (52%) rear end and 13 (14%) sideswipe-passing crashes. The most crashes (22, 24%) occurred on a Friday and the most common time of day for a crash to occur was during the 12:00 and 4:00 PM hour (12, 13%). A majority of crashes happened on dry pavement (71, 76%) during daylight conditions (72, 77%).

The following summarizes crash trends observed from the crash reports obtained from GCAT and the Ohio Department of Public Safety:

1. Rear end collisions accounted for more than half of the total area crashes (52%) and were observed at all approaches of the intersection and three occurring within the intersection or past it.
2. Sideswipe-passing crashes occurred along intersection approaches and none of the 13 crashes taking place within the intersection.
3. A majority of angle crashes occurred within the intersection, however there were 3 angle crashes that occurred at nearby driveways on the signal approaches.
4. Left and Right turn crashes account for 19 (21%) of total crashes combined with a majority of crashes occurring within the intersection and 4 crashes occurring at nearby driveways.
5. 19 crash related injuries from 13 crashes were reported with no fatalities. This included 1 serious visible injury that was also incapacitating.
6. 3 (3%) crashes were attributed to drugs or alcohol.

Kenwood Between Montgomery Road & I-71SB

Kenwood Road south of Montgomery Road has a high density of access points and originally was a four-lane road with a Two-Way-Left-Turn (TWLT) median. To provide improved access management and reduce crashes in the area, the TWLT was replaced with a raised median between 2013 and 2014 to eliminate turning outside of signalized intersections. Due to constraints of GCAT data, the two years crash information before and after construction were collected to compare crash information. The following summarizes changes in crash trends from before and after the implementation of the raised median:

1. Overall crash volumes were reduced from 61 to 35 (a reduction of 13 crashes per year).
2. 8 injury crashes occurred before construction versus 5 after construction.
3. Before the construction, the most common crash type was Angle crashes with 22 (36%) occurring. After construction, the most common crash type was rear end crashes with 17 (49%) crashes. Angle crashes were reduced to 3 crashes that all occurred at American Way.

The unsignalized intersection of Kenwood Road & the I-71SB on ramp experienced 15 crashes between 2017 and 2021 with 4 (27%) of those being injury crashes. There were no serious or incapacitating injury crashes and no fatalities. Rear end crashes accounted for 5(33%) of the total crashes in the area and left turn crashes occurred in another 4 (27%).

Kenwood Road & Orchard Lane

Kenwood Road & Orchard Lane experienced a total of 28 crashes during the five-year period with no fatal or serious injuries. Of these crashes, 8 occurred in 2017, 7 in 2018, 6 in 2019, 1 in 2020, and 6 in 2021. There were no fatal crashes at the intersection as well as 26 (93%) property damage and 2 (7%) injury crashes.

The two main crash types that occurred at Orchard Lane were rear end and sideswipe-passing crashes. There were 15 (60%) rear end crashes and 7 (25%) sideswipe-passing crashes. The most crashes (7, 25%) occurred on Friday and the most common time of day for a crash to occur was during the 3:00PM hour (6, 21%). The majority of crashes happened on dry pavement (21, 75%) during daylight conditions (26, 93%).

The following summarizes crash trends observed from the crash reports obtained from GCAT and the Ohio Department of Public Safety:

1. Rear end collisions resulted in in half of the total crashes within the intersection at 15 (60%) crashes. All of these crashes occurred on the Kenwood Road approaches outside of the intersection itself.
2. 7 (25%) of the crashes were left turn or right turn crashes. The right turn crashes occurred when vehicles turned onto Kenwood Road from Orchard Lane and the left turn crashes occurred when turning onto Orchard Lane.

Kenwood Road & Galbraith Road

Kenwood & Galbraith Road experienced a total of 75 crashes throughout the five-year study period. There were 15 crashes in 2017, 11 in 2018, 16 in 2019, 17 in 2020, and 16 in 2021. There were 18 (24%) injury crashes, 57 (76%) property damage only crashes, and no fatal crashes during the study period.

The two largest crash types were rear end and angle crashes with a total of 37 (49%) rear end and 12 (16%) angle crashes. The most crashes (15, 20%) occurred on a Tuesday and the most common time of

day for a crash to occur was during the 12:00 PM hour (13, 17%). A majority of crashes happened on dry pavement (56, 73%) during daylight conditions (57, 76%).

The following summarizes crash trends observed from the crash reports obtained from GCAT and the Ohio Department of Public Safety:

1. Rear end collisions accounted for nearly half of the total crashes in the area with 37 (49%) crashes. These crashes occurred at all approaches but outside of the intersection.
2. 12 (16%) of the crashes were angle crashes, all of which occurred within the intersection.
3. Left turn (8, 11%) and right turn (3, 4%) crashes for the third highest crash type when combined. These crashes only occurred within the intersection.
4. 18 injury crashes resulted in 25 reported injuries with no fatalities and one incapacitating injury.
5. 1 (1%) crash involved drugs and alcohol.

A complete report of the crash analysis figures can be found in *Appendix B*.

Collision Diagrams

Collision diagrams for the analysis period of 2017-2021 are provided in *Appendix C*. These diagrams present a visual representation of the crashes as they relate to locations throughout the study area. The crash diagram for the intersections of Kenwood Road & Montgomery Road, Kenwood Road & Orchard Lane, and Kenwood Road & Galbraith Road are provided in *Figures 6.1-6.3*.

Figure 6.1 – Kenwood Rd & Montgomery Rd Crash Diagram

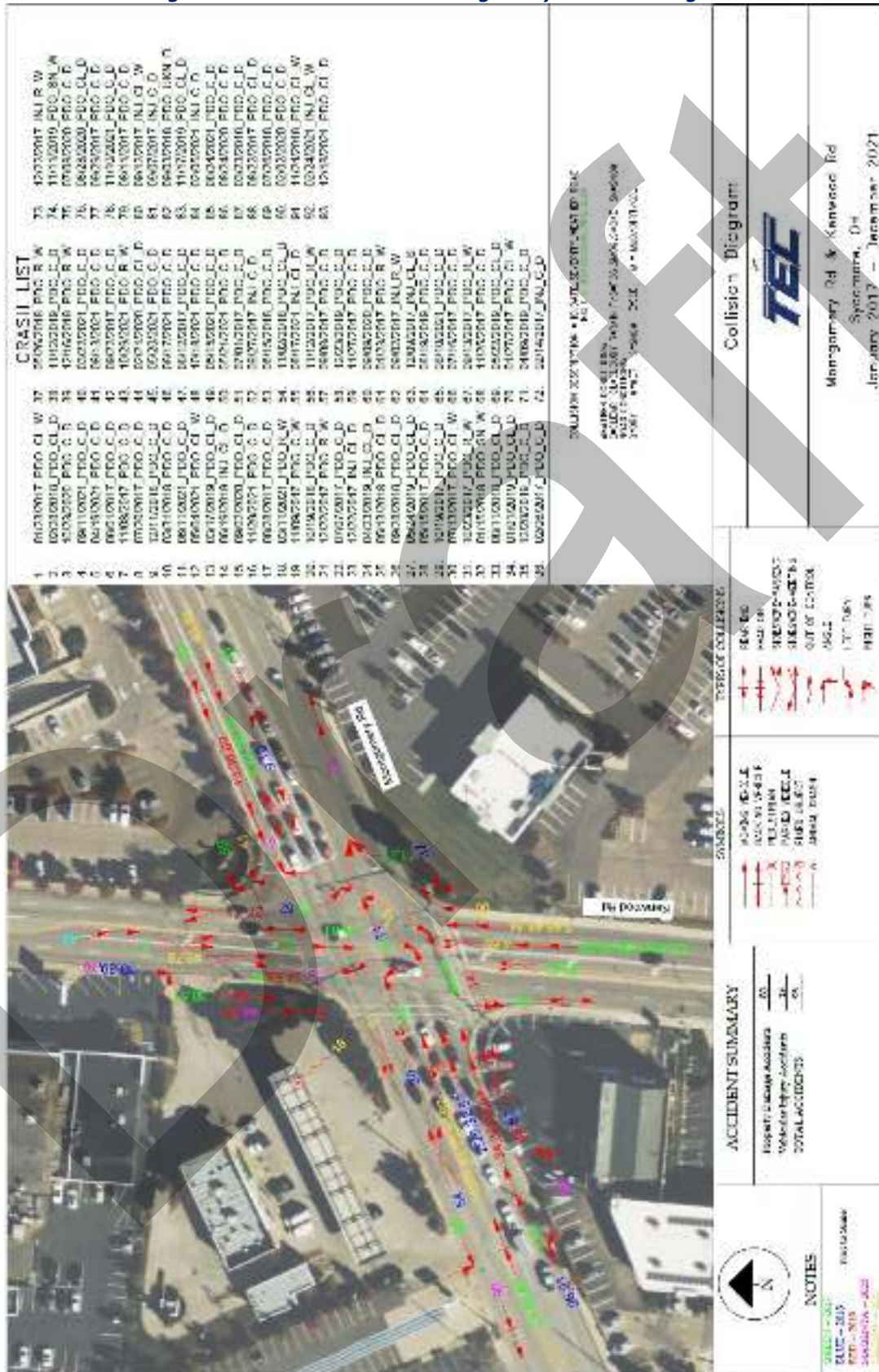


Figure 6.2 – Kenwood Rd & Orchard Lane Crash Diagram

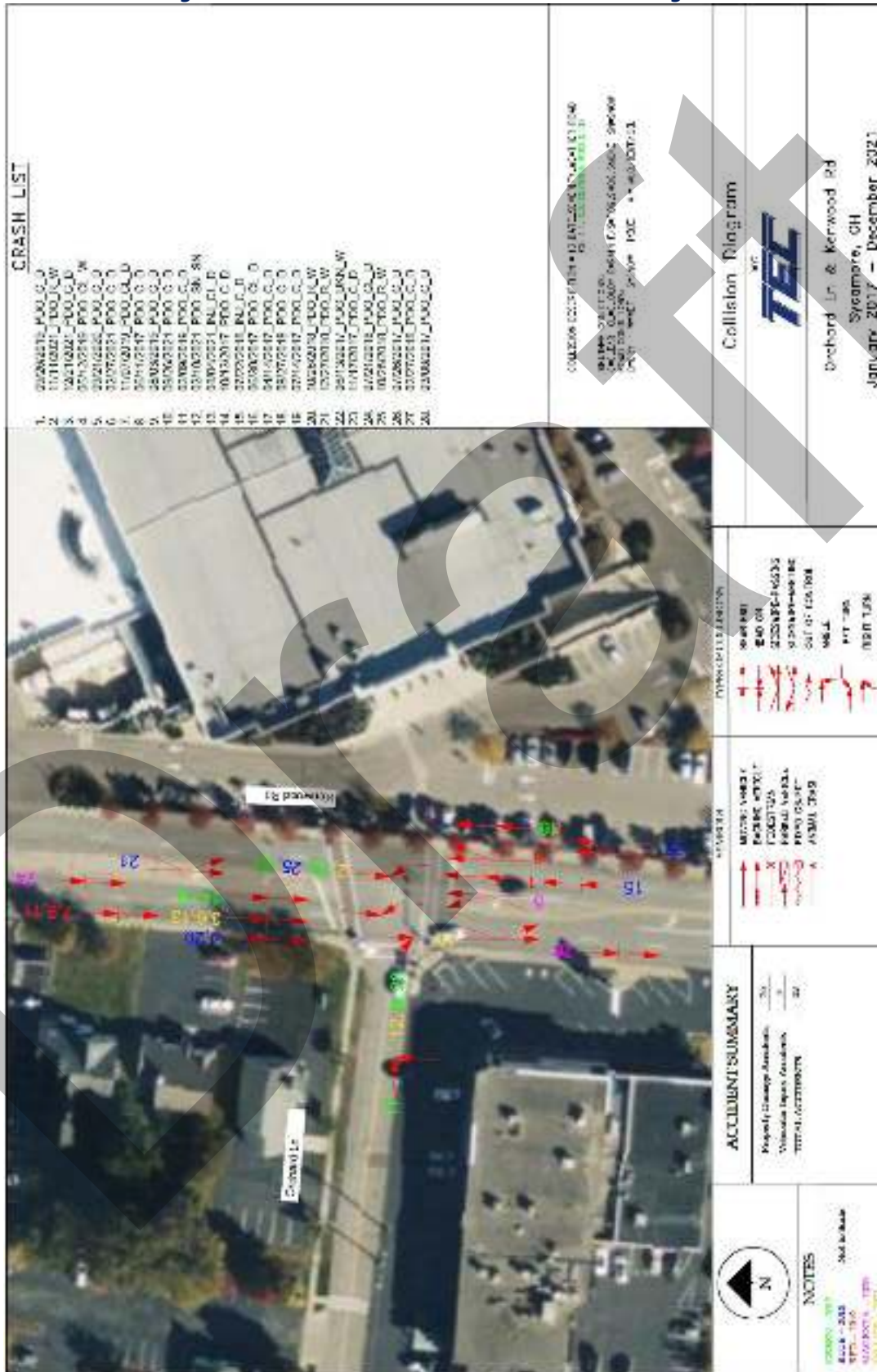


Figure 6.3 – Kenwood Rd & Galbraith Road Crash Diagram



7. Safety & Accessibility

Outside of recorded crash data, safety and accessibility concerns based on observations made by TEC Engineering and local stakeholders were investigated as well. The following safety and accessibility observations as well as their effects on the study area.

The intersection of Kenwood Road & Happiness Way has been under construction and just recently brought into signalized operation as part of a development project. Further studies outside of this Action Plan have been proposed to better assess if this is creating modified trip capture between Jewish Hospital and the nearby area. This study is expected to examine the intersection of Kenwood Road & Galbraith Road as well.

Local stakeholders have raised concerns about accessibility along the stretch of Kenwood Road between Montgomery Road and I-71SB. The implementation of the raised median to prevent left turns has caused concerns about drivers taking unsafe U-Turns at other available openings at American Way. This is a result of demographics south of I-71SB. Kenwood Road south of the area is residential and does not have a convenient turn around location.

Emergency vehicle preemption is not present in Sycamore Township except for an all-red preemption that activates at Galbraith Road in the event of a helicopter landing at the nearby Jewish Hospital. The lack of preemption in an area with the high volumes of traffic around the Kenwood area can be a safety hazard during emergency situations where first responders are traveling to or from the hospital. The previously mentioned development at Happiness Way included improvements to the connectivity of Jewish Hospital with Kenwood Road. A grant has been secured this year for the implementation of emergency vehicle preemption for Sycamore Township signals which should include emergency vehicles from Jewish Hospital.

8. Countermeasures

Site Diagnosis and Identification of Potential Countermeasures

In order to correctly identify crash trends and determine applicable safety improvements, TEC completed in-depth reviews of crash reports. The observations based on these reports showed the following:

- Signal visibility at intersections is a likely cause of rear end, angle and turning crashes at all signalized intersections.
- The proximity of Orchard Lane to Montgomery Road may cause sudden stops or lane changes and result in sideswipe and rear end crashes at the approaches of both intersections. Signals in close proximity also cause congestion and a backup of vehicles that can extend into the intersections.

- Short lane changes and shared movement lanes at Kenwood Road & Montgomery Road can result in the sideswipe-passing crashes as drivers attempt to navigate to the correct lane.
- Access management on Kenwood Road south of Montgomery Road forces drivers to turn at American Way, including illegal U-turns reduce safety at the intersection.

Project Details

Project 1: I-71SB Roundabout

The implementation of a roundabout at Kenwood Road & I-71 SB would include replacing the existing unsignalized intersection with a 2-lane roundabout to maintain a similar lane assignment to what is present. Roundabouts are proven to reduce angle crashes by removing points of conflict which should allow for safer access to the I-71SB on ramp for vehicles that would currently be making a left turn. This project would also reduce U-turns at other unsafe locations along Kenwood Road by providing a design where the movement can be completed safely. Pedestrian crossing and accessibility at roundabouts are sometimes hindered due to the more continuous flow of traffic, however the intersection at American Way to the north provides a signalized crossing to assist pedestrians needing to cross Kenwood Road. A roundabout will also act as a traffic calming measure by as through traffic slows down to navigate the intersection. There are two businesses accesses on the east side of Kenwood, a restaurant and closed gas station, which would have their current access to Kenwood Road affected by the roundabout. Access to these lots would be maintained by connecting them to the nearby Sycamore Plaza lot that borders it to the east. An engineering drawing of the proposed roundabout is provided in *Figure 8.1*.

Figure 8.1 –Kenwood Rd & I-71SB Roundabout Design

Project 2: Kenwood Road & Montgomery Road Modifications

Project 2 would add right turn lanes on the north and southbound approaches of Kenwood Road at the Montgomery Road intersection and extend the southbound left turn lane by 170'. The right turn lanes would be 250' in length each to allow for increased capacity and separation of lane movements. The extension of the southbound left turn lane will extend it into the intersection of Orchard Lane. Closing Orchard Lane off from Kenwood Road would remove the rear end crash, congestion and back up issues that occur due to the proximity between Montgomery Road and Orchard Lane. This design would also require the implementation of new five section signals to facilitate right turn overlap movements for both new right lanes. An engineering drawing of this upgrade is provided in *Figure 8.2*.

Figure 8.2 –Kenwood Rd & Montgomery Improvements



Drawings of Projects 1 and 2 are provided in *Appendix D*.

Project 3: Signal Backplates

To reduce the rear end collisions that occur throughout Kenwood Road, the addition of signal backplates would bring the existing Sycamore Township signal heads into current ODOT standards and make them more visible to drivers. The following signals along Kenwood Road currently do not have backplates: Euclid Road, I-71NB on Ramp, Montgomery Road, and Galbraith Road.

Project Estimates

Preliminary estimates for all three proposed projects were completed based on the project engineering drawings. The estimate for Project 2 did not account for the required Right of Way acquisition that would be necessary and was calculated using an Ohio Department of Transportation R/W Cost Estimator.

Table 8.1 –Project Estimates

Project Year	Project Year	Design Costs	Construction Costs	Right of Way Costs	
1	2023	\$1,188,000			Design I-71 SB
2	2024	\$1,188,000	\$52,772		Design Mont & Kenwood + Construction Backpattes
3	2025				\$0
4	2026			\$1,838,720	ROW I-71 SB
5	2027		\$3,088,594	\$7,223,850	Const I-71 + ROW Mont & Kenwood
6	2028		\$2,171,946		Const Mont & Kenwood
	Total	\$2,376,000	\$5,313,313	\$9,062,570	

9. Summary of Supplemental Traffic Studies

Capacity Analysis Study

A capacity analysis was performed to determine if recommended improvements to the intersection would negatively affect delay or level of service. TEC used the software *Synchro 11* to evaluate the existing conditions vs. proposed conditions for each peak. The Level of Service (LOS) for the intersection is directly related to the average total delay per vehicle. The LOS is classified into six difference levels ranging from A to F.

To better account for growth within the area and how the projects would affect traffic in the future, a 2025 opening year and a ten-year horizon in 2035. A 1% linear growth rate was applied to these two scenarios using traffic counts collected by TEC Engineering from 3/30/2022 to 4/26/2022. Due to modeling constraints, a No Build assessment of Kenwood Road & I-71SB cannot be calculated, but proposed capacity for the roundabout was calculated using the software *Sidra*. Two roundabout scenarios were examined based on southbound flow, a two-lane scenario where the outer lane is right turn only and another where it is a through/right movement.

Multiple scenarios were modeled of Kenwood Road & Montgomery Road to examine if the addition of the north or southbound improvements would provide greater benefits than implementing changes in both directions. The right turn lanes were modeled as having left turn overlaps with the Montgomery Road movements. The delay and LOS for modeled intersections can be found below in *Table 9.1* and *9.2*.

Table 9.1 – Kenwood Rd & Montgomery Rd Capacity Analysis Results (Existing vs Proposed Changes)

Kenwood Road & Montgomery Road											
Peak	Scenario	EB Montgomery Rd		WB Montgomery Rd		NB Kenwood Rd		SB Kenwood Rd		Total Intersection	
AM	2025 No Build	19.5	B	17.1	B	48.5	D	49.3	D	35.2	D
	2025 NB RT	16.6	B	14.5	B	37.2	D	54.1	D	31.7	C
	2025 SB RT/LT	19.5	B	17.1	B	48.4	D	45.1	D	34.2	C
	2025 NB & SB	16.6	B	14.5	B	37.1	D	48.2	D	30.2	C
	2035 No Build	21.6	C	18.8	B	53.6	D	47.3	D	36.9	D
	2035 NB RT	18.5	B	16.1	B	36.4	D	50.7	D	30.9	C
	2035 SB RT/LT	21.6	C	18.8	B	53.5	D	45.4	D	36.5	D
MID	2025 No Build	14.6	B	25.1	C	60.6	E	53.8	D	40.6	D
	2025 NB RT	26.3	C	23.9	C	55.9	E	41.4	D	38.1	D
	2025 SB RT/LT	9.2	A	20.3	C	56	E	51.3	D	36.4	D
	2025 NB & SB	9.2	A	20.3	C	53	D	51.3	D	35.5	D
	2035 No Build	19	B	28.5	C	62.1	E	50.2	D	41.7	D
	2035 NB RT	13.1	B	23.9	C	51.5	D	61.3	E	39.6	D
	2035 SB RT/LT	19	B	28.5	C	61.7	E	43.7	D	39.8	D
PM	2025 No Build	35	D	24.1	C	51.7	D	66.2	E	44.7	D
	2025 NB RT	34.2	C	23.4	C	31.3	C	63.5	E	38.7	D
	2025 SB RT/LT	35.1	D	24.1	C	51.2	D	42	D	38.1	D
	2025 NB & SB	24.9	C	20.3	C	37.2	D	54.9	D	34.8	C
	2035 No Build	45.2	D	27.1	C	61.1	E	72.3	E	51.9	D
	2035 NB RT	43.6	D	25.7	C	31.9	C	74.4	E	44.7	D
	2035 SB RT/LT	45	D	27	C	60.3	E	43.6	D	43.9	D
2035 NB & SB	34.6	C	23.1	C	36.6	D	51.9	D	36.9	D	

During all peak hours, the implementation of north and southbound intersection improvements will provide slight improvements to intersection delay.

Table 9.2 – Capacity Analysis Results Kenwood Rd & I71SB Roundabout

Kenwood Road & I-71 SB Ramp							
Peak	Scenario	NB Kenwood Rd		SB Kenwood Rd		Total Intersection	
AM	2025 SB RT	8.1	A	8.6	A	8.3	A
	2025 2-Lane	8.1	A	8.6	A	8.3	A
	2035 SB RT	9	A	9.9	A	9.3	A
	2035 2-Lane	9	A	9.8	A	9.3	A
MID	2025 SB RT	6.3	A	6.6	A	6.5	A
	2025 2-Lane	6.3	A	6.5	A	6.5	A
	2035 SB RT	6.8	A	7.3	A	7	A
	2035 2-Lane	6.8	A	7.3	A	7	A
PM	2025 SB RT	6.9	A	10.5	B	8.7	A
	2025 2-Lane	6.9	A	10.5	B	8.7	A
	2035 SB RT	7.5	A	12.4	B	10	A
	2035 2-Lane	7.5	A	12.4	B	10	A

Appendix E provides the Capacity Analysis information for both locations.

10. Recommendations

It is recommended that the application of these three projects be implemented to compliment other referenced township projects to provide area wide safety improvements to the Kenwood Road corridor. Through these improvements, crashes should be reduced without increasing delay and provide accessibility and calming benefits. These accessibility improvements should benefit local businesses and improve access for emergency vehicles, especially those needing access to Jewish Hospital. Implementation all three of these projects should cost a total of \$16,751,883.

APPENDIX A: TURNING MOVEMENTS

Galbraith Rd and Kenwood Rd
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102
Wednesday, March 30, 2022

Start Time	Galbraith Rd Eastbound					Galbraith Rd Westbound					Kenwood Rd Northbound					Kenwood Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	13	54	33	0	100	11	27	22	0	60	30	63	15	0	108	47	84	14	0	145	413
7:45 AM	13	37	32	0	82	10	31	16	0	57	47	62	12	0	121	41	101	16	0	158	418
8:00 AM	18	39	17	0	74	11	31	25	0	67	39	45	12	0	96	58	85	24	0	167	404
8:15 AM	12	40	24	0	76	11	41	14	0	66	38	64	19	0	121	40	67	27	0	134	397
Total	56	170	106	0	332	43	130	77	0	250	154	234	58	0	446	186	337	81	0	604	1632
PHF	0.78	0.79	0.80		0.83	0.98	0.79	0.77		0.93	0.82	0.91	0.76		0.92	0.80	0.83	0.75		0.90	0.98
HV%	7.1%	4.1%	6.6%		5.4%	0.0%	2.3%	1.3%		1.6%	1.9%	3.4%	10.3%		3.8%	2.2%	3.0%	2.5%		2.6%	3.4%
BREAK																					
12:00 PM	15	52	49	0	116	18	42	41	0	101	23	97	16	0	136	47	98	23	0	168	521
12:15 PM	15	55	41	0	111	15	55	43	0	113	45	87	11	0	143	41	91	26	0	158	525
12:30 PM	18	52	41	0	111	16	42	45	0	103	41	94	20	0	155	47	80	29	0	156	525
12:45 PM	19	49	35	0	103	17	48	39	0	104	50	104	21	0	175	42	102	23	0	167	549
Total	67	208	166	0	441	66	187	168	0	421	159	382	68	0	609	177	371	101	0	649	2120
PHF	0.88	0.95	0.85		0.95	0.92	0.85	0.93		0.93	0.80	0.92	0.81		0.87	0.94	0.91	0.87		0.97	0.97
HV%	4.5%	3.4%	0.6%		2.5%	0.0%	2.1%	1.2%		1.4%	0.6%	0.8%	8.8%		1.6%	2.3%	1.3%	2.0%		1.7%	1.8%
BREAK																					
2:00 PM	22	39	47	0	108	19	40	42	0	101	45	102	28	0	175	41	82	26	0	149	533
2:15 PM	31	63	47	0	141	24	58	46	0	128	51	99	21	0	171	45	64	28	0	137	577
2:30 PM	24	63	39	0	126	14	38	44	0	96	61	123	19	0	203	37	85	17	0	139	564
2:45 PM	29	53	55	0	137	16	44	53	0	113	48	96	21	0	165	54	95	23	0	172	587
Total	106	218	188	0	512	73	180	185	0	438	205	420	89	0	714	177	326	94	0	597	2261
PHF	0.85	0.87	0.85		0.91	0.76	0.78	0.87		0.86	0.84	0.85	0.79		0.88	0.82	0.86	0.84		0.87	0.96
HV%	2.8%	3.2%	1.1%		2.3%	2.7%	3.9%	2.7%		3.2%	1.0%	2.1%	3.4%		2.0%	0.0%	1.5%	7.4%		2.0%	2.3%
BREAK																					
5:00 PM	43	64	63	0	170	20	60	71	0	151	23	137	10	0	170	45	95	10	0	150	641
5:15 PM	39	63	38	0	140	22	44	59	0	125	33	153	23	0	209	43	142	14	0	199	673
5:30 PM	19	44	38	0	101	20	58	66	0	144	25	137	16	0	178	45	116	12	0	173	596
5:45 PM	23	44	39	0	106	15	27	44	0	86	26	127	15	0	168	43	128	17	0	188	548
Total	124	215	178	0	517	77	189	240	0	506	107	554	64	0	725	176	481	53	0	710	2458
PHF	0.72	0.84	0.71		0.76	0.88	0.79	0.85		0.84	0.81	0.91	0.70		0.87	0.98	0.85	0.78		0.89	0.91
HV%	0.0%	0.9%	1.7%		1.0%	0.0%	2.1%	0.4%		1.0%	0.0%	1.3%	4.7%		1.4%	0.0%	0.0%	0.0%		0.0%	0.8%

Jewish Hospital Entrance/Mall and Kenwood Rd.
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102
Wednesday, March 30, 2022

Start Time	Jewish Hospital Entrance Eastbound					Mall Westbound					Kenwood Rd. Northbound					Kenwood Rd. Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	1	0	5	0	6	3	0	2	0	5	16	110	6	0	132	1	113	7	0	121	264
7:45 AM	1	0	4	0	5	0	0	2	0	2	15	124	6	0	145	0	151	13	0	164	316
8:00 AM	2	1	3	0	6	0	0	0	0	0	19	91	4	0	114	1	100	7	0	108	228
8:15 AM	1	0	9	0	10	0	0	0	0	0	14	103	1	0	118	4	99	4	0	107	235
Total	5	1	21	0	27	3	0	4	0	7	64	428	17	0	509	6	463	31	0	500	1043
PHF	0.63	0.25	0.58		0.68	0.25	0.00	0.50		0.35	0.84	0.86	0.71		0.88	0.38	0.77	0.60		0.76	0.83
HV%	0.0%	0.0%	9.5%		7.4%	0.0%	0.0%	25.0%		14.3%	1.6%	3.3%	0.0%		2.9%	0.0%	3.0%	9.7%		3.4%	3.4%
BREAK																					
12:00 PM	2	0	4	0	6	10	0	20	0	30	7	118	13	0	138	18	148	5	0	171	345
12:15 PM	2	1	7	0	10	7	0	13	0	20	6	132	4	0	142	14	139	1	0	154	326
12:30 PM	0	0	7	0	7	5	1	24	0	30	7	157	6	0	170	7	141	4	0	152	359
12:45 PM	0	0	4	0	4	10	0	18	0	28	8	156	12	0	176	16	133	6	0	155	363
Total	4	1	22	0	27	32	1	75	0	108	28	563	35	0	626	55	561	16	0	632	1393
PHF	0.50	0.25	0.79		0.68	0.80	0.25	0.78		0.90	0.88	0.90	0.67		0.89	0.76	0.95	0.67		0.92	0.96
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	1.3%		0.9%	7.1%	3.2%	0.0%		3.2%	0.0%	1.4%	0.0%		1.3%	2.1%
BREAK																					
2:00 PM	3	1	4	0	8	4	0	28	0	32	5	142	6	0	153	17	123	0	0	140	333
2:15 PM	1	0	12	0	13	4	0	22	0	26	8	156	9	0	173	6	126	4	0	136	348
2:30 PM	2	1	18	0	21	3	0	35	0	38	9	151	2	0	162	10	133	3	0	146	367
2:45 PM	2	1	13	0	16	12	0	19	0	31	9	139	9	0	157	9	145	0	0	154	358
Total	8	3	47	0	58	23	0	104	0	127	31	588	26	0	645	42	527	7	0	576	1406
PHF	0.67	0.75	0.65		0.69	0.48	0.00	0.74		0.84	0.86	0.94	0.72		0.93	0.62	0.91	0.44		0.94	0.96
HV%	0.0%	0.0%	2.1%		1.7%	0.0%	0.0%	0.0%		0.0%	3.2%	3.2%	0.0%		3.1%	0.0%	1.3%	0.0%		1.2%	2.0%
BREAK																					
5:00 PM	1	1	12	0	14	6	0	18	0	24	2	186	7	0	195	10	177	0	0	187	420
5:15 PM	5	0	8	0	13	6	0	30	0	36	4	151	8	0	163	13	187	0	0	200	412
5:30 PM	0	0	9	0	9	5	0	24	0	29	3	147	13	0	163	16	165	0	0	181	382
5:45 PM	2	0	6	0	8	10	1	21	0	32	2	142	7	0	151	12	166	0	0	178	369
Total	8	1	35	0	44	27	1	93	0	121	11	626	35	0	672	51	695	0	0	746	1583
PHF	0.40	0.25	0.73		0.79	0.68	0.25	0.78		0.84	0.69	0.84	0.67		0.86	0.80	0.93	0.00		0.93	0.94
HV%	0.0%	0.0%	5.7%		4.5%	0.0%	0.0%	0.0%		0.0%	27.3%	1.9%	2.9%		2.4%	0.0%	0.3%	0.0%		0.3%	1.3%

Towne Centre Entrance and SB Kenwood Rd
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102-001
Wednesday, March 30, 2022

Start Time	Towne Centre Entrance Eastbound					Westbound					Northbound					SB Kenwood Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	0	0	0	0	0	1	0	0	0	1	1	122	9	0	132	4	107	2	0	113	246
7:45 AM	0	0	0	0	0	2	0	2	0	4	2	153	7	0	162	3	155	3	0	161	327
8:00 AM	0	0	1	0	1	0	0	2	0	2	2	127	6	0	135	2	103	1	0	106	244
8:15 AM	2	0	0	0	2	2	0	1	0	3	4	127	8	0	139	0	97	3	0	100	244
Total	2	0	1	0	3	5	0	5	0	10	9	529	30	0	568	9	462	9	0	480	1061
PHF	0.25	0.00	0.25		0.38	0.63	0.00	0.63		0.63	0.56	0.86	0.83		0.88	0.56	0.75	0.75		0.75	0.81
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	20.0%		10.0%	0.0%	2.3%	16.7%		3.0%	0.0%	3.2%	0.0%		3.1%	3.1%
BREAK																					
12:00 PM	5	1	2	0	8	41	0	3	0	44	2	130	42	0	174	17	141	7	0	165	391
12:15 PM	15	0	3	0	18	38	2	9	0	49	1	124	41	0	166	11	144	6	0	161	394
12:30 PM	9	1	4	0	14	34	1	5	0	40	2	160	36	0	198	16	128	5	0	149	401
12:45 PM	6	1	6	0	13	44	1	5	0	50	7	174	44	0	225	13	125	12	0	150	438
Total	35	3	15	0	53	157	4	22	0	183	12	588	163	0	763	57	538	30	0	625	1624
PHF	0.58	0.75	0.63		0.74	0.89	0.50	0.61		0.92	0.43	0.84	0.93		0.85	0.84	0.93	0.63		0.95	0.93
HV%	0.0%	0.0%	6.7%		1.9%	0.6%	0.0%	13.6%		2.2%	8.3%	2.2%	1.2%		2.1%	3.5%	0.4%	3.3%		0.8%	1.6%
BREAK																					
2:00 PM	7	0	5	0	12	47	1	3	0	51	1	156	51	0	208	5	127	4	0	136	407
2:15 PM	2	1	2	0	5	43	0	6	0	49	5	165	38	0	208	4	144	1	0	149	411
2:30 PM	4	2	10	0	16	46	0	6	0	52	5	154	35	0	194	4	148	6	0	158	420
2:45 PM	3	1	5	0	9	34	0	9	0	43	1	117	24	0	142	6	115	6	0	127	321
Total	16	4	22	0	42	170	1	24	0	195	12	592	148	0	752	19	534	17	0	570	1559
PHF	0.57	0.50	0.55		0.66	0.90	0.25	0.67		0.94	0.60	0.90	0.73		0.90	0.79	0.90	0.71		0.90	0.93
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	8.3%	3.2%	0.0%		2.7%	0.0%	1.3%	0.0%		1.2%	1.7%
BREAK																					
5:00 PM	6	1	8	0	15	38	0	11	0	49	2	174	23	0	199	11	190	4	0	205	468
5:15 PM	3	0	8	0	11	32	0	10	0	42	2	156	26	0	184	10	189	5	0	204	441
5:30 PM	5	0	2	0	7	36	0	10	0	46	5	148	37	0	190	13	160	8	0	181	424
5:45 PM	2	0	2	0	4	38	1	8	0	47	2	142	30	0	174	13	170	1	0	184	409
Total	16	1	20	0	37	144	1	39	0	184	11	620	116	0	747	47	709	18	0	774	1742
PHF	0.67	0.25	0.63		0.62	0.95	0.25	0.89		0.94	0.55	0.89	0.78		0.94	0.90	0.93	0.56		0.94	0.93
HV%	0.0%	0.0%	0.0%		0.0%	0.7%	0.0%	0.0%		0.5%	0.0%	2.6%	0.0%		2.1%	0.0%	0.8%	0.0%		0.8%	1.3%

Nordstrom RI/RO and NB Kenwood Rd
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102-001
Wednesday, March 30, 2022

Start Time	Eastbound					Nordstrom RI/RO Westbound					NB Kenwood Rd Northbound					Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	2	0	0	0	2	8
7:45 AM	0	0	0	0	0	1	0	0	0	1	0	0	11	0	11	4	0	0	0	4	16
8:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	4
Total	0	0	0	0	0	2	0	0	0	2	0	0	23	0	23	6	0	0	0	6	31
PHF	0.00	0.00	0.00		0.00	0.50	0.00	0.00		0.50	0.00	0.00	0.52		0.52	0.38	0.00	0.00		0.38	0.48
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%
#VALUE!																					
12:00 PM	0	0	0	0	0	1	0	3	0	4	0	0	15	0	15	2	0	0	0	2	21
12:15 PM	0	0	0	0	0	5	0	3	0	8	0	0	7	0	7	0	0	0	0	0	15
12:30 PM	0	0	0	0	0	1	0	1	0	2	0	0	3	0	3	1	0	0	0	1	6
12:45 PM	0	0	0	0	0	0	0	7	0	7	0	0	14	0	14	5	0	0	0	5	26
Total	0	0	0	0	0	7	0	14	0	21	0	0	39	0	39	8	0	0	0	8	68
PHF	0.00	0.00	0.00		0.00	0.35	0.00	0.50		0.66	0.00	0.00	0.65		0.65	0.40	0.00	0.00		0.40	0.65
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	7.1%		4.8%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	1.5%
#VALUE!																					
2:00 PM	0	0	0	0	0	3	0	7	0	10	0	0	5	0	5	3	0	0	0	3	18
2:15 PM	0	0	0	0	0	2	0	5	0	7	0	0	5	0	5	2	0	0	0	2	14
2:30 PM	0	0	0	0	0	1	0	3	0	4	0	0	14	0	14	0	0	0	0	0	18
2:45 PM	0	0	0	0	0	5	0	2	0	7	0	0	12	0	12	0	0	0	0	0	19
Total	0	0	0	0	0	11	0	17	0	28	0	0	36	0	36	5	0	0	0	5	69
PHF	0.00	0.00	0.00		0.00	0.55	0.00	0.61		0.70	0.00	0.00	0.64		0.64	0.42	0.00	0.00		0.42	0.91
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	5.9%		3.6%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	1.4%
BREAK																					
5:00 PM	0	0	0	0	0	6	0	7	0	13	0	0	5	0	5	0	0	0	0	0	18
5:15 PM	0	0	0	0	0	1	0	8	0	9	0	0	8	0	8	1	0	0	0	1	18
5:30 PM	0	0	0	0	0	1	0	6	0	7	0	0	7	0	7	2	0	0	0	2	16
5:45 PM	0	0	0	0	0	1	0	1	0	2	0	0	7	0	7	1	0	0	0	1	10
Total	0	0	0	0	0	9	0	22	0	31	0	0	27	0	27	4	0	0	0	4	62
PHF	0.00	0.00	0.00		0.00	0.38	0.00	0.69		0.60	0.00	0.00	0.84		0.84	0.50	0.00	0.00		0.50	0.86
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%

Orchard Ln. and Kenwood Rd.
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN:
Thursday, March 31, 2022

Start Time	Orchard Ln. Eastbound					Westbound					Kenwood Rd. Northbound					Kenwood Rd. Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	2	0	18	0	20	0	0	0	0	0	5	154	0	0	159	0	114	0	0	114	293
7:45 AM	2	0	17	0	19	0	0	0	0	0	10	169	0	0	179	0	92	1	0	93	291
8:00 AM	0	0	14	0	14	0	0	0	0	0	3	154	0	0	157	0	116	0	0	116	287
8:15 AM	1	0	6	1	7	0	0	0	0	0	6	150	0	0	156	0	107	1	0	108	271
Total	5	0	55	1	60	0	0	0	0	0	24	627	0	0	651	0	429	2	0	431	1142
PHF	0.63	0.00	0.76		0.75	0.00	0.00	0.00		0.00	0.60	0.93	0.00		0.91	0.00	0.92	0.50		0.93	0.97
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	1.1%	0.0%		1.1%	0.0%	0.9%	0.0%		0.9%	1.0%
BREAK																					
12:00 PM	5	0	25	1	30	0	0	0	1	0	25	201	0	0	226	0	221	8	0	229	485
12:15 PM	7	0	19	1	26	0	0	0	0	0	20	211	0	0	231	0	198	12	0	210	467
12:30 PM	7	0	19	1	26	0	0	0	0	0	21	211	0	0	232	0	180	15	0	195	453
12:45 PM	8	0	8	1	16	0	0	0	0	0	37	209	0	0	246	0	162	16	2	178	440
Total	27	0	71	4	98	0	0	0	1	0	103	832	0	0	935	0	761	51	2	812	1845
PHF	0.84	0.00	0.71		0.82	0.00	0.00	0.00		0.00	0.70	0.99	0.00		0.95	0.00	0.86	0.80		0.89	0.95
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.6%	0.0%		0.5%	0.0%	0.4%	0.0%		0.4%	0.4%
#VALUE!																					
2:00 PM	16	0	26	3	42	0	0	0	0	0	11	209	0	0	220	0	198	16	0	214	476
2:15 PM	7	0	16	4	23	0	0	0	0	0	12	186	0	0	198	0	199	8	0	207	428
2:30 PM	8	0	11	4	19	0	1	0	0	1	18	167	0	0	185	0	198	5	0	203	408
2:45 PM	12	0	15	0	27	0	0	0	0	0	12	177	0	0	189	0	181	9	0	190	406
Total	43	0	68	11	111	0	1	0	0	1	53	739	0	0	792	0	776	38	0	814	1718
PHF	0.67	0.00	0.65		0.66	0.00	0.25	0.00		0.25	0.74	0.88	0.00		0.90	0.00	0.97	0.59		0.95	0.90
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	100.0%	0.0%		100.0%	0.0%	0.3%	0.0%		0.3%	0.0%	0.4%	0.0%		0.4%	0.3%
#VALUE!																					
5:00 PM	6	0	11	4	17	0	0	0	0	0	26	221	0	0	247	0	208	3	1	211	475
5:15 PM	3	0	13	1	16	0	0	0	0	0	18	194	0	0	212	0	214	3	0	217	445
5:30 PM	2	0	6	1	8	0	0	0	0	0	21	91	0	0	112	0	95	4	1	99	219
5:45 PM	6	0	17	2	23	0	0	0	0	0	18	176	0	0	194	0	189	13	0	202	419
Total	17	0	47	8	64	0	0	0	0	0	83	682	0	0	765	0	706	23	2	729	1558
PHF	0.71	0.00	0.69		0.70	0.00	0.00	0.00		0.00	0.80	0.77	0.00		0.77	0.00	0.82	0.44		0.84	0.82
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.3%	0.0%		0.3%	0.0%	0.1%	0.0%		0.1%	0.2%

#VALUE!

Montgomery Rd and Kenwood Rd
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102
Wednesday, March 30, 2022

Start Time	Montgomery Rd Eastbound					Montgomery Rd Westbound					Kenwood Rd Northbound					Kenwood Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	15	82	6	0	103	35	57	36	0	128	23	105	34	0	162	31	88	13	0	132	525
7:45 AM	24	76	15	0	115	31	69	24	0	124	15	132	51	0	198	16	92	11	0	119	556
8:00 AM	16	85	10	0	111	36	61	19	0	116	22	100	42	0	164	20	87	11	0	118	509
8:15 AM	37	90	12	0	139	35	75	18	0	128	33	98	23	0	154	16	76	22	0	114	535
Total	92	333	43	0	468	137	262	97	0	496	93	435	150	0	678	83	343	57	0	483	2125
PHF	0.62	0.93	0.72		0.84	0.95	0.87	0.67		0.97	0.70	0.82	0.74		0.86	0.67	0.93	0.65		0.91	0.96
HV%	6.5%	0.9%	7.0%		2.6%	5.1%	5.3%	2.1%		4.6%	4.3%	3.2%	2.7%		3.2%	6.0%	3.5%	5.3%		4.1%	3.6%
BREAK																					
12:00 PM	35	105	29	0	169	57	96	37	0	190	35	113	60	0	208	61	145	42	0	248	815
12:15 PM	32	102	30	0	164	27	106	27	0	160	42	115	47	0	204	58	108	27	0	193	721
12:30 PM	50	112	20	0	182	53	90	37	0	180	56	111	49	0	216	64	109	35	0	208	786
12:45 PM	41	58	24	0	123	32	94	38	0	164	32	108	47	0	187	36	86	25	0	147	621
Total	158	377	103	0	638	169	386	139	0	694	165	447	203	0	815	219	448	129	0	796	2943
PHF	0.79	0.84	0.86		0.88	0.74	0.91	0.91		0.91	0.74	0.97	0.85		0.94	0.86	0.77	0.77		0.80	0.90
HV%	3.2%	1.9%	1.9%		2.2%	1.2%	2.3%	0.7%		1.7%	1.8%	2.2%	1.0%		1.8%	1.8%	0.9%	0.8%		1.1%	1.7%
BREAK																					
2:00 PM	41	100	17	0	158	42	108	42	0	192	46	93	39	0	178	56	123	31	0	210	738
2:15 PM	39	79	22	0	140	56	92	38	0	186	29	105	34	0	168	58	130	33	0	221	715
2:30 PM	30	88	39	0	157	52	92	37	0	181	47	86	59	0	192	47	118	36	0	201	731
2:45 PM	48	113	23	0	184	58	129	17	0	204	31	98	50	0	179	44	116	26	0	186	753
Total	158	380	101	0	639	208	421	134	0	763	153	382	182	0	717	205	487	126	0	818	2937
PHF	0.82	0.84	0.65		0.87	0.90	0.82	0.80		0.94	0.81	0.91	0.77		0.93	0.88	0.94	0.88		0.93	0.98
HV%	1.3%	2.6%	1.0%		2.0%	1.4%	1.7%	4.5%		2.1%	0.7%	2.1%	1.6%		1.7%	1.5%	1.2%	4.8%		1.8%	1.9%
BREAK																					
5:00 PM	49	155	27	0	231	48	134	61	0	243	39	123	55	0	217	46	142	28	0	216	907
5:15 PM	35	136	36	0	207	44	102	37	0	183	30	132	52	0	214	43	152	35	0	230	834
5:30 PM	48	122	33	0	203	64	115	45	0	224	30	110	47	0	187	42	118	25	0	185	799
5:45 PM	36	104	29	0	169	44	98	40	0	182	40	94	50	0	184	40	139	37	0	216	751
Total	168	517	125	0	810	200	449	183	0	832	139	459	204	0	802	171	551	125	0	847	3291
PHF	0.86	0.83	0.87		0.88	0.78	0.84	0.75		0.86	0.87	0.87	0.93		0.92	0.93	0.91	0.84		0.92	0.91
HV%	3.0%	0.4%	0.8%		1.0%	0.0%	0.9%	0.5%		0.6%	1.4%	1.3%	0.5%		1.1%	0.0%	0.5%	0.0%		0.4%	0.8%

American Way and Kenwood Rd
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102-001
Tuesday, April 05, 2022

Start Time	American Way Eastbound					American Way Westbound					Kenwood Rd Northbound					Kenwood Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	2	0	0	0	2	1	0	0	0	1	6	158	4	0	168	6	128	13	0	147	318
7:45 AM	21	1	22	0	44	4	0	1	0	5	28	193	13	0	234	2	129	24	0	155	438
8:00 AM	4	0	7	0	11	1	0	5	0	6	14	173	9	0	196	6	122	34	0	162	375
8:15 AM	2	0	4	0	6	3	0	4	0	7	12	176	2	0	190	8	117	11	0	136	339
Total	29	1	33	0	63	9	0	10	0	19	60	700	28	0	788	22	496	82	0	600	1470
PHF	0.35	0.25	0.38		0.36	0.56	0.00	0.50		0.68	0.54	0.91	0.54		0.84	0.69	0.96	0.60		0.93	0.84
HV%	0.0%	0.0%	6.1%		3.2%	0.0%	0.0%	0.0%		0.0%	0.0%	2.7%	3.6%		2.5%	0.0%	5.6%	0.0%		4.7%	3.4%
#VALUE!																					
12:00 PM	13	2	7	0	22	20	1	10	0	31	3	183	25	0	211	24	191	13	0	228	492
12:15 PM	13	0	7	0	20	20	0	13	1	33	5	178	24	0	207	23	139	12	0	174	434
12:30 PM	9	1	5	0	15	15	1	19	0	35	5	178	15	0	198	21	149	7	0	177	425
12:45 PM	15	0	3	0	18	17	0	11	0	28	7	170	17	0	194	34	171	11	0	216	456
Total	50	3	22	0	75	72	2	53	1	127	20	709	81	0	810	102	650	43	0	795	1807
PHF	0.83	0.38	0.79		0.85	0.90	0.50	0.70		0.91	0.71	0.97	0.81		0.96	0.75	0.85	0.83		0.87	0.92
HV%	4.0%	0.0%	4.5%		4.0%	0.0%	0.0%	0.0%		0.0%	0.0%	2.8%	0.0%		2.5%	0.0%	1.7%	4.7%		1.6%	2.0%
#VALUE!																					
2:00 PM	6	0	10	0	16	19	3	14	0	36	8	133	8	0	149	23	187	9	0	219	420
2:15 PM	10	1	5	0	16	21	0	7	0	28	8	141	13	0	162	21	198	16	0	235	441
2:30 PM	10	0	9	0	19	22	2	16	0	40	10	152	7	0	169	24	172	9	0	205	433
2:45 PM	7	0	7	0	14	23	2	17	0	42	13	162	16	0	191	22	192	30	0	244	491
Total	33	1	31	0	65	85	7	54	0	146	39	588	44	0	671	90	749	64	0	903	1785
PHF	0.83	0.25	0.78		0.86	0.92	0.58	0.79		0.87	0.75	0.91	0.69		0.88	0.94	0.95	0.53		0.93	0.91
HV%	0.0%	0.0%	9.7%		4.6%	2.4%	0.0%	0.0%		1.4%	2.6%	2.4%	0.0%		2.2%	0.0%	1.6%	0.0%		1.3%	1.8%
BREAK																					
5:00 PM	17	1	17	0	35	22	0	8	0	30	6	173	10	0	189	13	238	8	0	259	513
5:15 PM	12	0	6	0	18	25	0	8	0	33	6	177	28	0	211	10	248	3	0	261	523
5:30 PM	8	0	5	0	13	30	0	10	0	40	0	180	22	0	202	14	214	8	0	236	491
5:45 PM	6	0	3	0	9	19	1	18	0	38	2	192	18	0	212	24	204	7	0	235	494
Total	43	1	31	0	75	96	1	44	0	141	14	722	78	0	814	61	904	26	0	991	2021
PHF	0.63	0.25	0.46		0.54	0.80	0.25	0.61		0.88	0.58	0.94	0.70		0.96	0.64	0.91	0.81		0.95	0.97
HV%	0.0%	0.0%	3.2%		1.3%	0.0%	0.0%	0.0%		0.0%	0.0%	1.0%	1.3%		1.0%	0.0%	0.9%	0.0%		0.8%	0.8%

I-71 SB On Ramp and Kenwood Rd.
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102-001
Tuesday, April 05, 2022

Start Time	Eastbound					I-71 SB On Ramp Westbound					Kenwood Rd. Northbound					Kenwood Rd. Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	0	0	0	0	0	0	0	0	0	0	158	176	0	0	334	0	67	65	0	132	466
7:45 AM	0	0	0	0	0	0	0	0	0	0	94	223	0	0	317	0	84	75	0	159	476
8:00 AM	0	0	0	0	0	0	0	0	0	0	98	198	0	0	296	0	66	61	0	127	423
8:15 AM	0	0	0	0	0	0	0	0	0	0	94	213	0	0	307	0	60	74	0	134	441
Total	0	0	0	0	0	0	0	0	0	0	444	810	0	0	1254	0	277	275	0	552	1806
PHF	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.70	0.91	0.00		0.94	0.00	0.82	0.92		0.87	0.95
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.9%	2.8%	0.0%		2.2%	0.0%	6.9%	4.0%		5.4%	3.2%
BREAK																					
12:00 PM	0	0	0	0	0	0	0	0	0	0	49	209	0	0	258	0	93	118	0	211	469
12:15 PM	0	0	0	0	0	0	0	0	0	0	35	190	0	0	225	0	83	89	0	172	397
12:30 PM	0	0	0	0	0	0	0	0	0	0	28	207	0	0	235	0	81	92	0	173	408
12:45 PM	0	0	0	0	0	0	0	0	0	0	34	195	0	0	229	0	96	97	0	193	422
Total	0	0	0	0	0	0	0	0	0	0	146	801	0	0	947	0	353	396	0	749	1696
PHF	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.74	0.96	0.00		0.92	0.00	0.92	0.84		0.89	0.90
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	4.1%	1.9%	0.0%		2.2%	0.0%	1.4%	1.0%		1.2%	1.8%
BREAK																					
2:00 PM	0	0	0	0	0	0	0	0	0	0	32	161	0	0	193	0	102	123	0	225	418
2:15 PM	0	0	0	0	0	0	0	0	0	0	43	178	0	0	221	0	96	131	0	227	448
2:30 PM	0	0	0	0	0	0	0	0	0	0	20	173	0	0	193	0	81	125	0	206	399
2:45 PM	0	0	0	0	0	0	0	0	0	0	39	204	0	0	243	0	104	115	0	219	462
Total	0	0	0	0	0	0	0	0	0	0	134	716	0	0	850	0	383	494	0	877	1727
PHF	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.78	0.88	0.00		0.87	0.00	0.92	0.94		0.97	0.93
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	3.0%	1.1%	0.0%		1.4%	0.0%	1.0%	1.0%		1.0%	1.2%
BREAK																					
5:00 PM	0	0	0	0	0	0	0	0	0	0	72	192	0	0	264	0	139	154	0	293	557
5:15 PM	0	0	0	0	0	0	0	0	0	0	56	207	0	0	263	0	152	122	0	274	537
5:30 PM	0	0	0	0	0	0	0	0	0	0	56	225	0	0	281	0	150	107	0	257	538
5:45 PM	0	0	0	0	0	0	0	0	0	0	41	216	0	0	257	0	118	120	0	238	495
Total	0	0	0	0	0	0	0	0	0	0	225	840	0	0	1065	0	559	503	0	1062	2127
PHF	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.78	0.93	0.00		0.95	0.00	0.92	0.82		0.91	0.95
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.9%	0.8%	0.0%		0.8%	0.0%	0.7%	0.4%		0.6%	0.7%

I-71 NB Exit Ramp and Kenwood Rd.
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102-001
Tuesday, April 05, 2022

Start Time	I-71 NB Exit Ramp Eastbound					Westbound					Kenwood Rd. Northbound					Kenwood Rd. Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	78	0	60	0	138	0	0	0	0	0	0	257	0	0	257	0	68	0	0	68	463
7:45 AM	129	0	49	0	178	0	0	0	0	0	0	206	0	0	206	0	82	0	0	82	466
8:00 AM	90	0	55	0	145	0	0	0	0	0	0	199	0	0	199	0	69	0	0	69	413
8:15 AM	88	0	67	0	155	0	0	0	0	0	0	211	0	0	211	0	63	0	0	63	429
Total	385	0	231	0	616	0	0	0	0	0	0	873	0	0	873	0	282	0	0	282	1771
PHF	0.75	0.00	0.86		0.87	0.00	0.00	0.00		0.00	0.00	0.85	0.00		0.85	0.00	0.86	0.00		0.86	0.95
HV%	2.9%	0.0%	3.0%		2.9%	0.0%	0.0%	0.0%		0.0%	0.0%	1.1%	0.0%		1.1%	0.0%	5.7%	0.0%		5.7%	2.5%
BREAK																					
12:00 PM	126	0	46	0	172	0	0	0	0	0	0	131	0	0	131	0	96	0	0	96	399
12:15 PM	117	0	50	0	167	0	0	0	0	0	0	121	0	0	121	0	83	0	0	83	371
12:30 PM	126	0	53	0	179	0	0	0	0	0	0	104	0	0	104	0	75	0	0	75	358
12:45 PM	138	0	31	0	169	0	0	0	0	0	0	78	0	0	78	0	99	0	0	99	346
Total	507	0	180	0	687	0	0	0	0	0	0	434	0	0	434	0	353	0	0	353	1474
PHF	0.92	0.00	0.85		0.96	0.00	0.00	0.00		0.00	0.00	0.83	0.00		0.83	0.00	0.89	0.00		0.89	0.92
HV%	2.4%	0.0%	7.8%		3.8%	0.0%	0.0%	0.0%		0.0%	0.0%	3.0%	0.0%		3.0%	0.0%	2.0%	0.0%		2.0%	3.1%
BREAK																					
2:00 PM	109	0	42	0	151	0	0	0	0	0	0	77	0	0	77	0	98	0	0	98	326
2:15 PM	130	0	58	0	188	0	0	0	0	0	0	79	0	0	79	0	88	0	0	88	355
2:30 PM	130	0	55	0	185	0	0	0	0	0	0	63	0	0	63	0	85	0	0	85	333
2:45 PM	146	0	57	0	203	0	0	0	0	0	0	88	0	0	88	0	108	0	0	108	399
Total	515	0	212	0	727	0	0	0	0	0	0	307	0	0	307	0	379	0	0	379	1413
PHF	0.88	0.00	0.91		0.90	0.00	0.00	0.00		0.00	0.00	0.87	0.00		0.87	0.00	0.88	0.00		0.88	0.89
HV%	1.9%	0.0%	0.9%		1.7%	0.0%	0.0%	0.0%		0.0%	0.0%	2.6%	0.0%		2.6%	0.0%	1.8%	0.0%		1.8%	1.9%
BREAK																					
5:00 PM	82	0	54	0	136	0	0	0	0	0	0	180	0	0	180	0	149	0	0	149	465
5:15 PM	97	0	49	0	146	0	0	0	0	0	0	161	0	0	161	0	148	0	0	148	455
5:30 PM	108	0	49	0	157	0	0	0	0	0	0	151	0	0	151	0	133	0	0	133	441
5:45 PM	128	0	54	0	182	0	0	0	0	0	0	129	0	0	129	0	119	0	0	119	430
Total	415	0	206	0	621	0	0	0	0	0	0	621	0	0	621	0	549	0	0	549	1791
PHF	0.81	0.00	0.95		0.85	0.00	0.00	0.00		0.00	0.00	0.86	0.00		0.86	0.00	0.92	0.00		0.92	0.96
HV%	0.7%	0.0%	0.5%		0.6%	0.0%	0.0%	0.0%		0.0%	0.0%	1.3%	0.0%		1.3%	0.0%	0.4%	0.0%		0.4%	0.8%

Euclid Rd and Kenwood Rd
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

TEC PN: 22102
Tuesday, April 26, 2022

Start Time	Euclid Rd Eastbound					Euclid Rd Westbound					Kenwood Rd Northbound					Kenwood Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	1	19	23	0	43	10	21	96	0	127	11	146	12	0	169	44	80	3	0	127	466
7:45 AM	3	16	15	0	34	6	27	78	0	111	17	125	19	0	161	47	95	3	0	145	451
8:00 AM	4	10	11	0	25	14	23	80	0	117	27	143	13	0	183	45	90	2	0	137	462
8:15 AM	3	18	12	0	33	6	28	79	0	113	12	111	20	0	143	34	86	4	0	124	413
Total	11	63	61	0	135	36	99	333	0	468	67	525	64	0	656	170	351	12	0	533	1792
PHF	0.69	0.83	0.66		0.78	0.64	0.88	0.87		0.92	0.62	0.90	0.80		0.90	0.90	0.92	0.75		0.92	0.96
HV%	9.1%	3.2%	1.6%		3.0%	8.3%	2.0%	2.1%		2.6%	6.0%	1.9%	3.1%		2.4%	5.3%	4.6%	0.0%		4.7%	3.2%
BREAK																					
12:00 PM	4	13	11	0	28	7	19	55	0	81	6	74	17	0	97	49	92	8	0	149	355
12:15 PM	3	18	8	0	29	8	20	55	0	83	10	71	12	0	93	68	81	6	0	155	360
12:30 PM	4	21	9	0	34	10	18	57	0	85	8	68	20	0	96	56	92	6	0	154	369
12:45 PM	4	11	9	0	24	14	16	70	0	100	11	64	12	0	87	47	89	7	0	143	354
Total	15	63	37	0	115	39	73	237	0	349	35	277	61	0	373	220	354	27	0	601	1438
PHF	0.94	0.75	0.84		0.85	0.70	0.91	0.85		0.87	0.80	0.94	0.76		0.96	0.81	0.96	0.84		0.97	0.97
HV%	6.7%	7.9%	5.4%		7.0%	0.0%	1.4%	3.8%		2.9%	2.9%	1.4%	3.3%		1.9%	5.5%	3.7%	0.0%		4.2%	3.5%
BREAK																					
2:00 PM	4	20	6	0	30	8	14	50	0	72	7	71	9	0	87	61	86	5	0	152	341
2:15 PM	2	15	8	0	25	6	17	55	0	78	5	70	9	0	84	49	91	3	0	143	330
2:30 PM	4	13	11	0	28	15	21	44	0	80	7	65	10	0	82	57	89	8	0	154	344
2:45 PM	6	20	24	0	50	26	18	57	0	101	11	73	13	0	97	71	122	9	0	202	450
Total	16	68	49	0	133	55	70	206	0	331	30	279	41	0	350	238	388	25	0	651	1465
PHF	0.67	0.85	0.51		0.67	0.53	0.83	0.90		0.82	0.68	0.96	0.79		0.90	0.84	0.80	0.69		0.81	0.81
HV%	6.3%	1.5%	2.0%		2.3%	7.3%	2.9%	4.4%		4.5%	0.0%	4.3%	2.4%		3.7%	1.7%	2.8%	0.0%		2.3%	3.1%
BREAK																					
5:00 PM	5	26	18	0	49	23	29	53	0	105	21	116	20	0	157	76	132	9	0	217	528
5:15 PM	3	32	24	0	59	21	33	64	0	118	20	110	37	0	167	68	130	7	0	205	549
5:30 PM	2	20	10	0	32	19	24	64	0	107	12	111	26	0	149	66	152	5	0	223	511
5:45 PM	1	25	13	0	39	20	19	63	0	102	17	90	18	0	125	70	114	7	0	191	457
Total	11	103	65	0	179	83	105	244	0	432	70	427	101	0	598	280	528	28	0	836	2045
PHF	0.55	0.80	0.68		0.76	0.90	0.80	0.95		0.92	0.83	0.92	0.68		0.90	0.92	0.87	0.78		0.94	0.93
HV%	0.0%	1.0%	0.0%		0.6%	0.0%	0.0%	2.5%		1.4%	0.0%	0.7%	0.0%		0.5%	1.1%	0.8%	3.6%		1.0%	0.9%

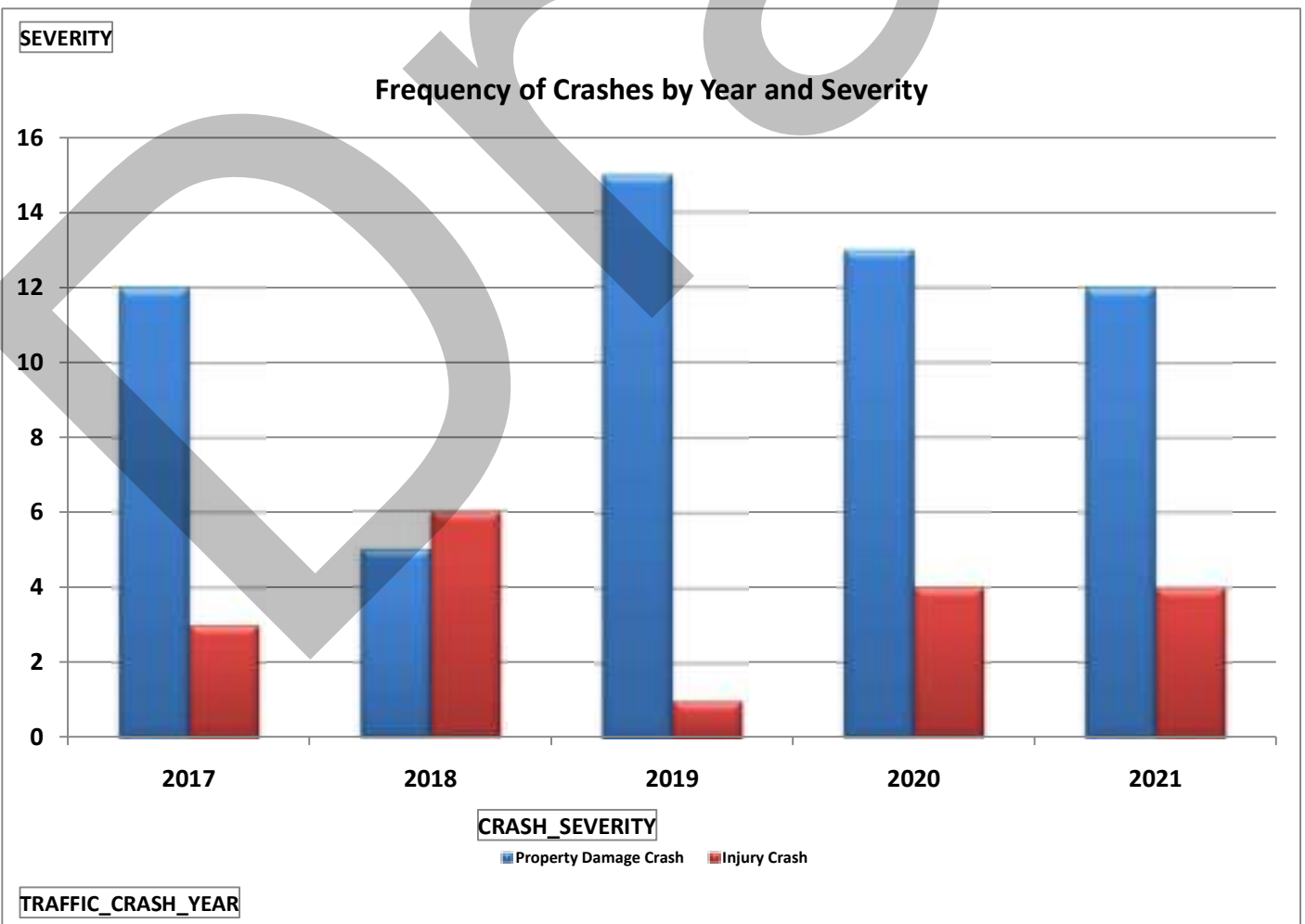
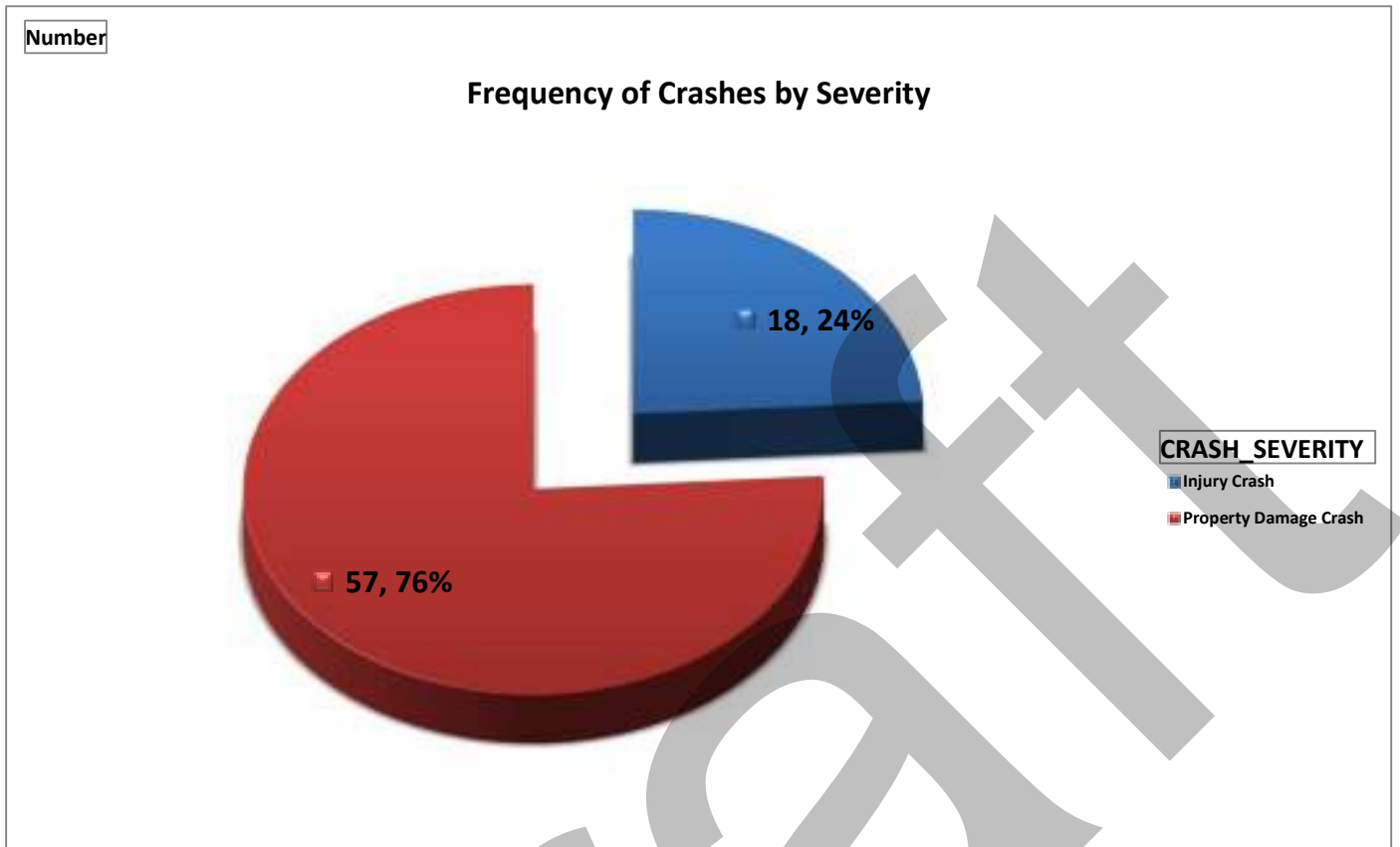
BOA Entrance/Exit and SB Kenwood Rd
Total Vehicles & PHF & Heavy Vehicle %

TEC Engineering, Inc.
Turning Movement Counts
7288 Central Parke Boulevard
Mason, Ohio 45040
PH: 513-771-8828

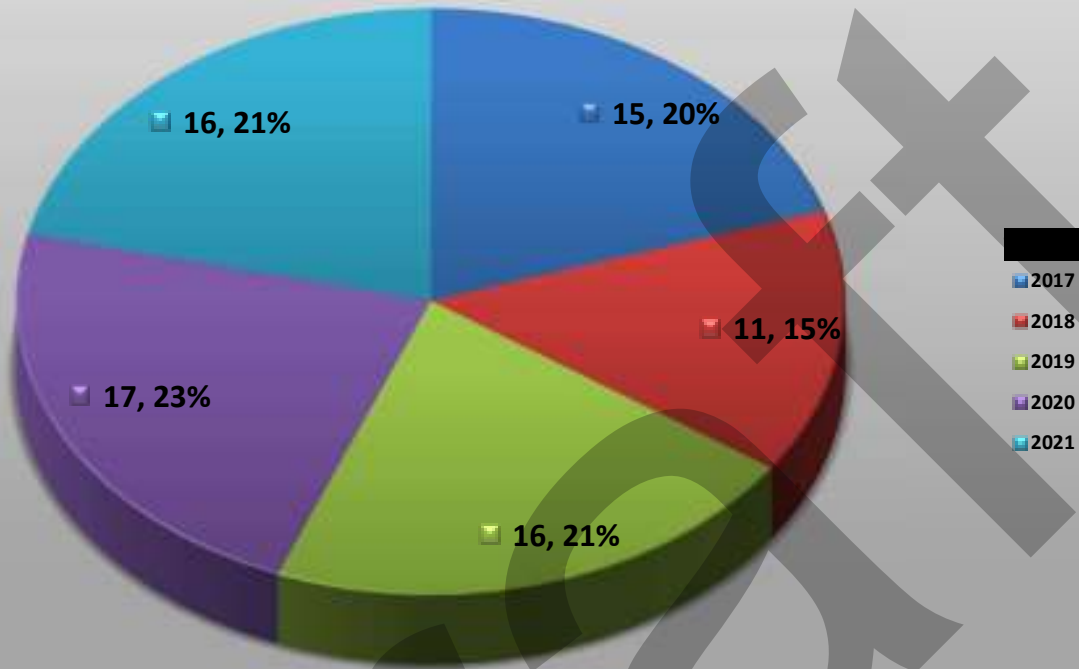
TEC PN: 22102-001
Thursday, March 31, 2022

Start Time	BOA Entrance/Exit Eastbound					Westbound					Northbound					SB Kenwood Rd Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
8:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	5
PHF	0.00	0.00	0.75		0.75	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.25		0.25	0.63
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%
BREAK																					
12:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
12:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
12:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
12:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Total	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	9
PHF	0.00	0.00	0.63		0.63	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	1.00		1.00	0.75
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%
BREAK																					
2:00 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	6
2:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Total	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	10
PHF	0.00	0.00	0.40		0.40	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.50		0.50	0.42
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%
BREAK																					
5:00 PM	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
PHF	0.00	0.00	0.42		0.42	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.42
HV%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	0.0%

APPENDIX B: CRASH DATA



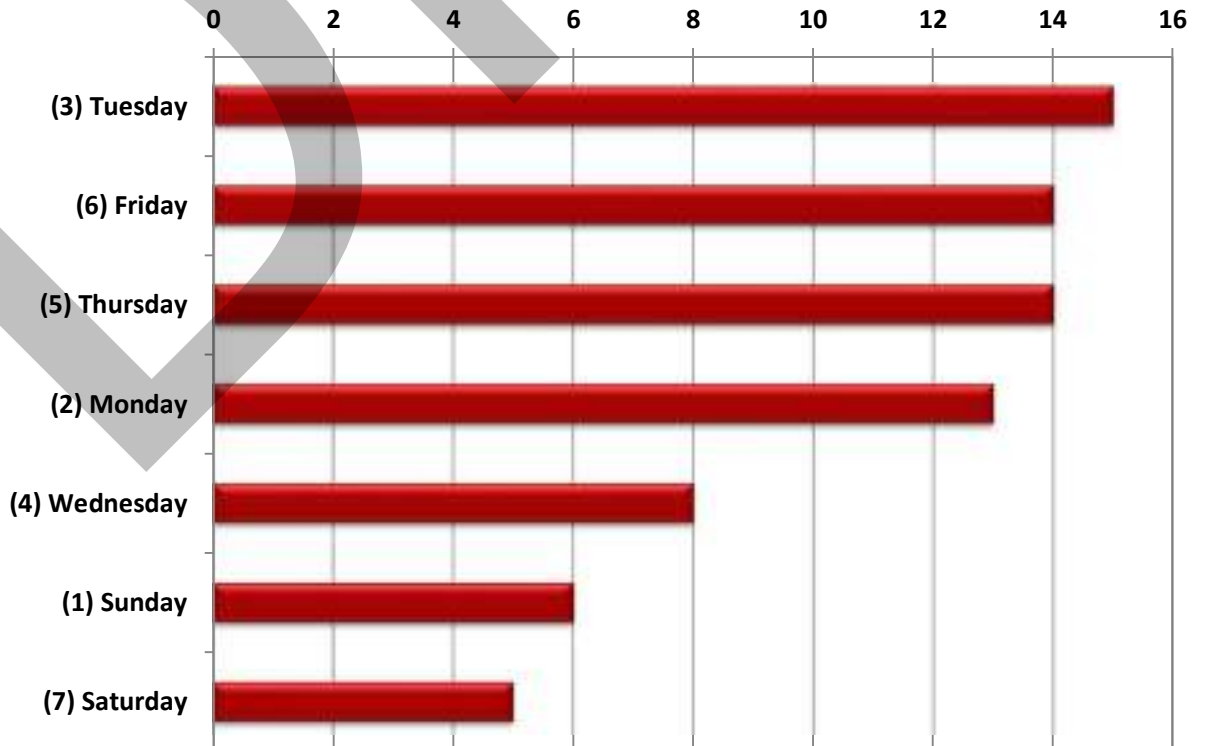
Frequency of Crashes by Year



Frequency of Crashes by Day of the Week

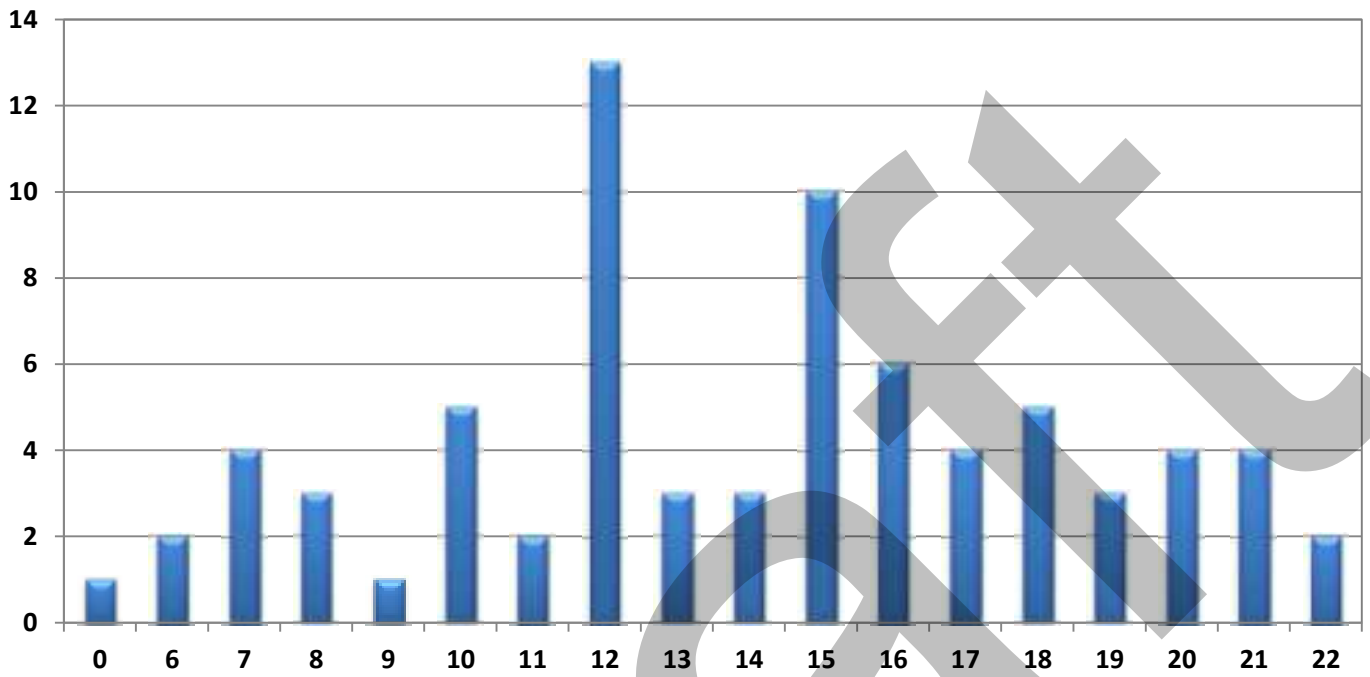
Number

DAY_OF_WEEK



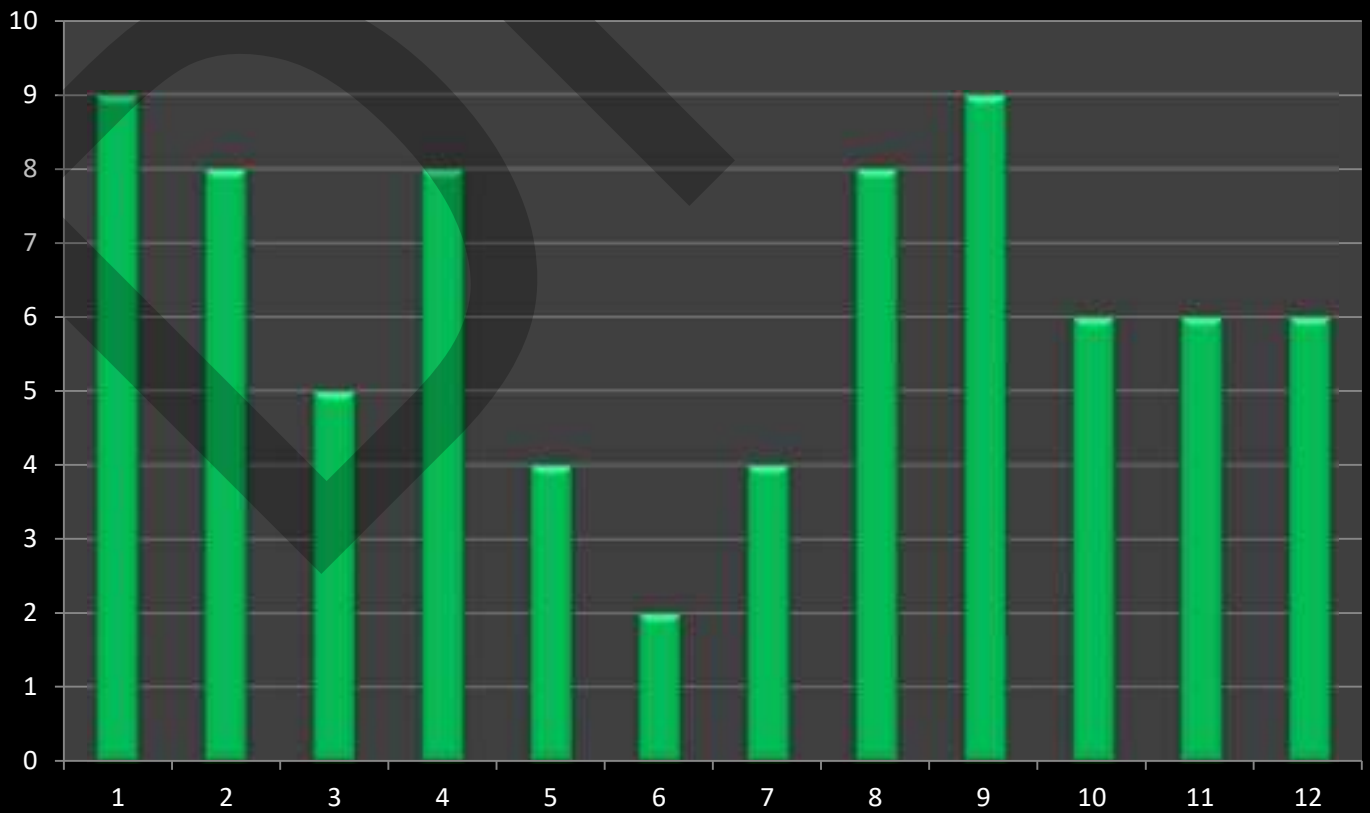


Frequency of Crashes by Hour

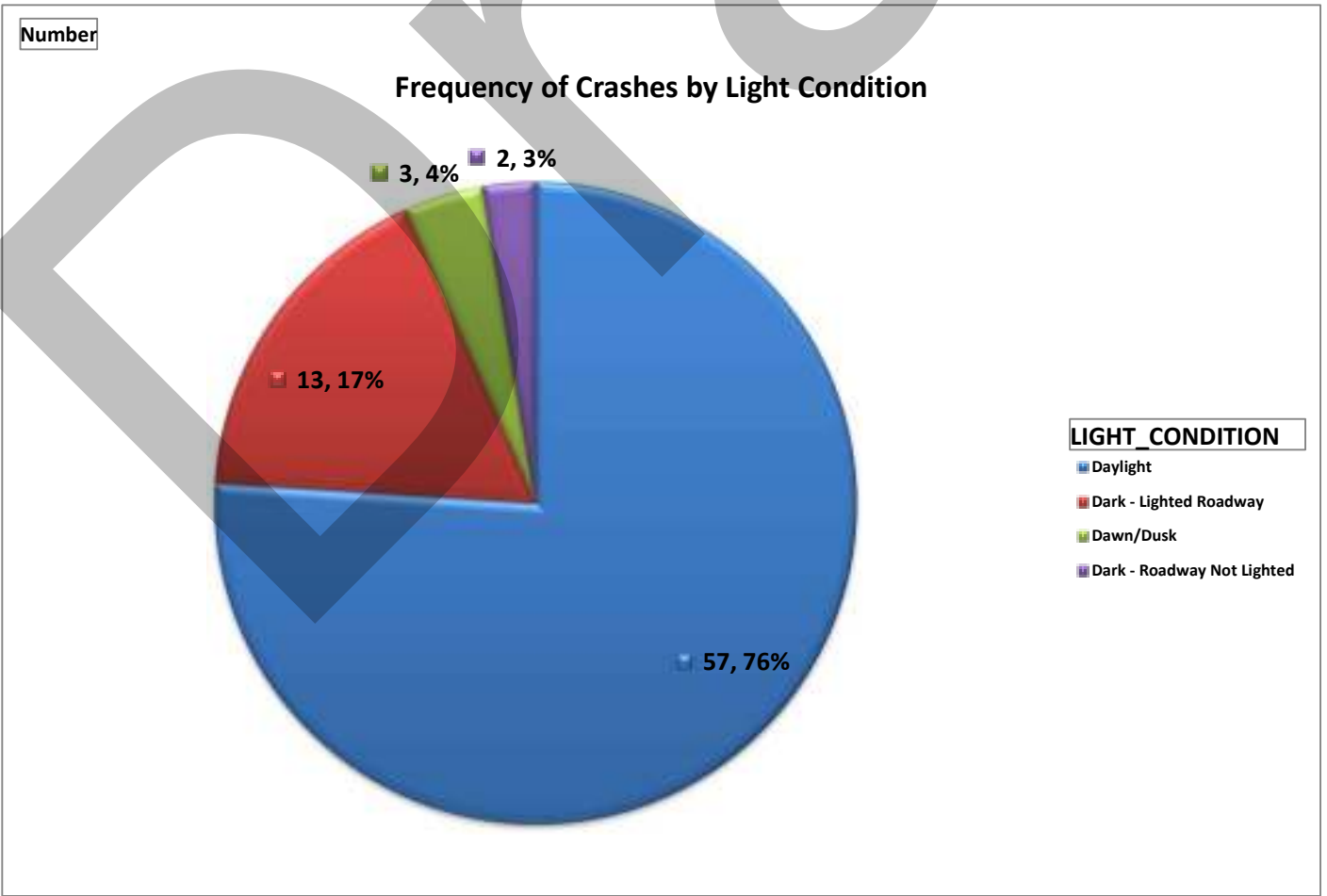
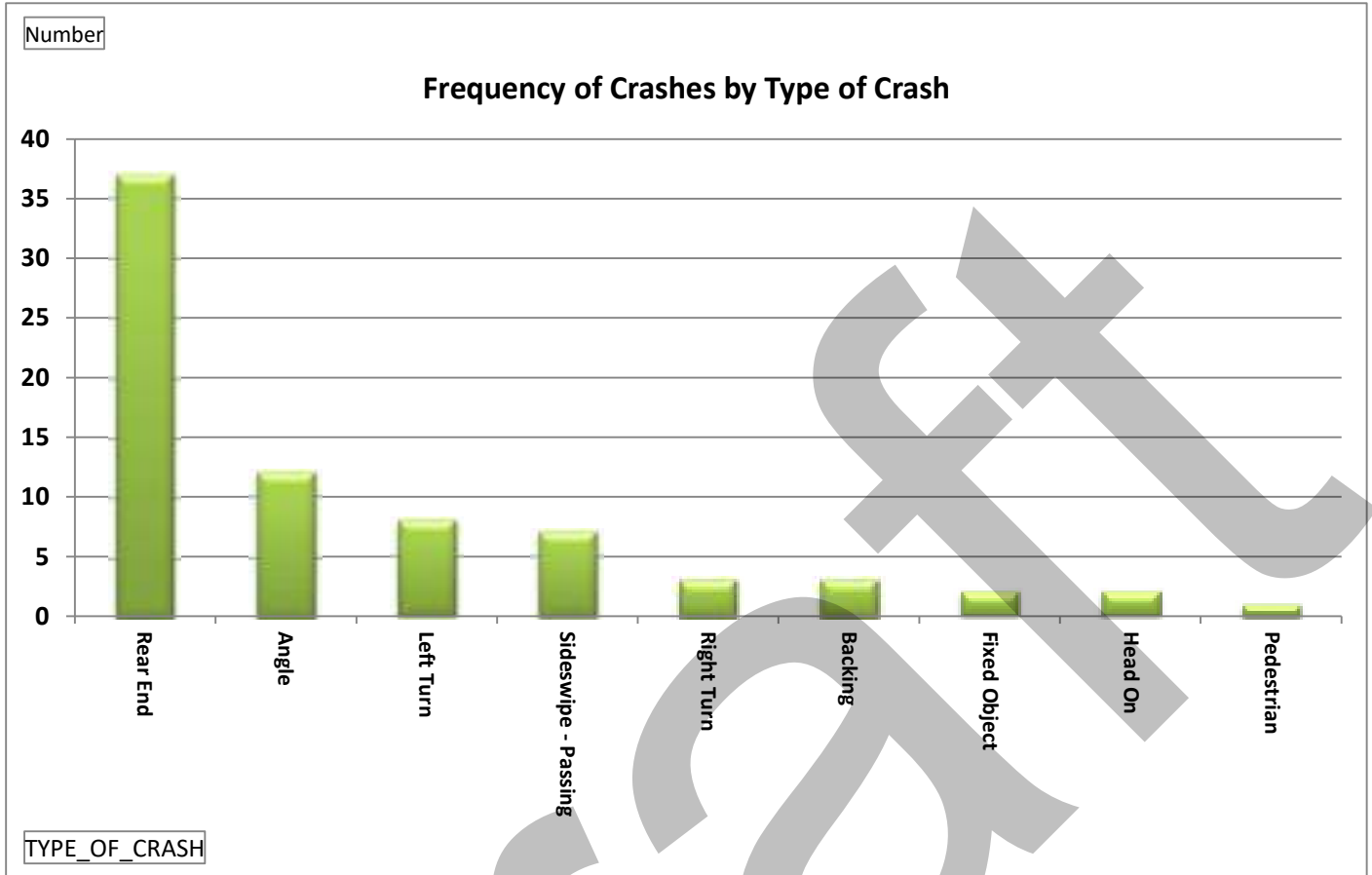


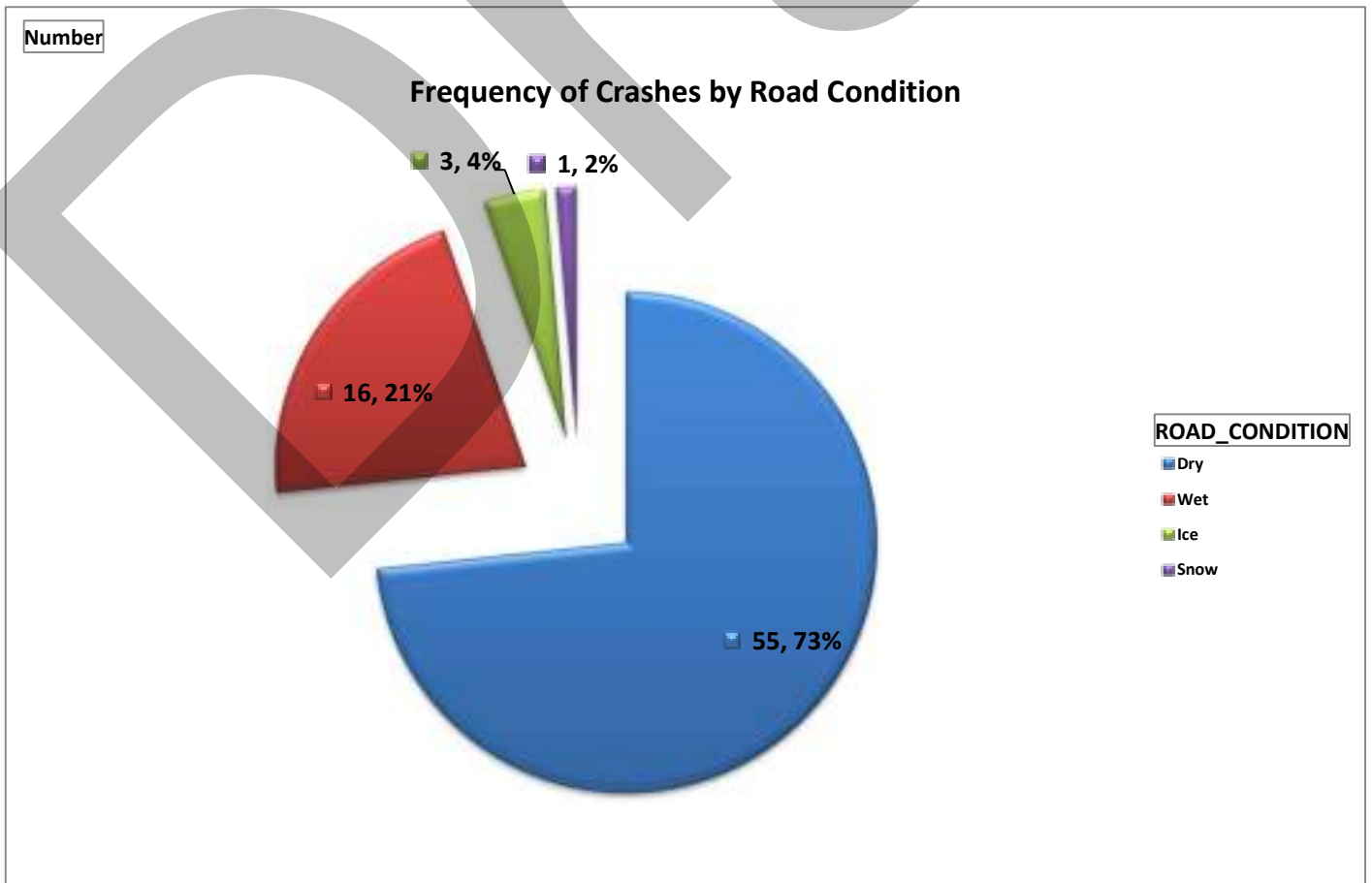
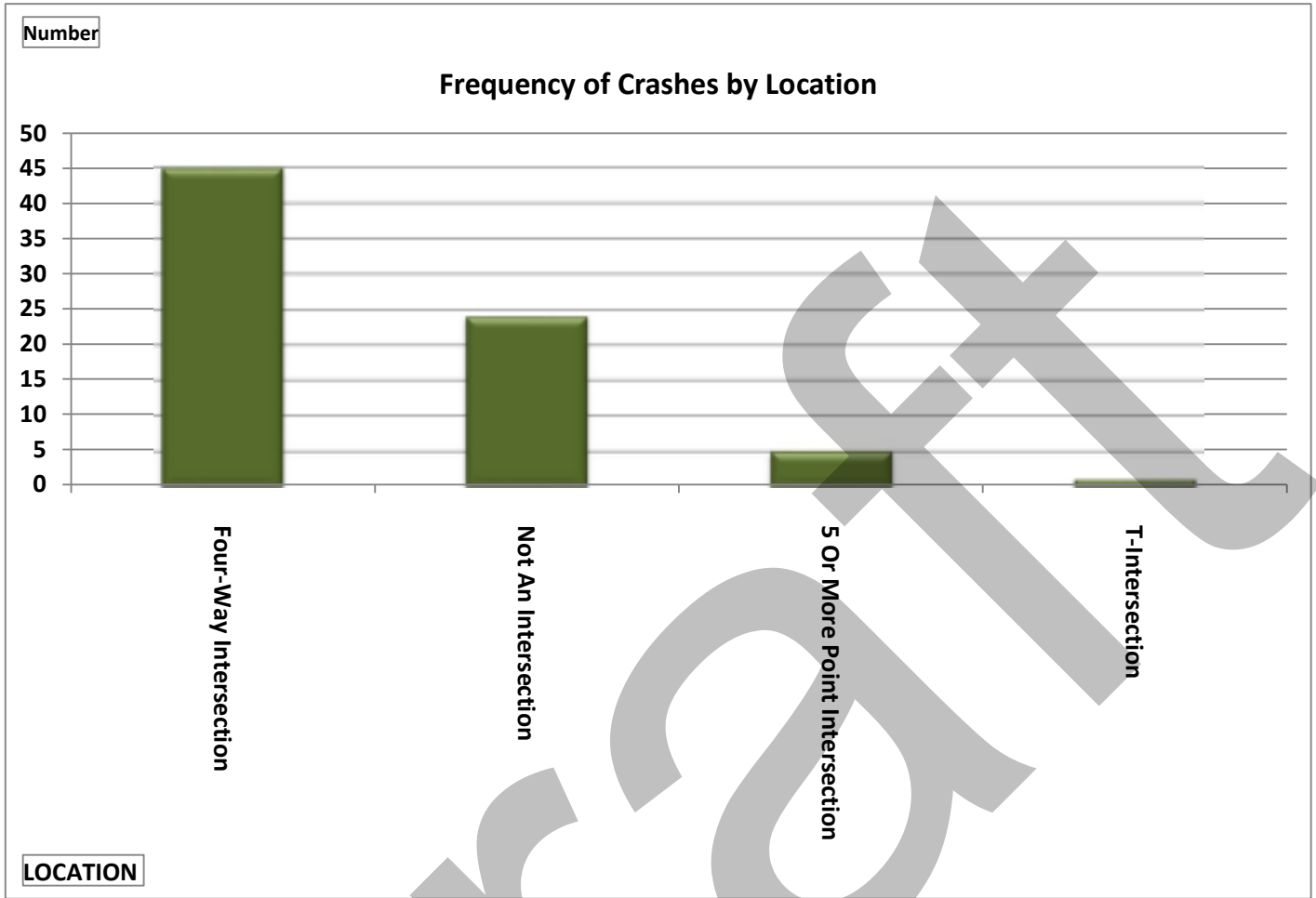
Number

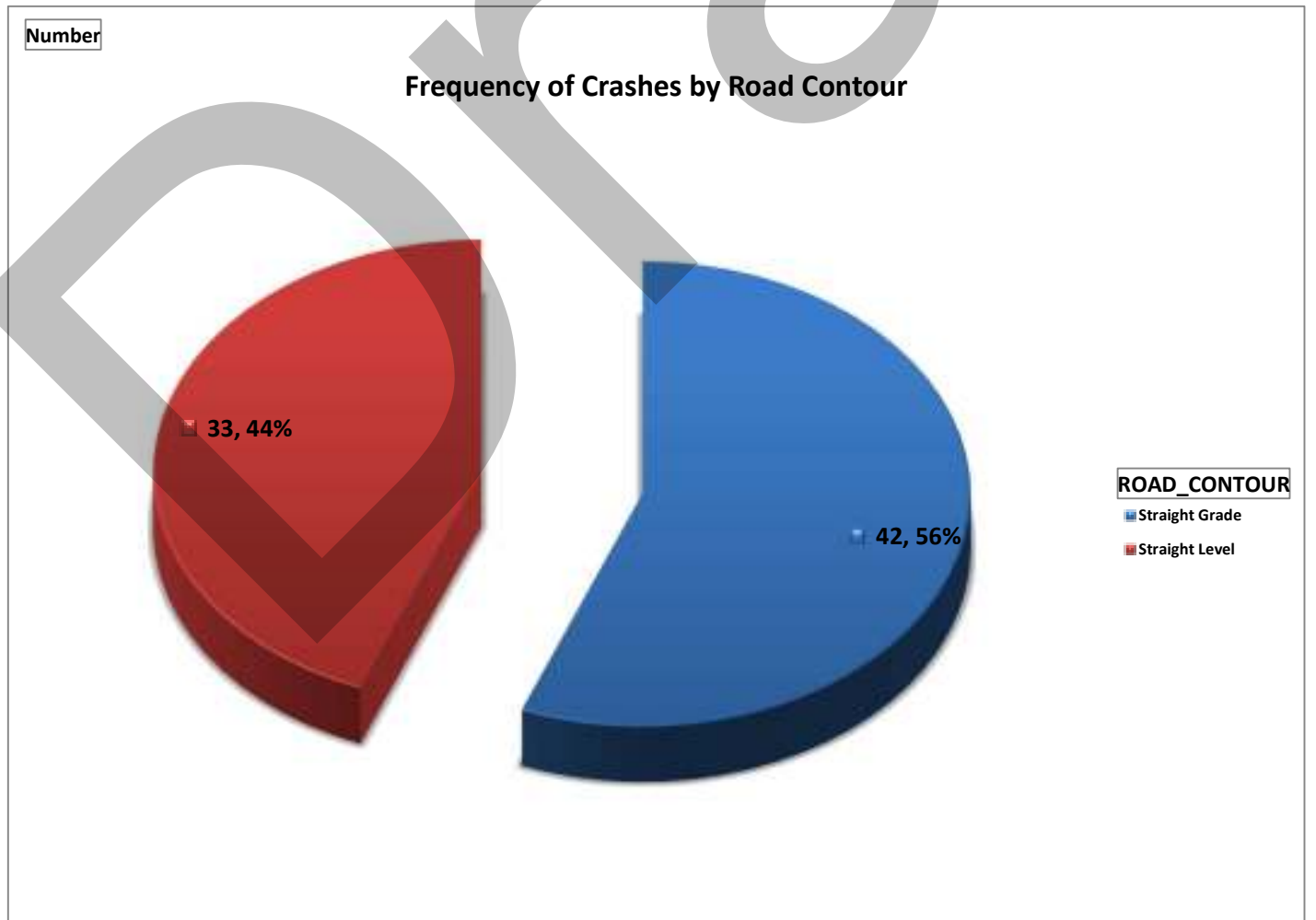
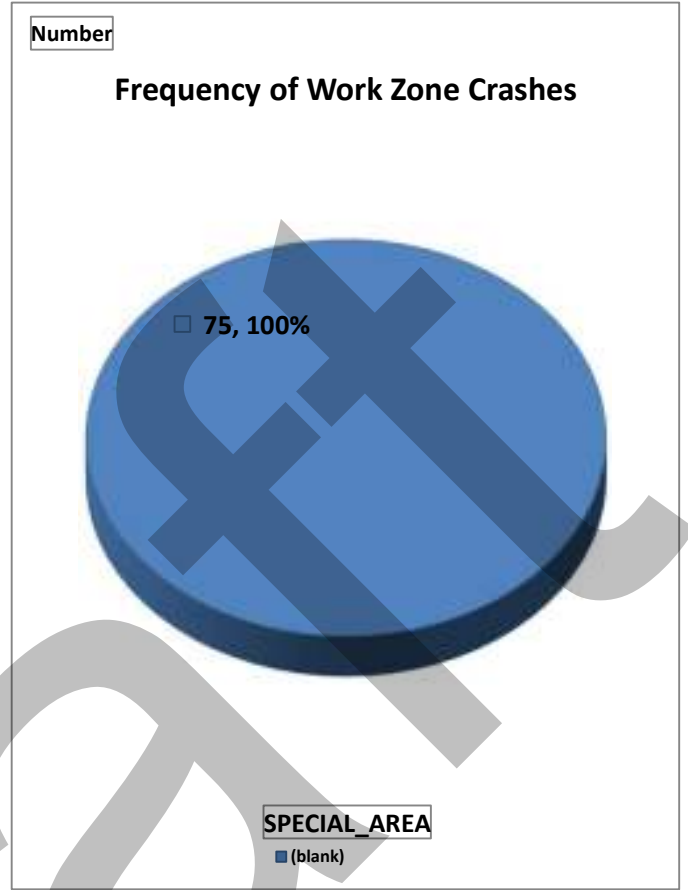
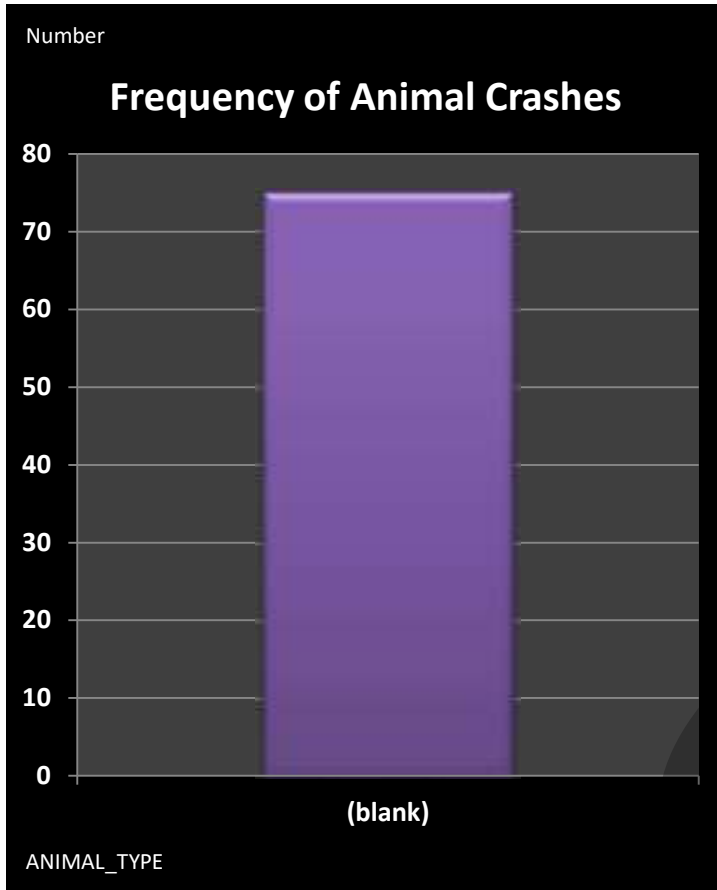
Frequency of Crashes by Month



CRASH_MONTH_NBR

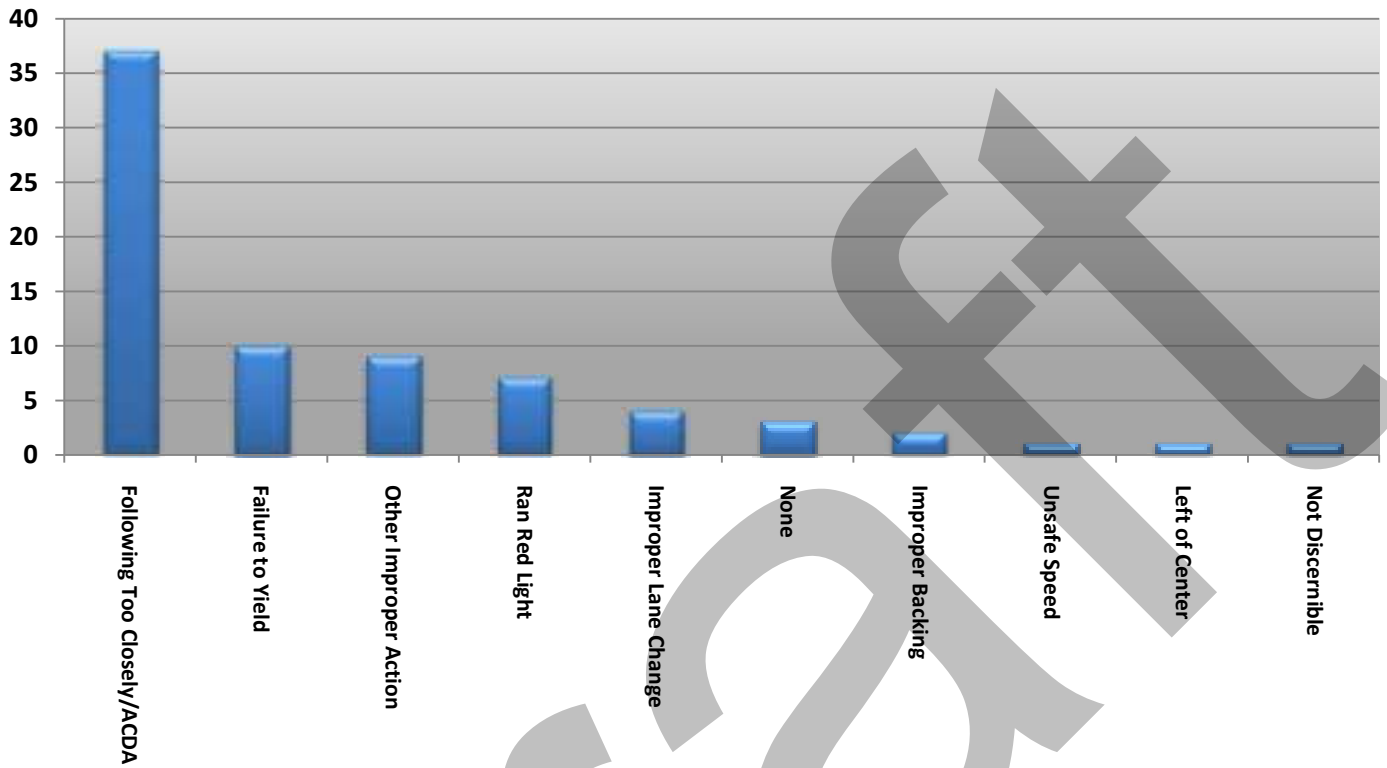




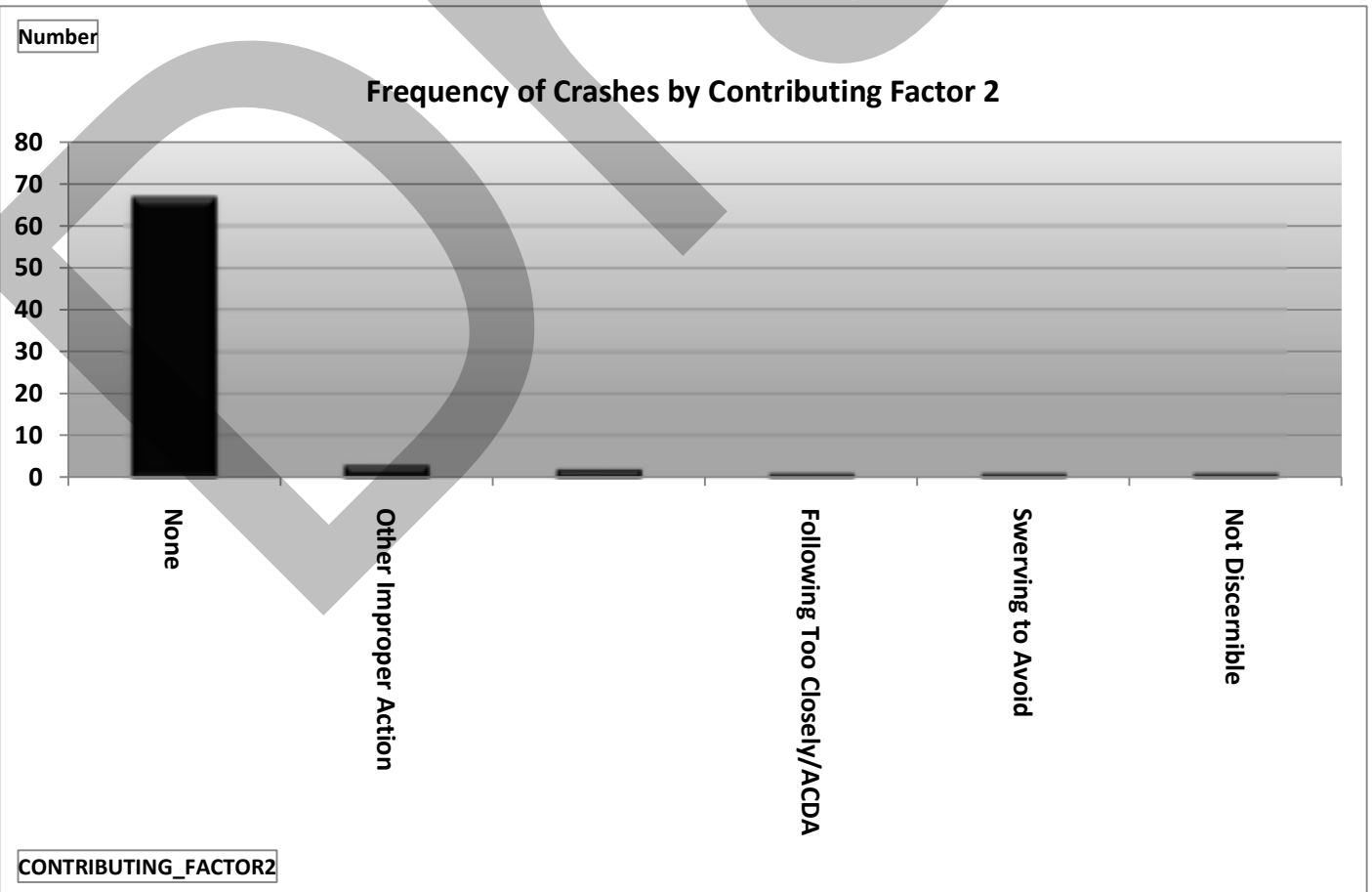


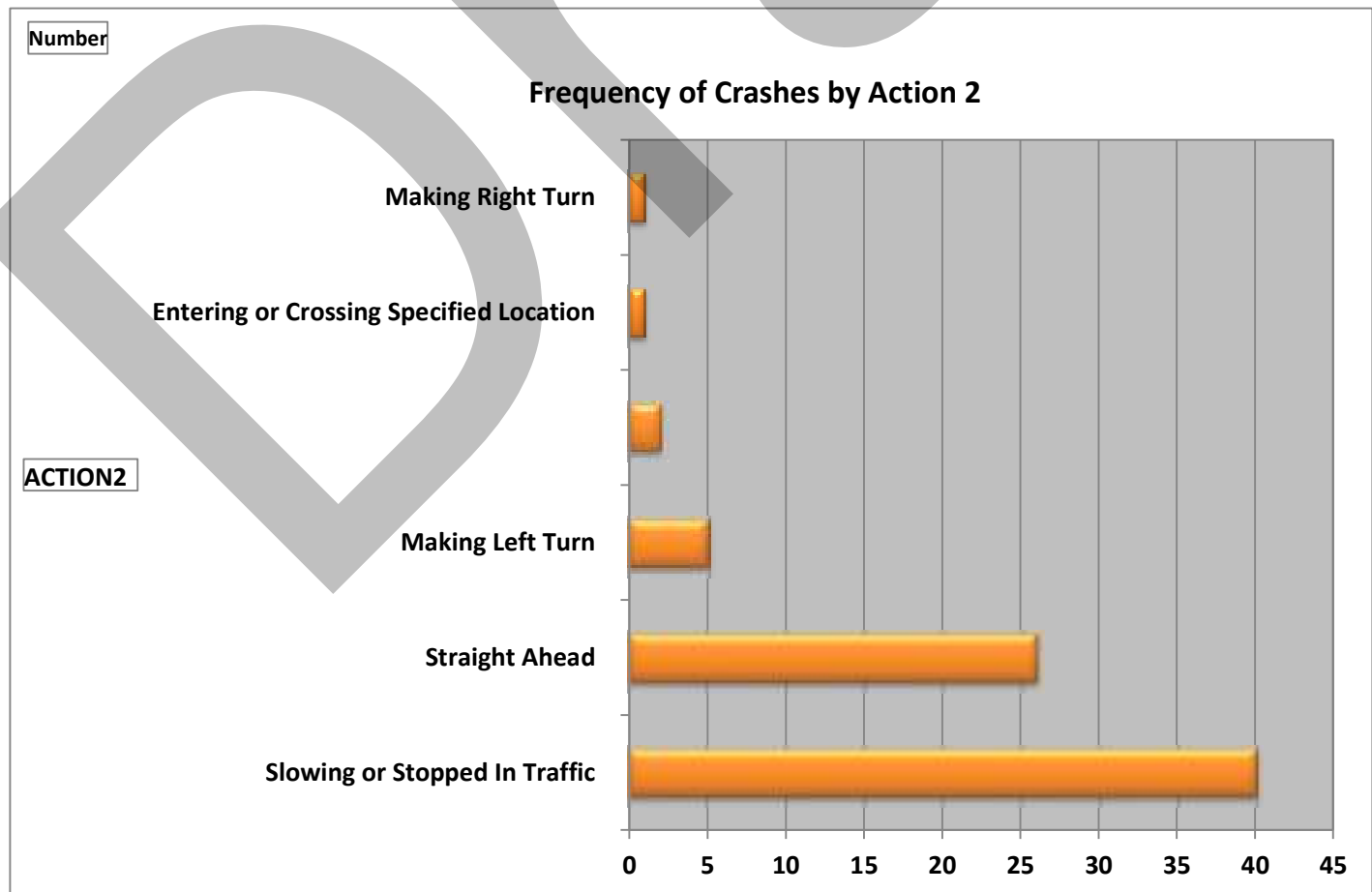
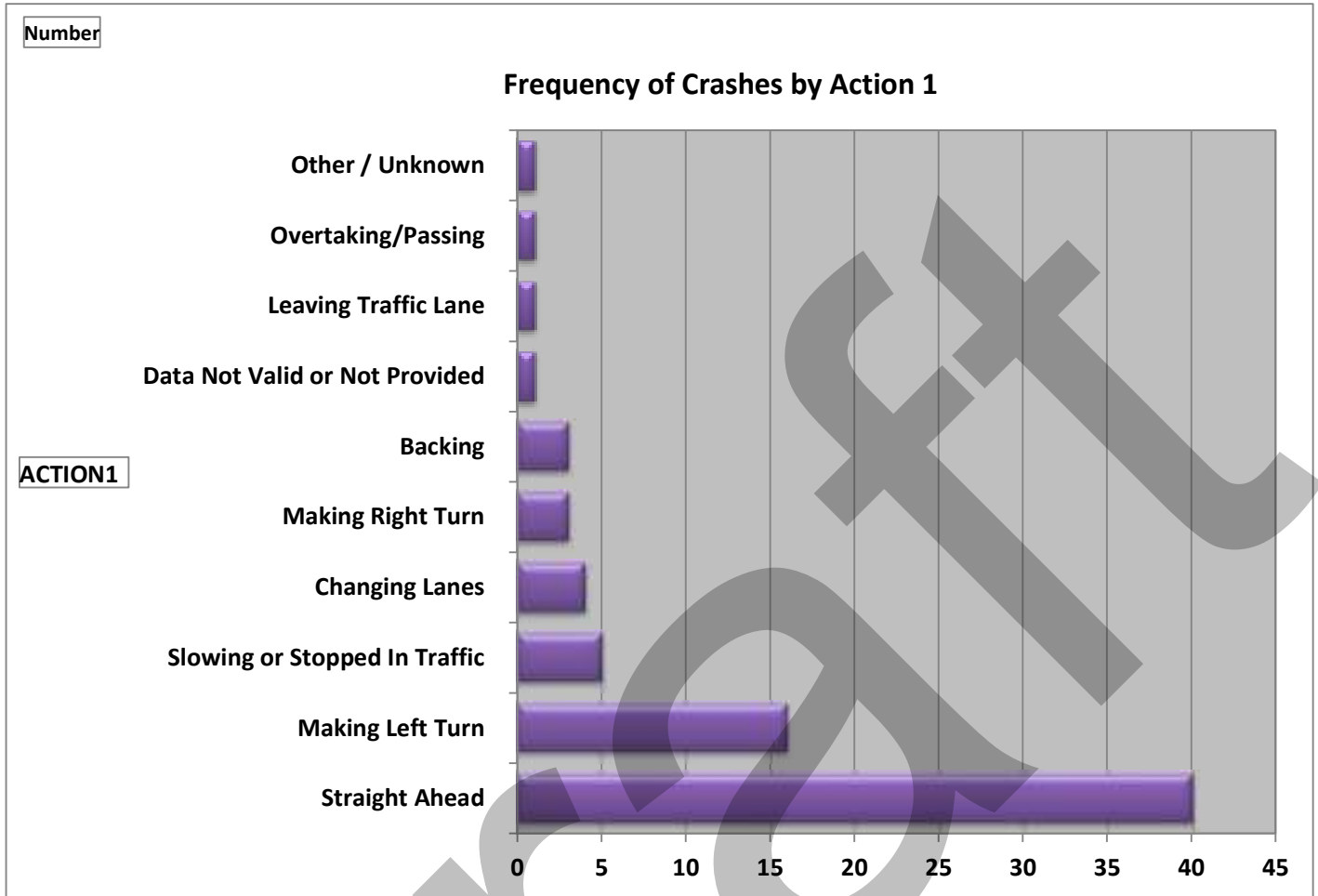


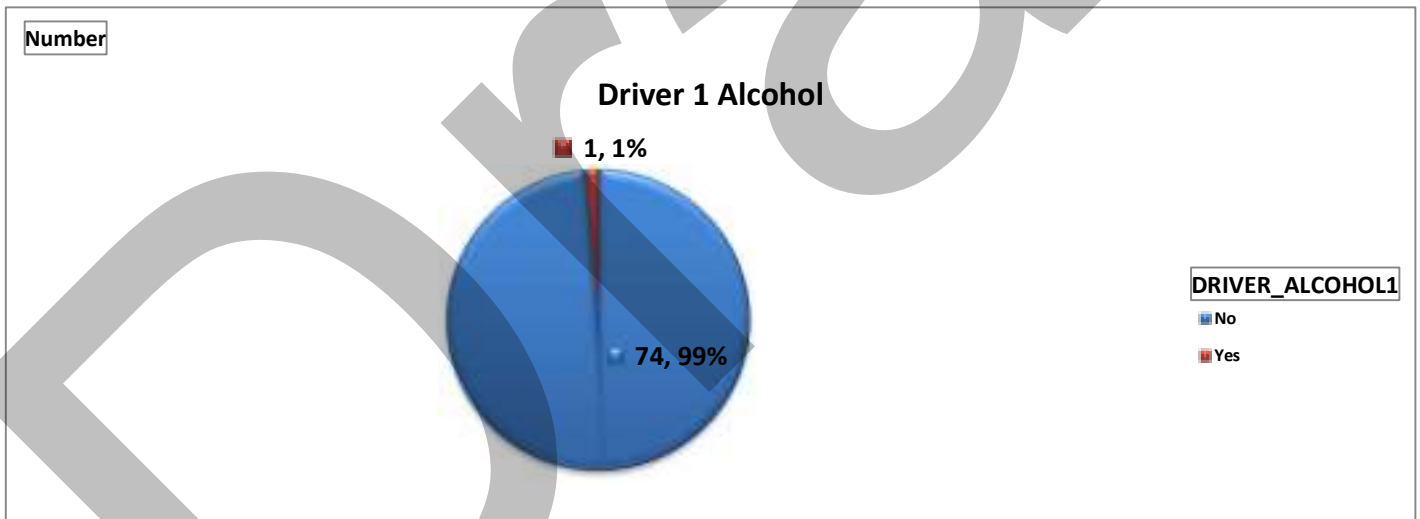
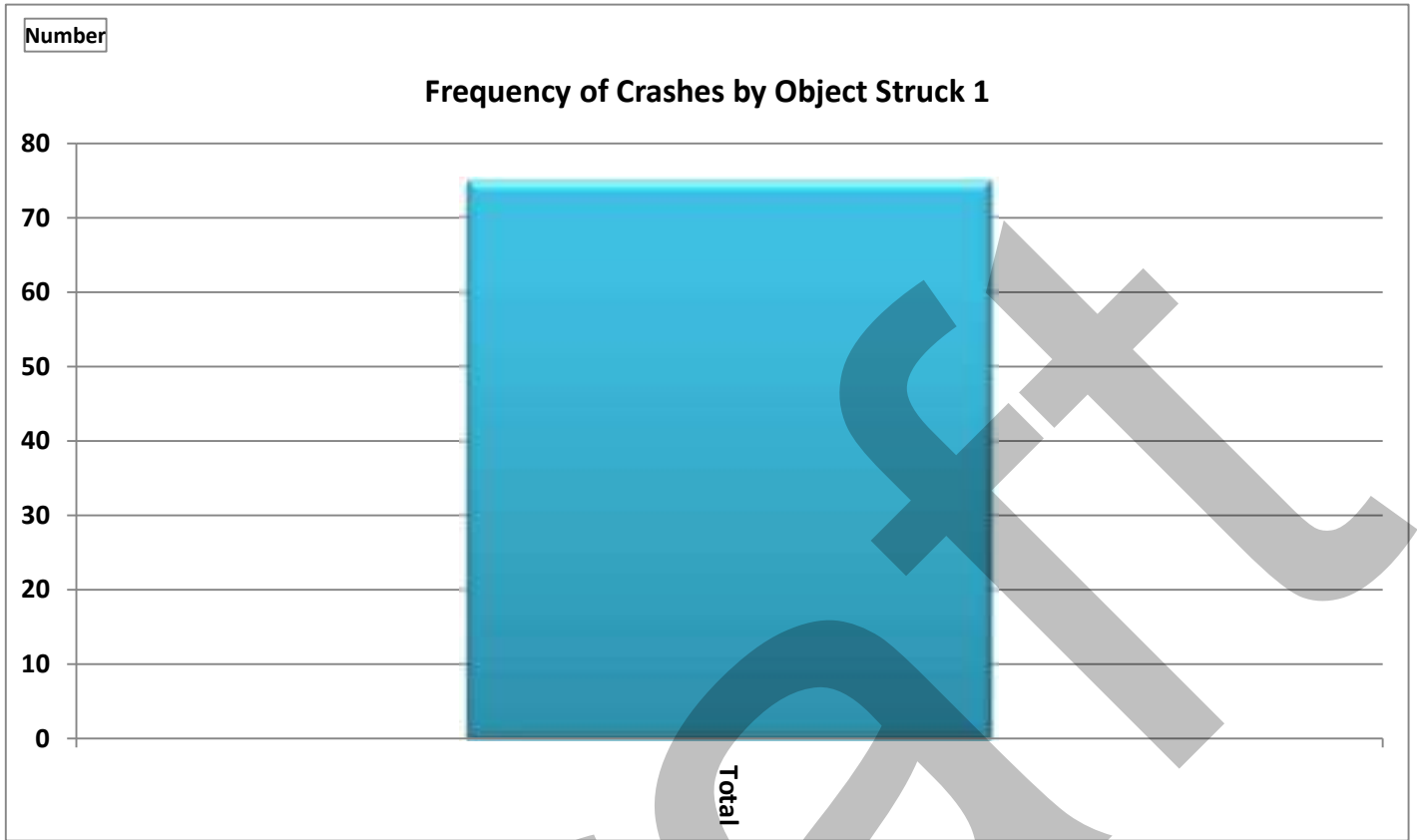
Frequency of Crashes by Contributing Factor 1

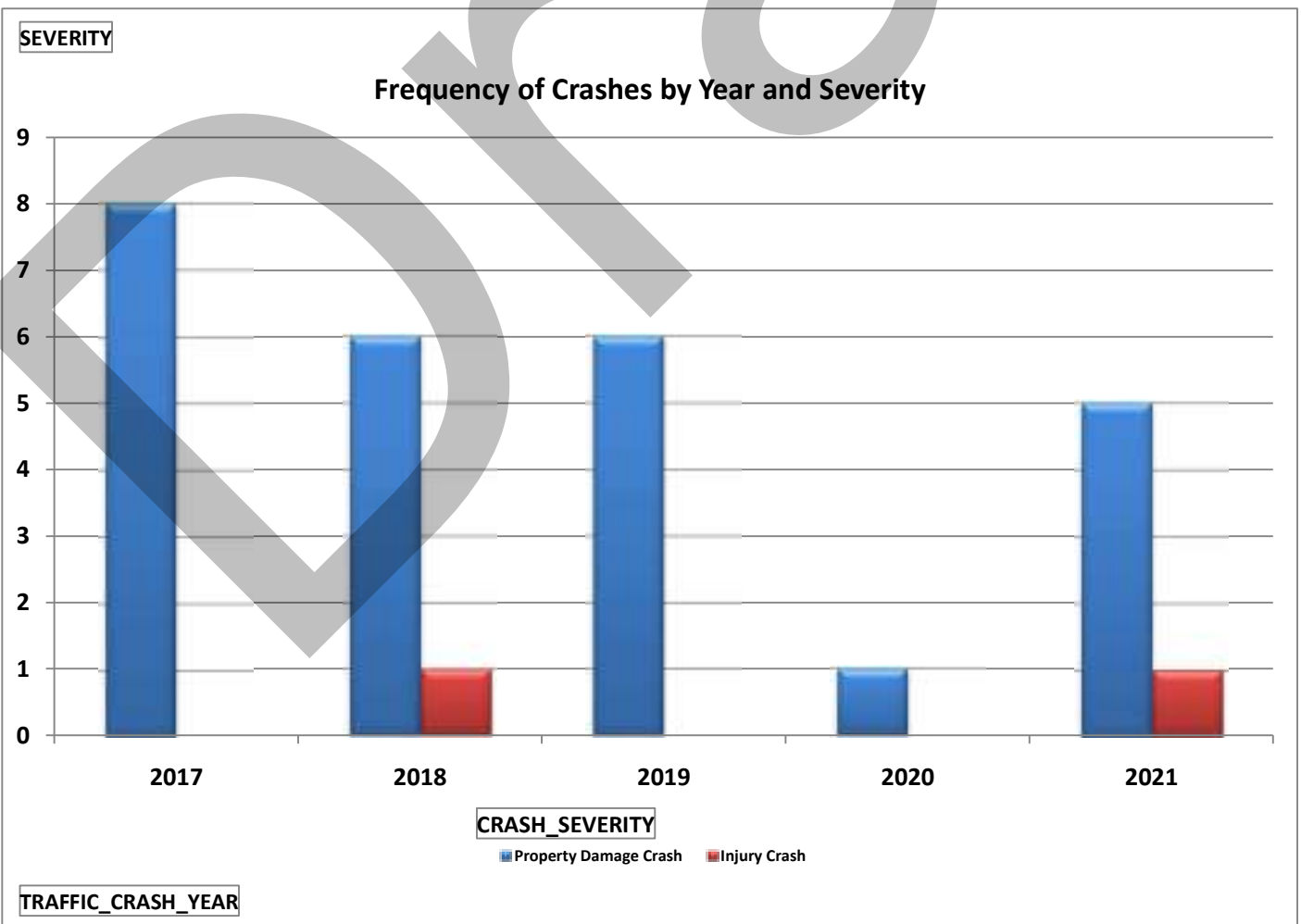
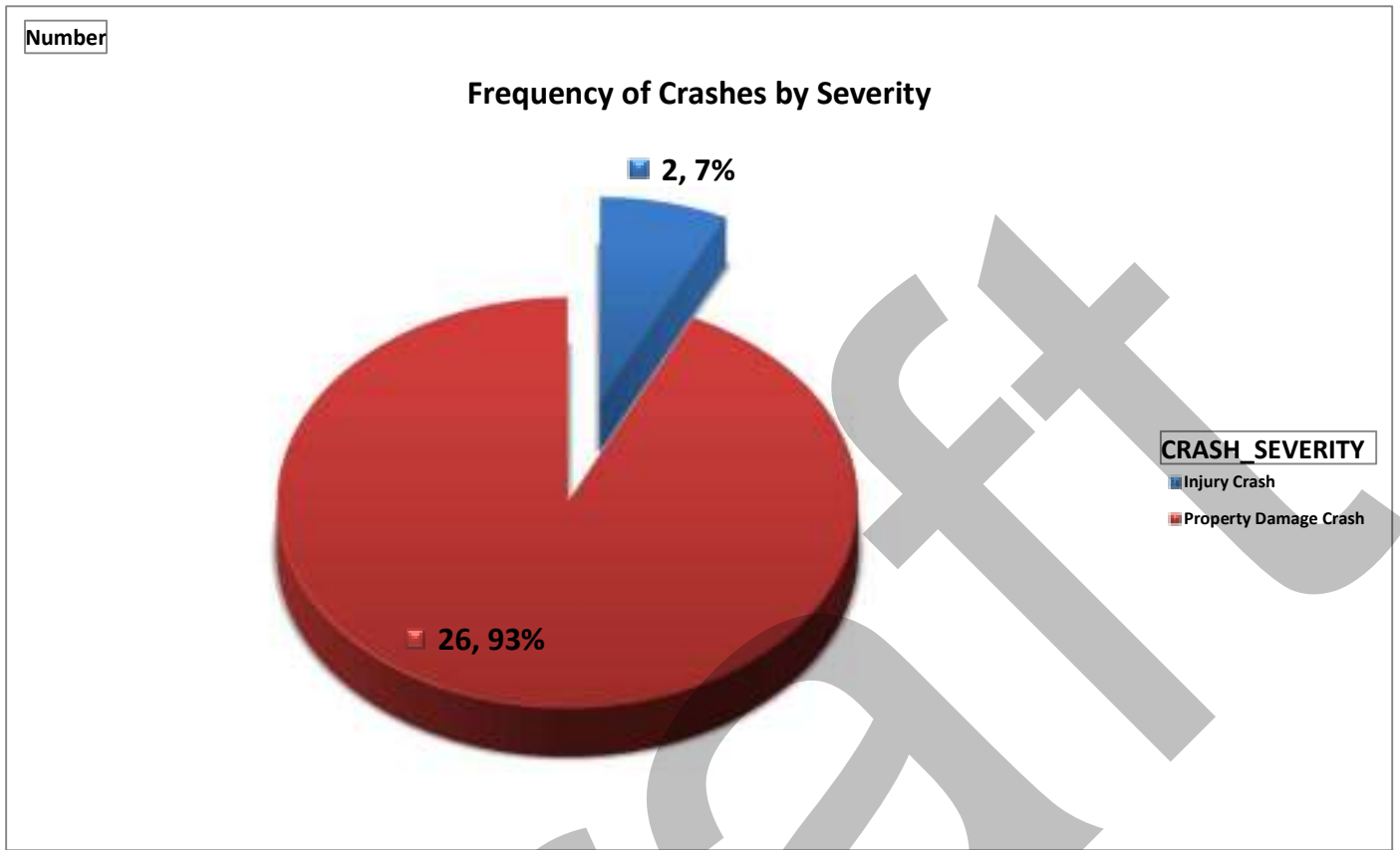


Frequency of Crashes by Contributing Factor 2

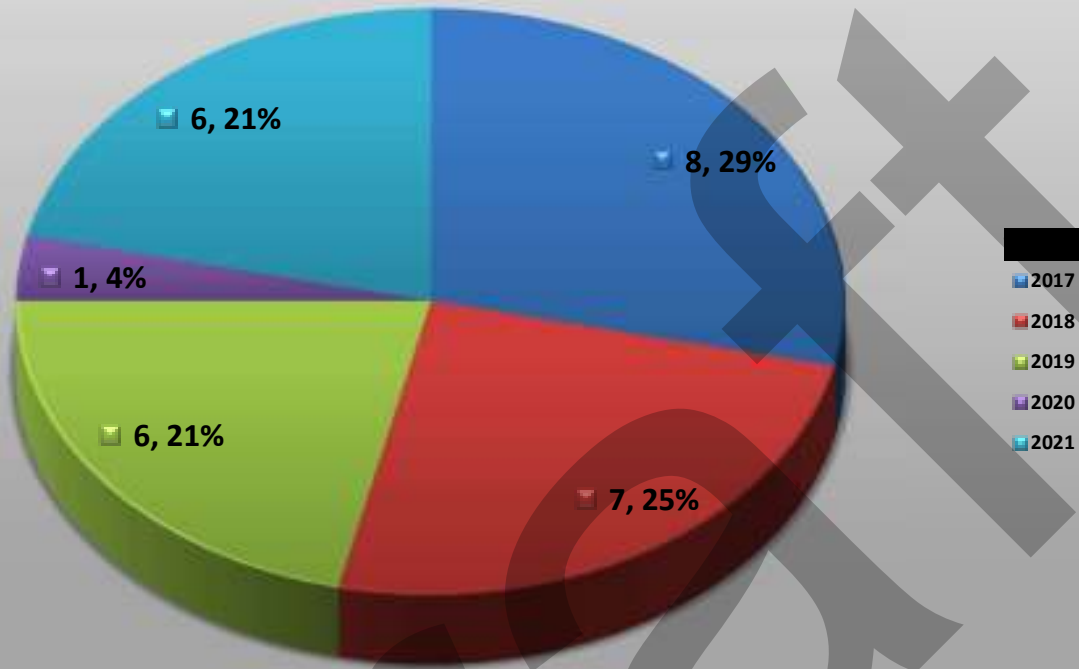








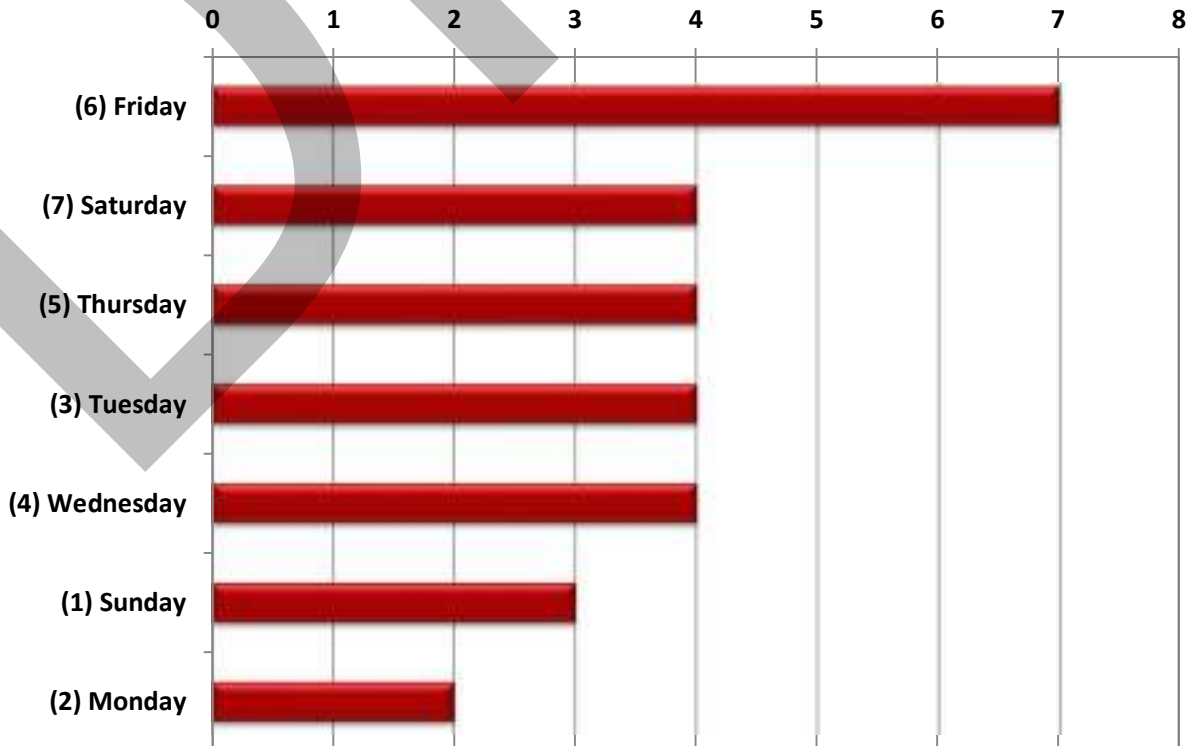
Frequency of Crashes by Year



Frequency of Crashes by Day of the Week

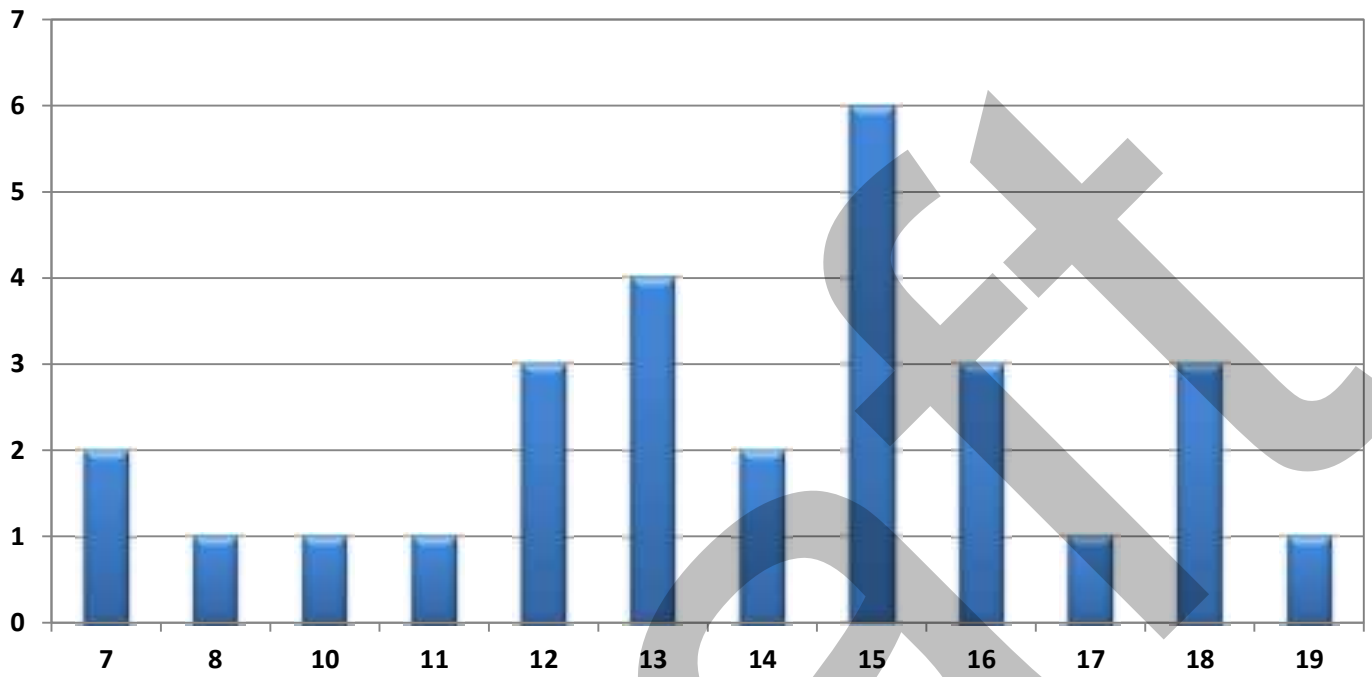
Number

DAY_OF_WEEK



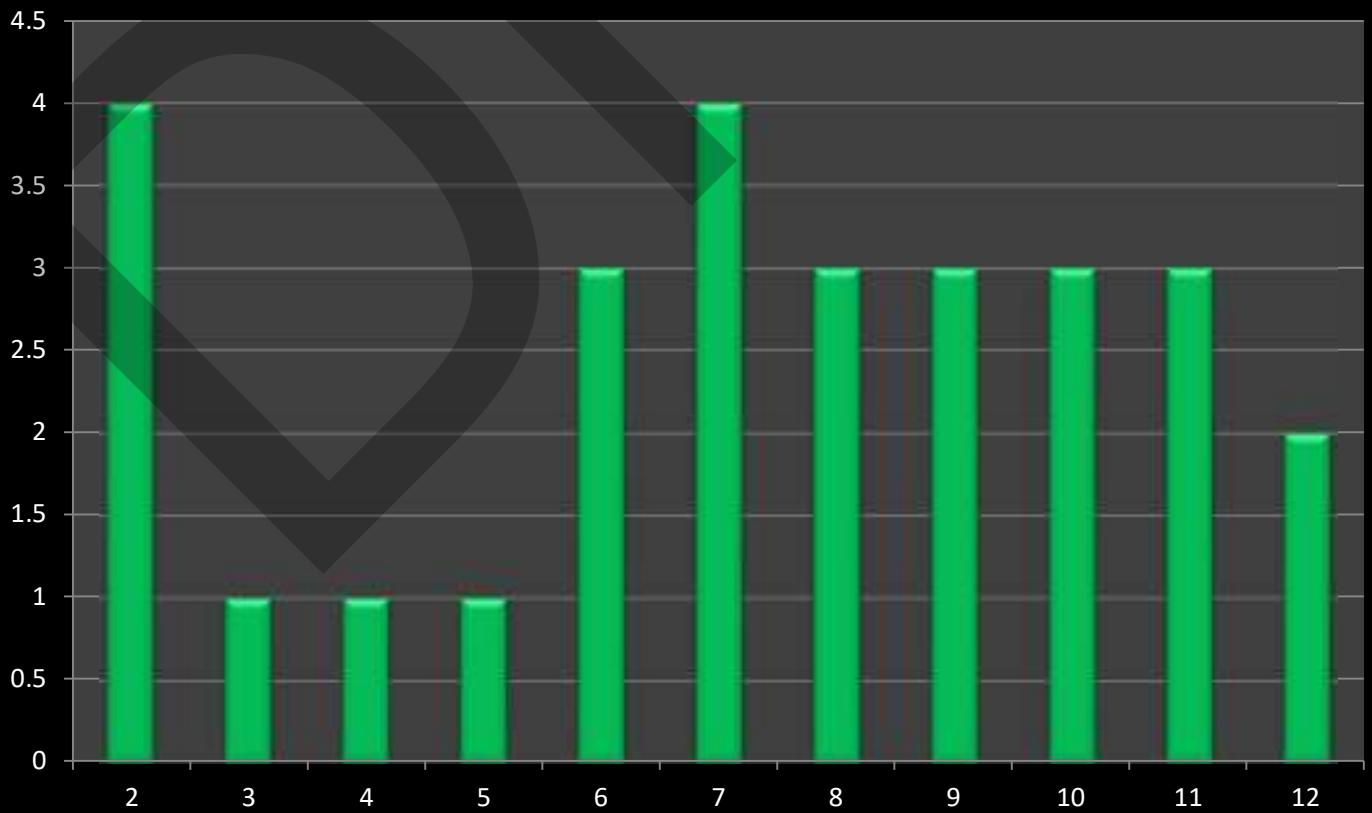


Frequency of Crashes by Hour

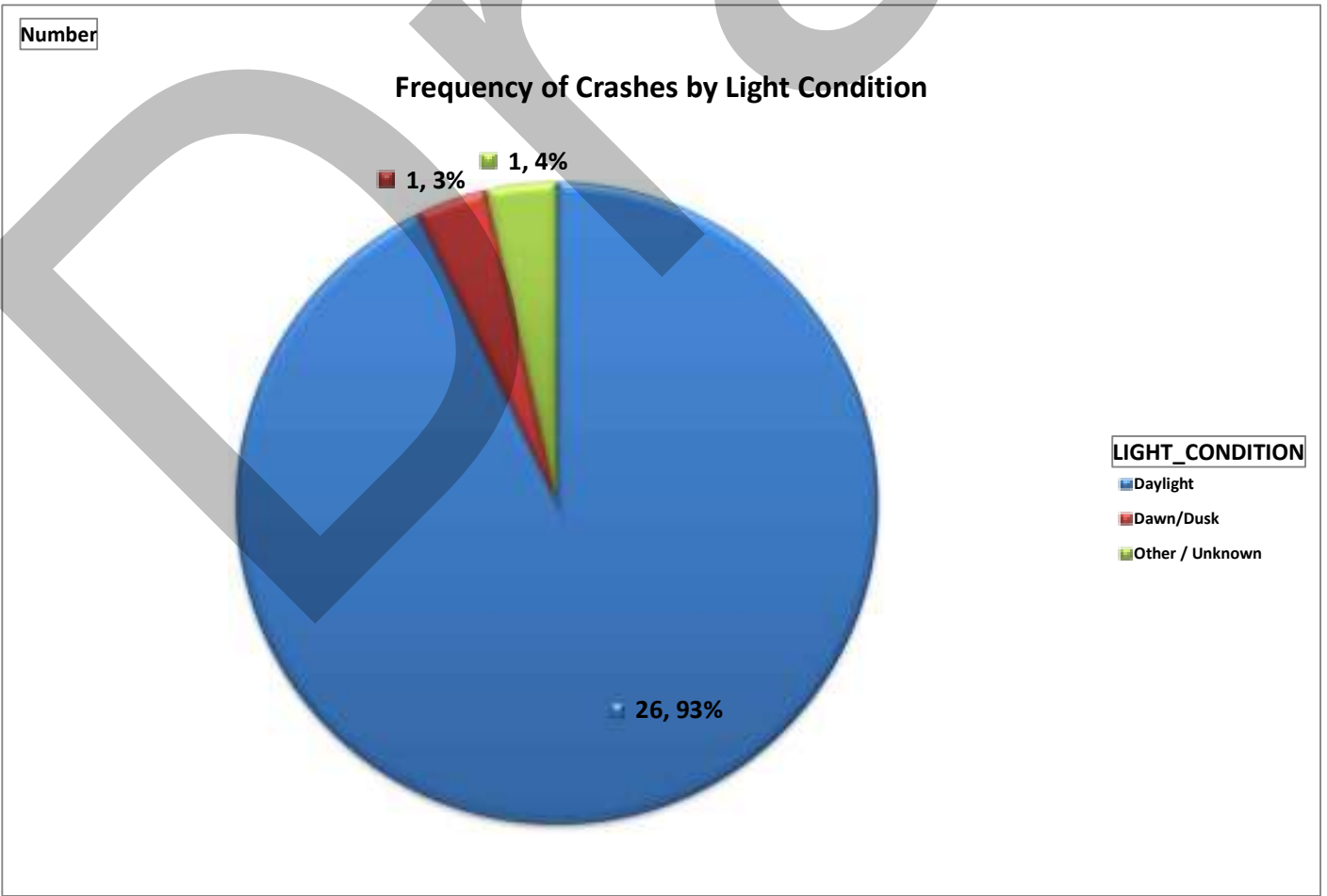
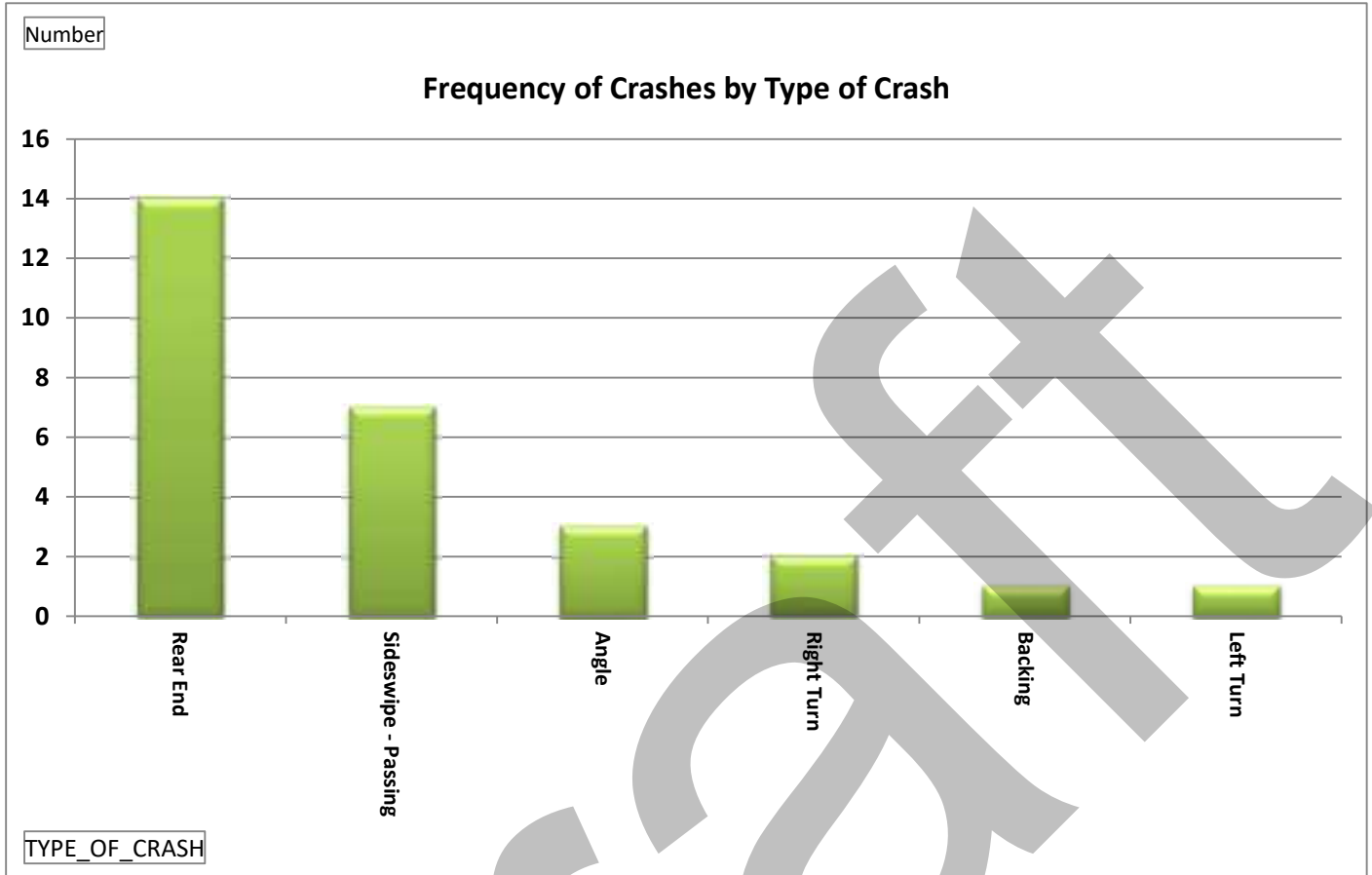


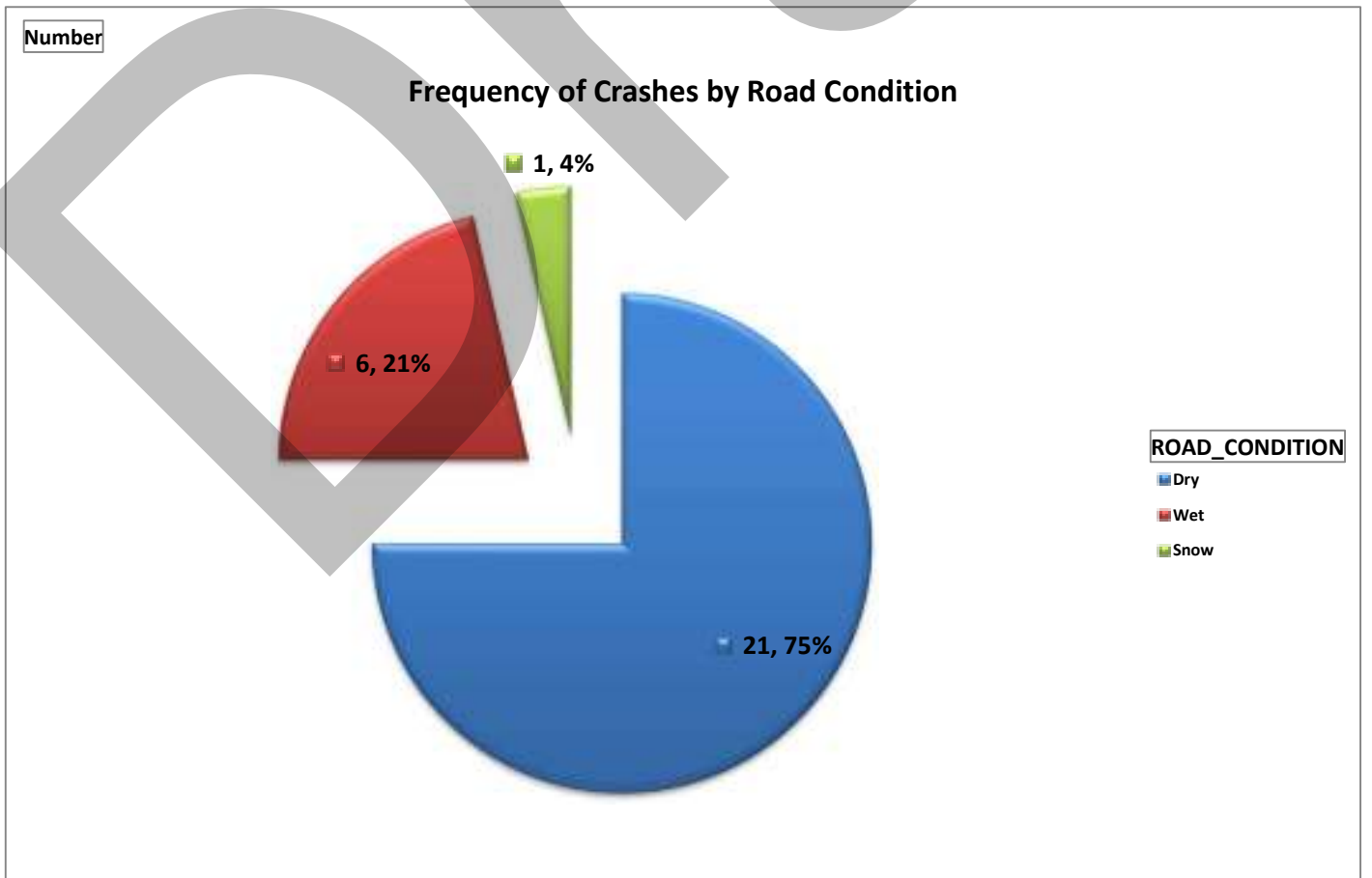
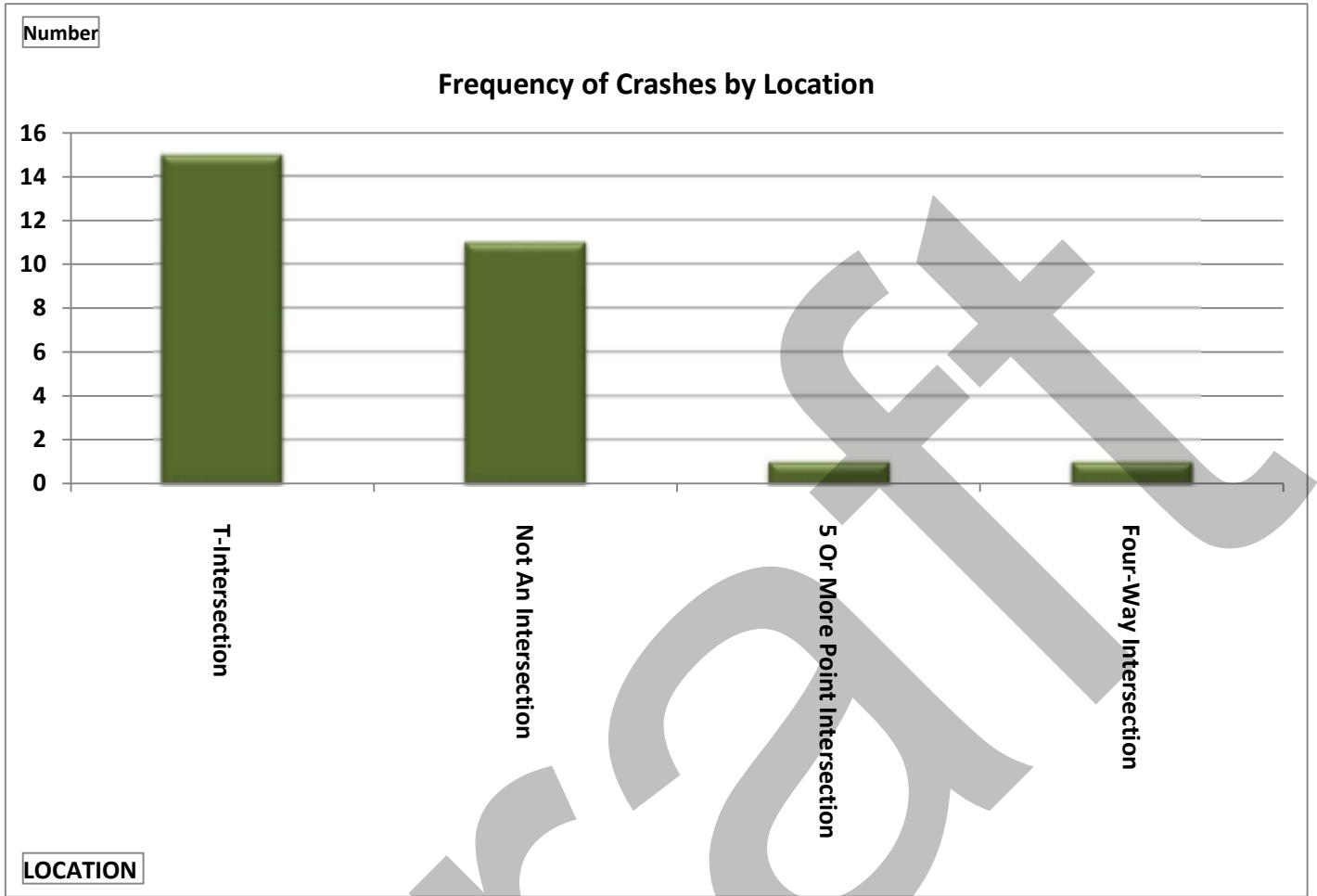
Number

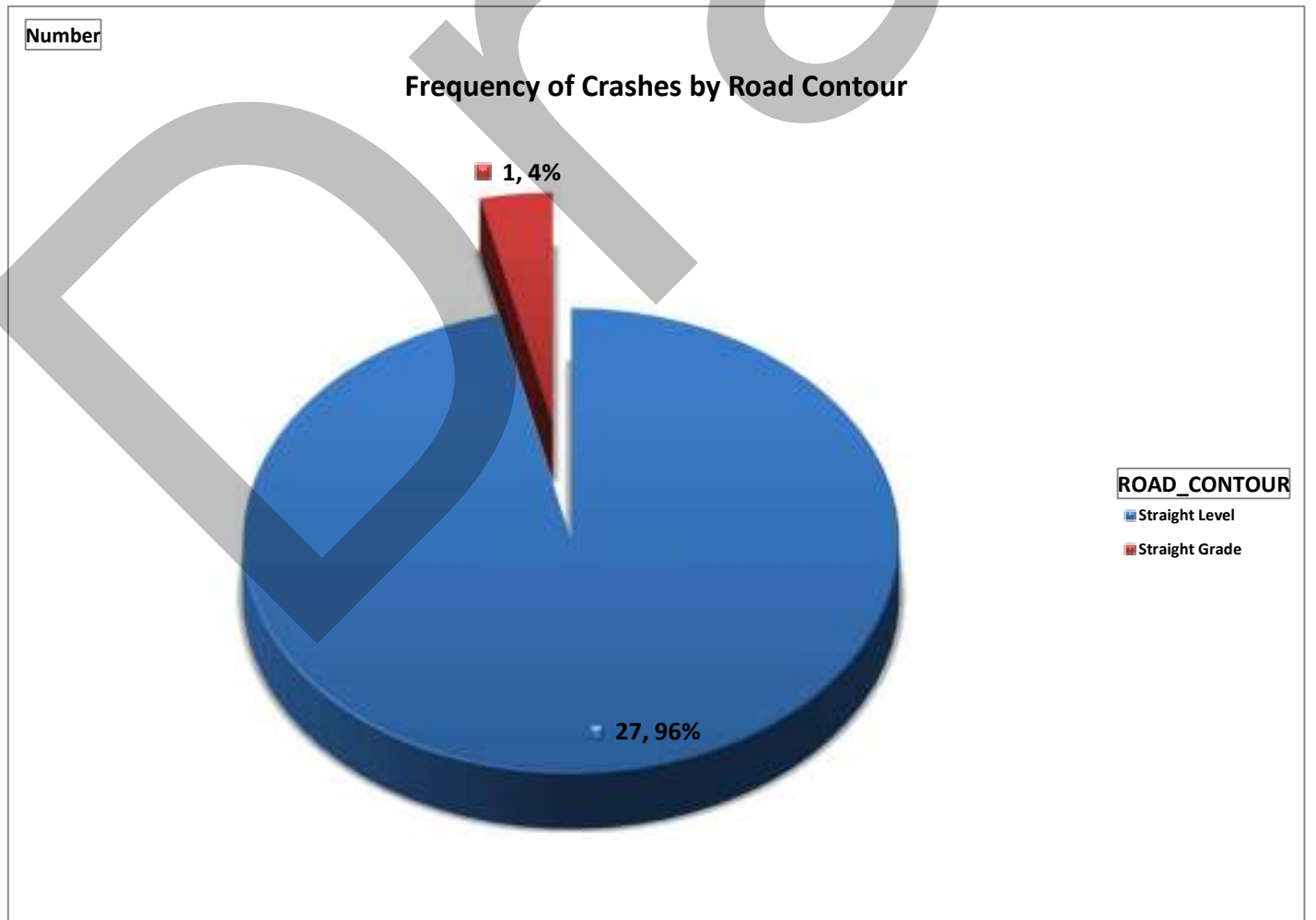
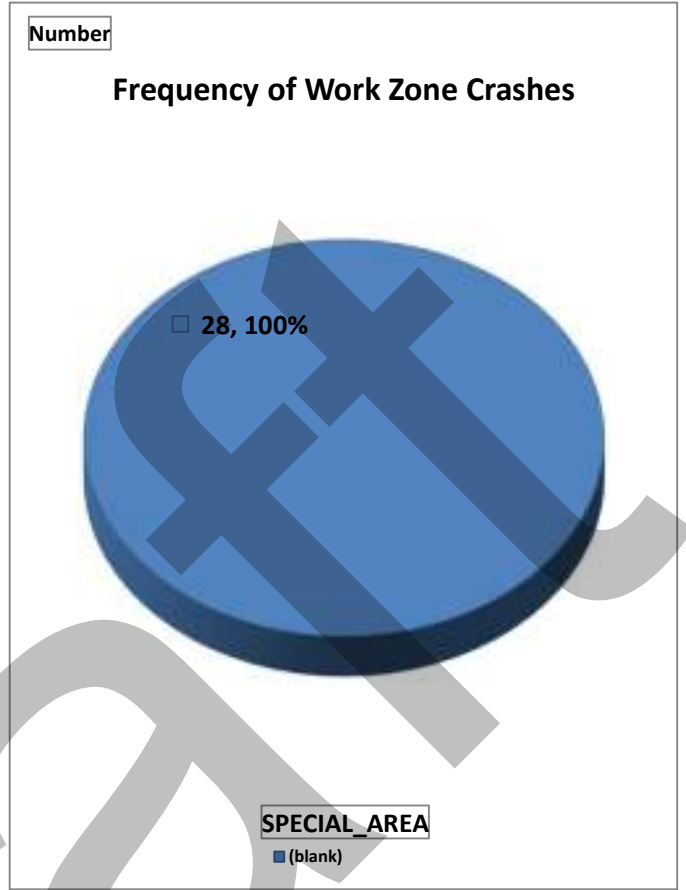
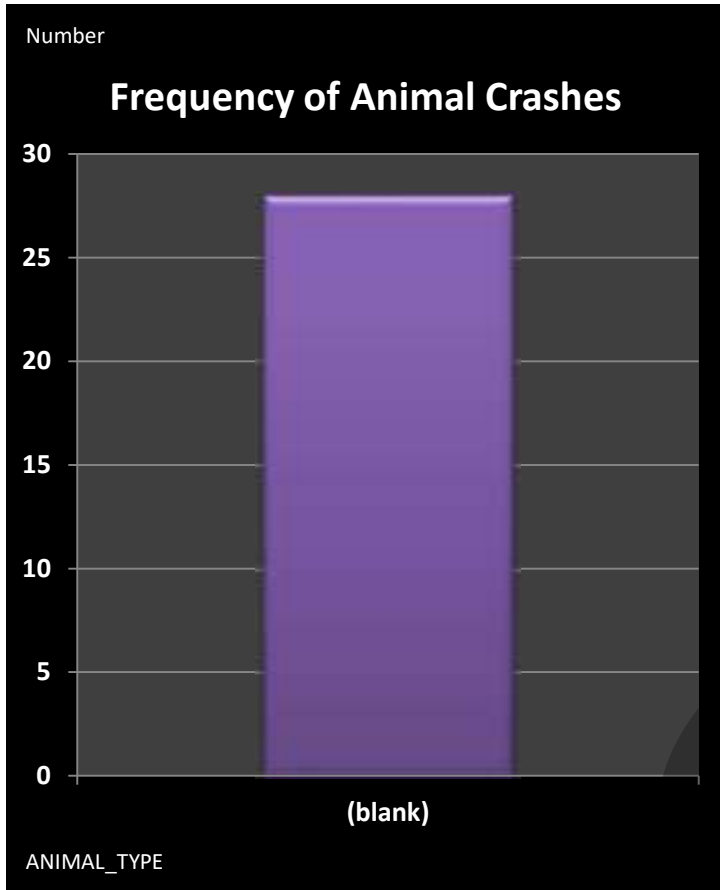
Frequency of Crashes by Month



CRASH_MONTH_NBR

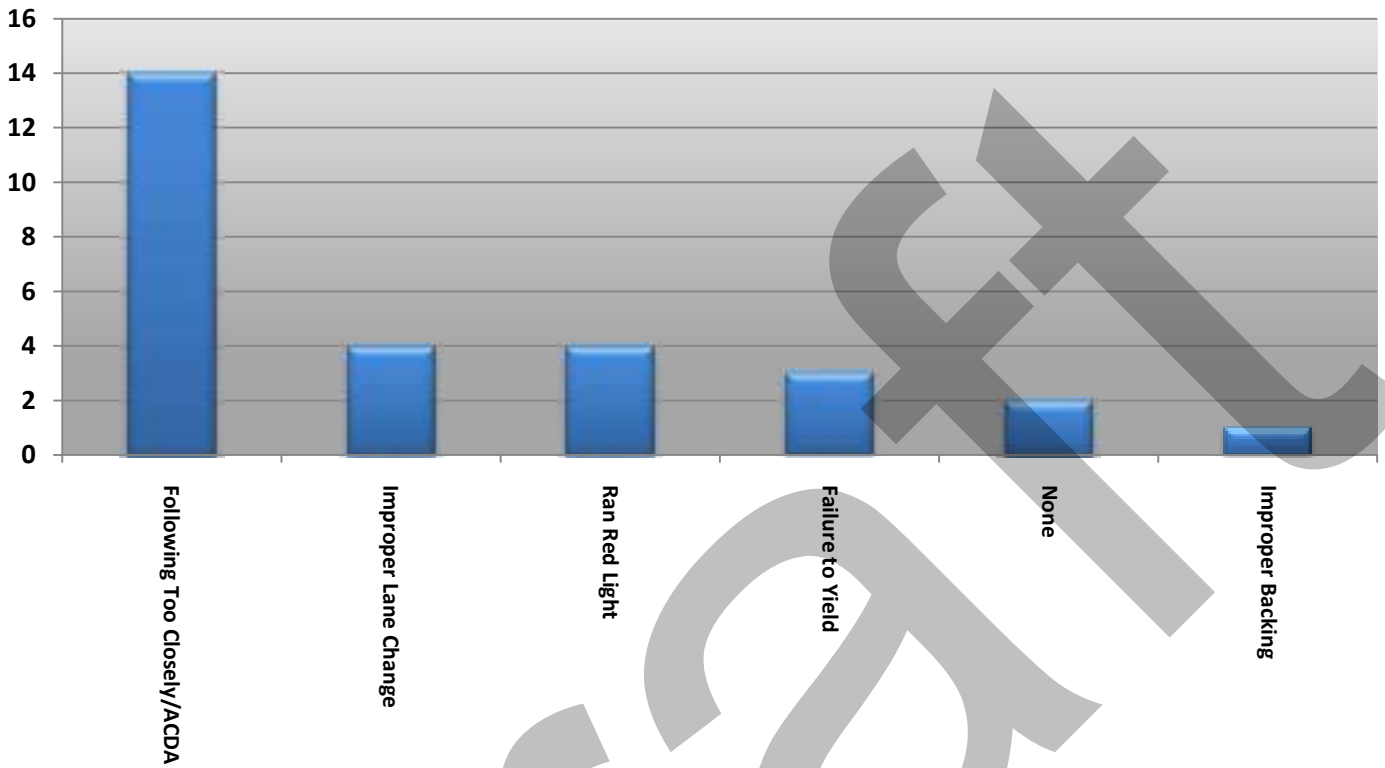




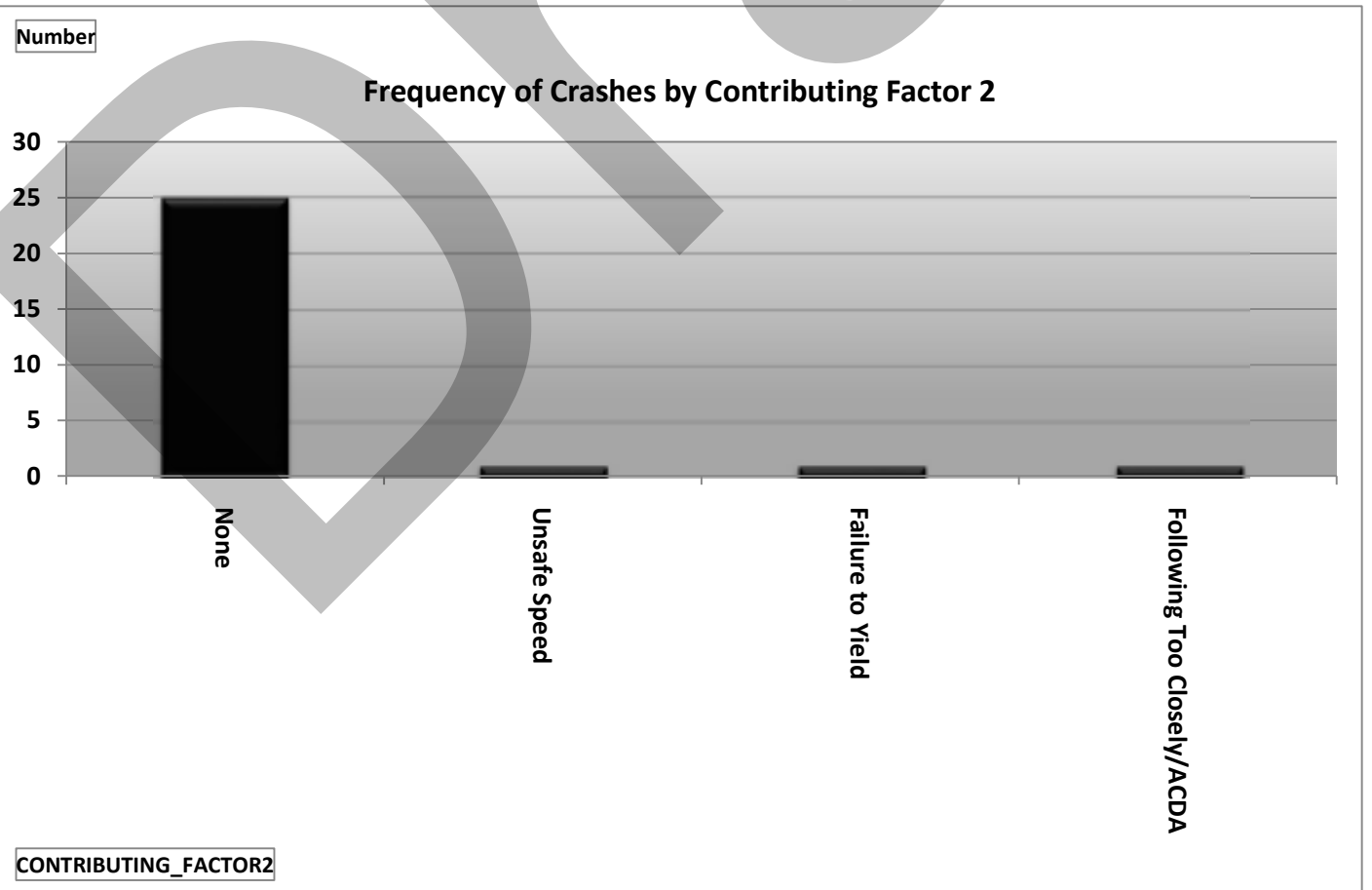


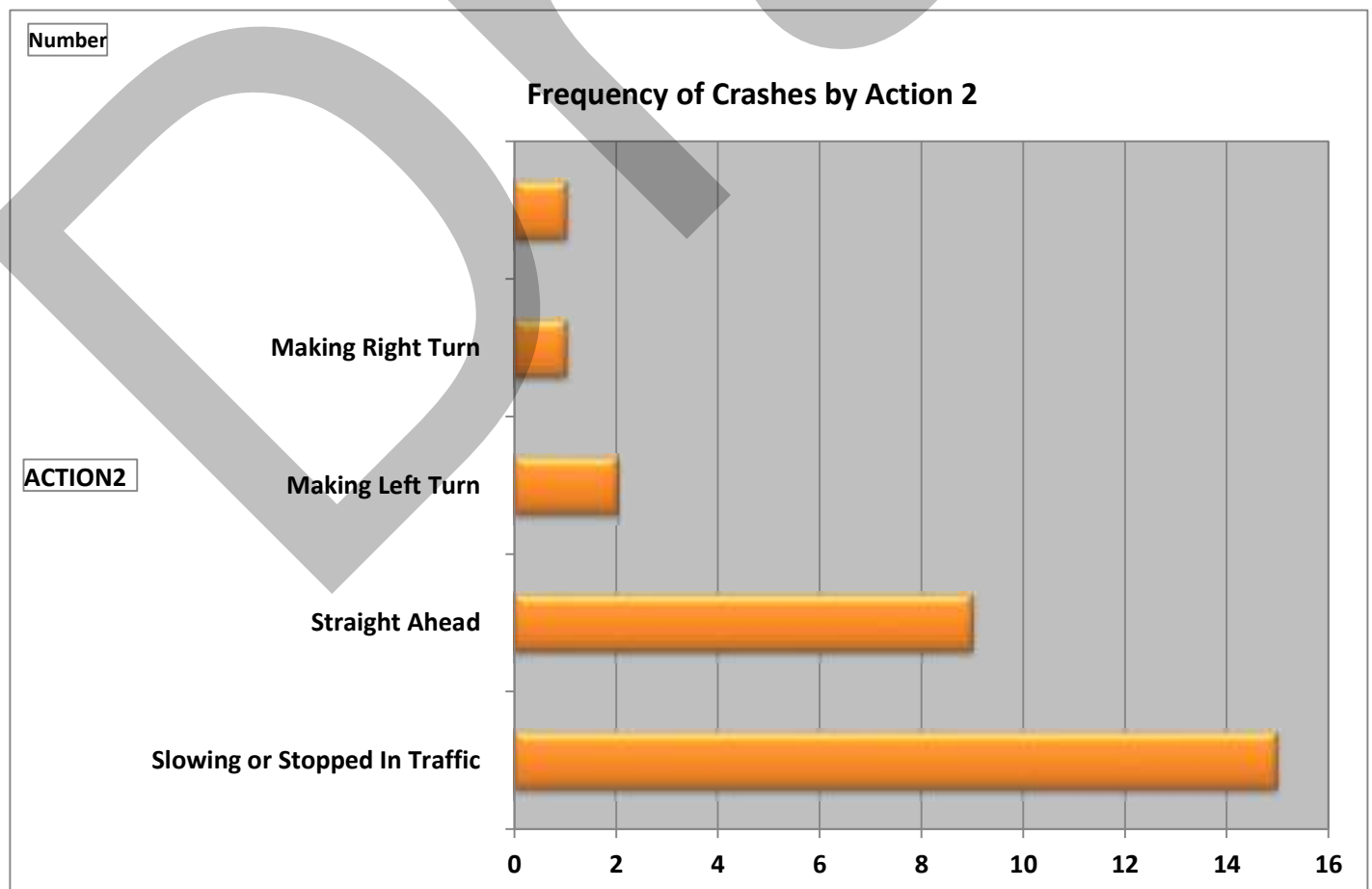
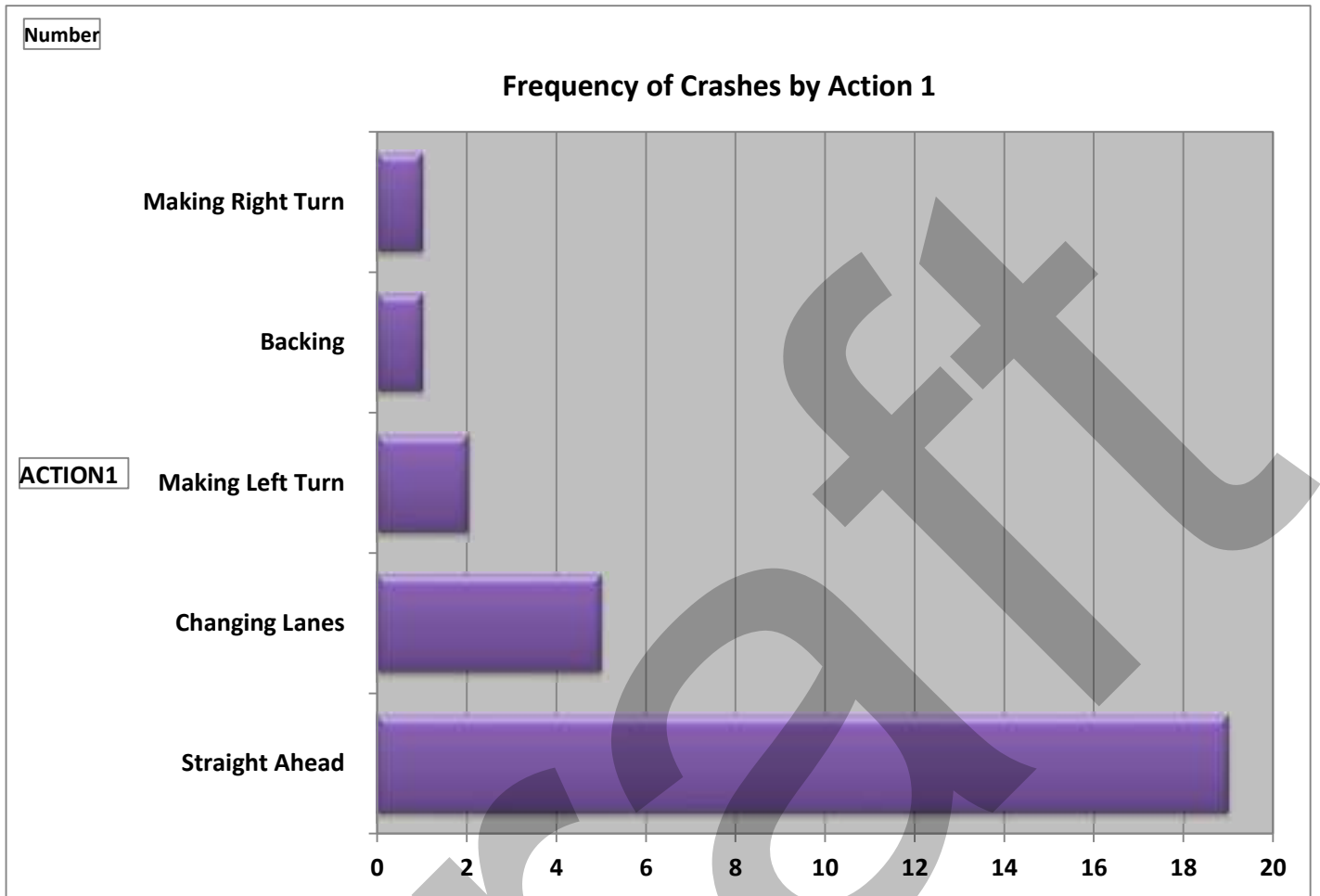


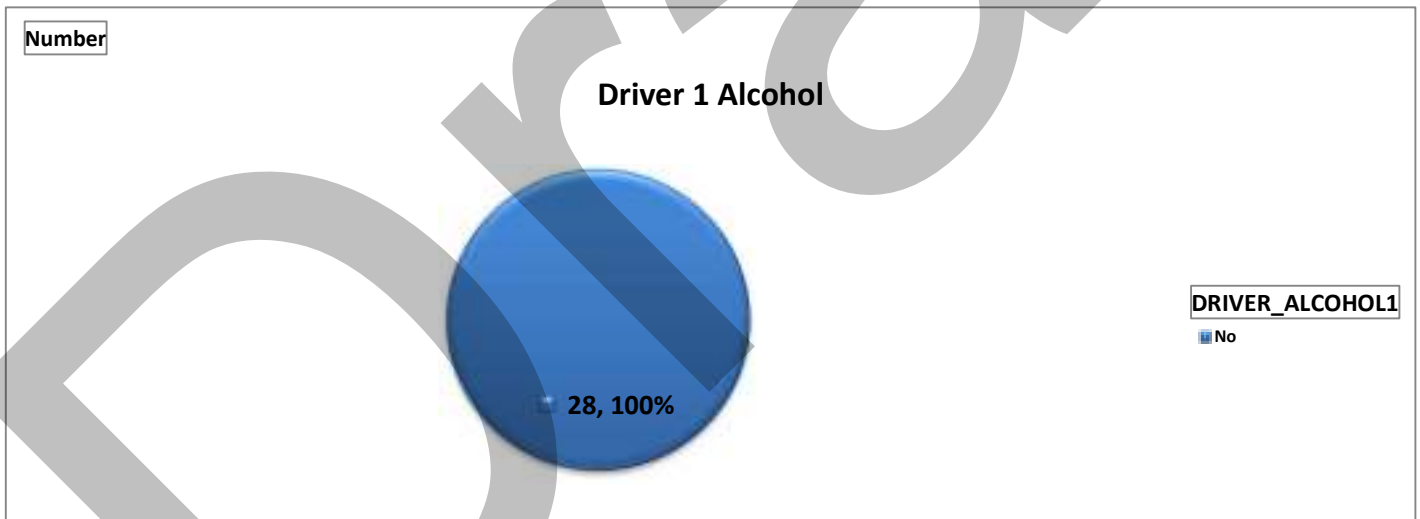
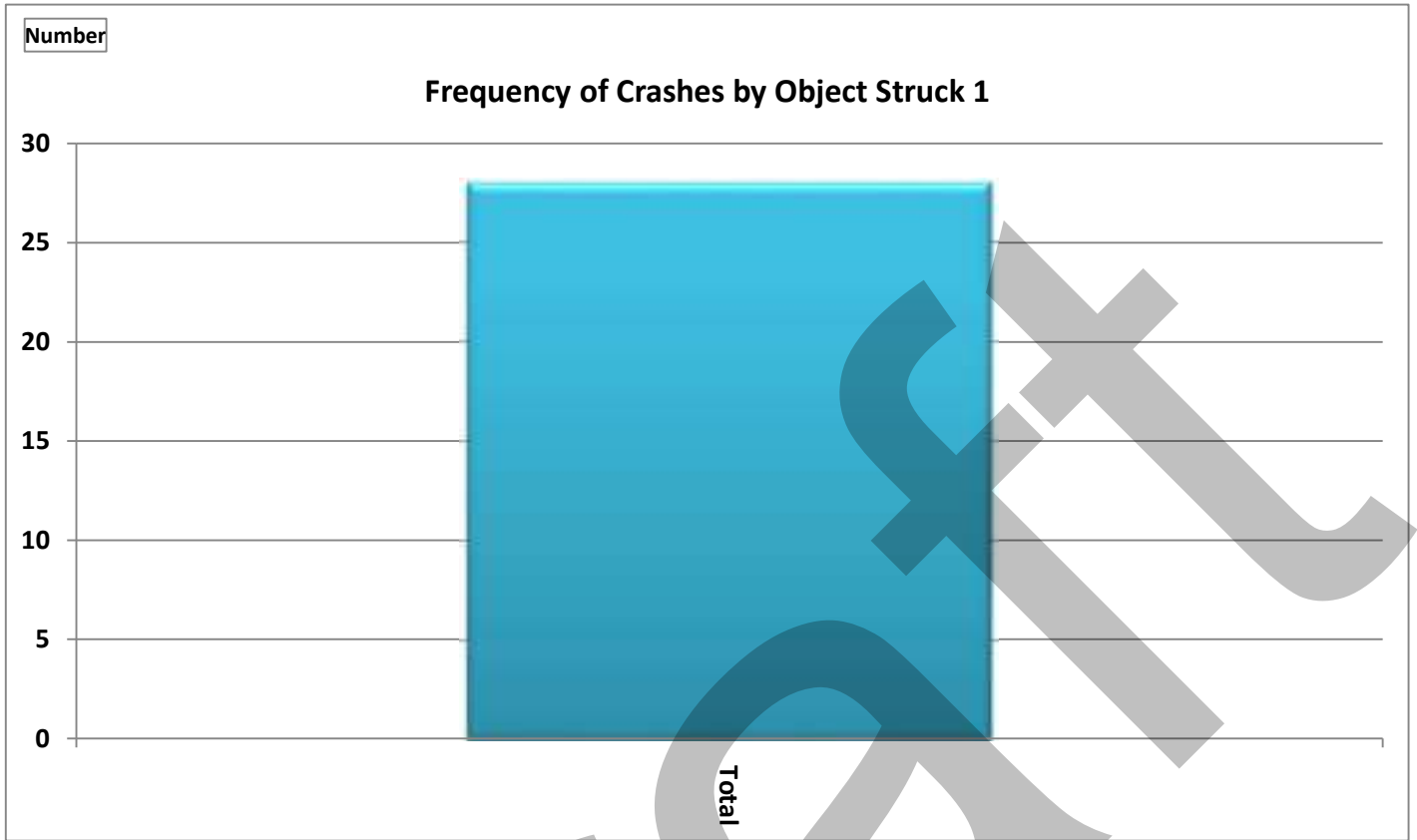
Frequency of Crashes by Contributing Factor 1

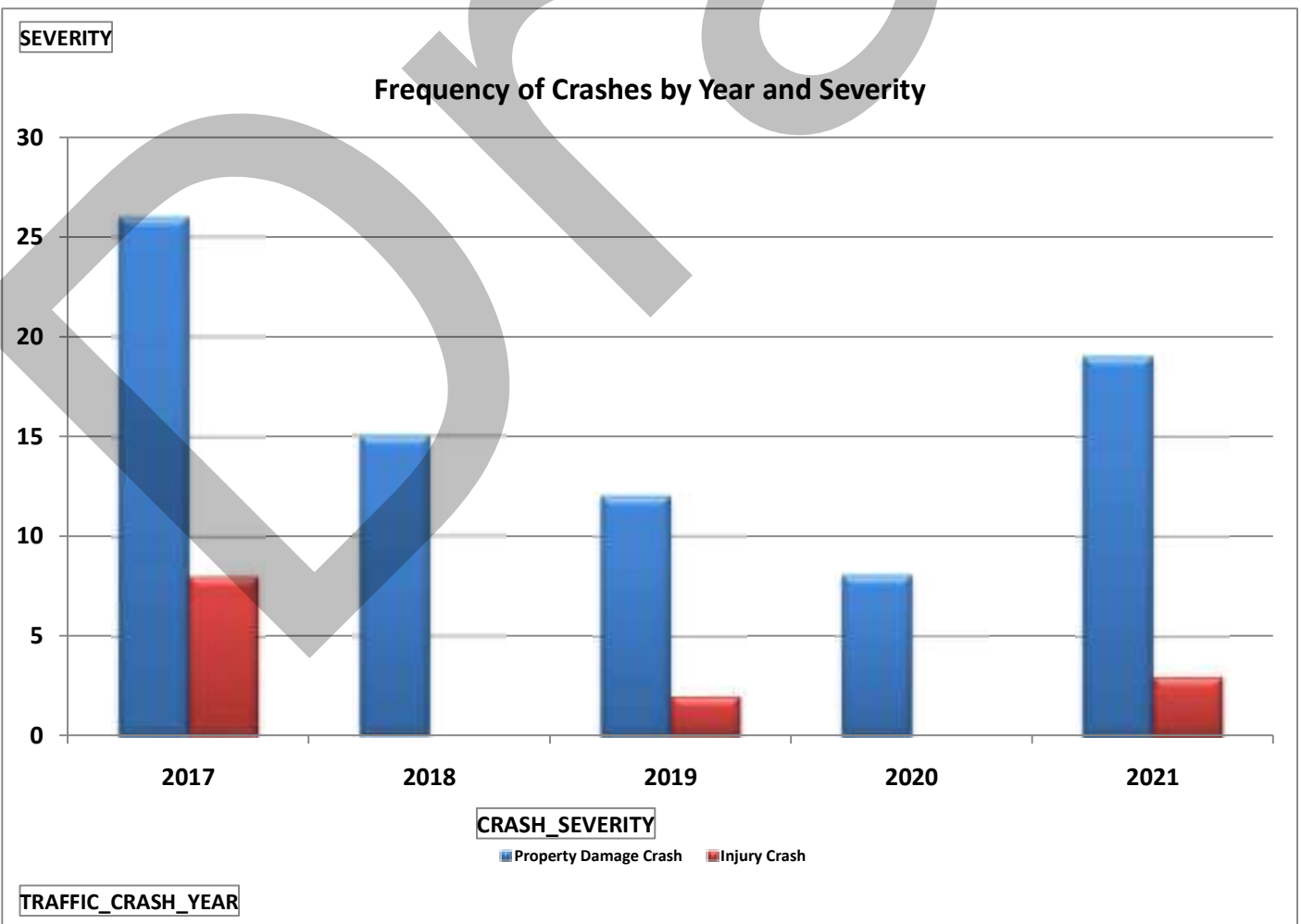
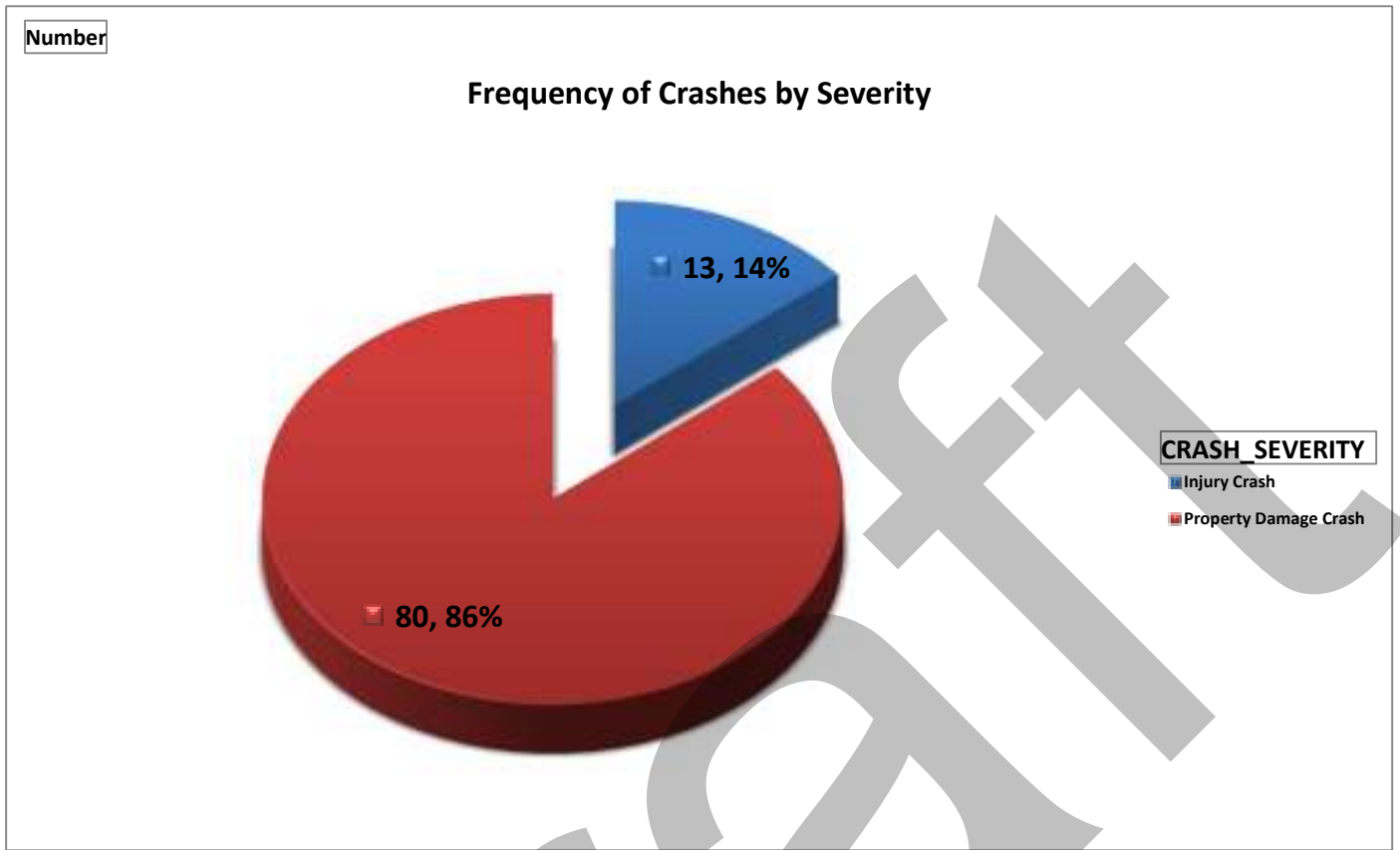


Frequency of Crashes by Contributing Factor 2

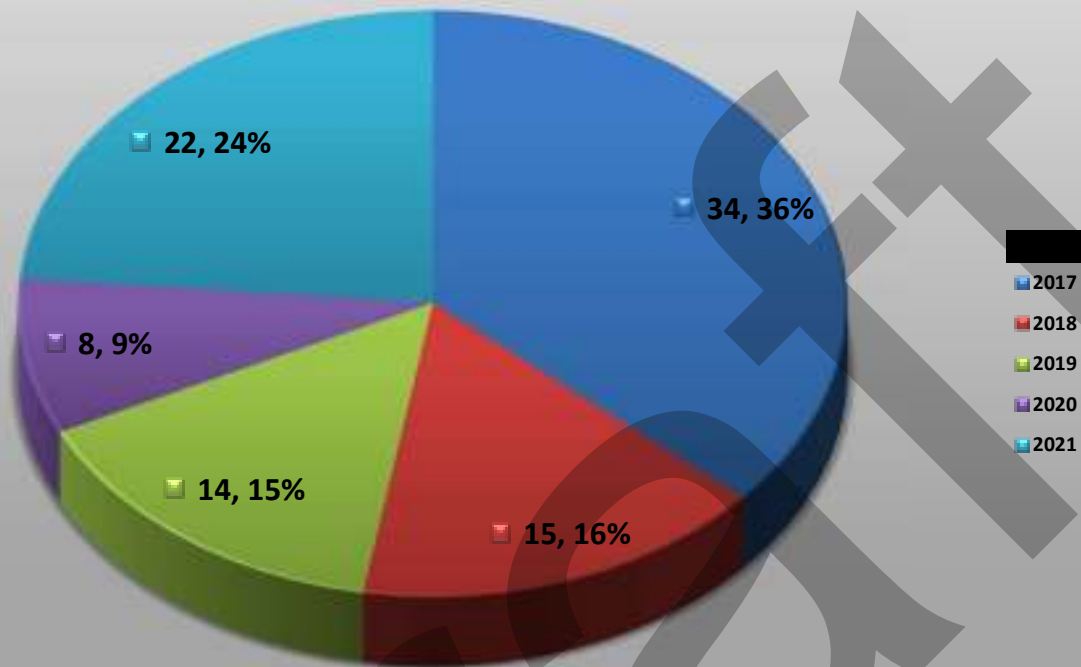




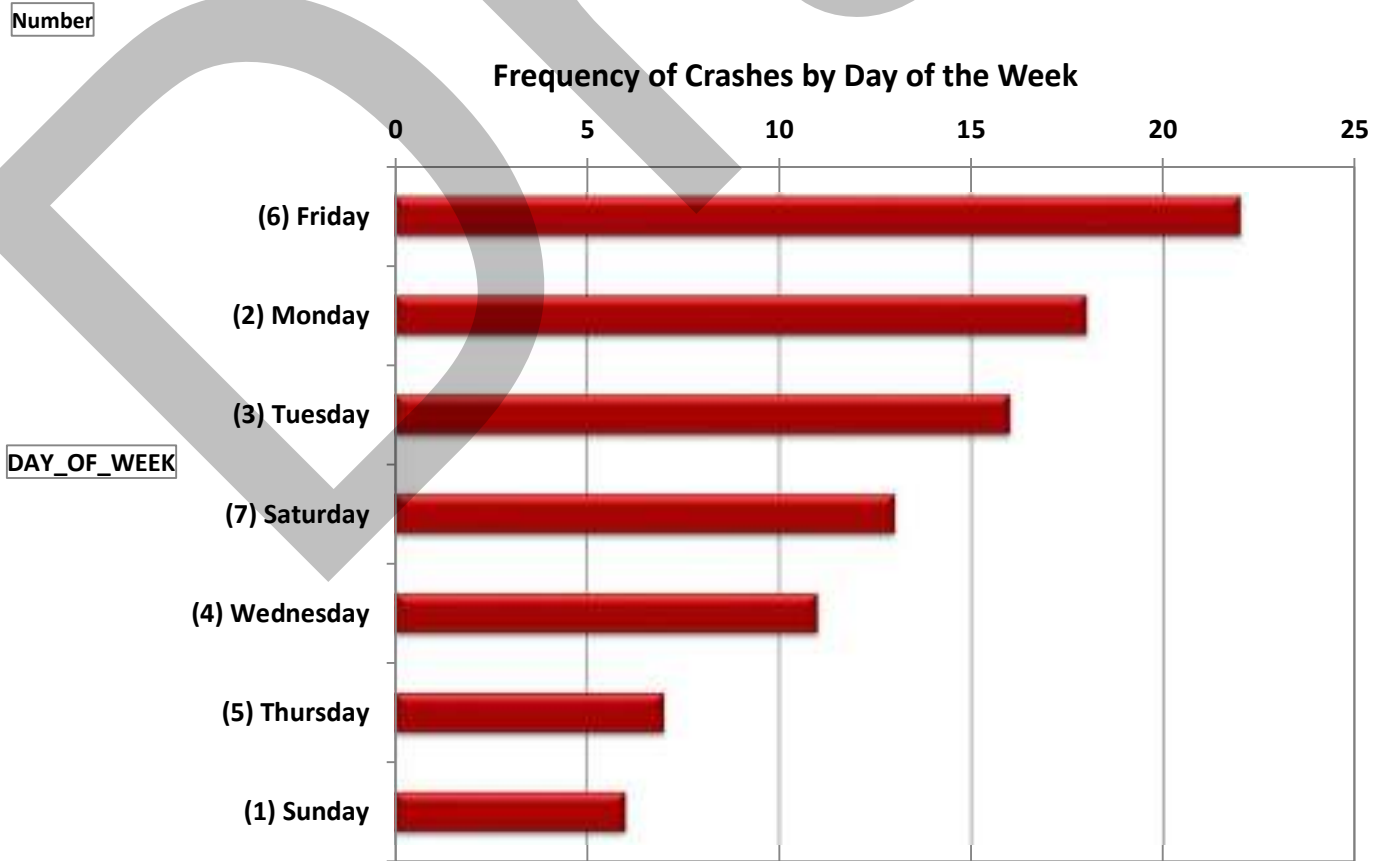




Frequency of Crashes by Year

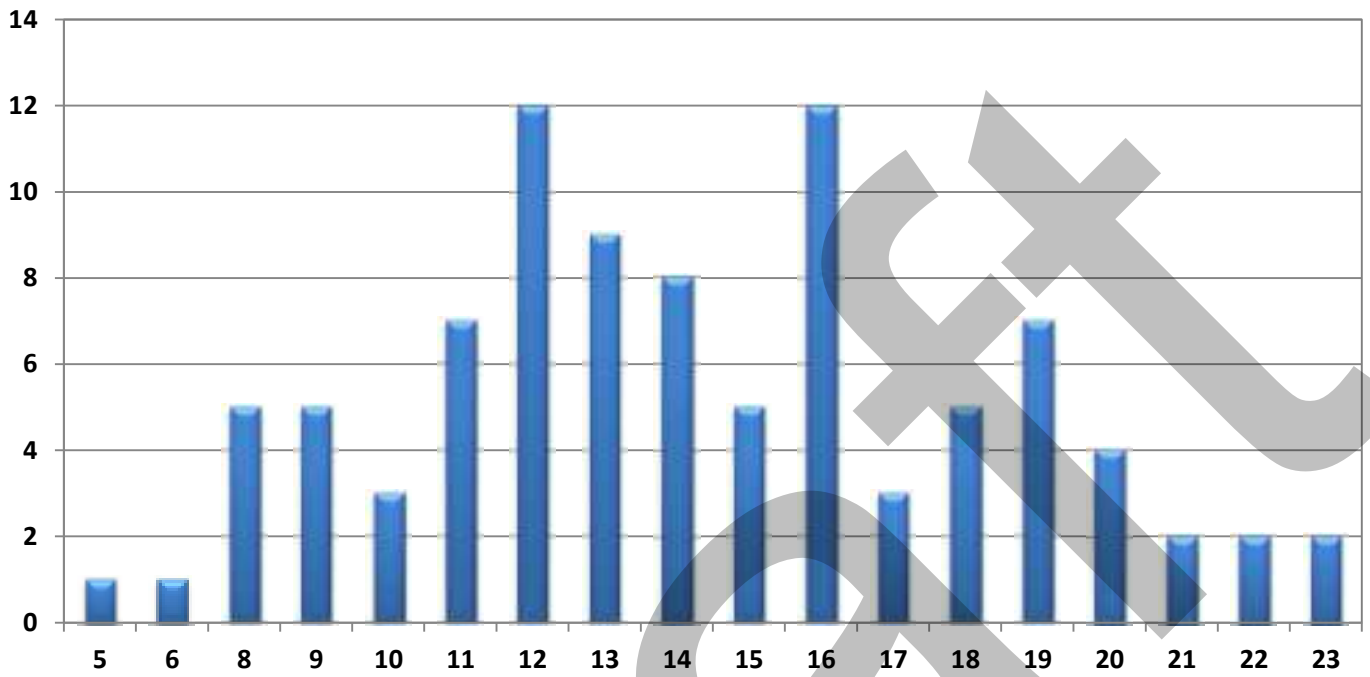


Frequency of Crashes by Day of the Week



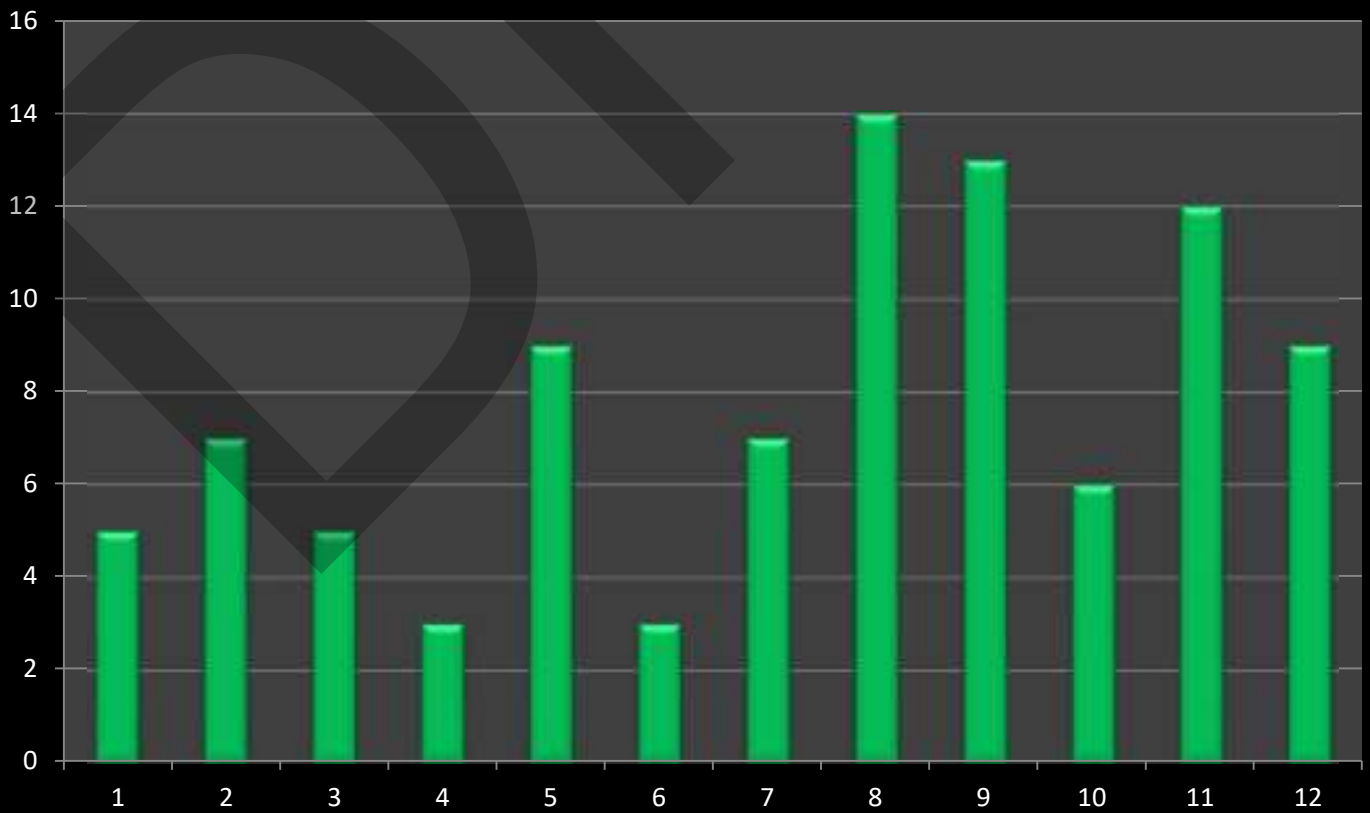


Frequency of Crashes by Hour

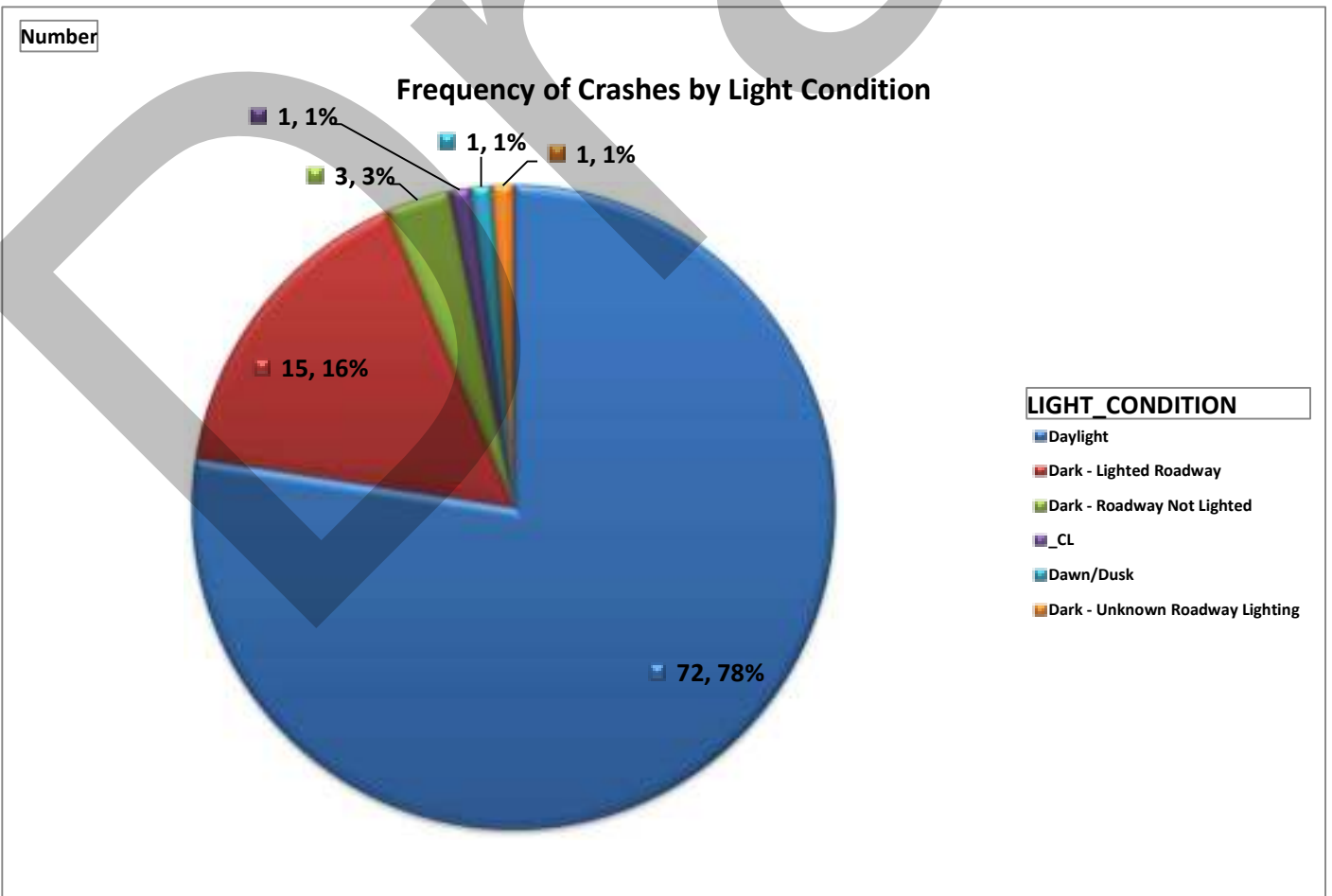
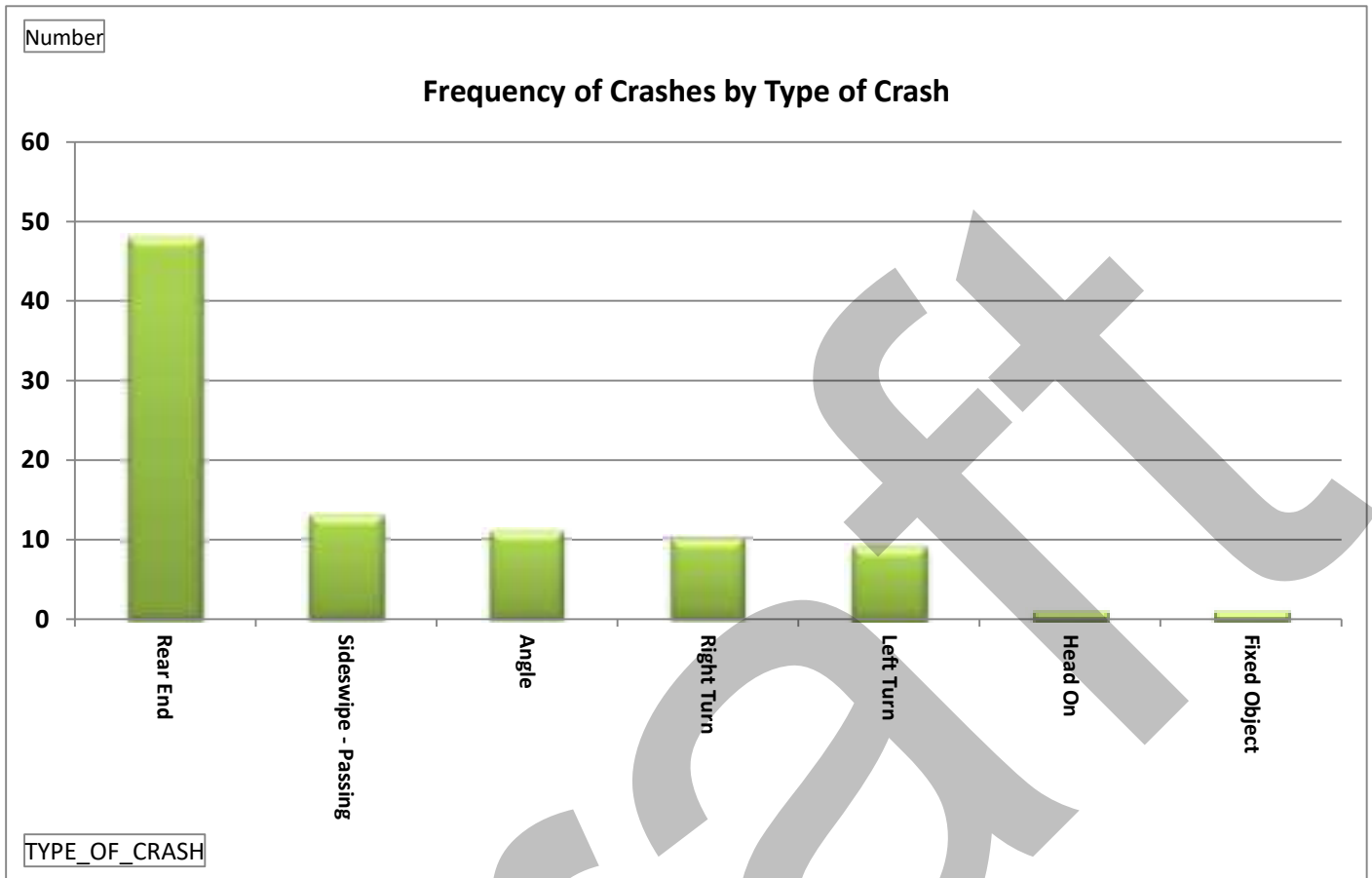


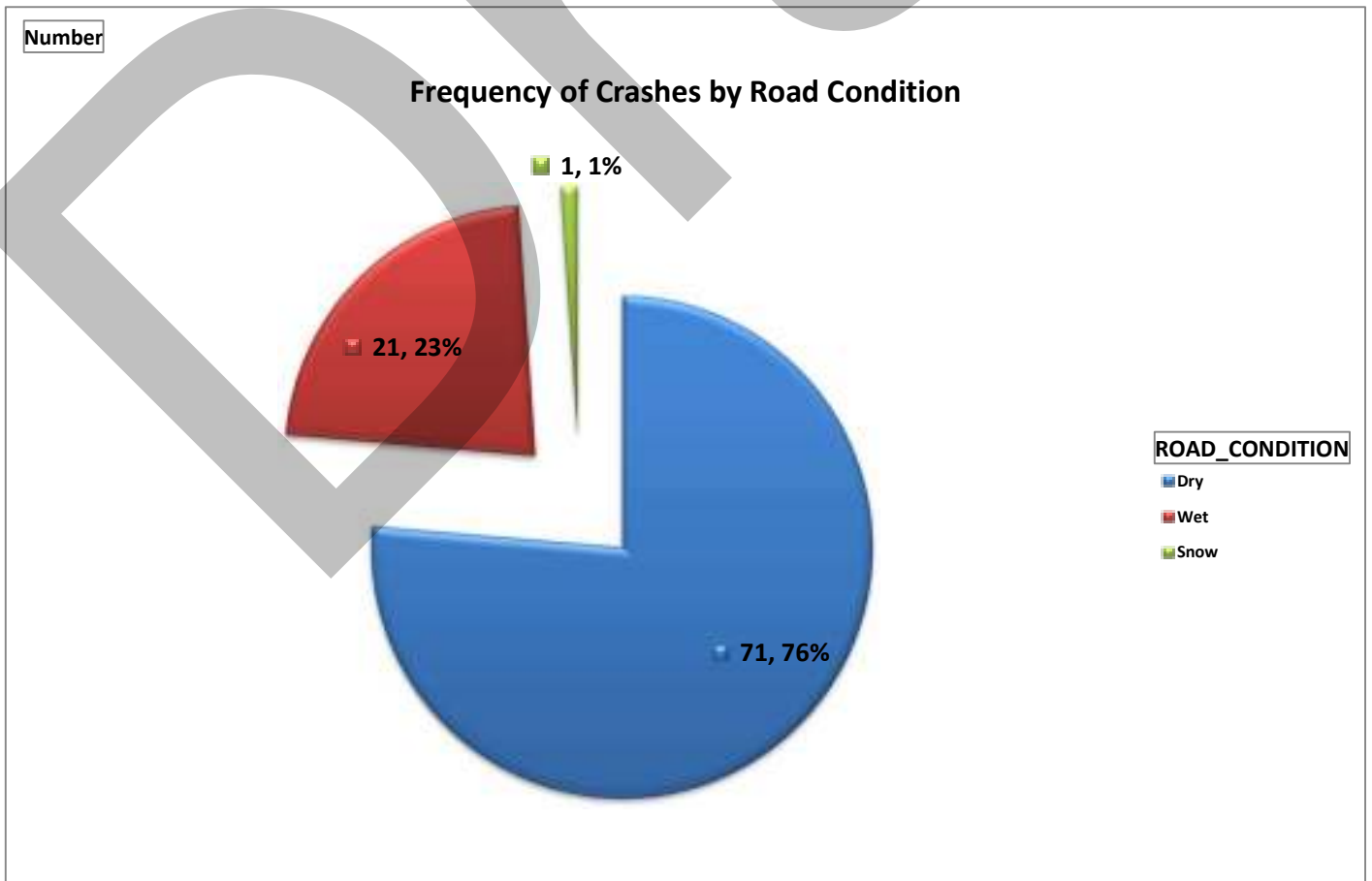
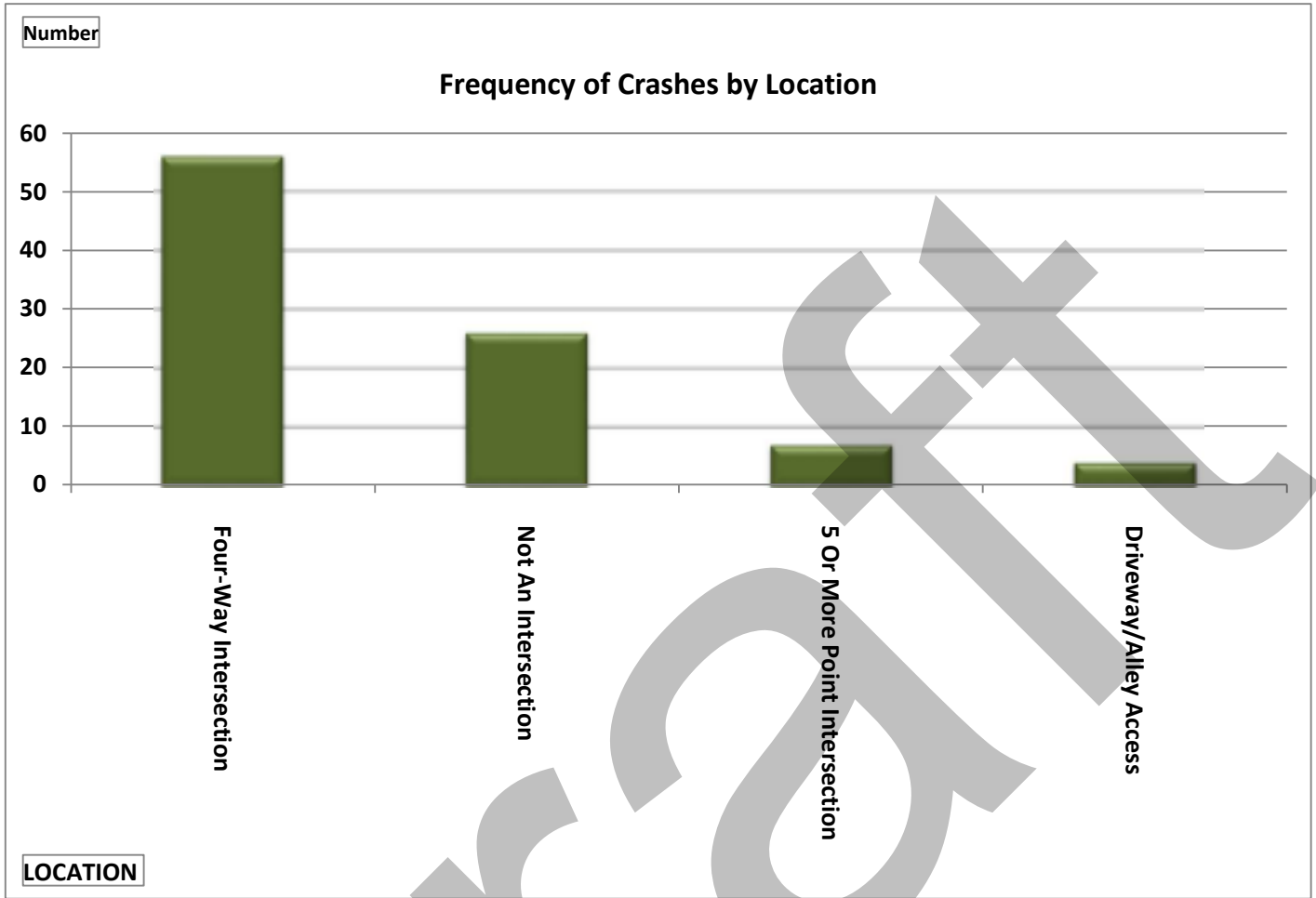
Number

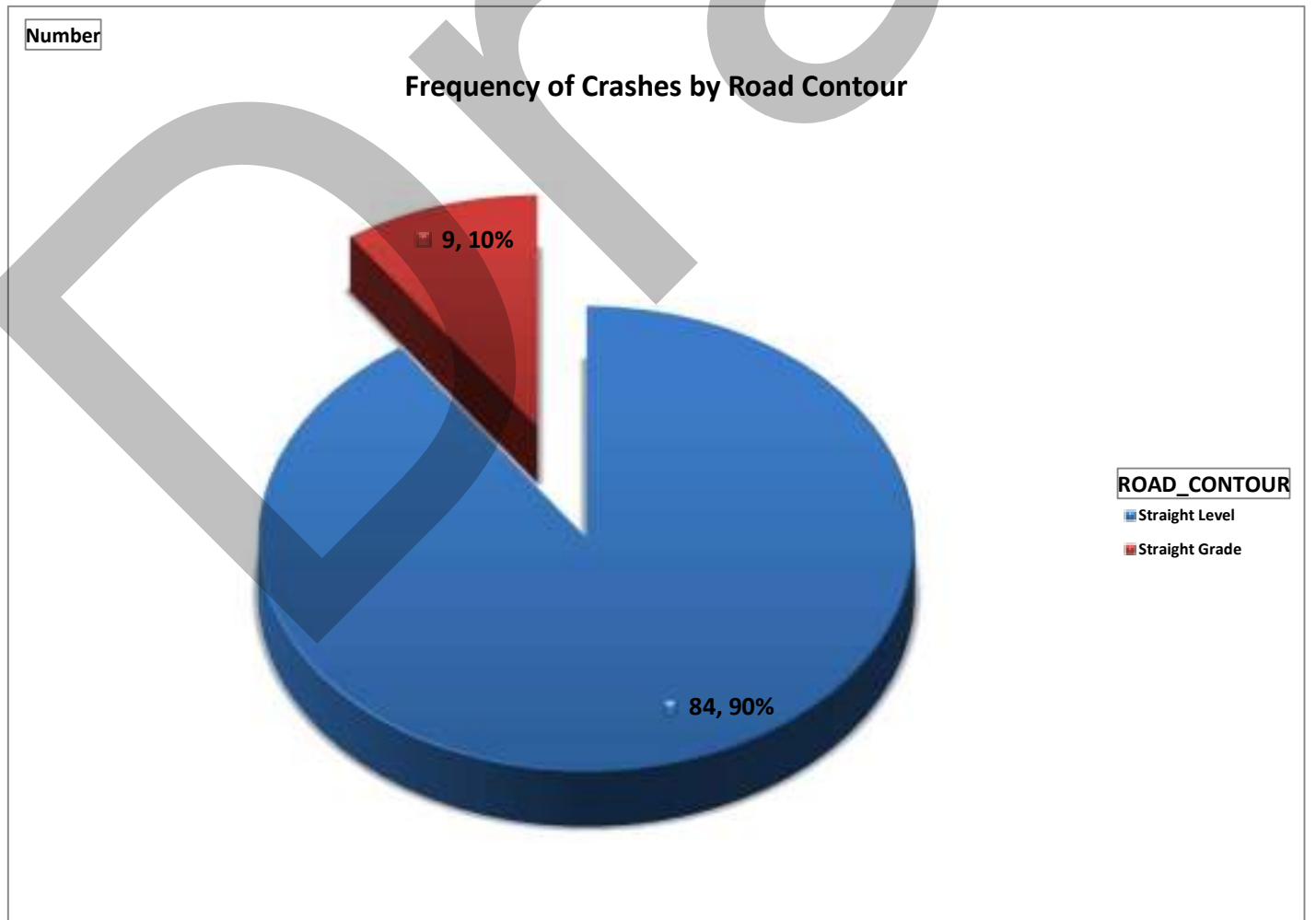
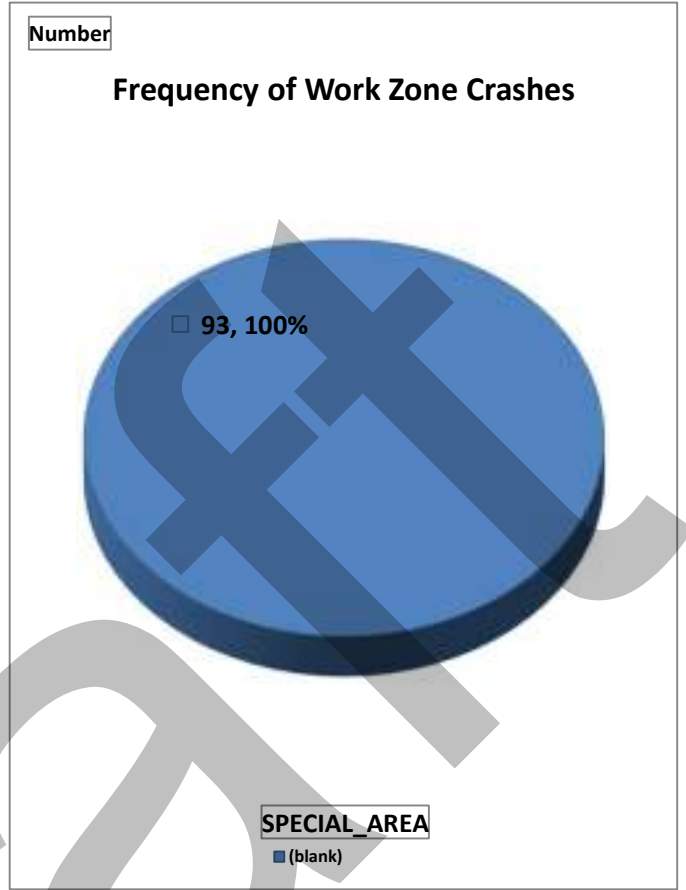
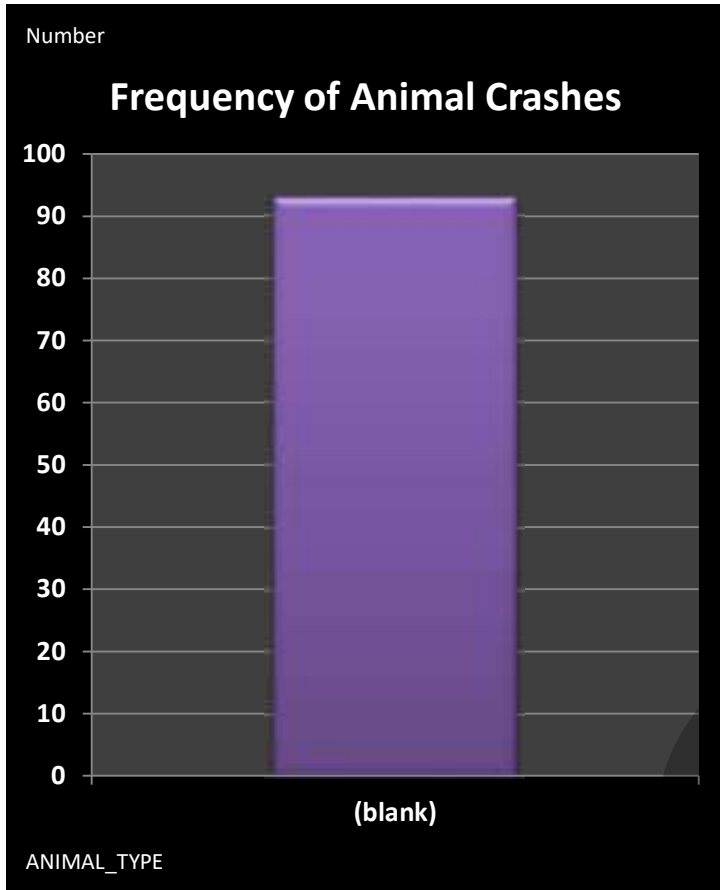
Frequency of Crashes by Month



CRASH_MONTH_NBR

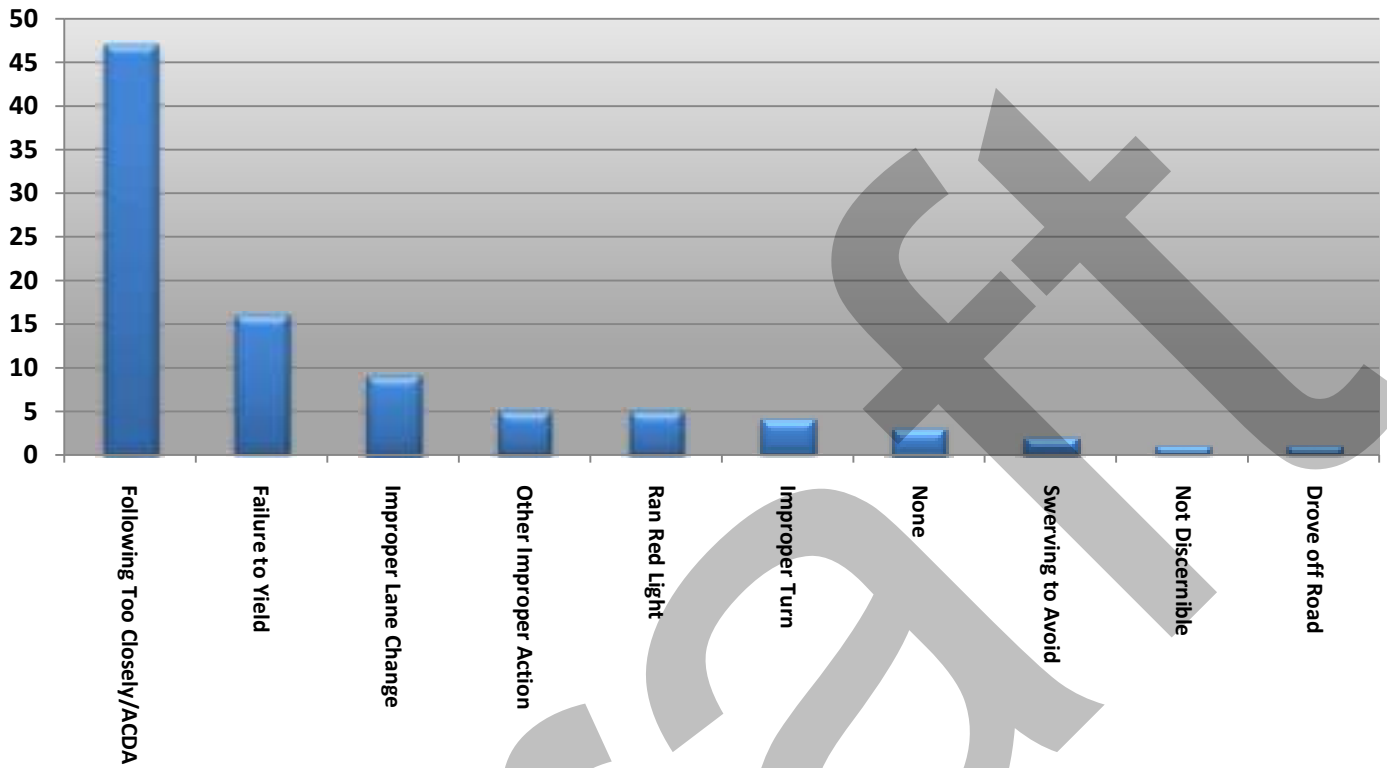




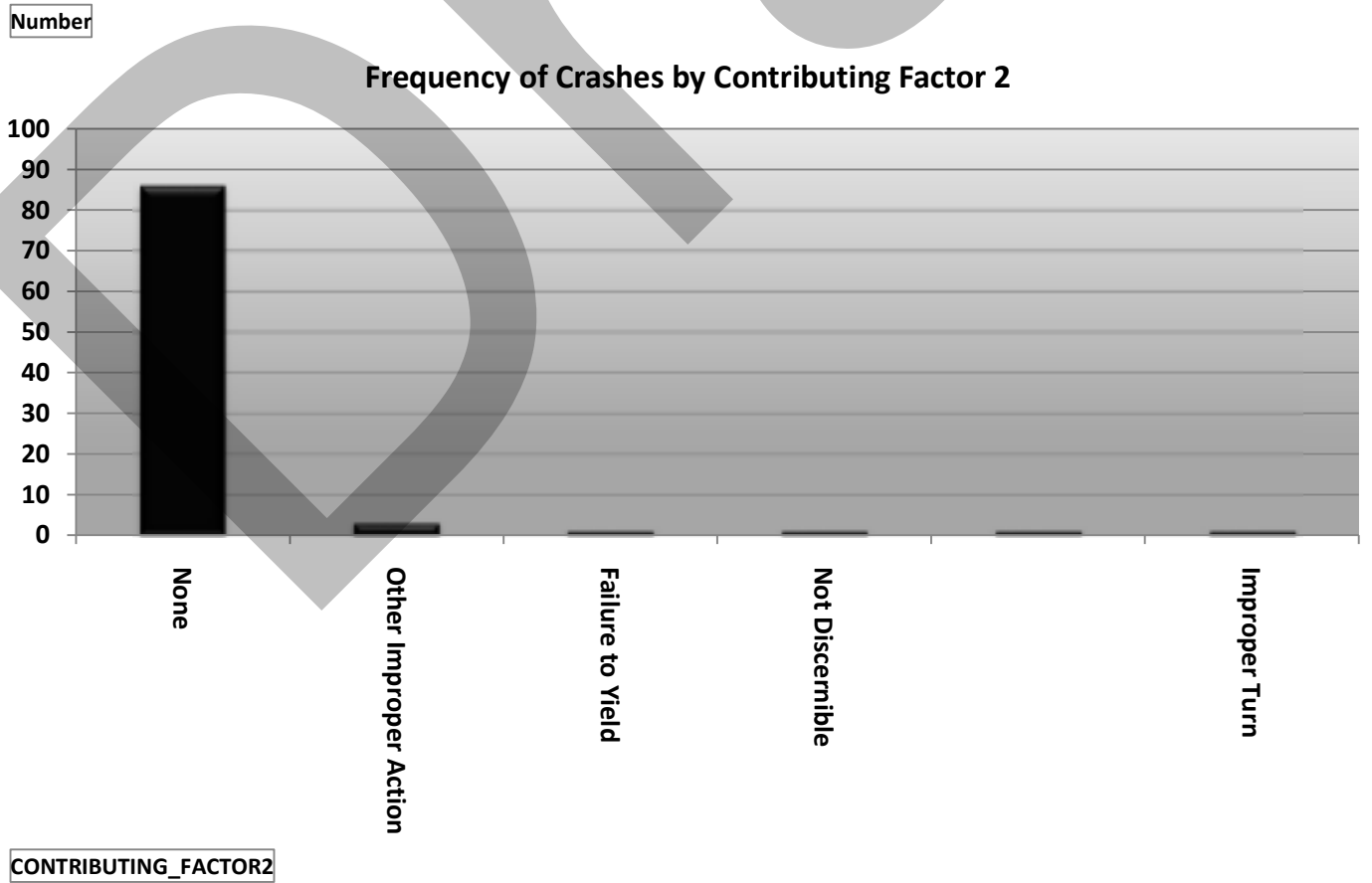


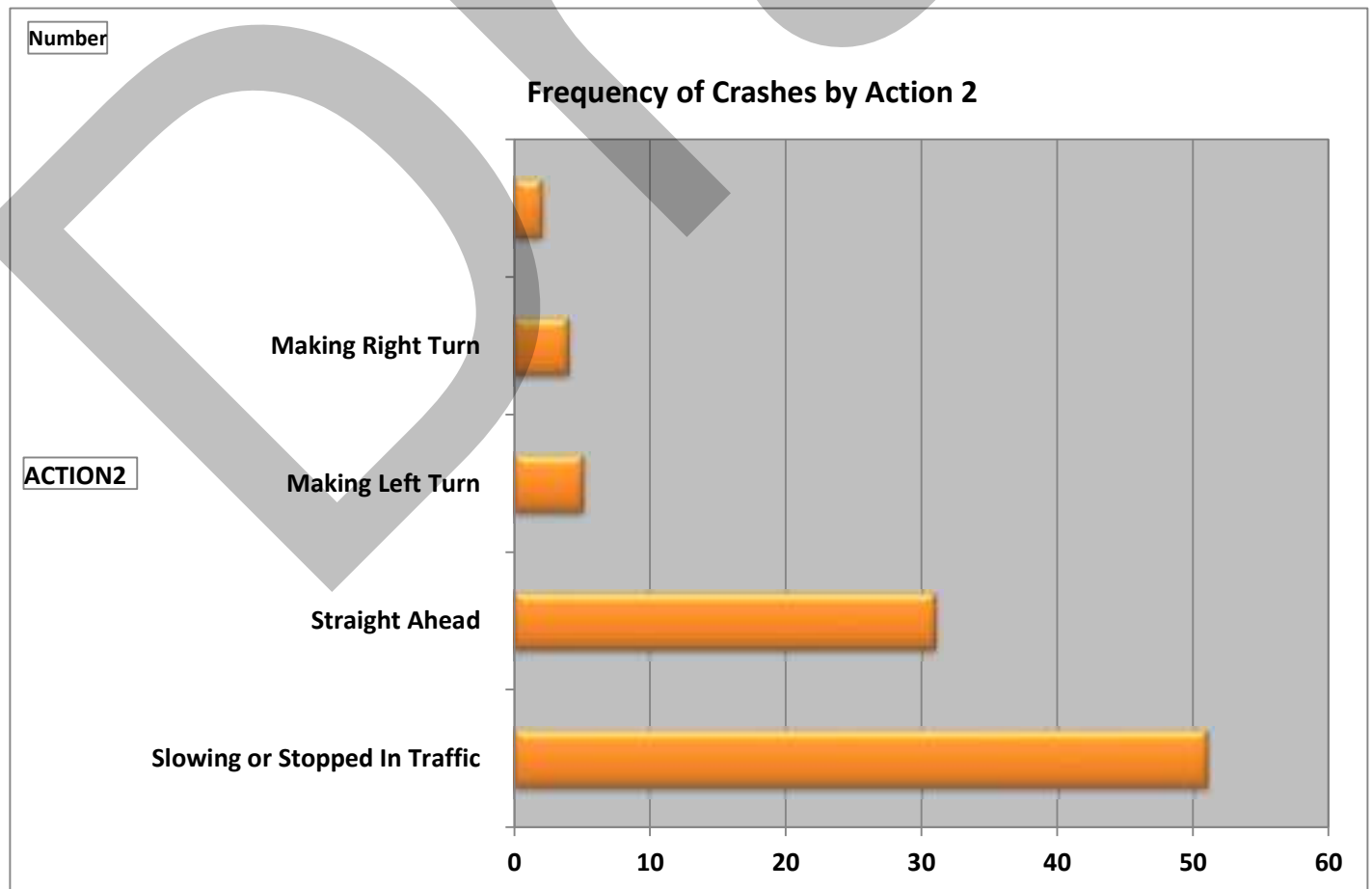
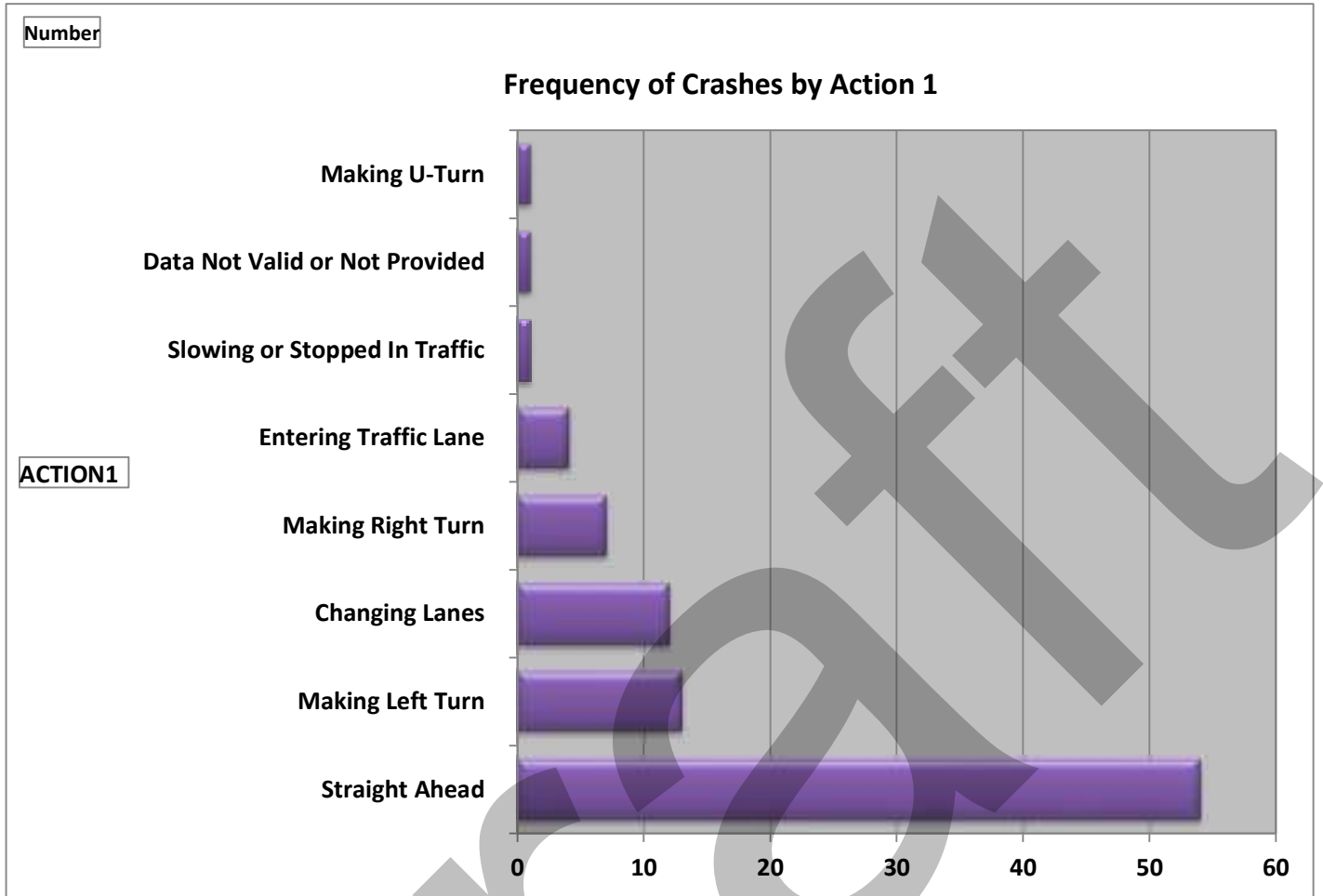


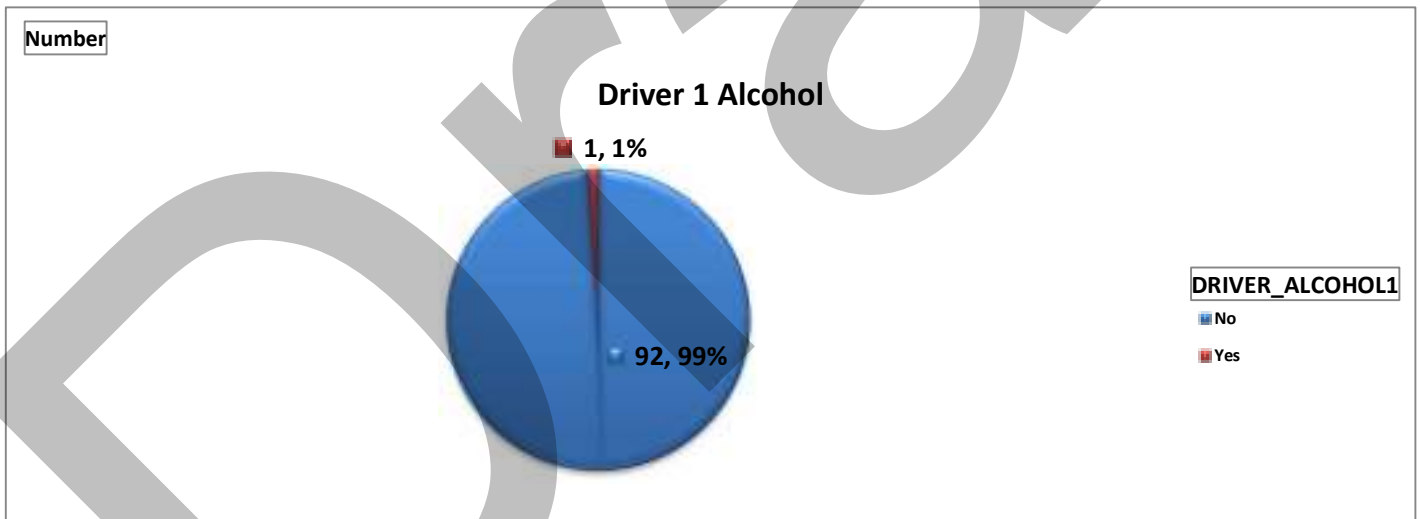
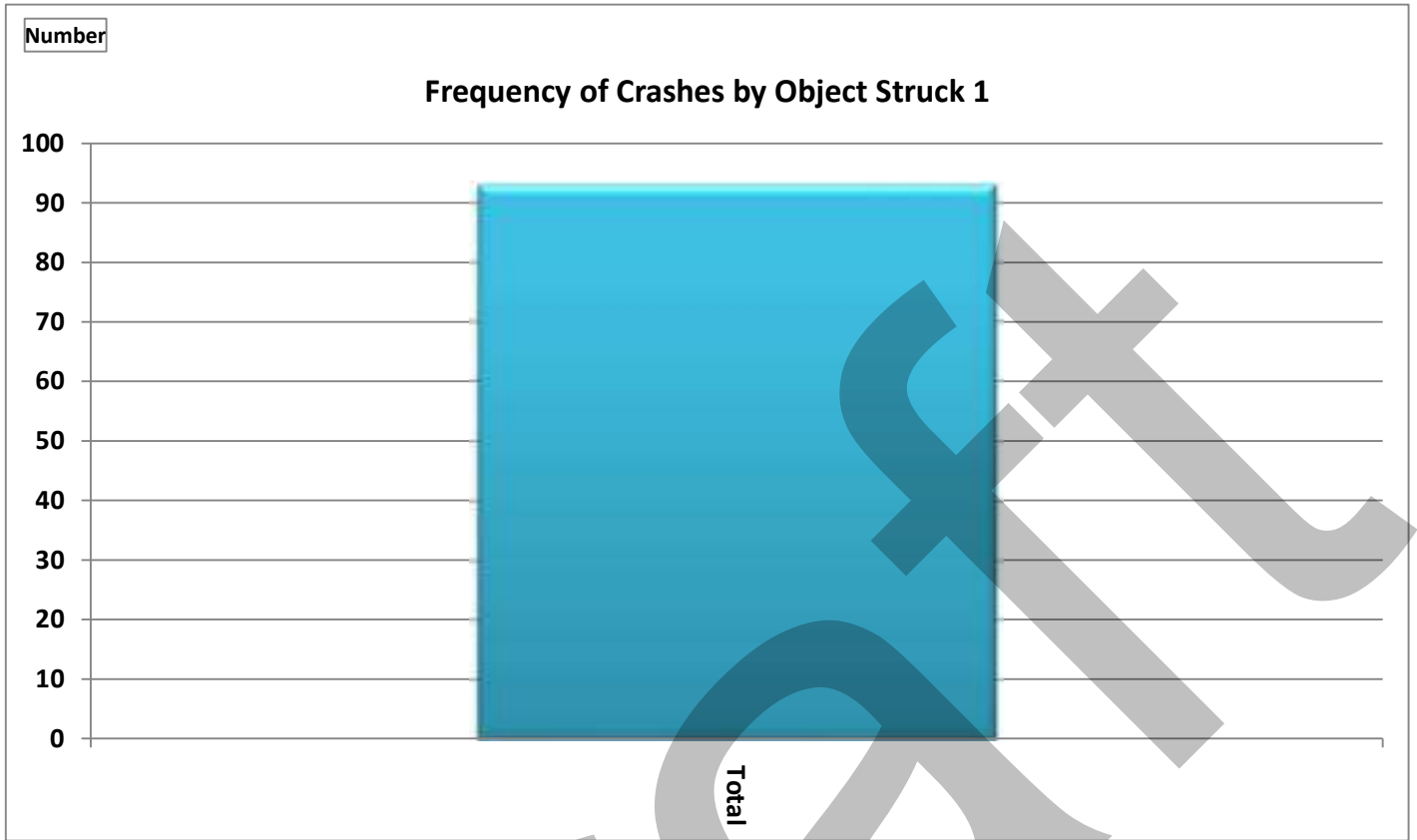
Frequency of Crashes by Contributing Factor 1

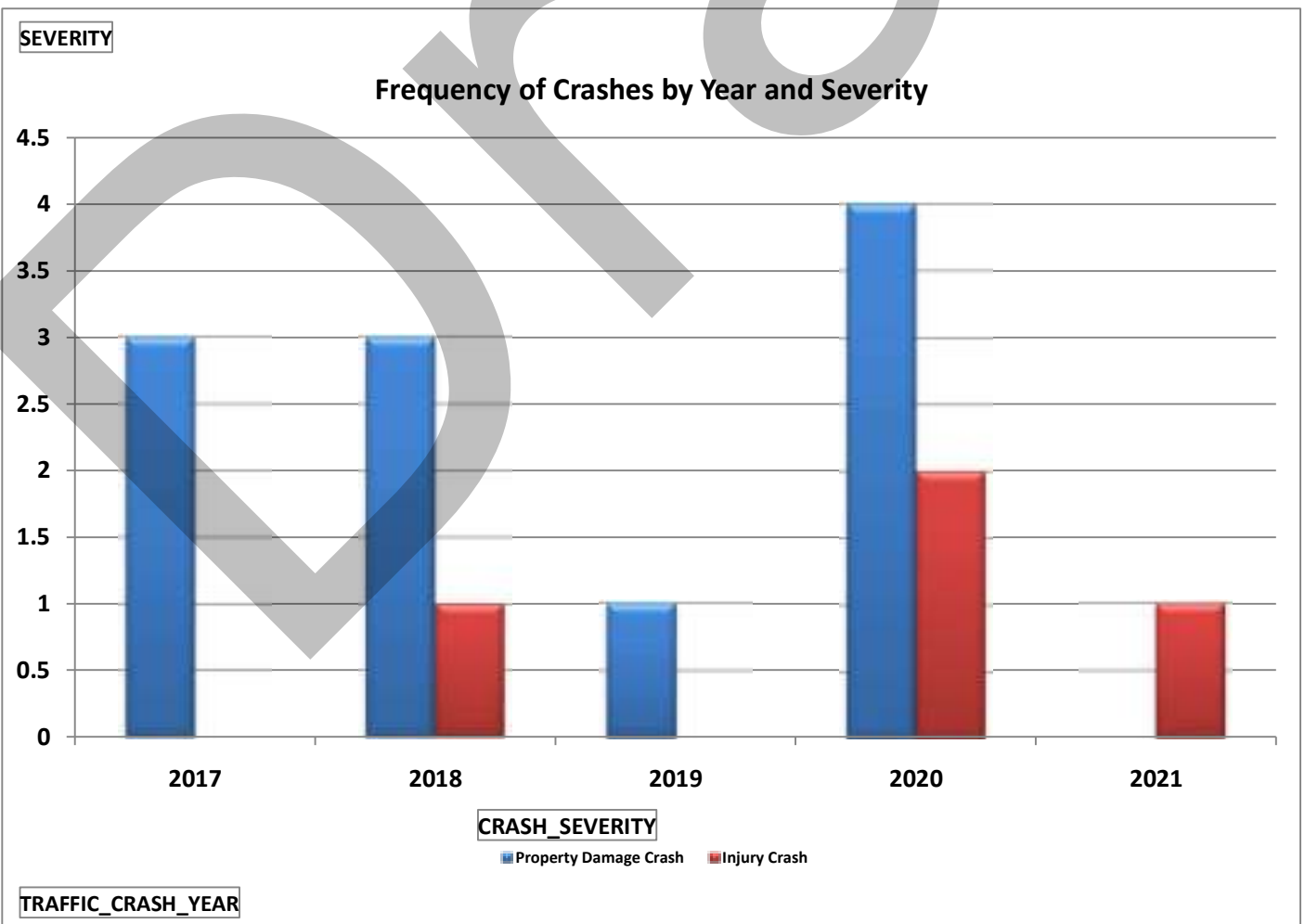
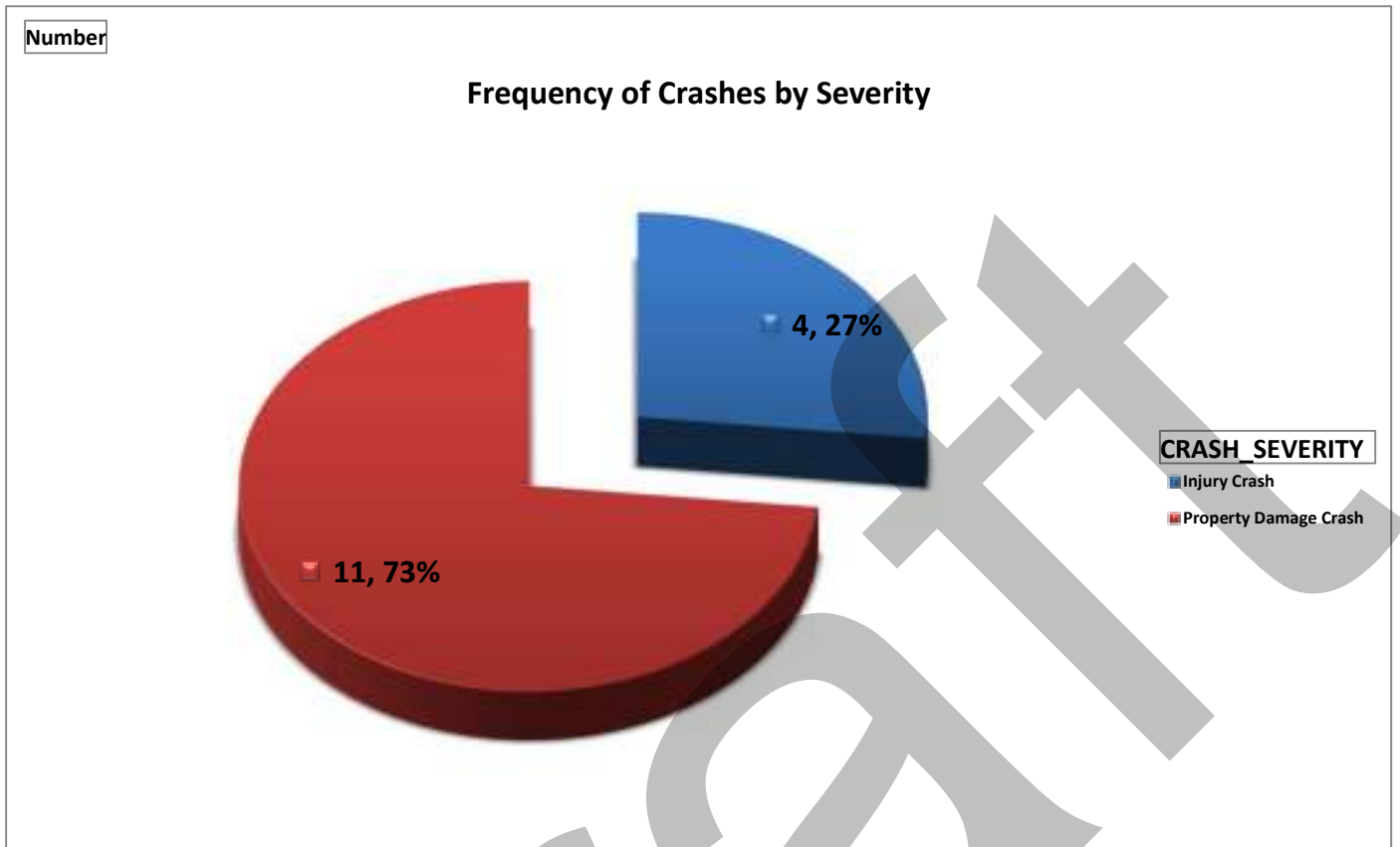


Frequency of Crashes by Contributing Factor 2

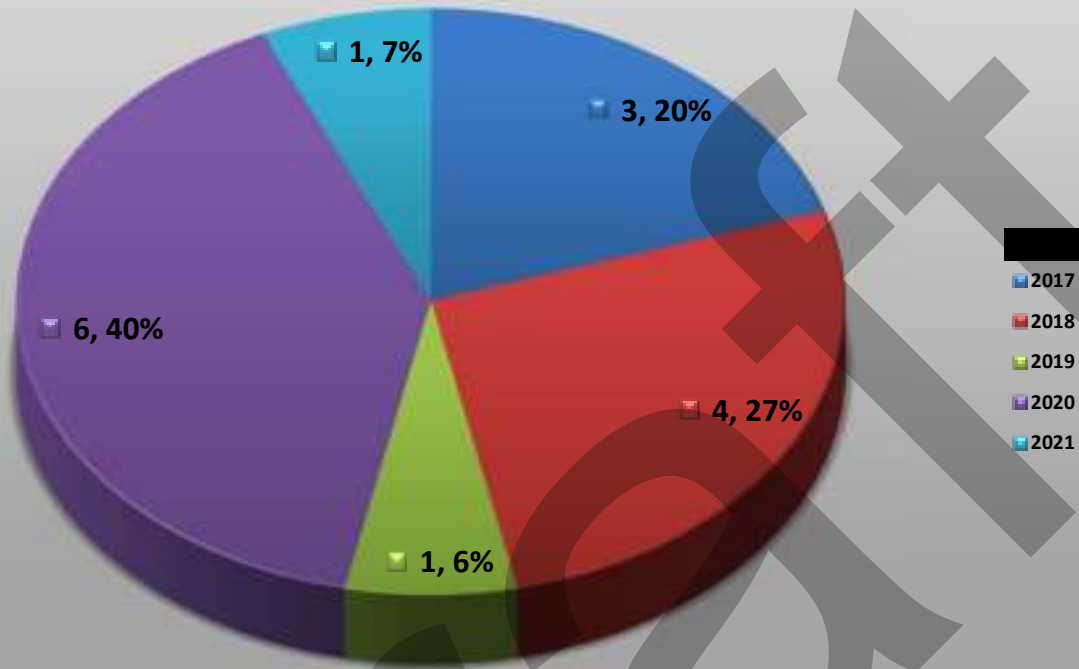








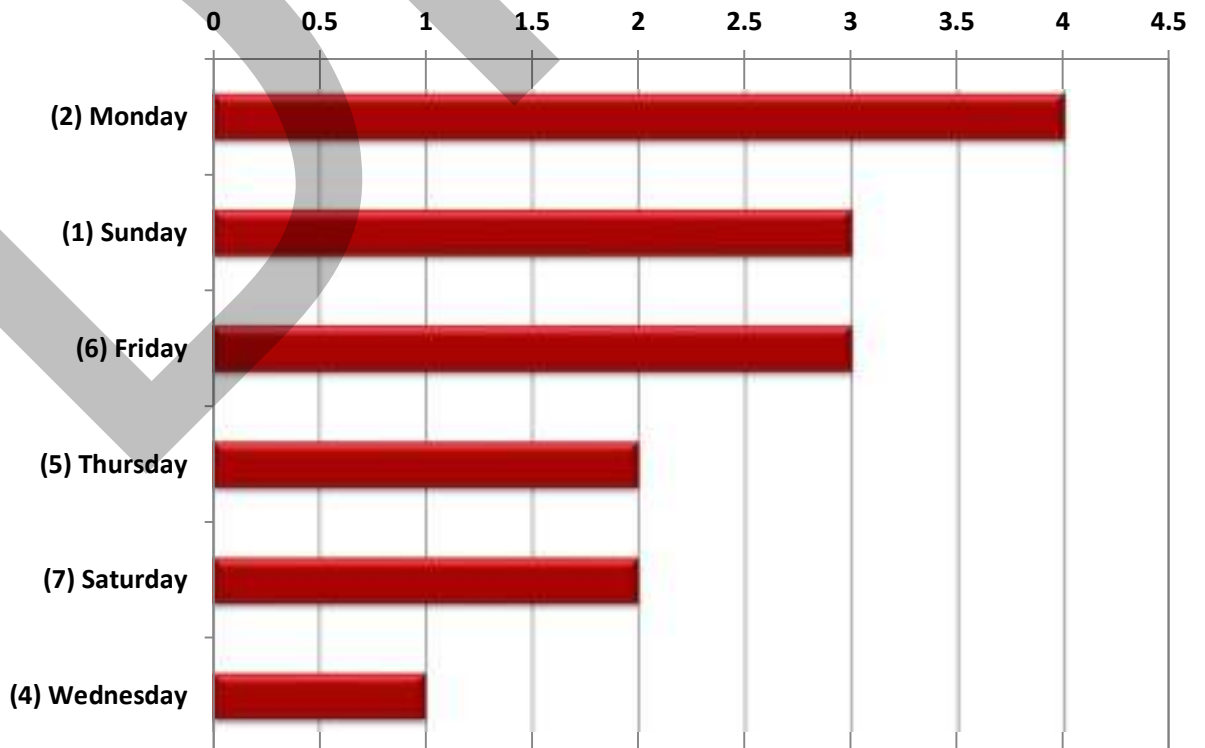
Frequency of Crashes by Year



Frequency of Crashes by Day of the Week

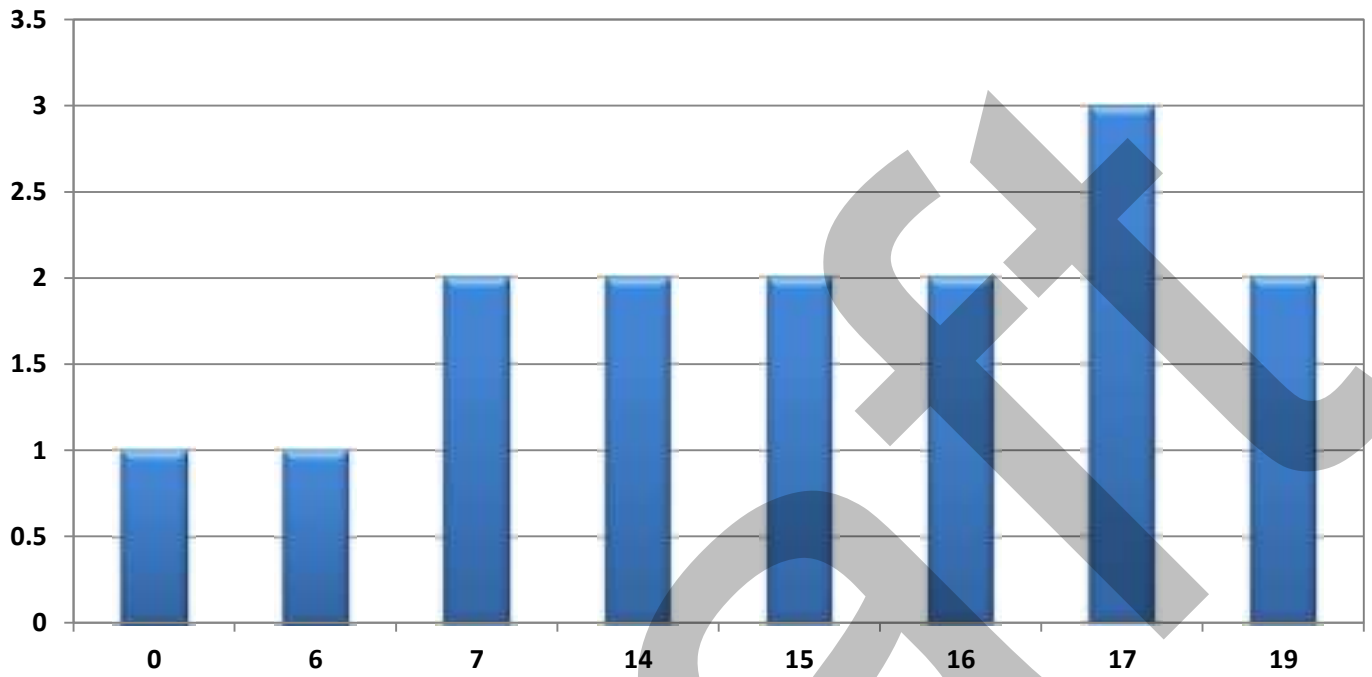
Number

DAY_OF_WEEK



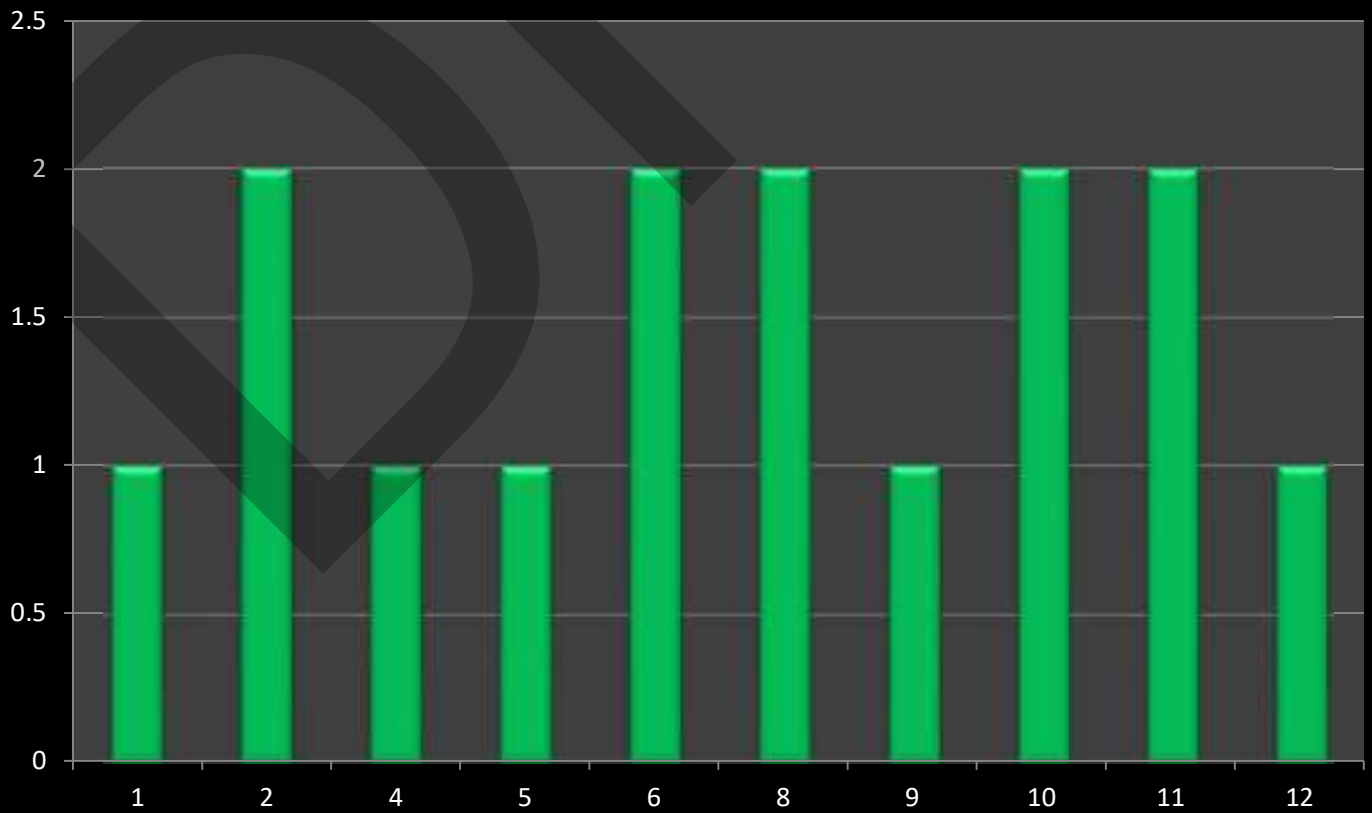


Frequency of Crashes by Hour

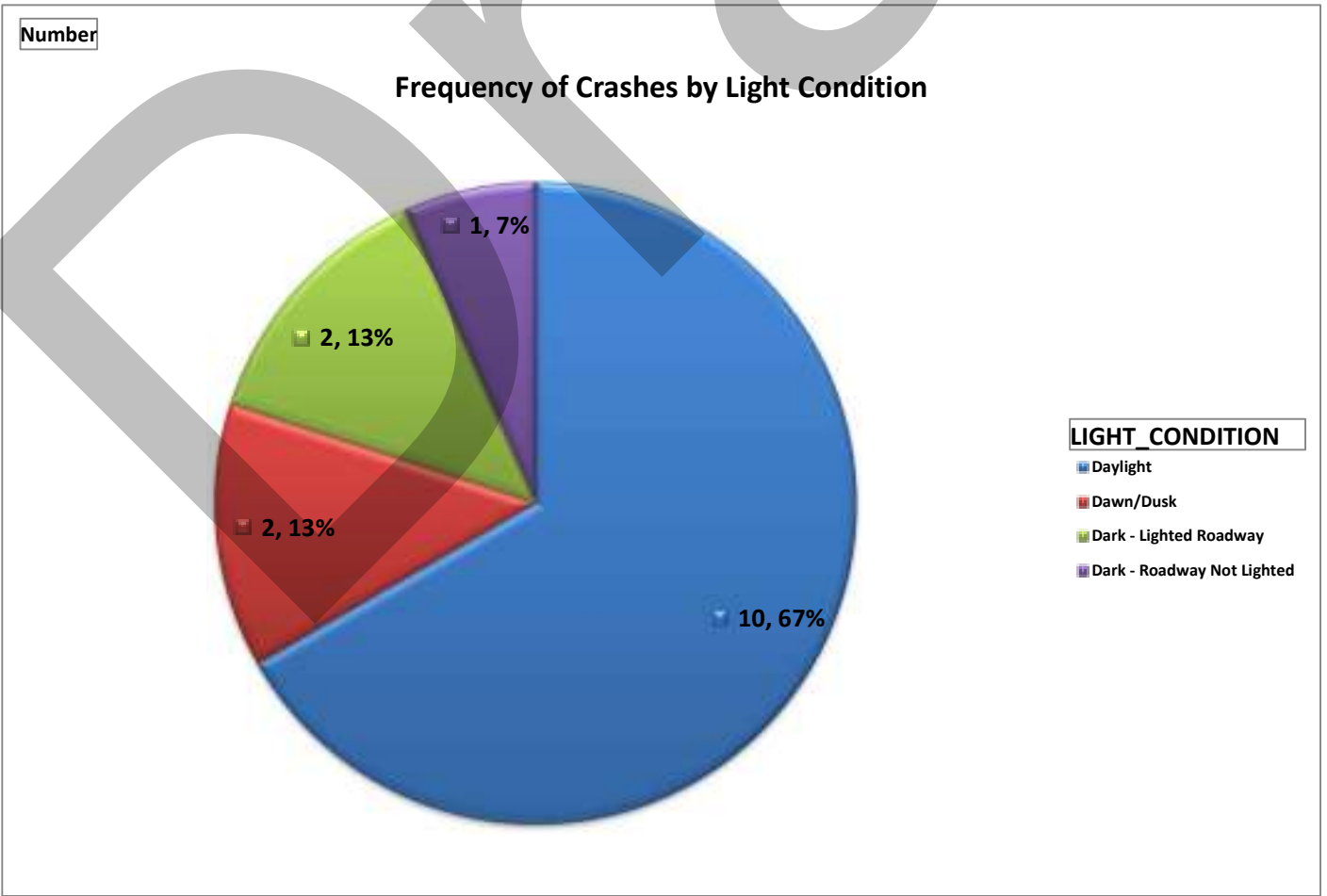
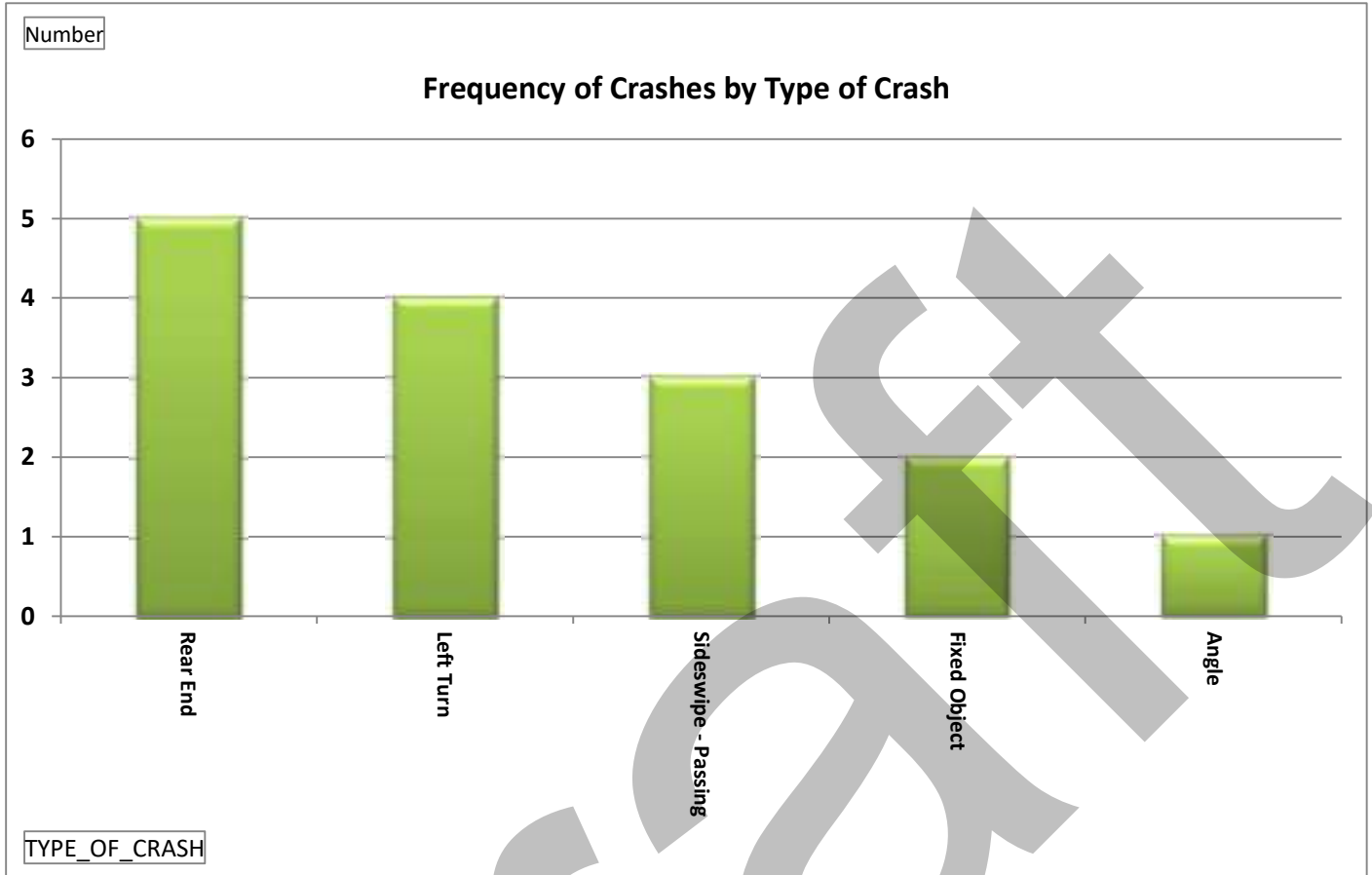


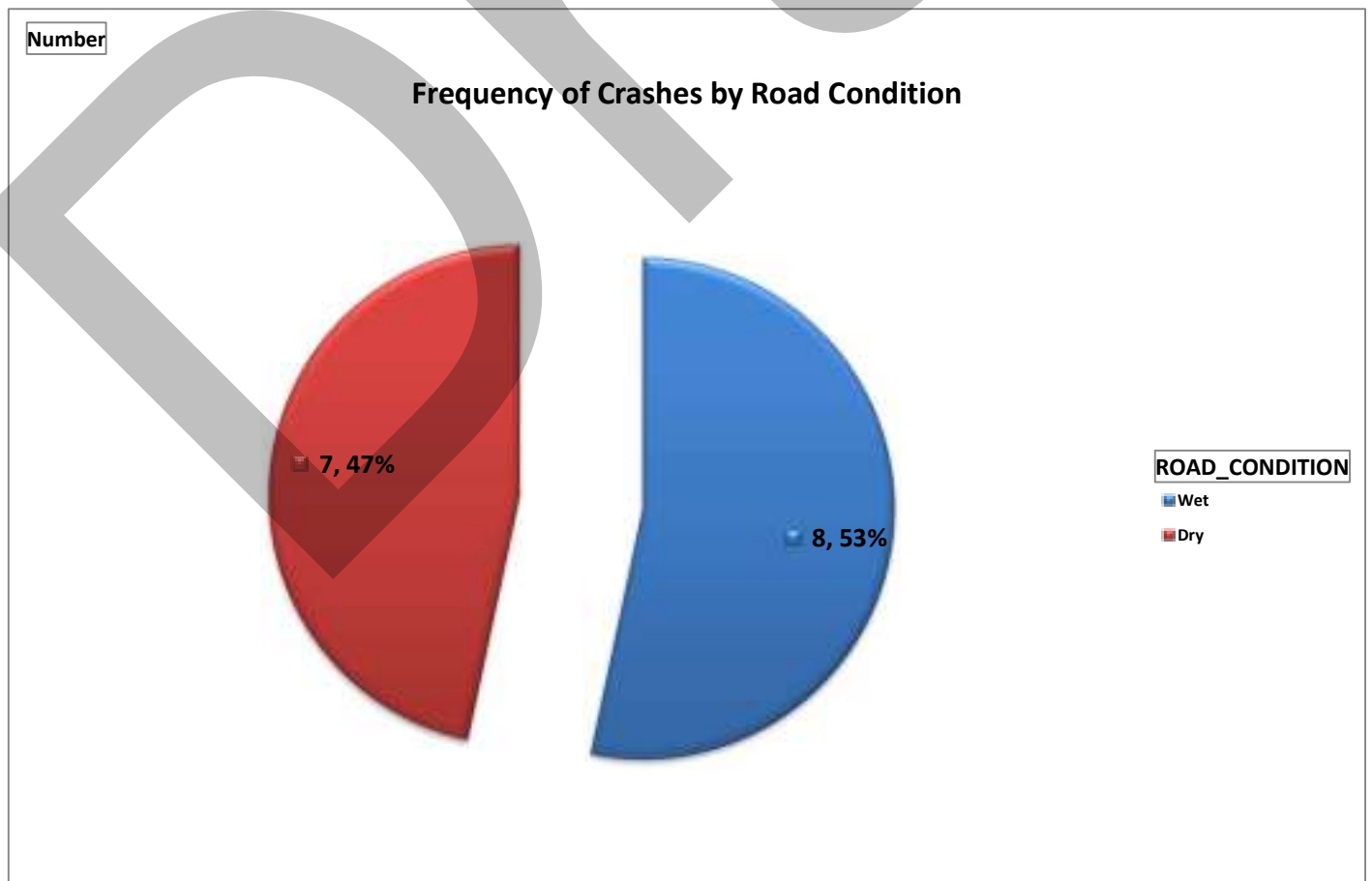
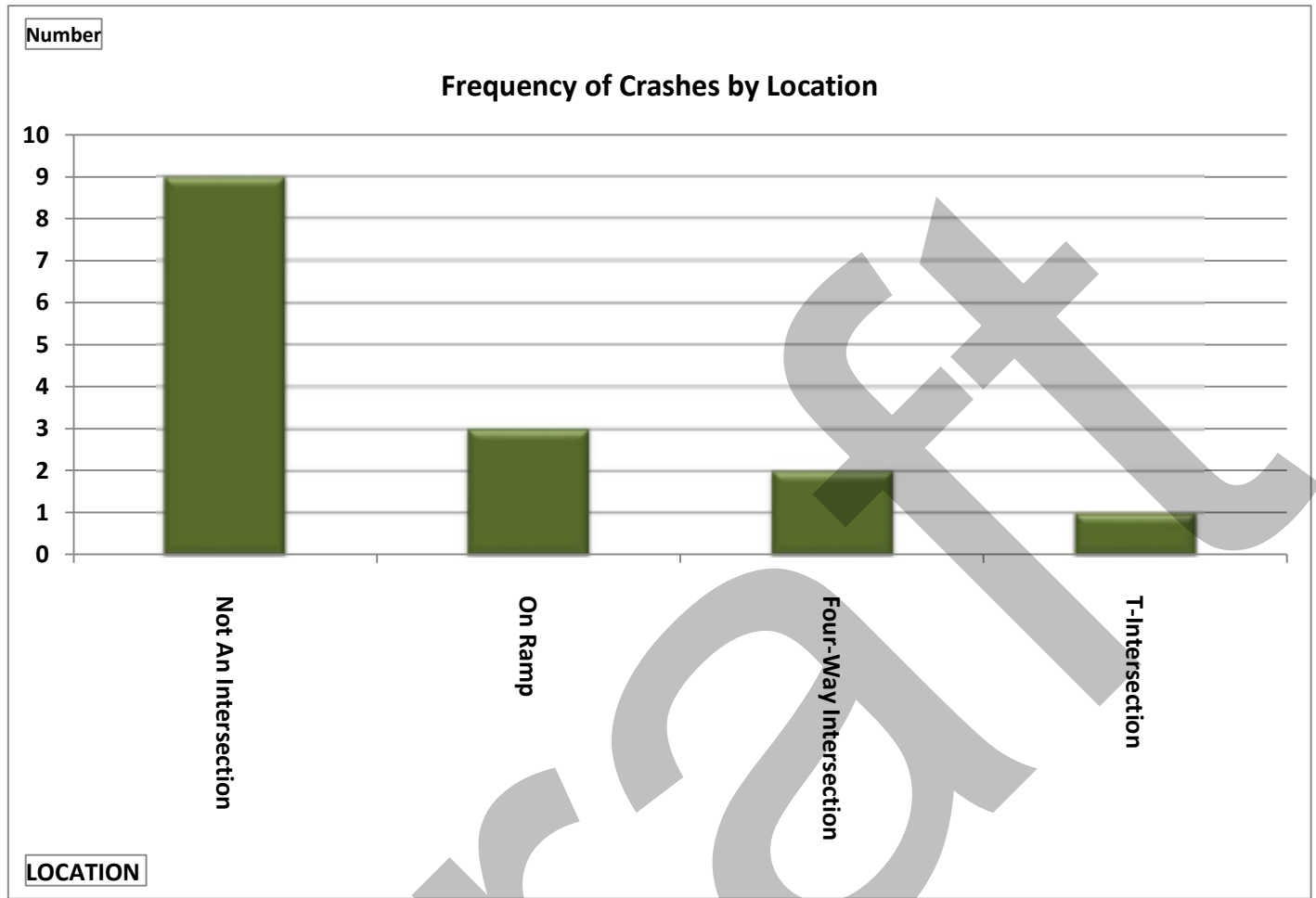
Number

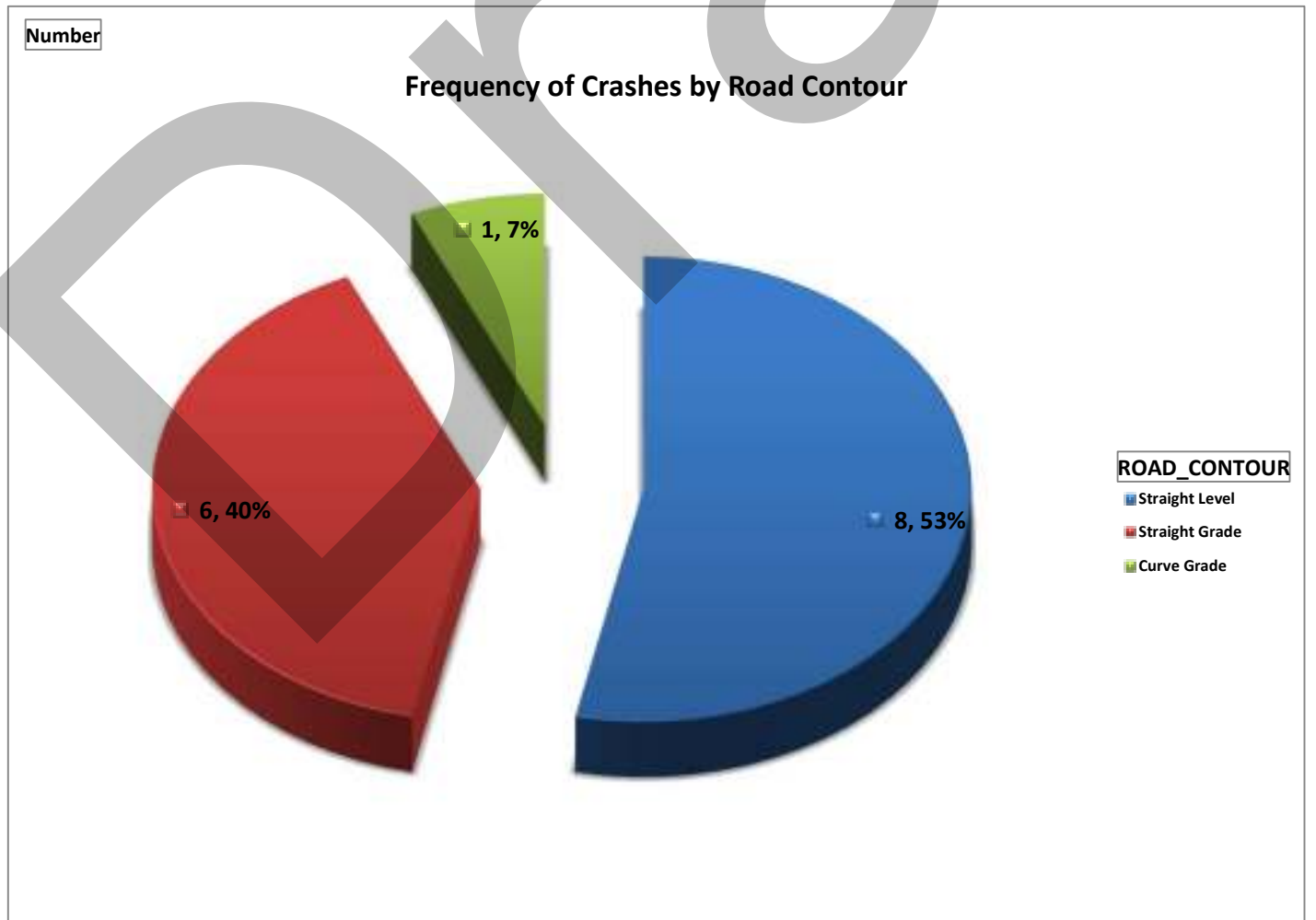
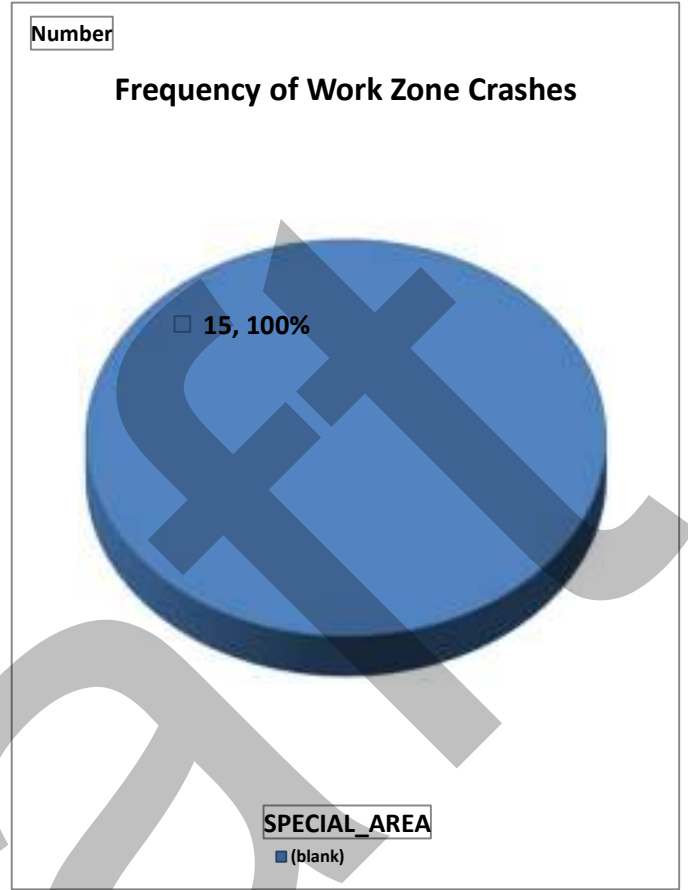
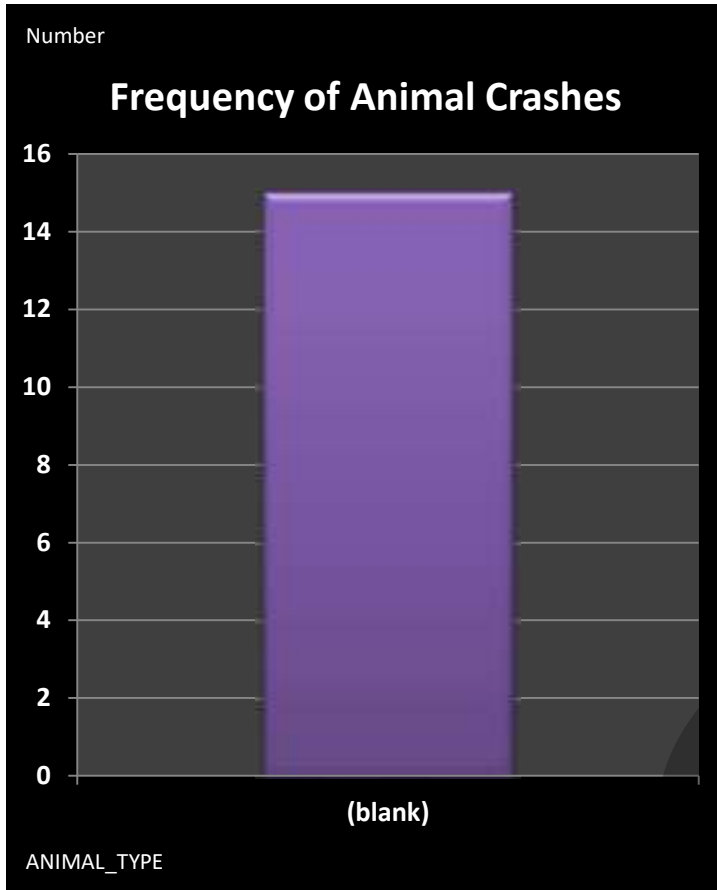
Frequency of Crashes by Month



CRASH_MONTH_NBR

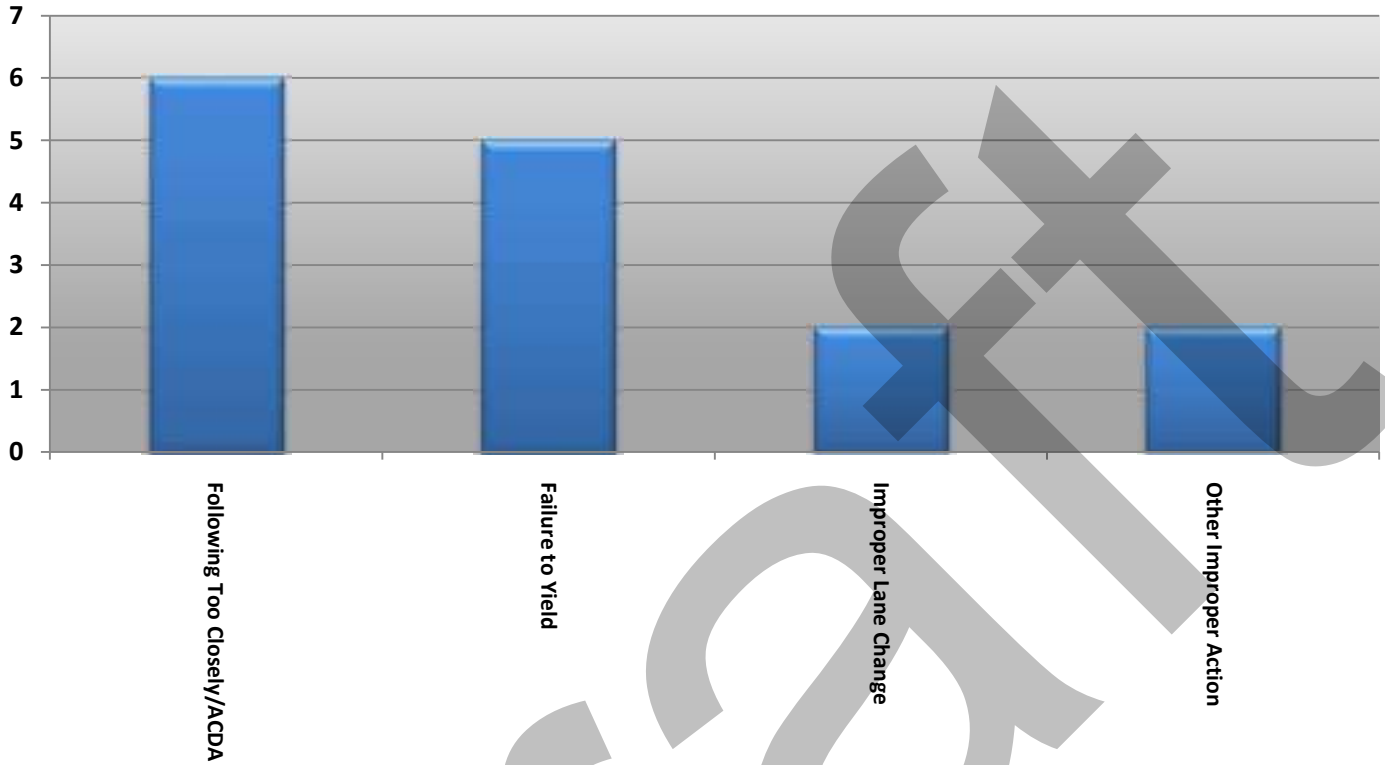






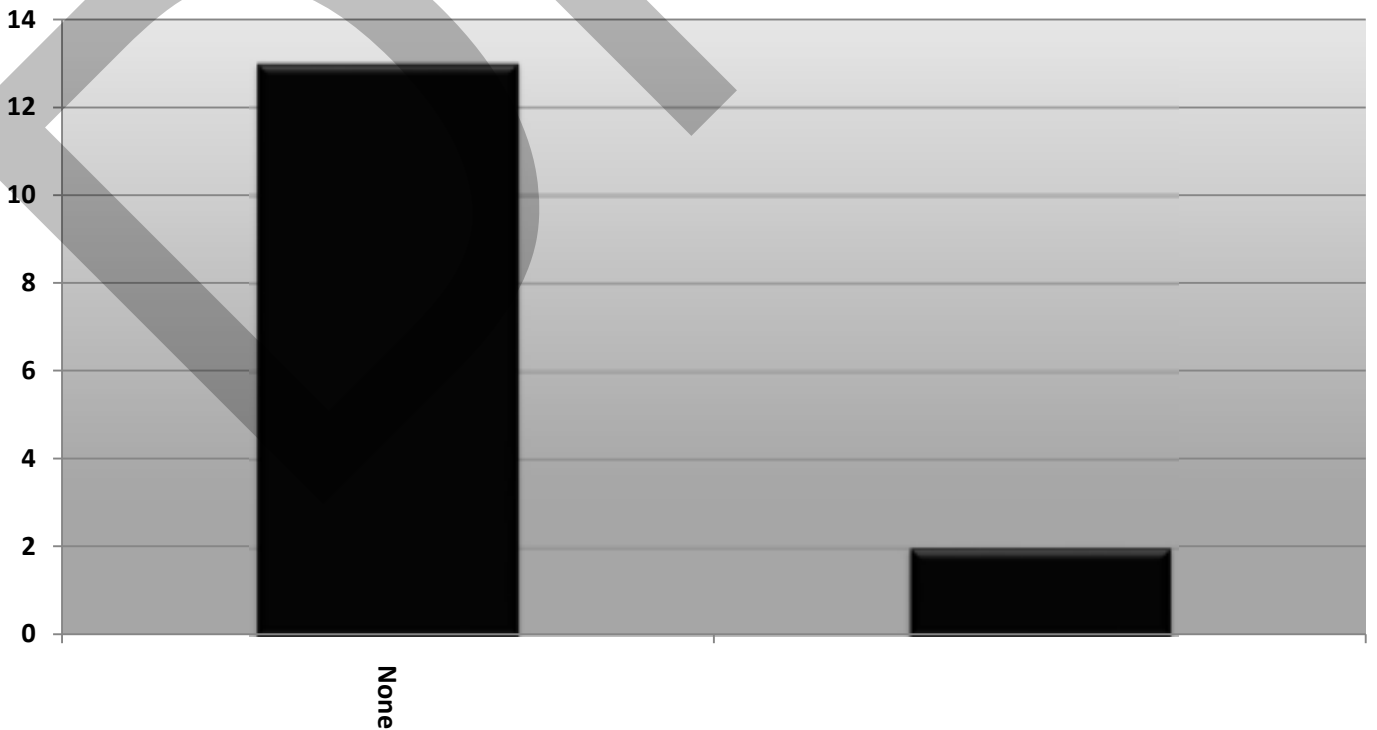


Frequency of Crashes by Contributing Factor 1

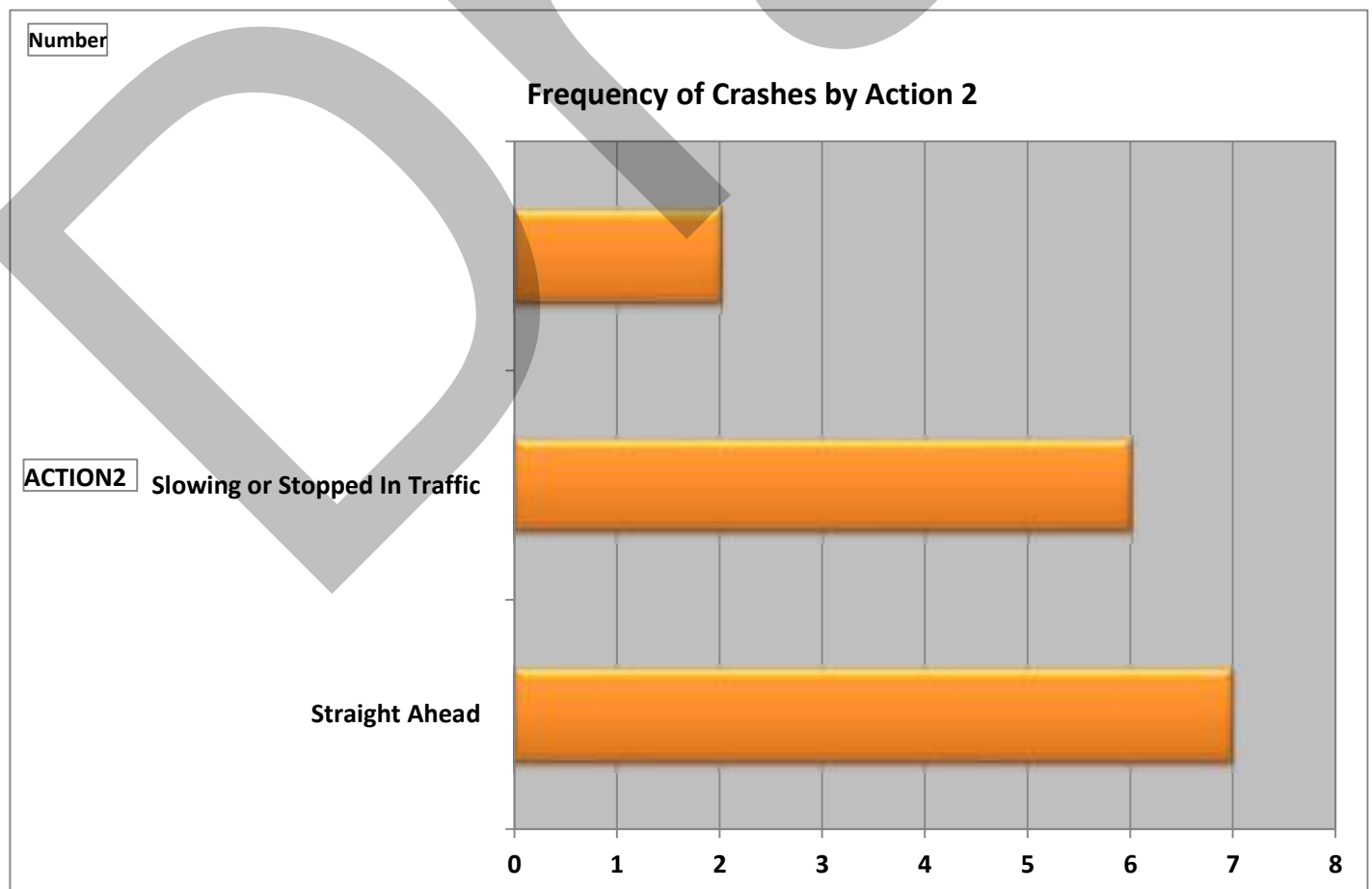
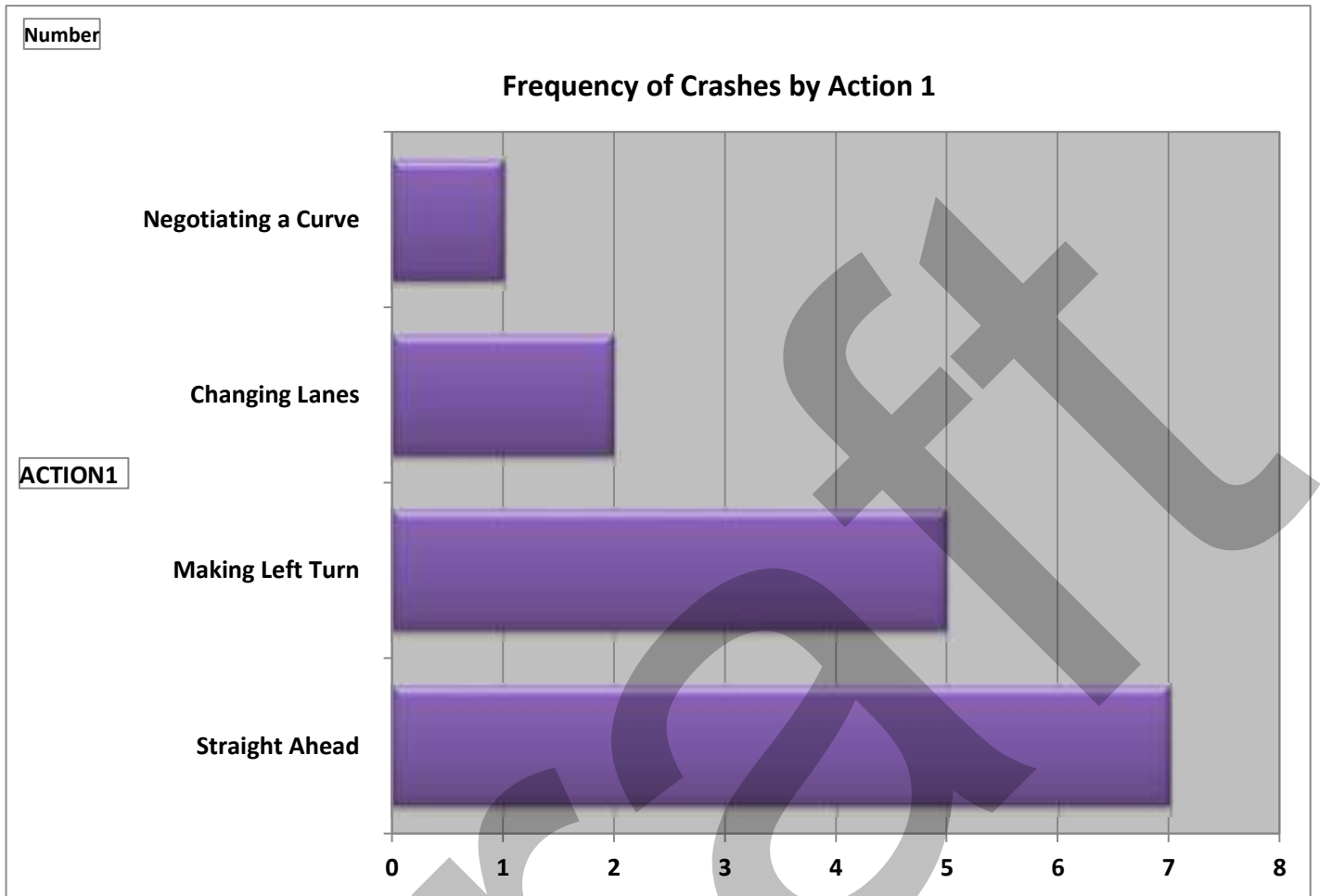


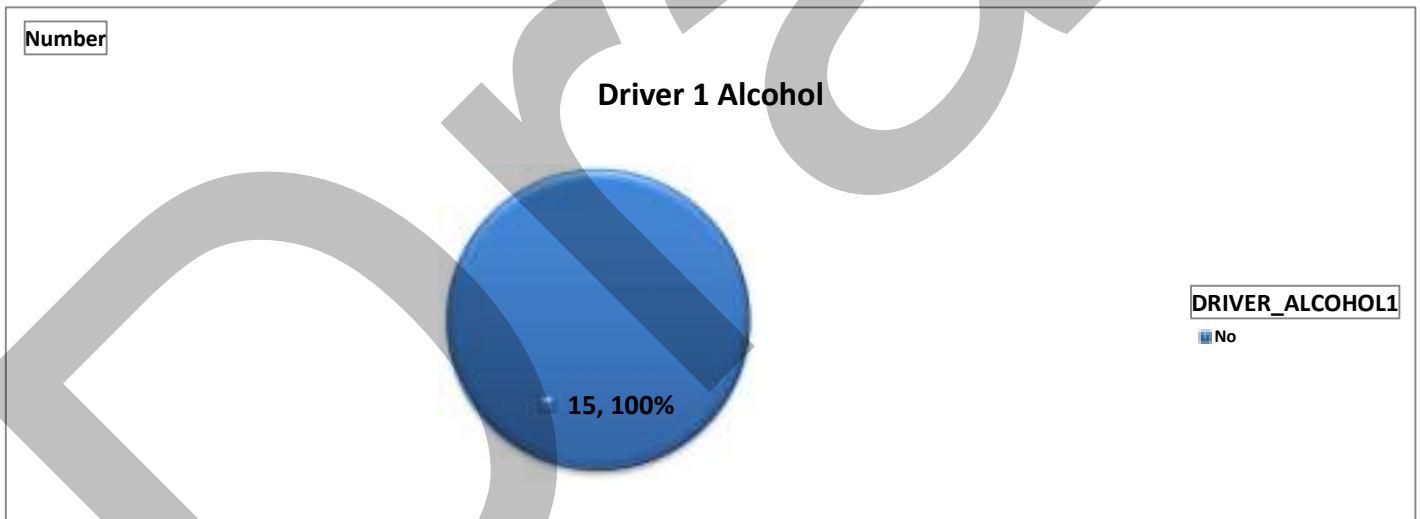
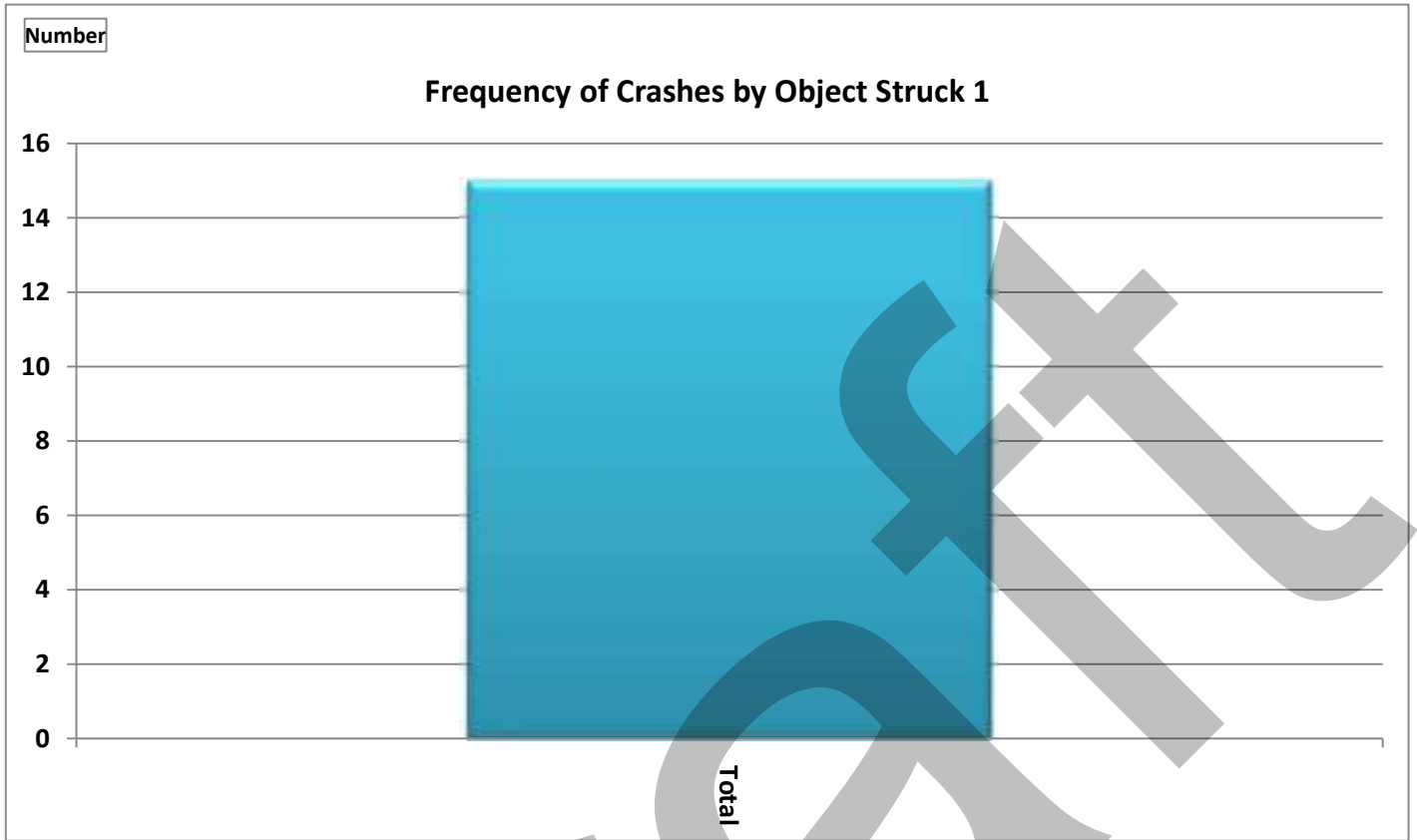
Number

Frequency of Crashes by Contributing Factor 2

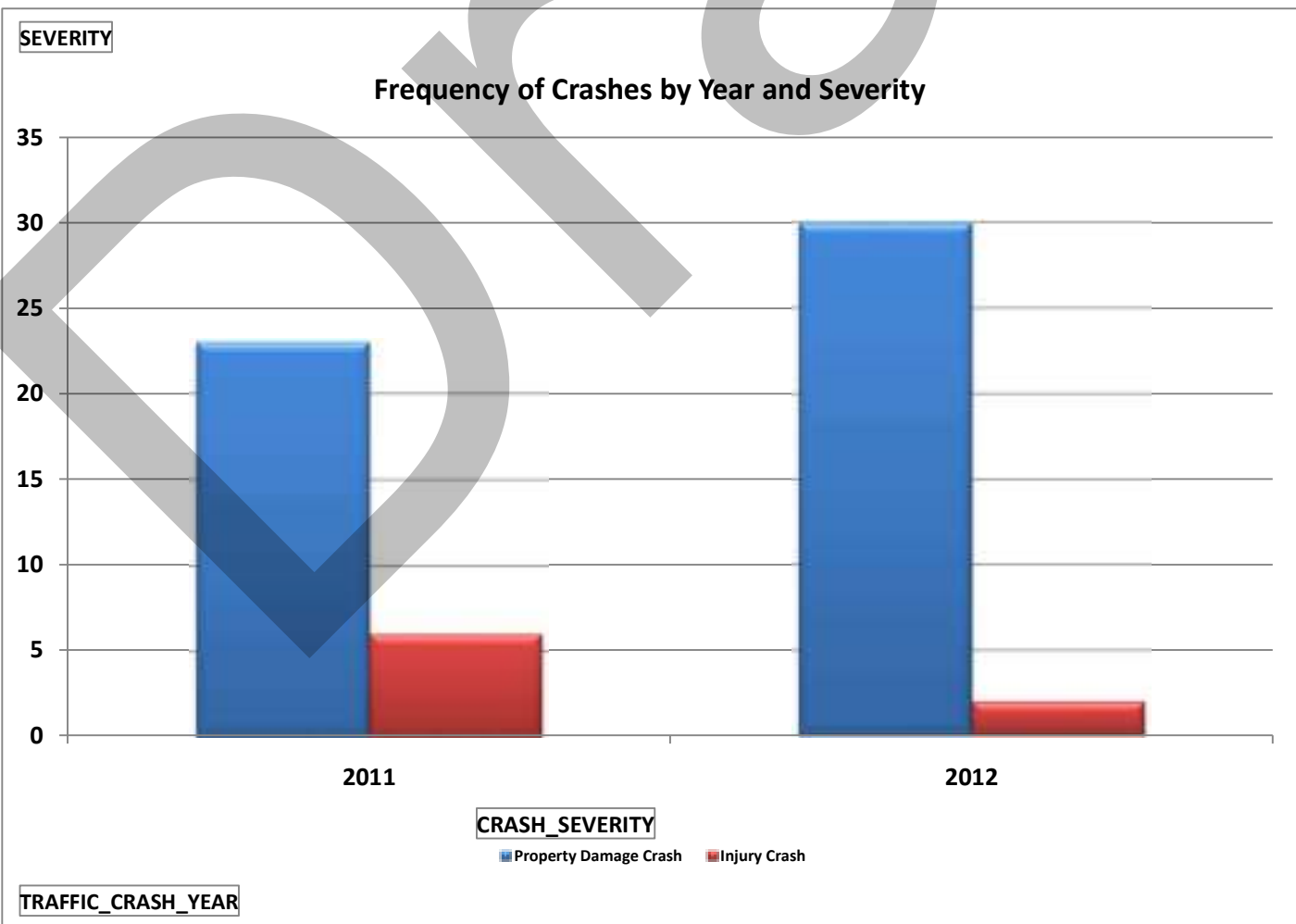
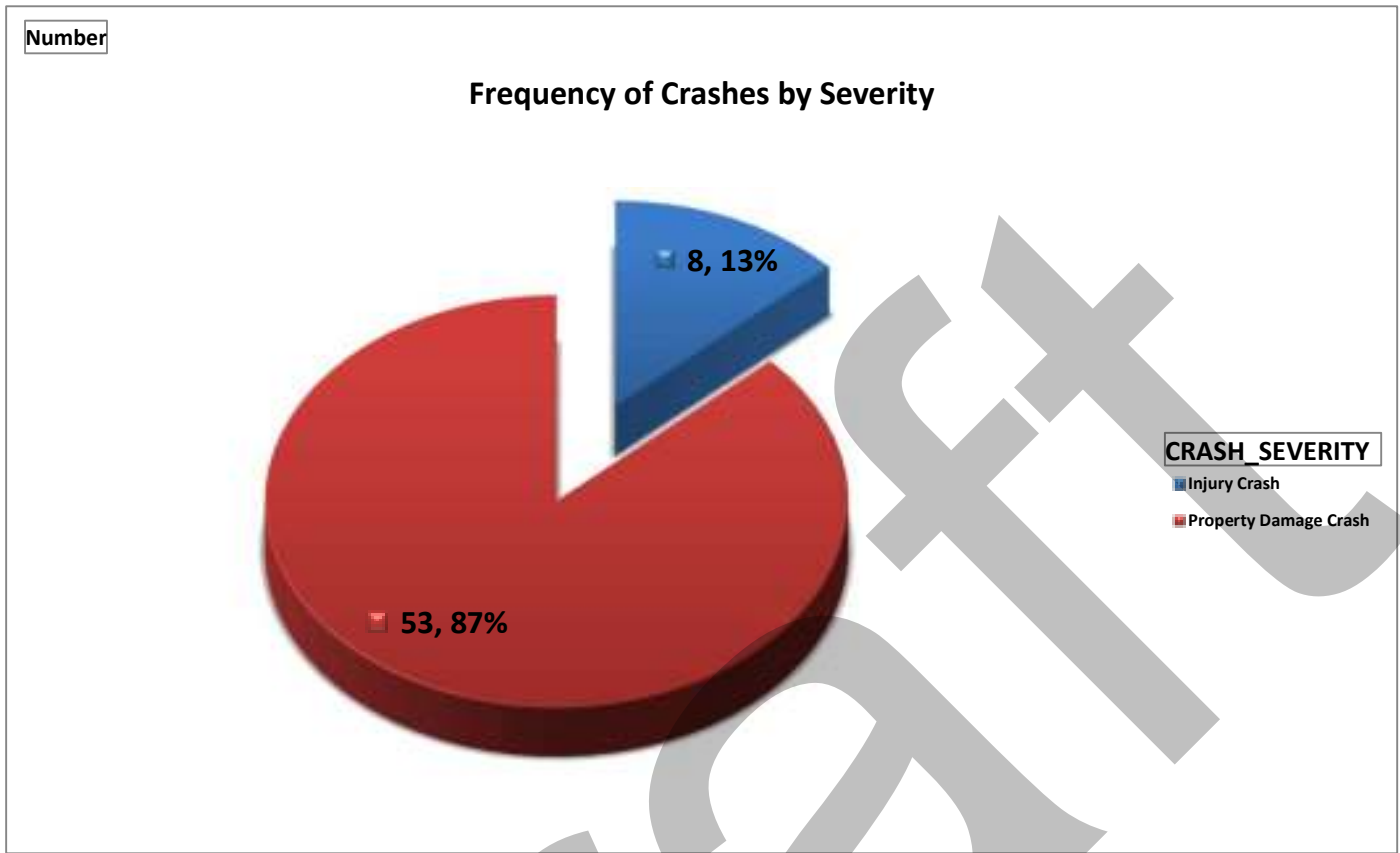


CONTRIBUTING_FACTOR2

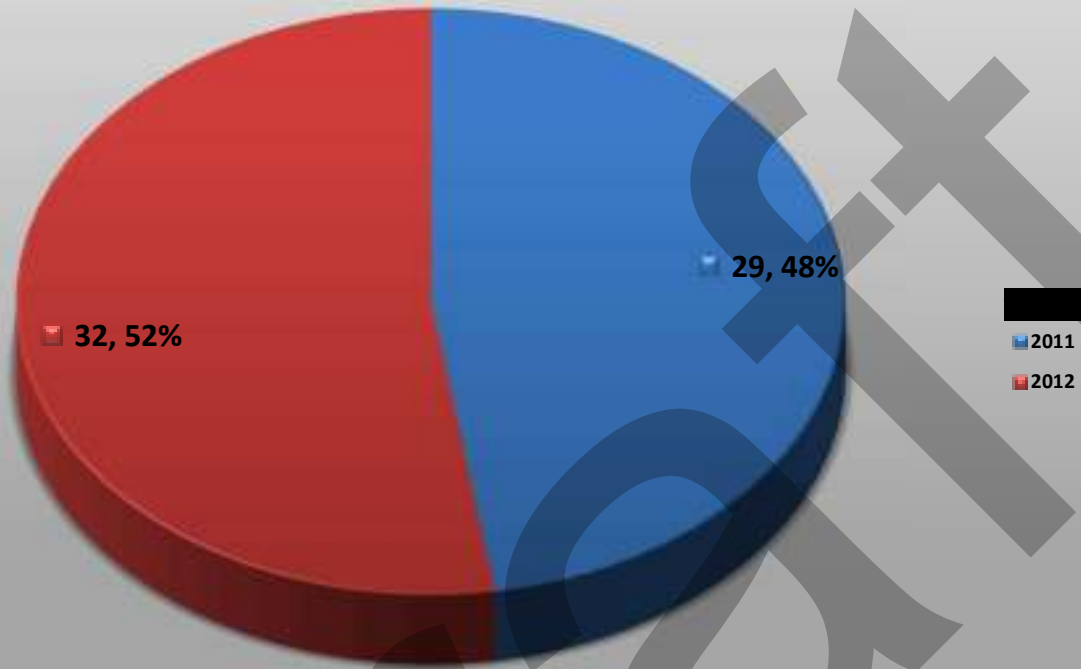




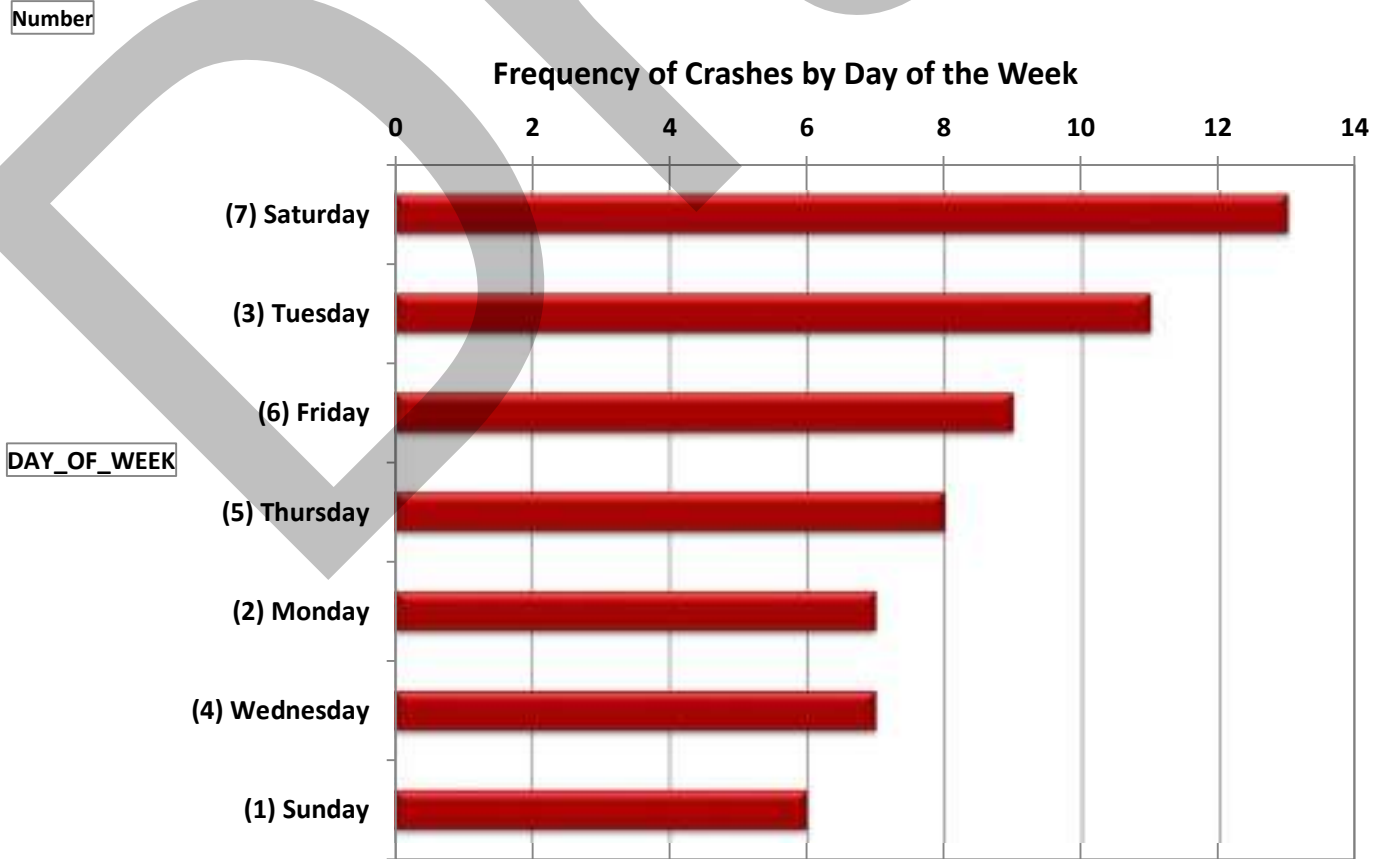
Kenwood Before Median



Frequency of Crashes by Year



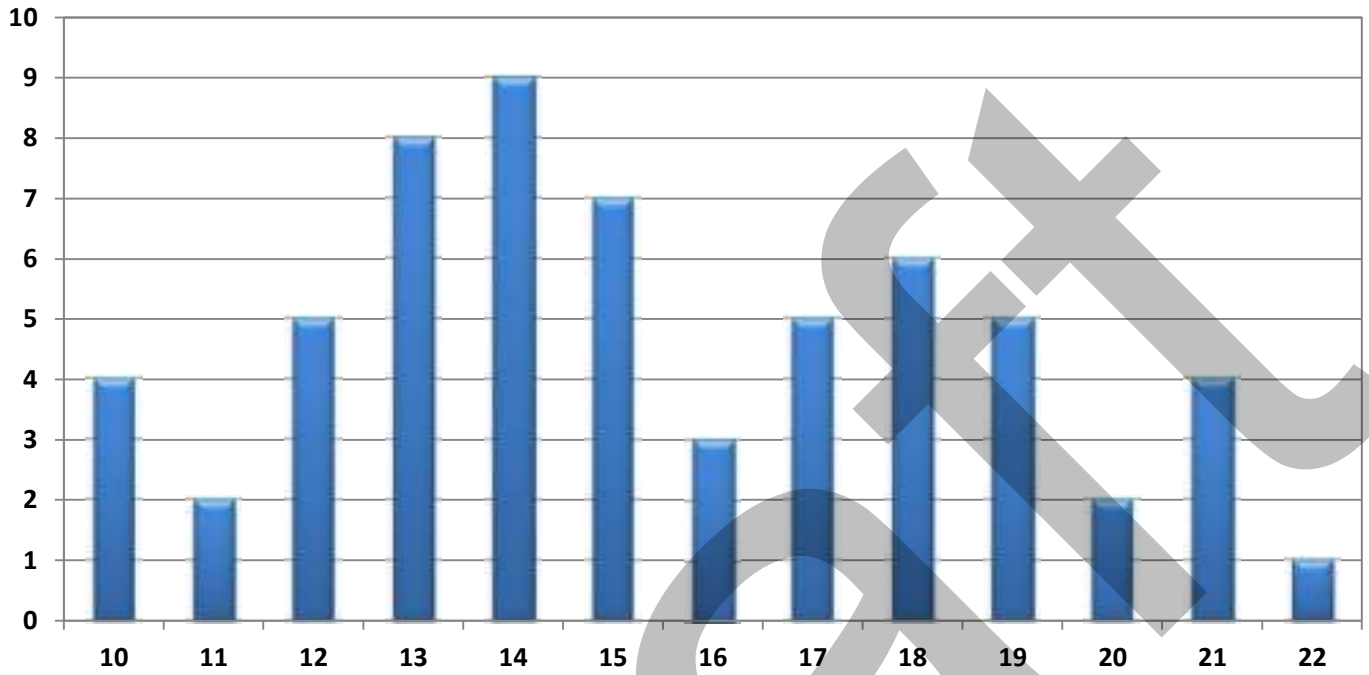
Frequency of Crashes by Day of the Week



Kenwood Before Median

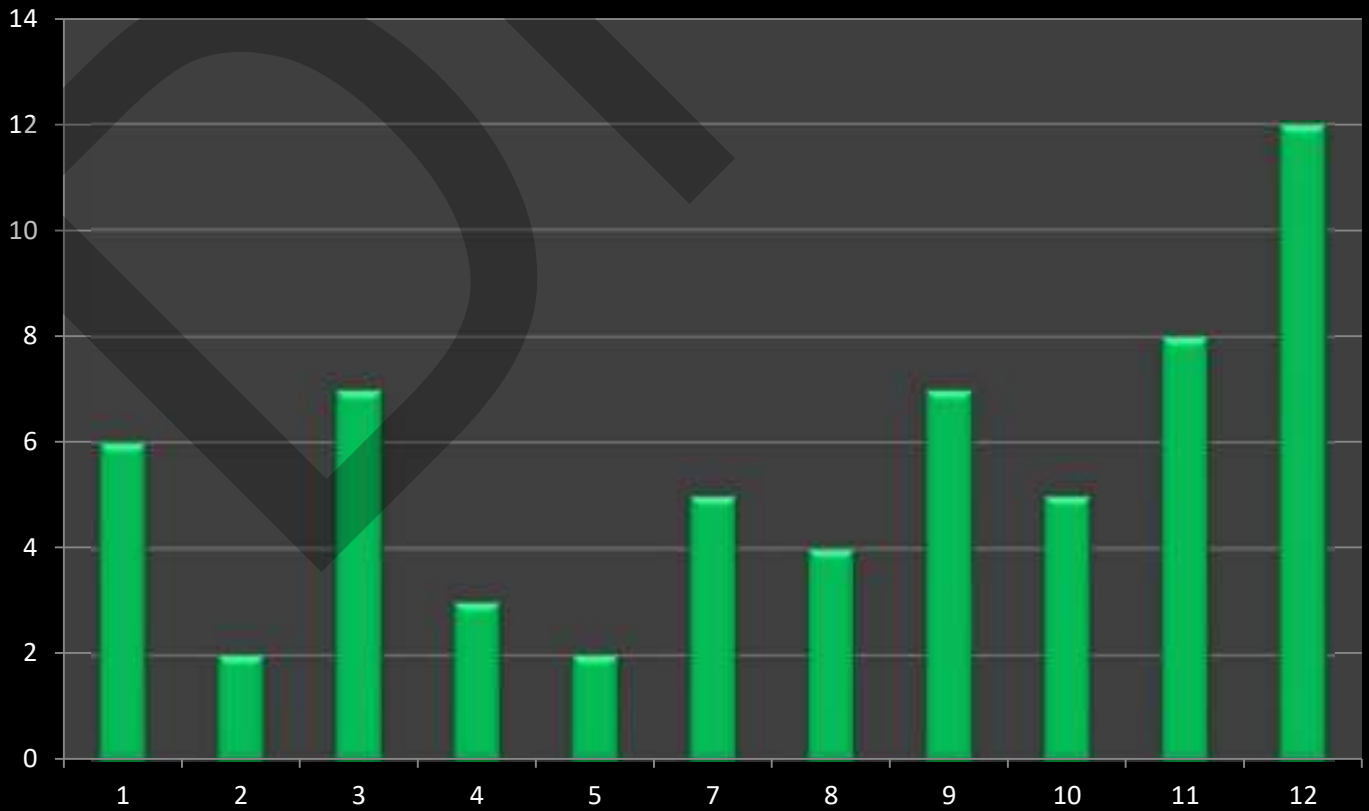


Frequency of Crashes by Hour



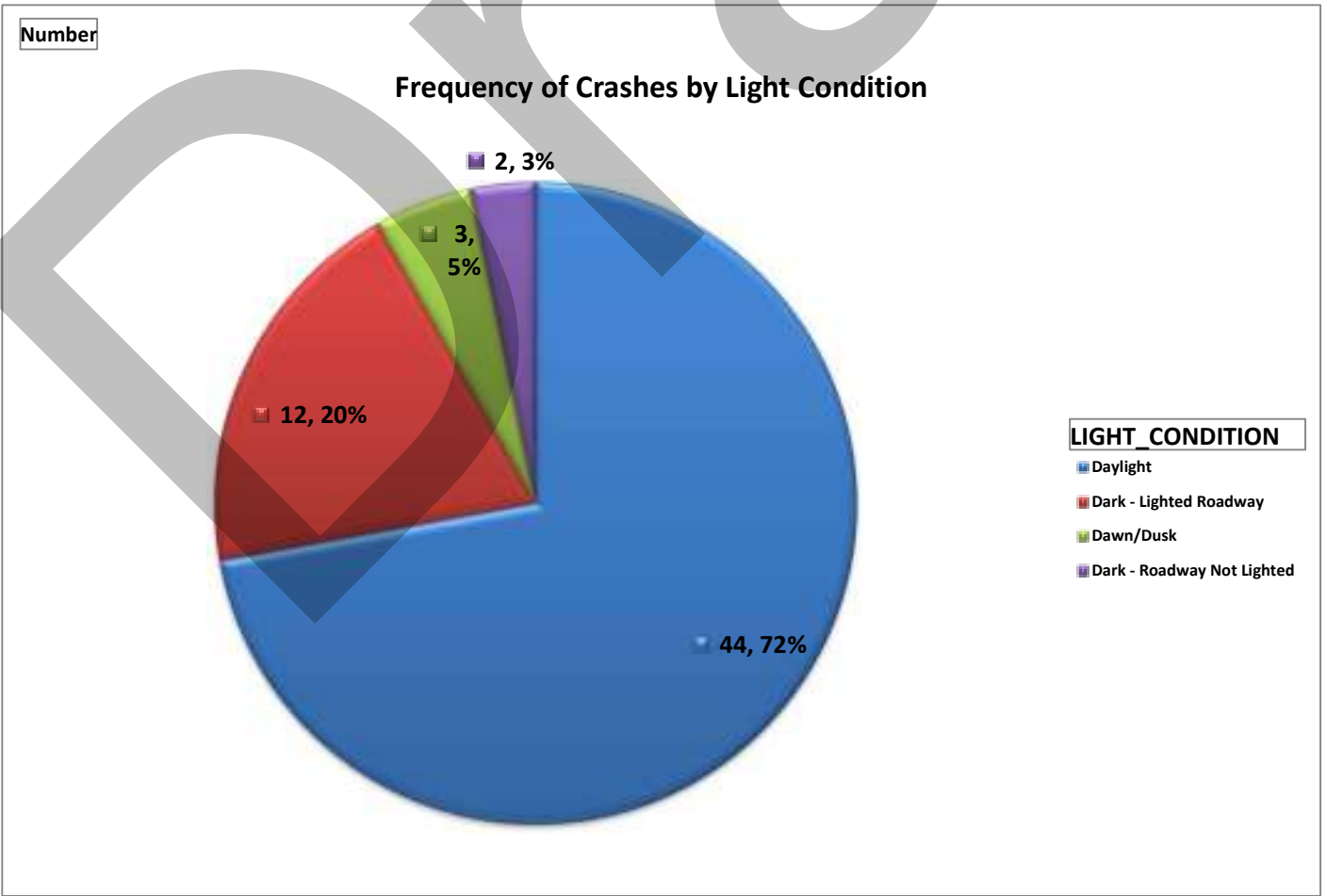
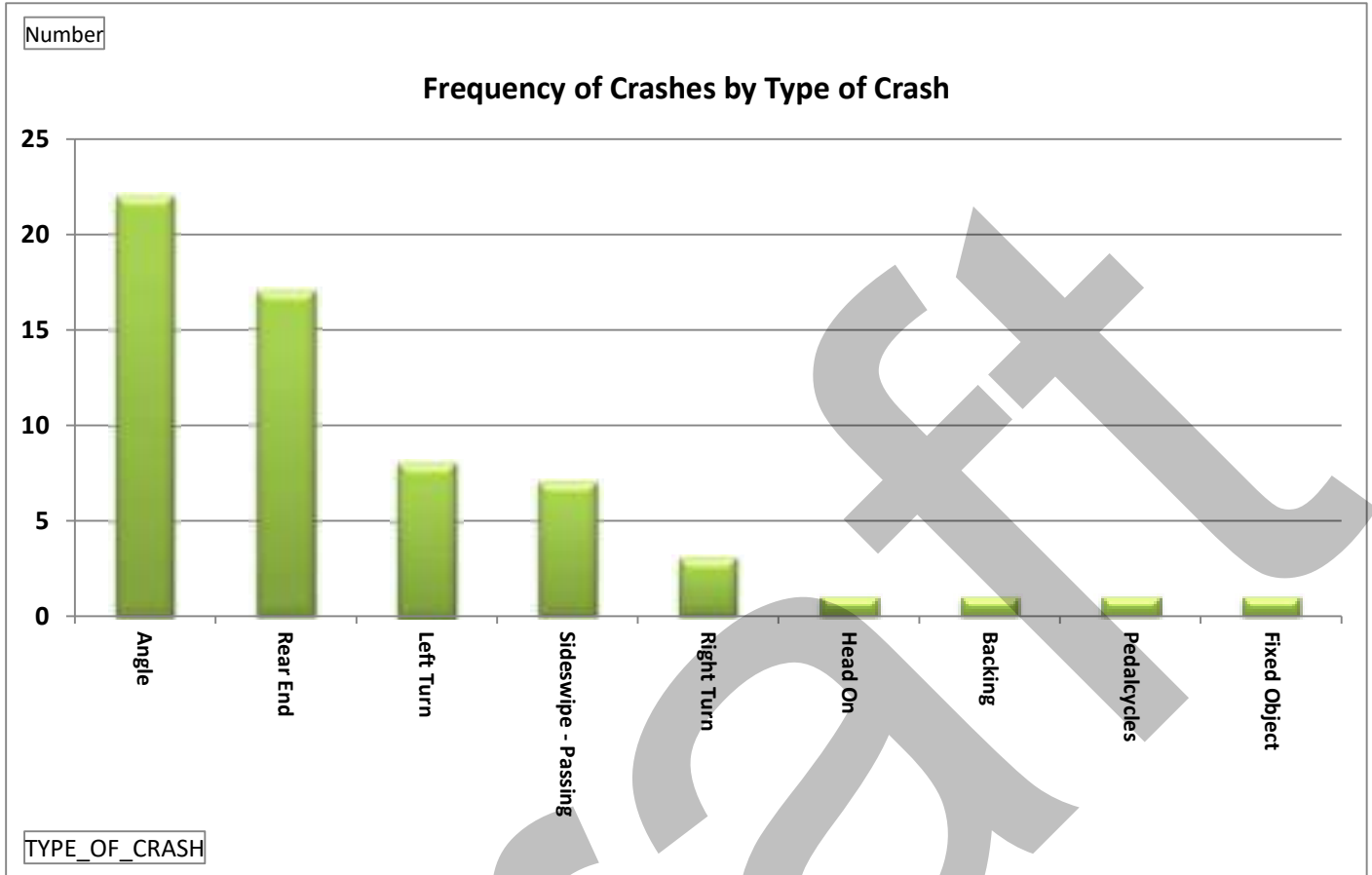
Number

Frequency of Crashes by Month

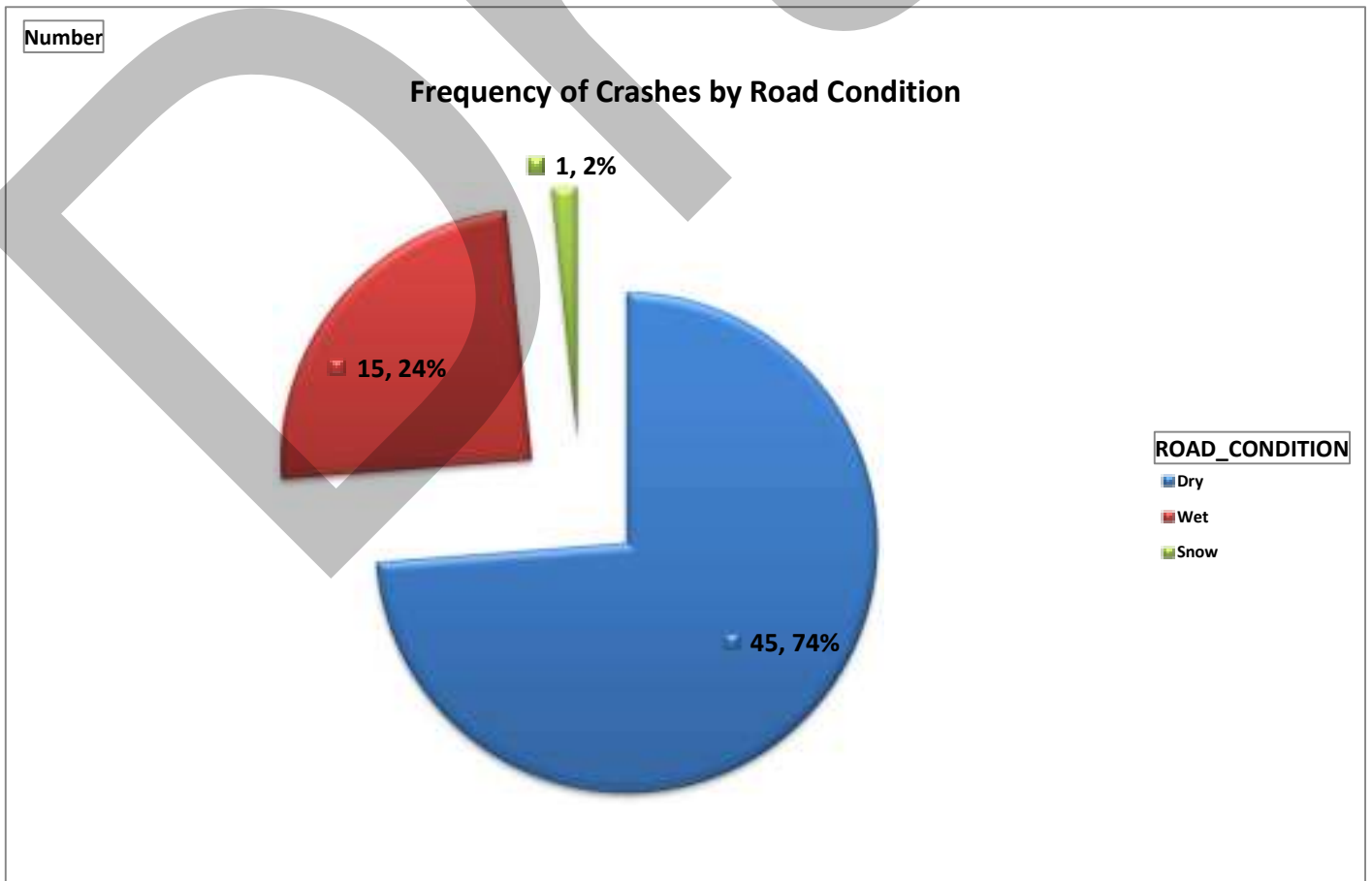
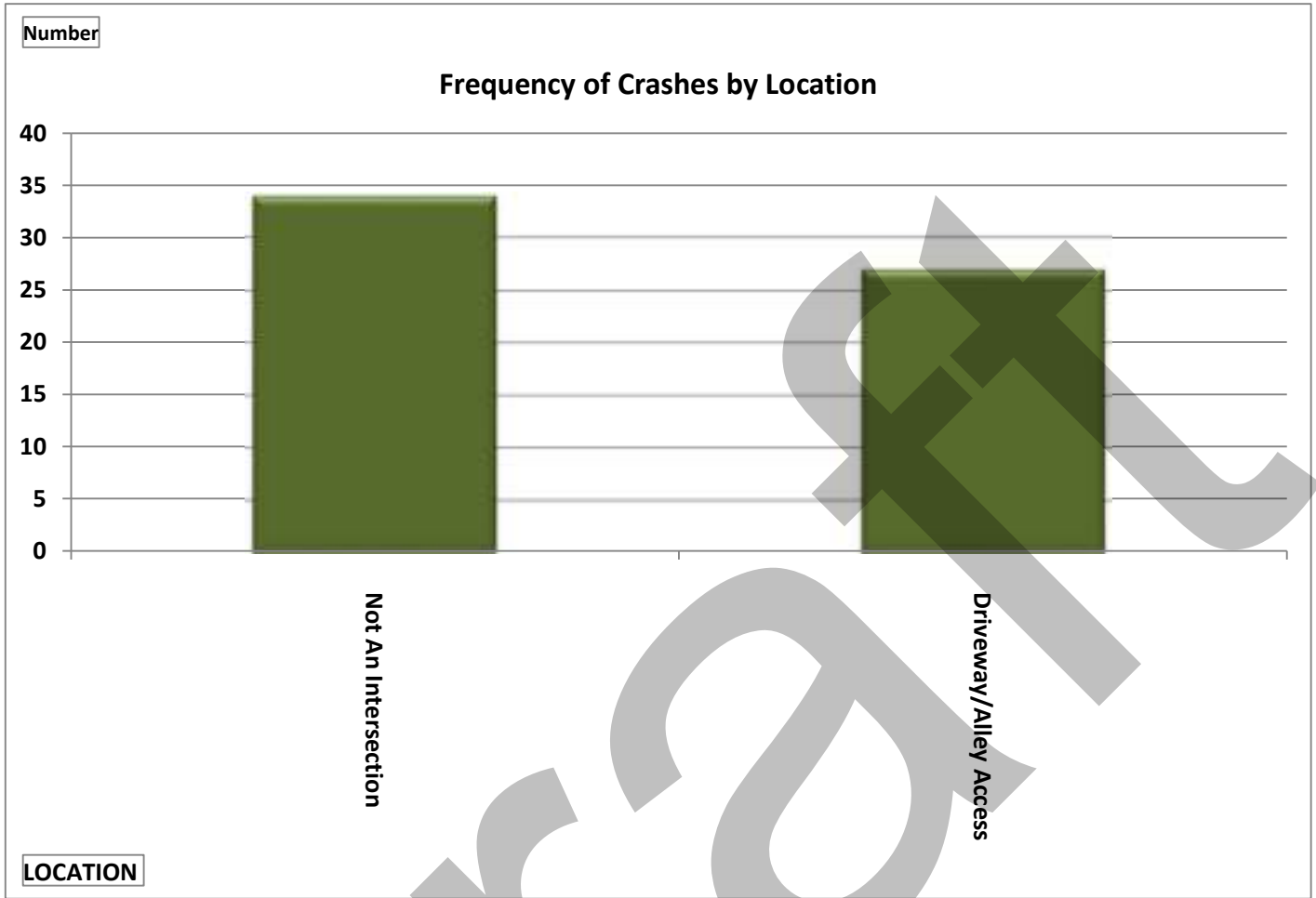


CRASH_MONTH_NBR

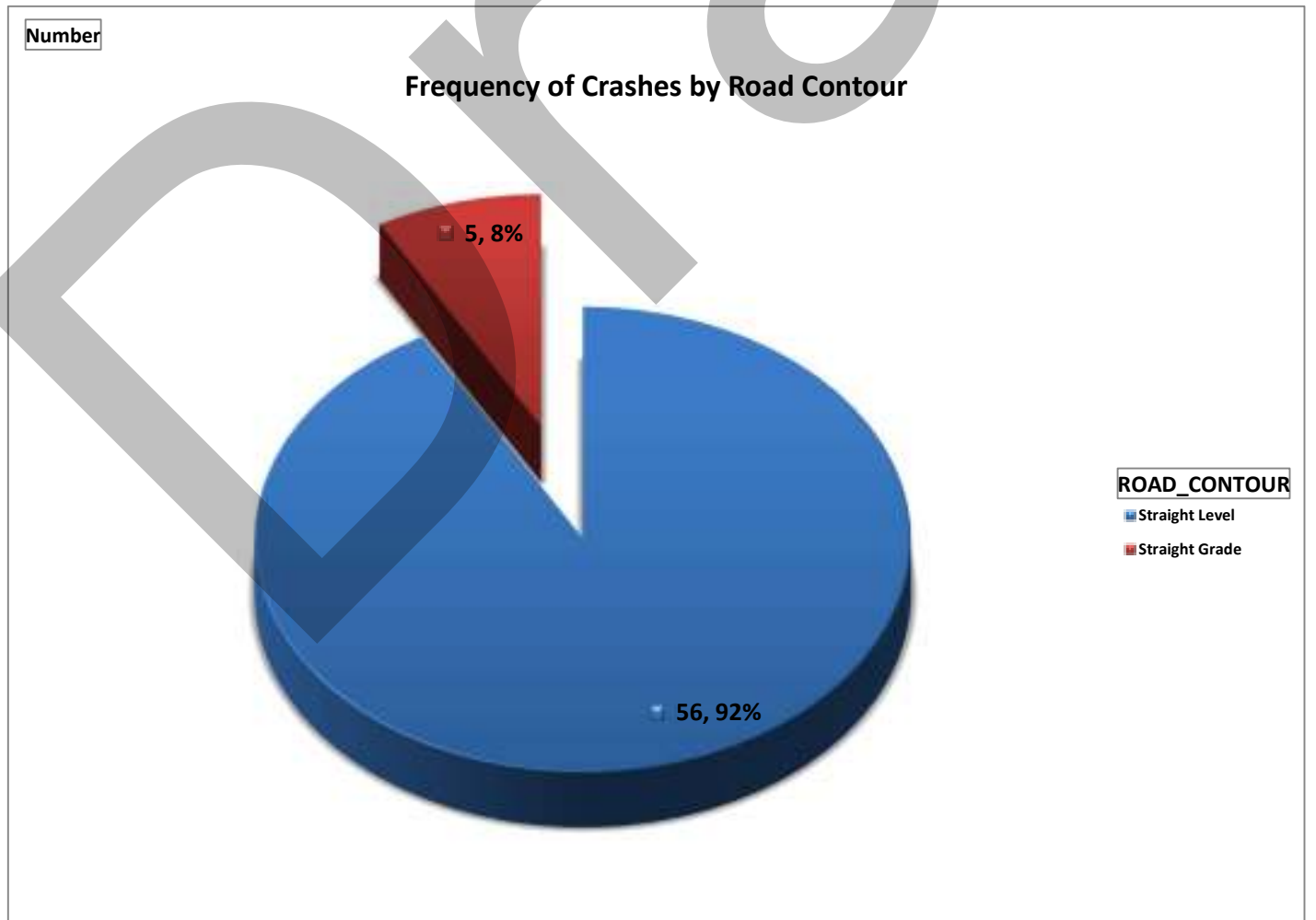
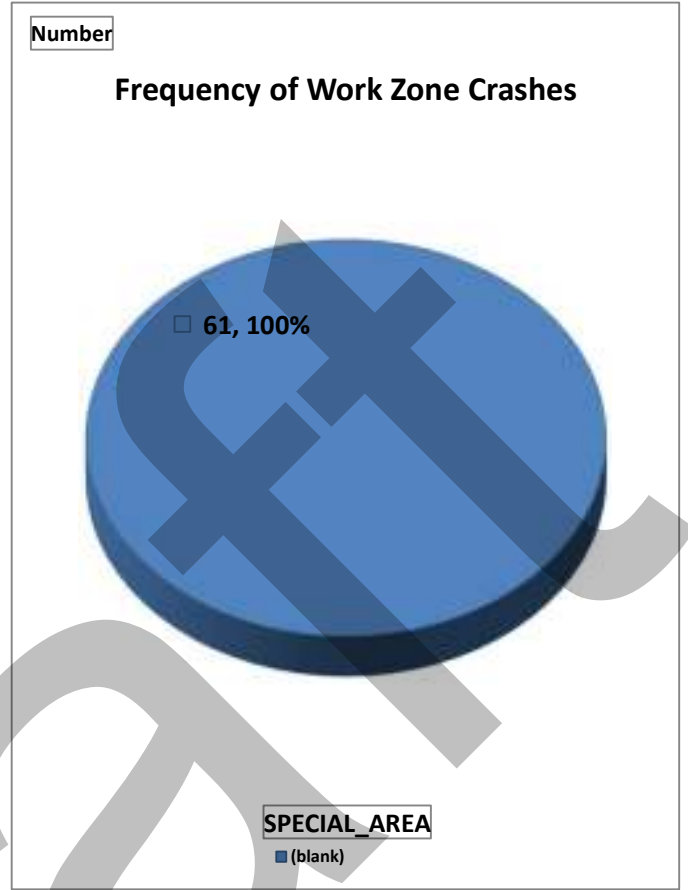
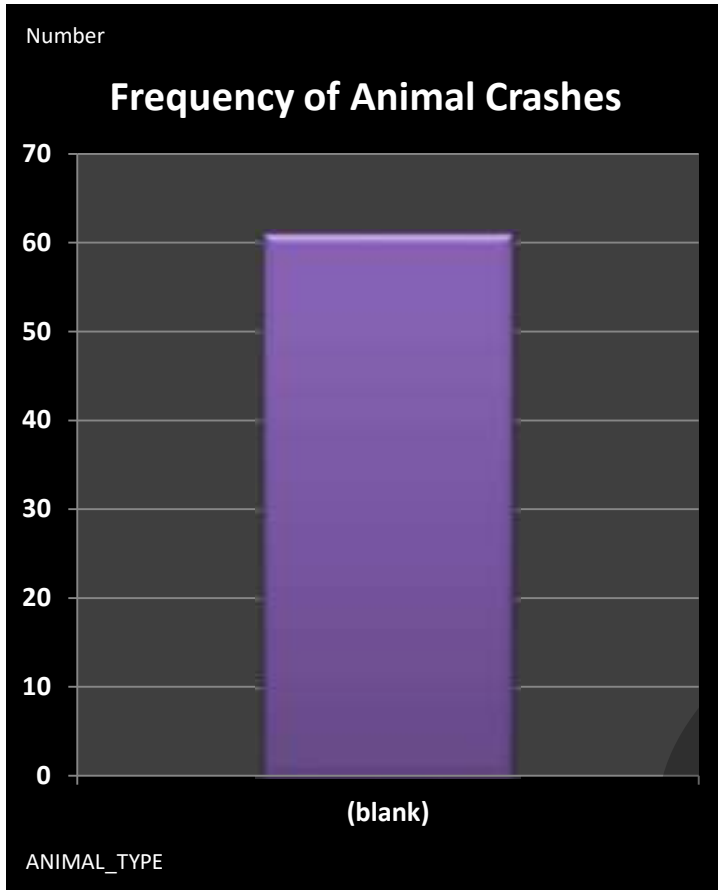
Kenwood Before Median



Kenwood Before Median



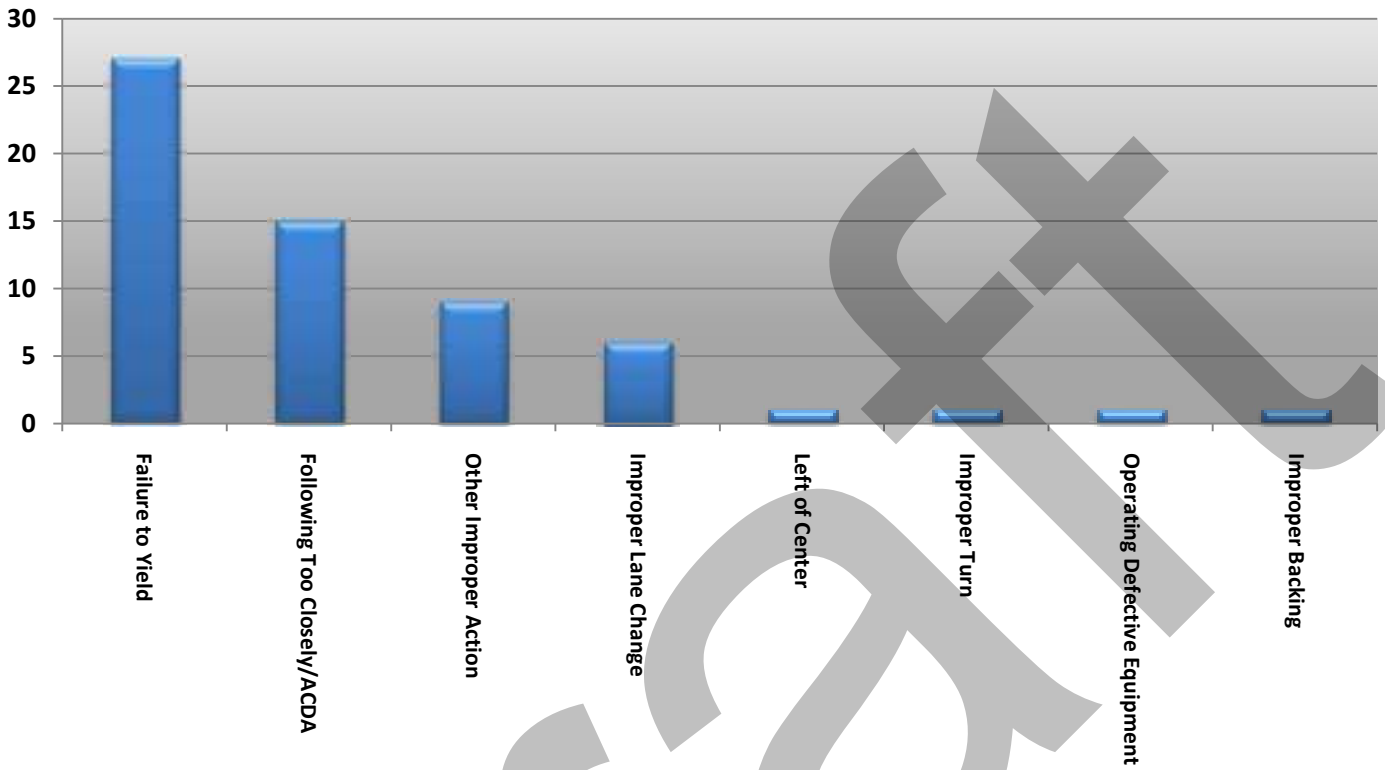
Kenwood Before Median



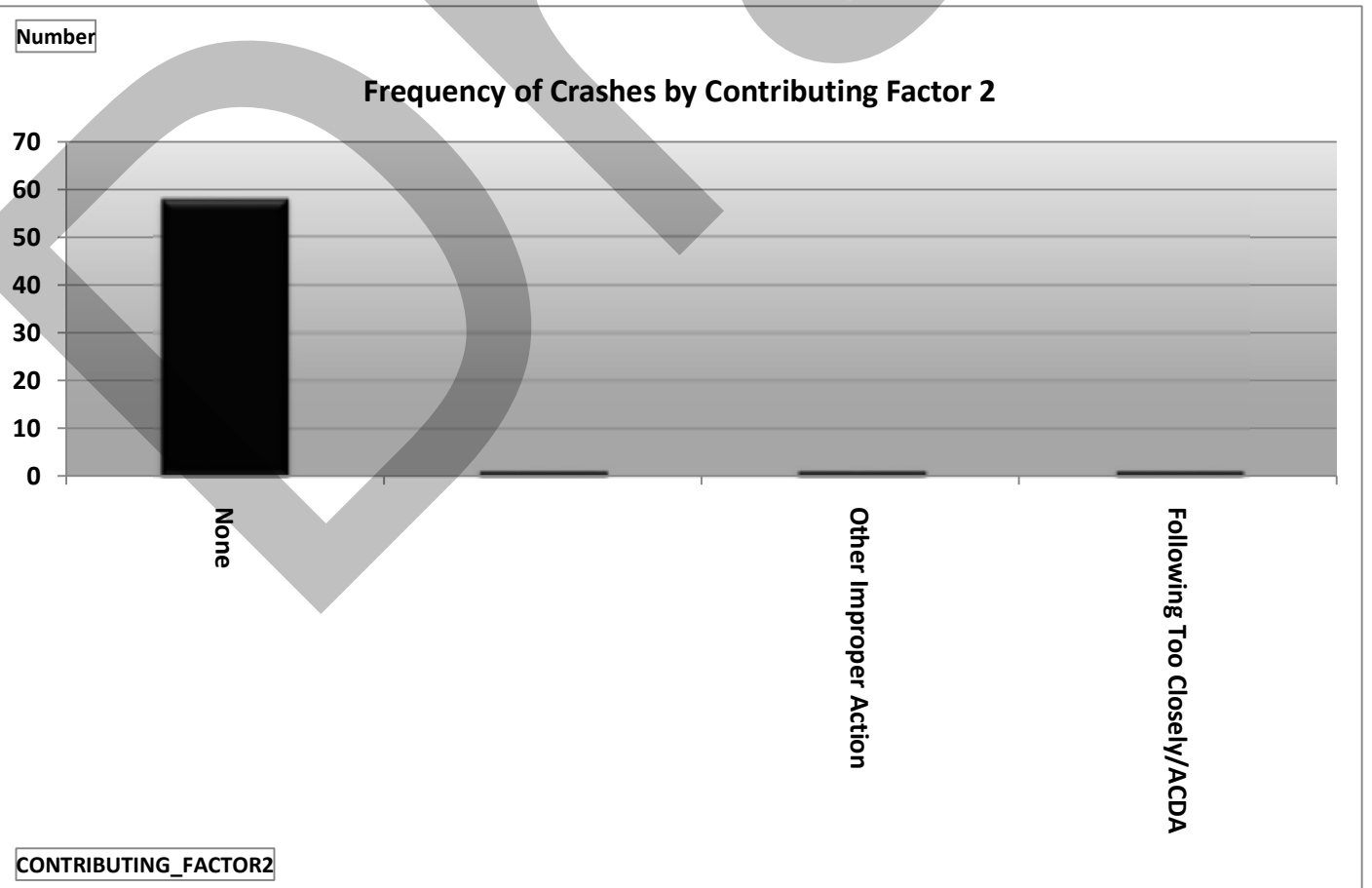
Kenwood Before Median

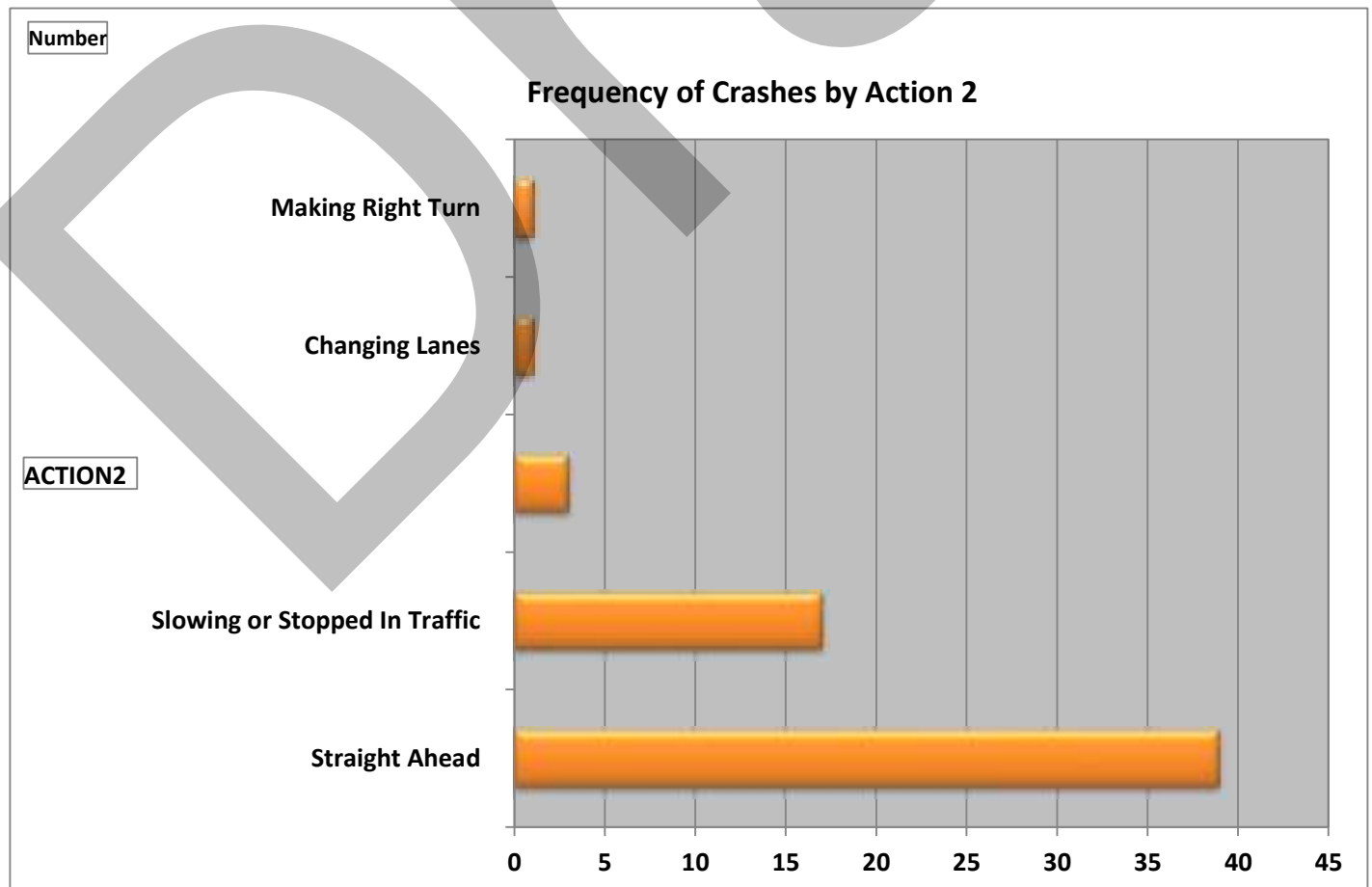
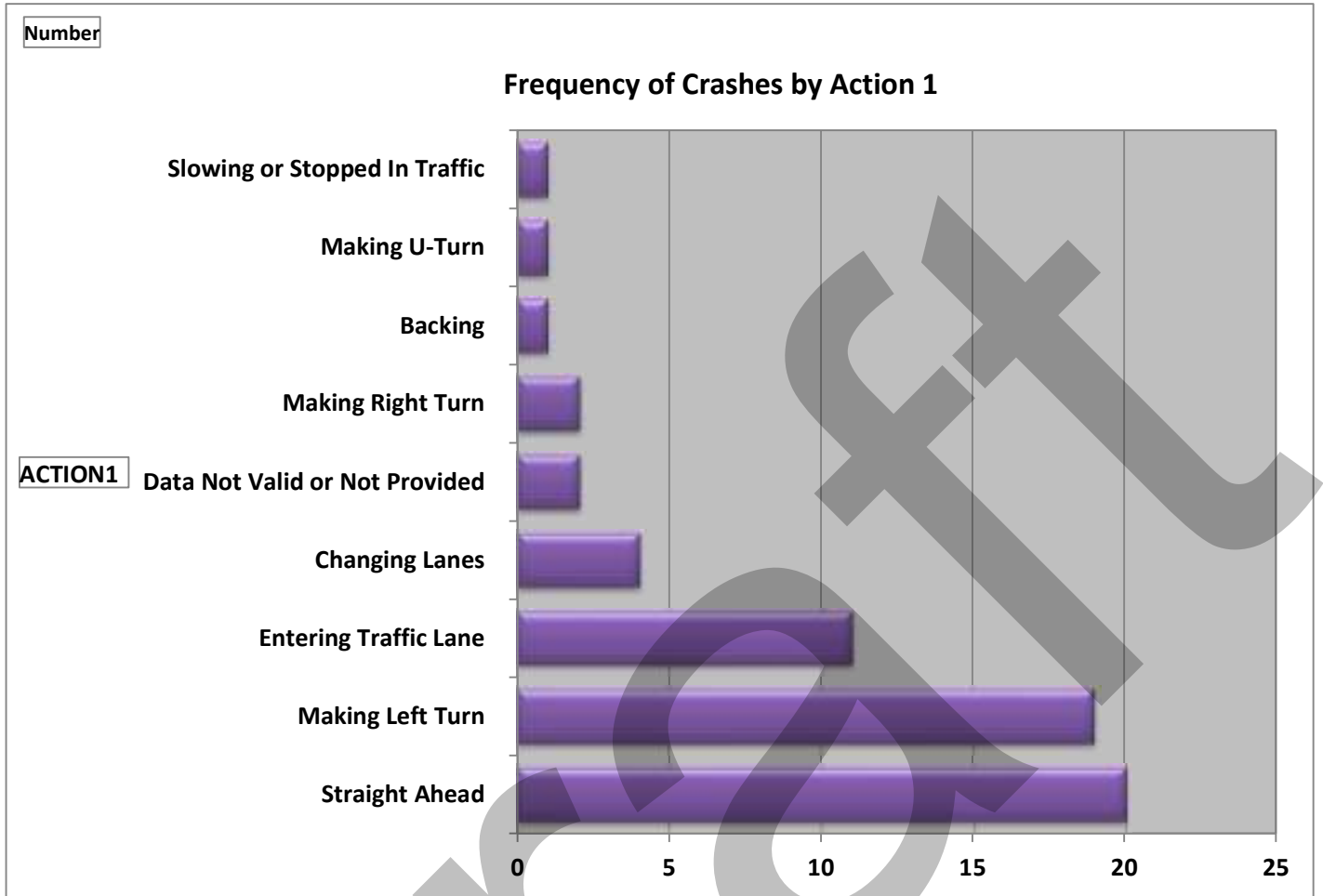


Frequency of Crashes by Contributing Factor 1

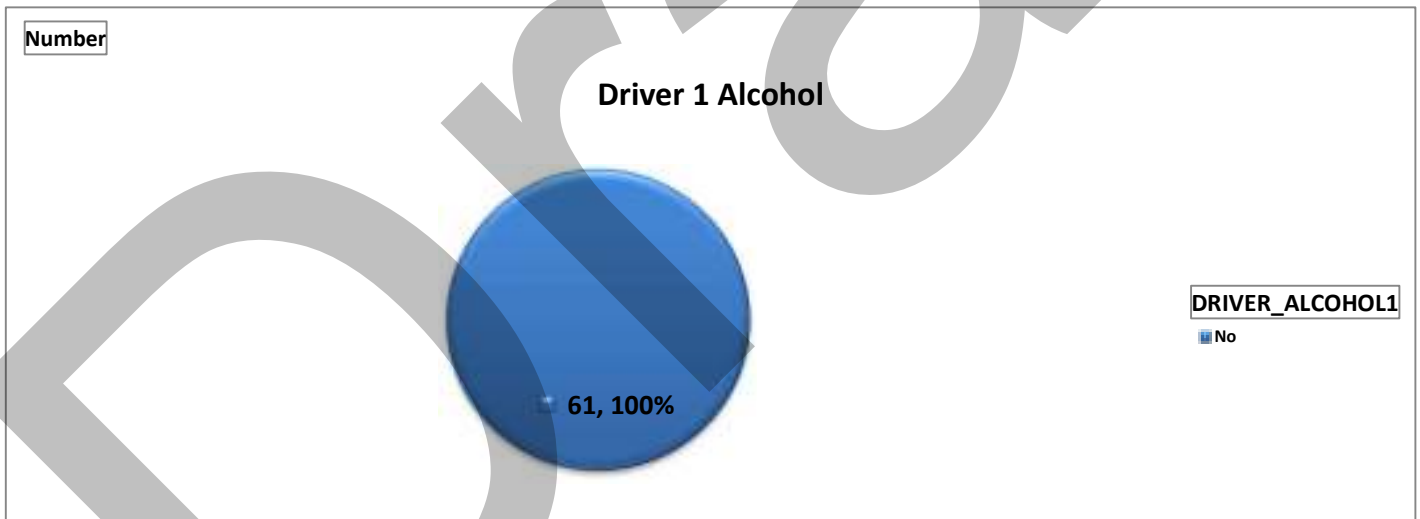
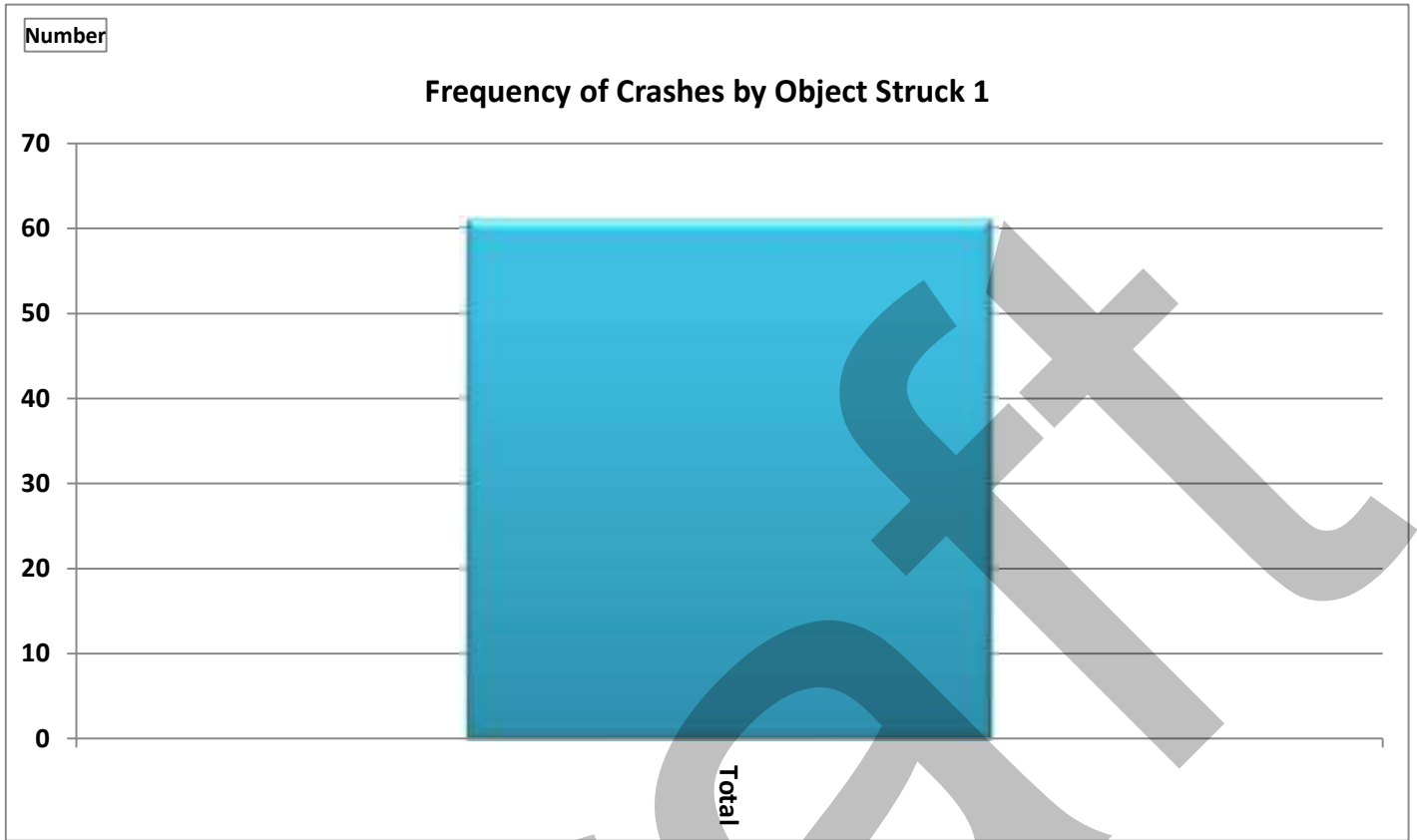


Frequency of Crashes by Contributing Factor 2

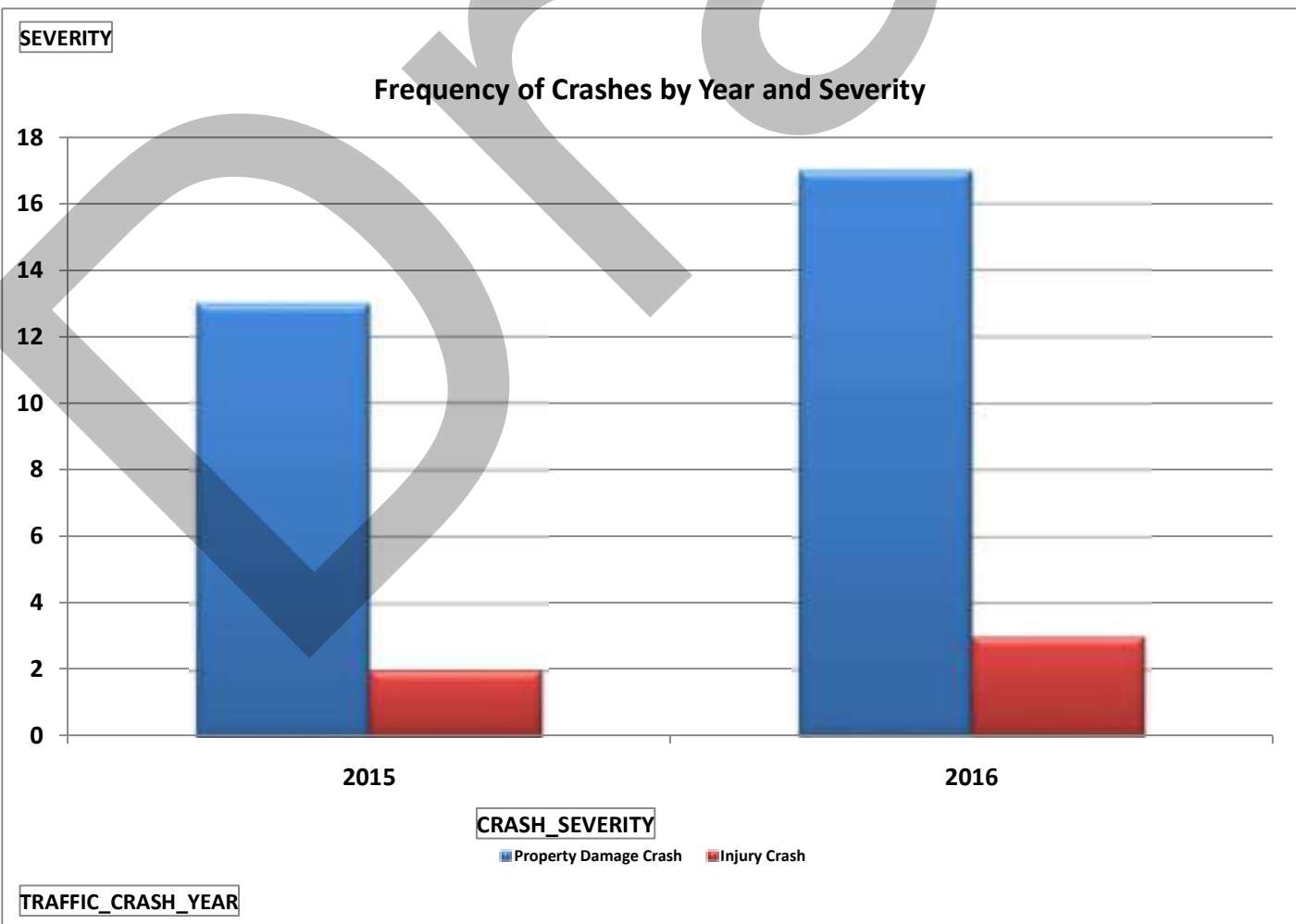
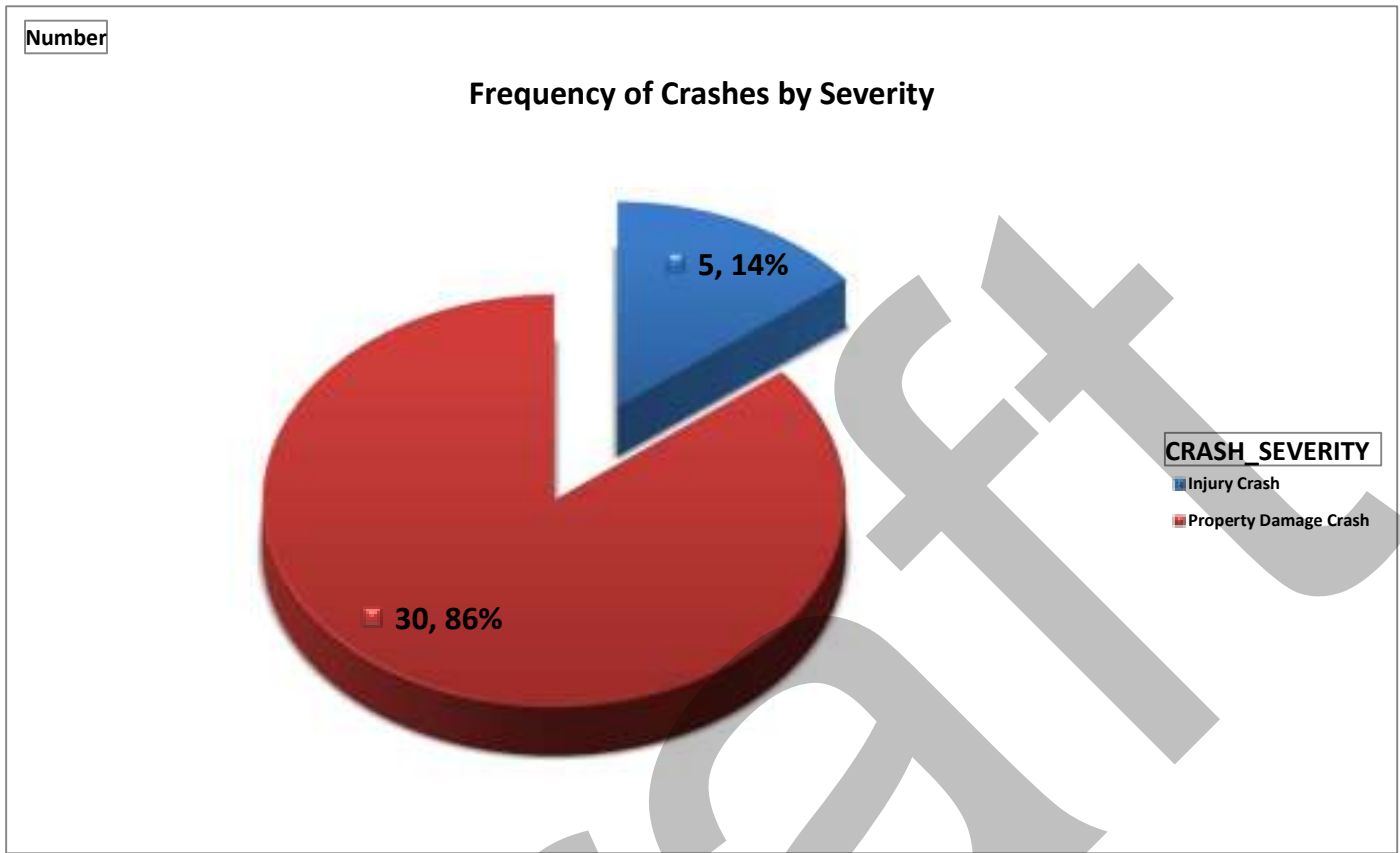




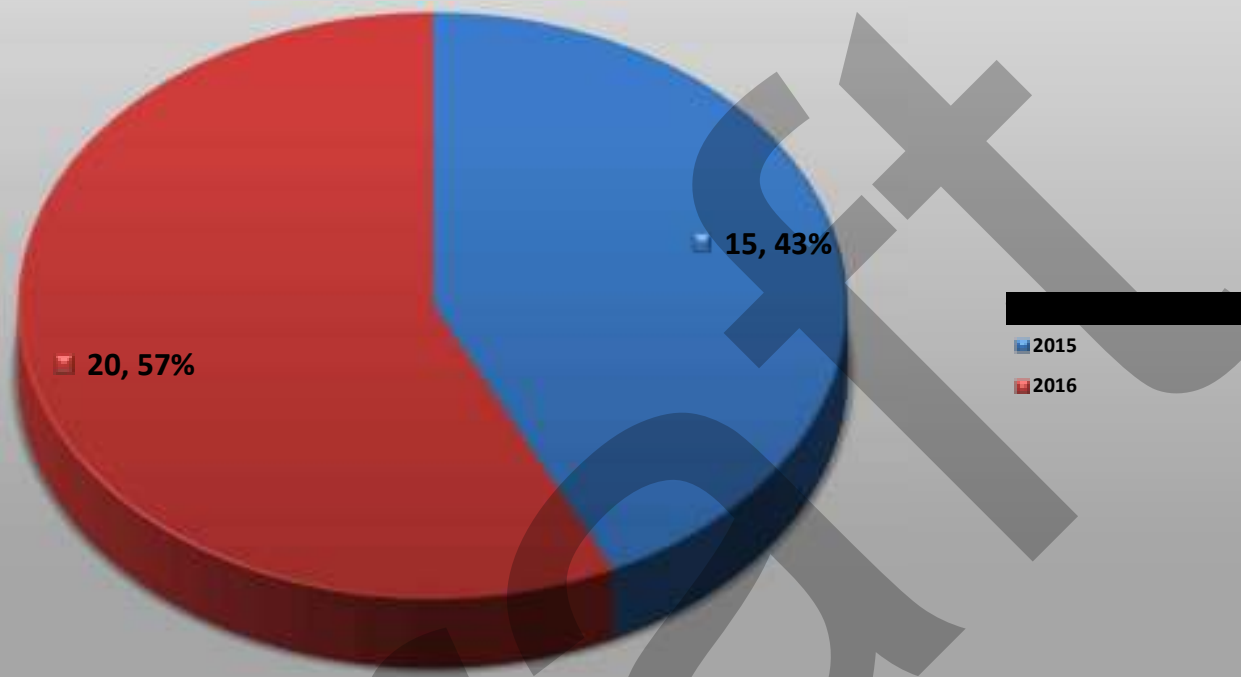
Kenwood Before Median



Kenwood Rd After Median



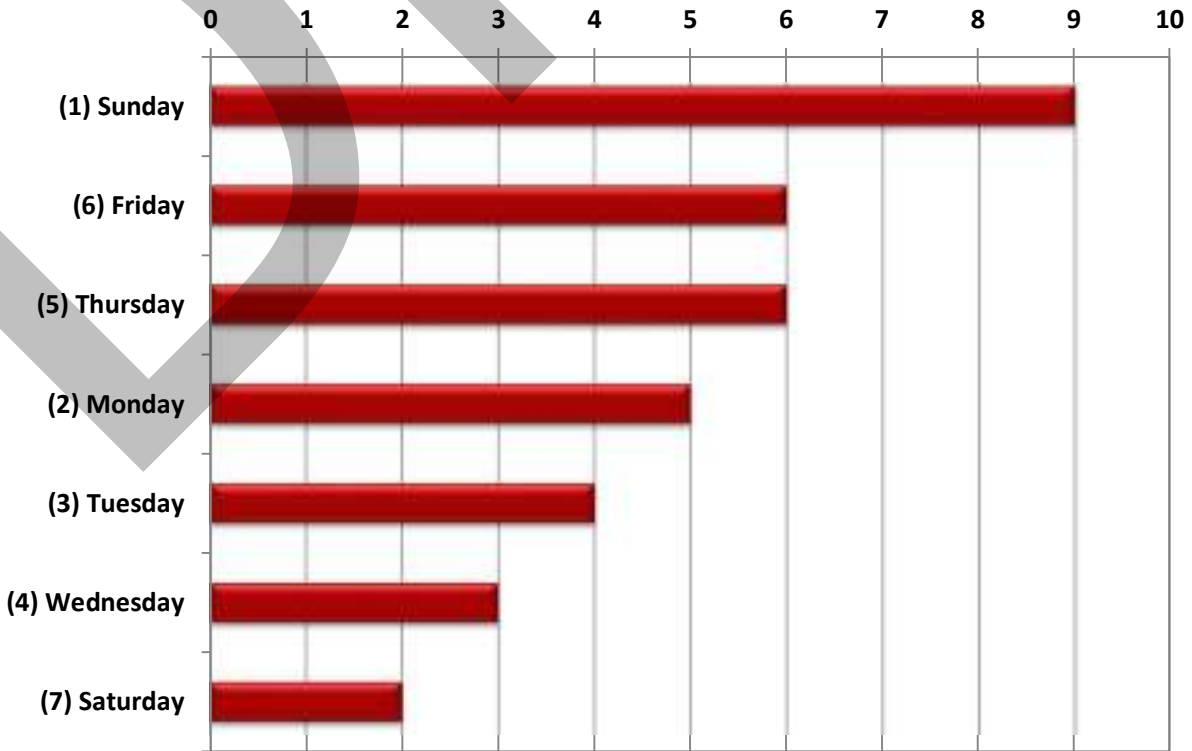
Frequency of Crashes by Year



Frequency of Crashes by Day of the Week

Number

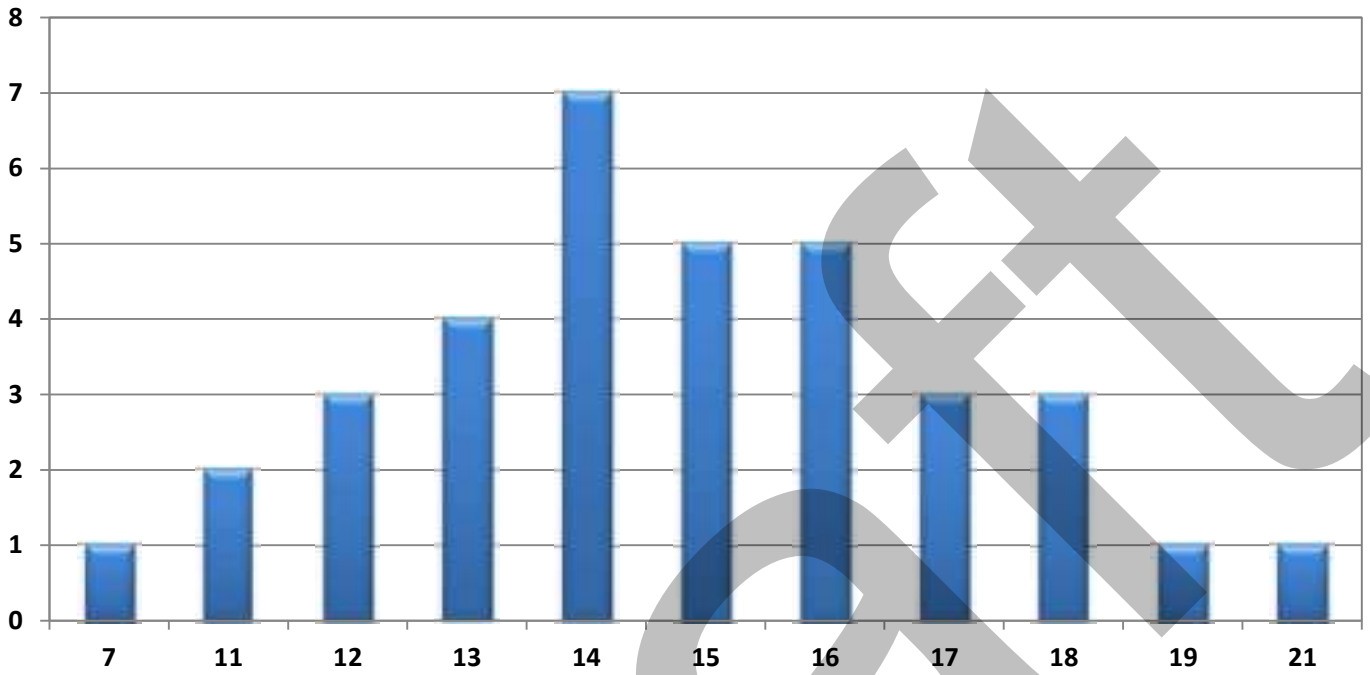
DAY_OF_WEEK



Kenwood Rd After Median

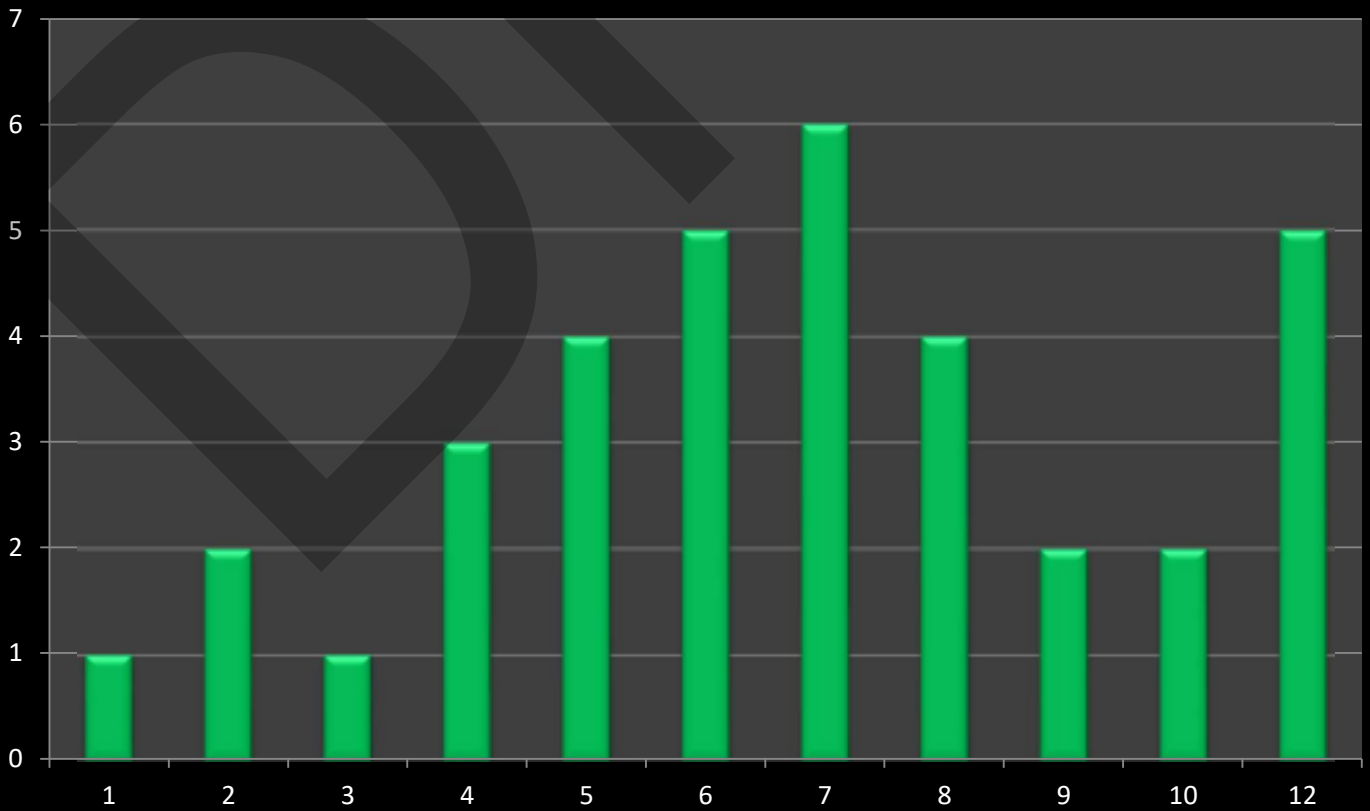


Frequency of Crashes by Hour



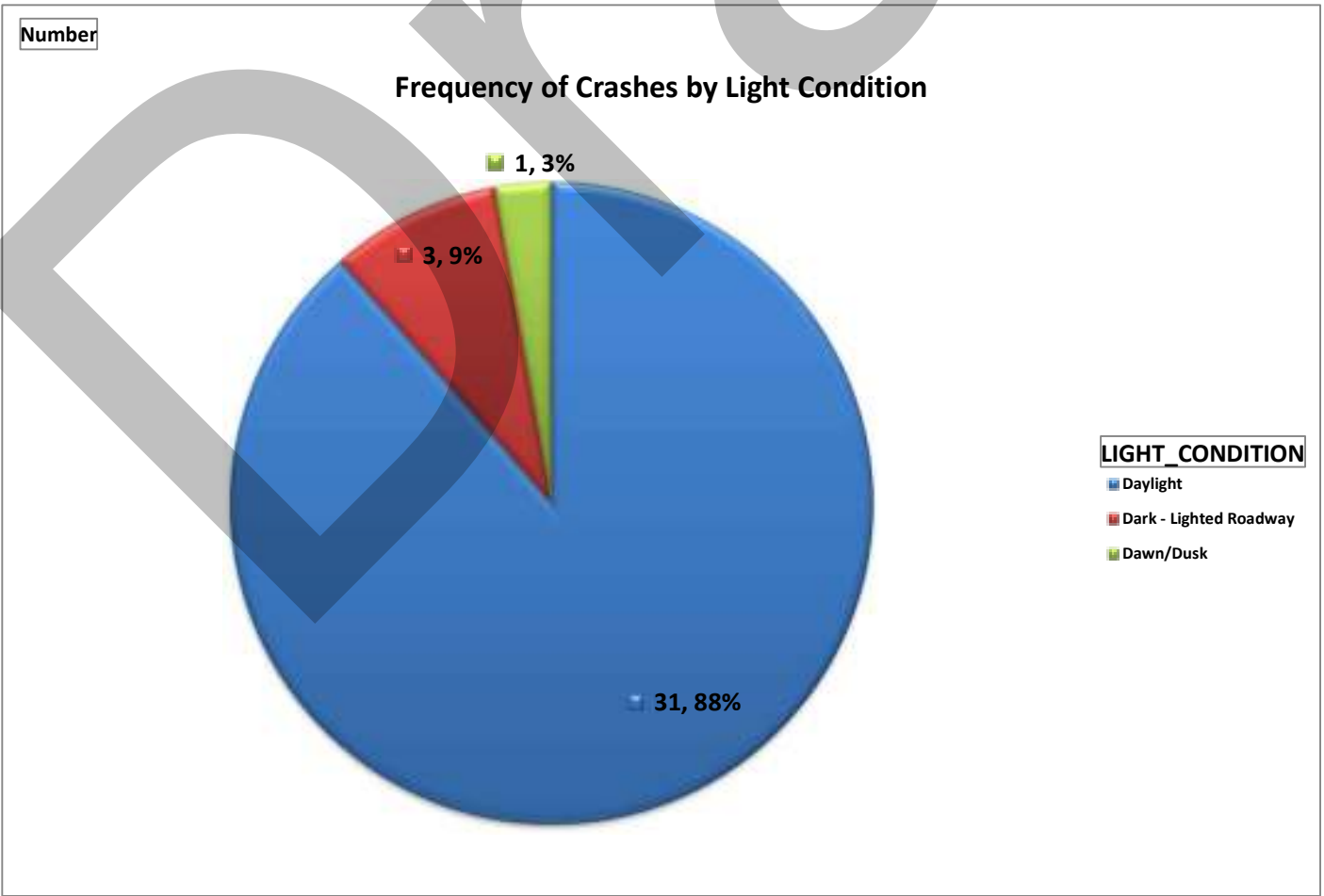
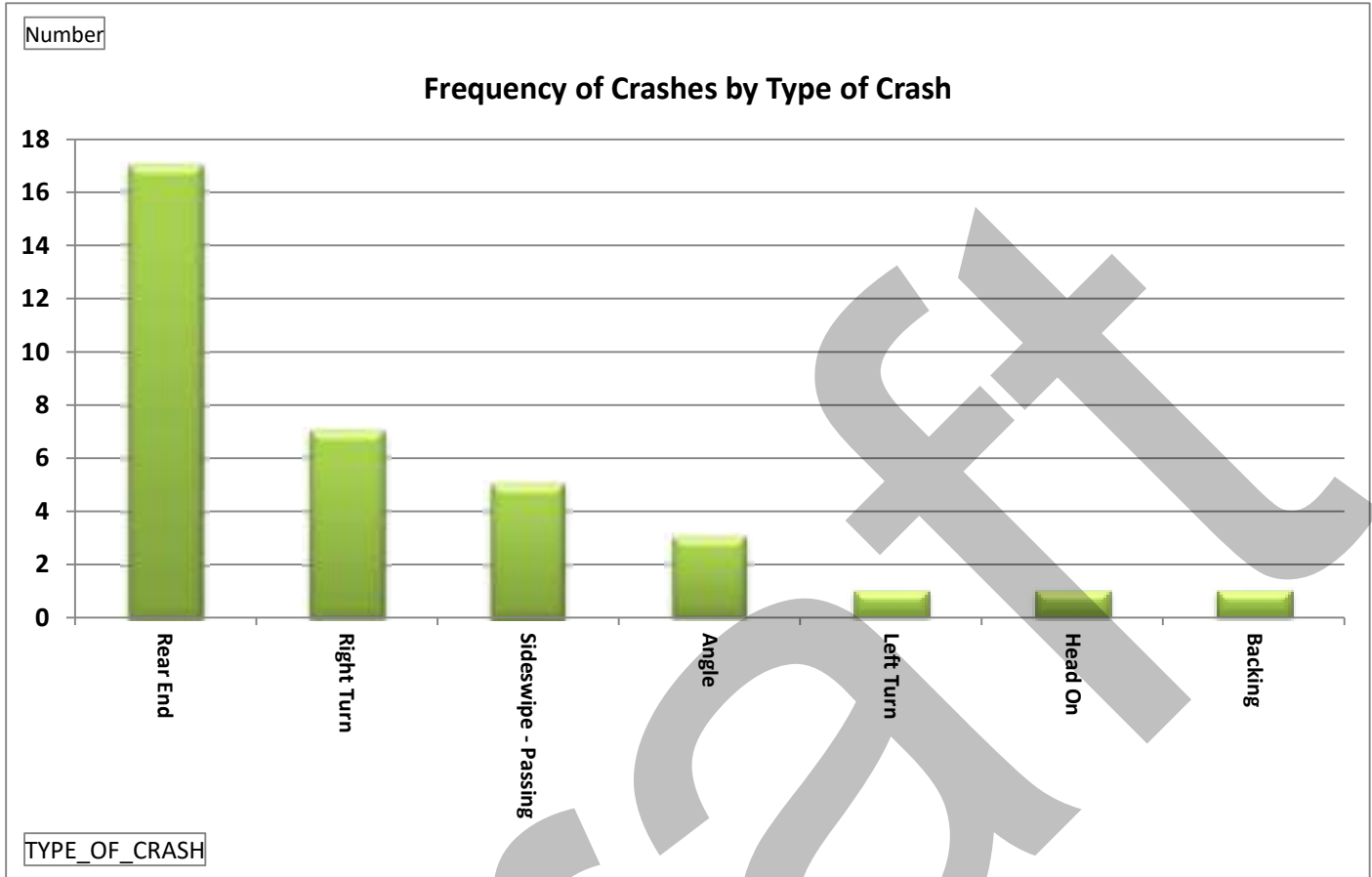
Number

Frequency of Crashes by Month

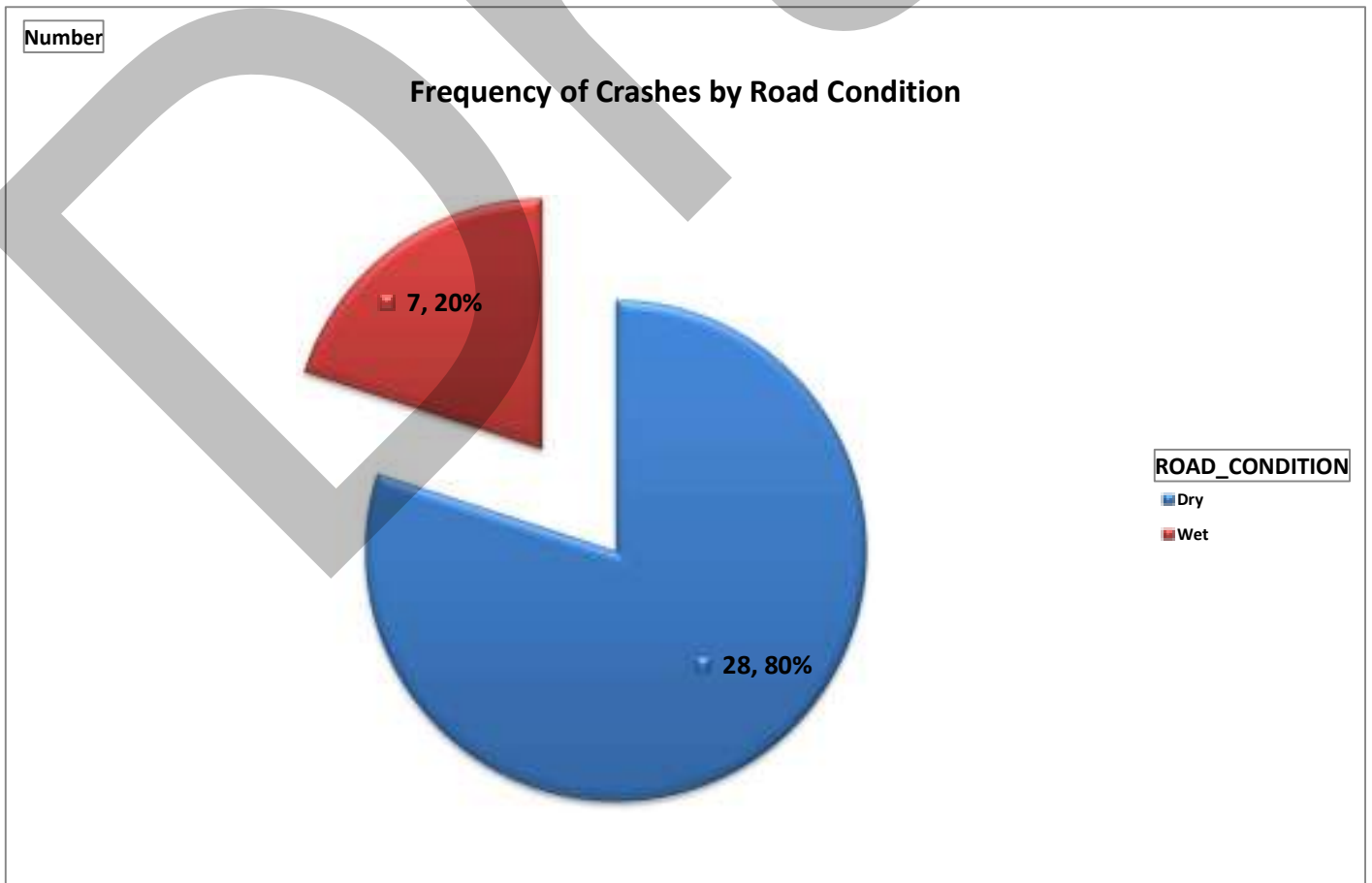
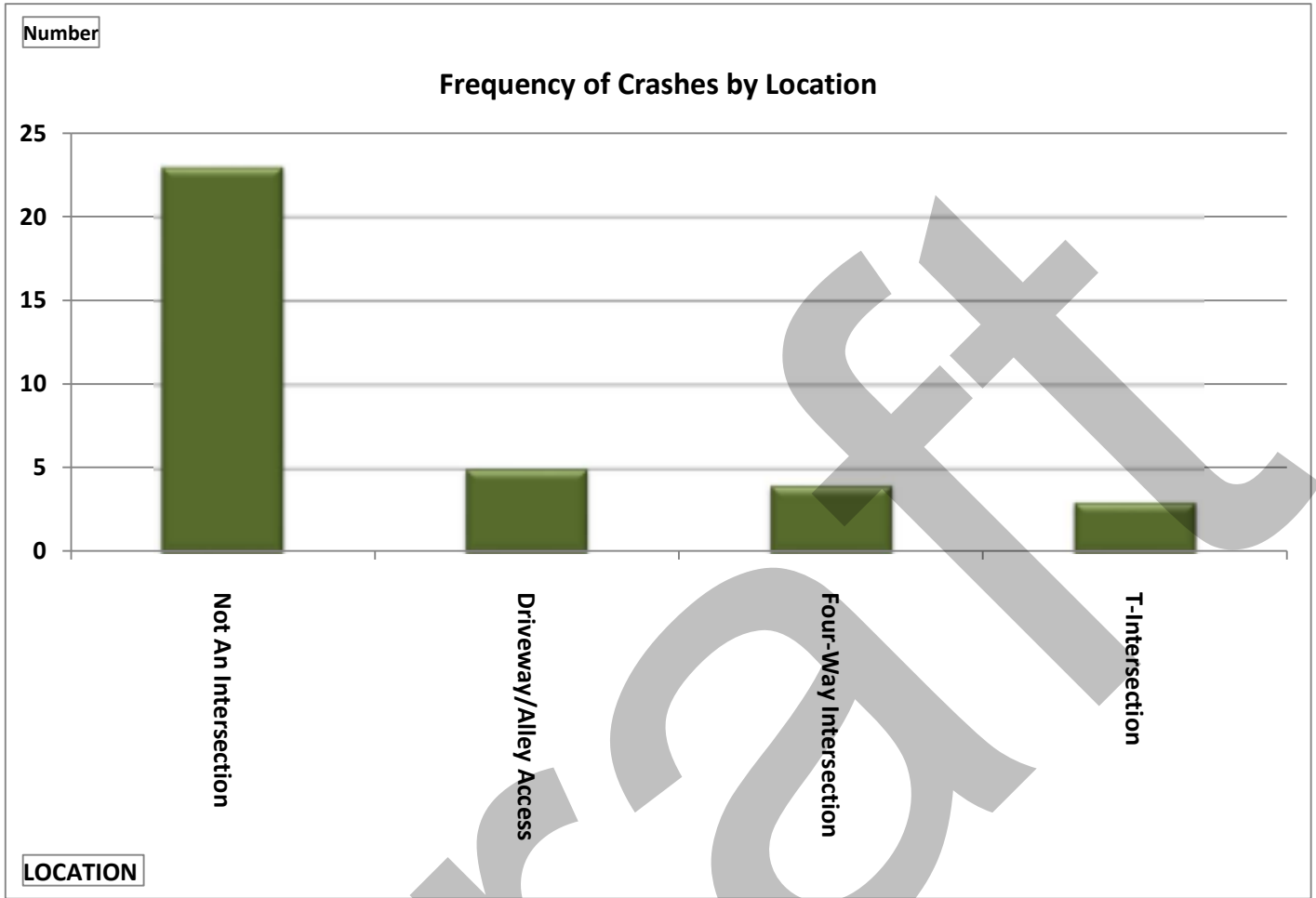


CRASH_MONTH_NBR

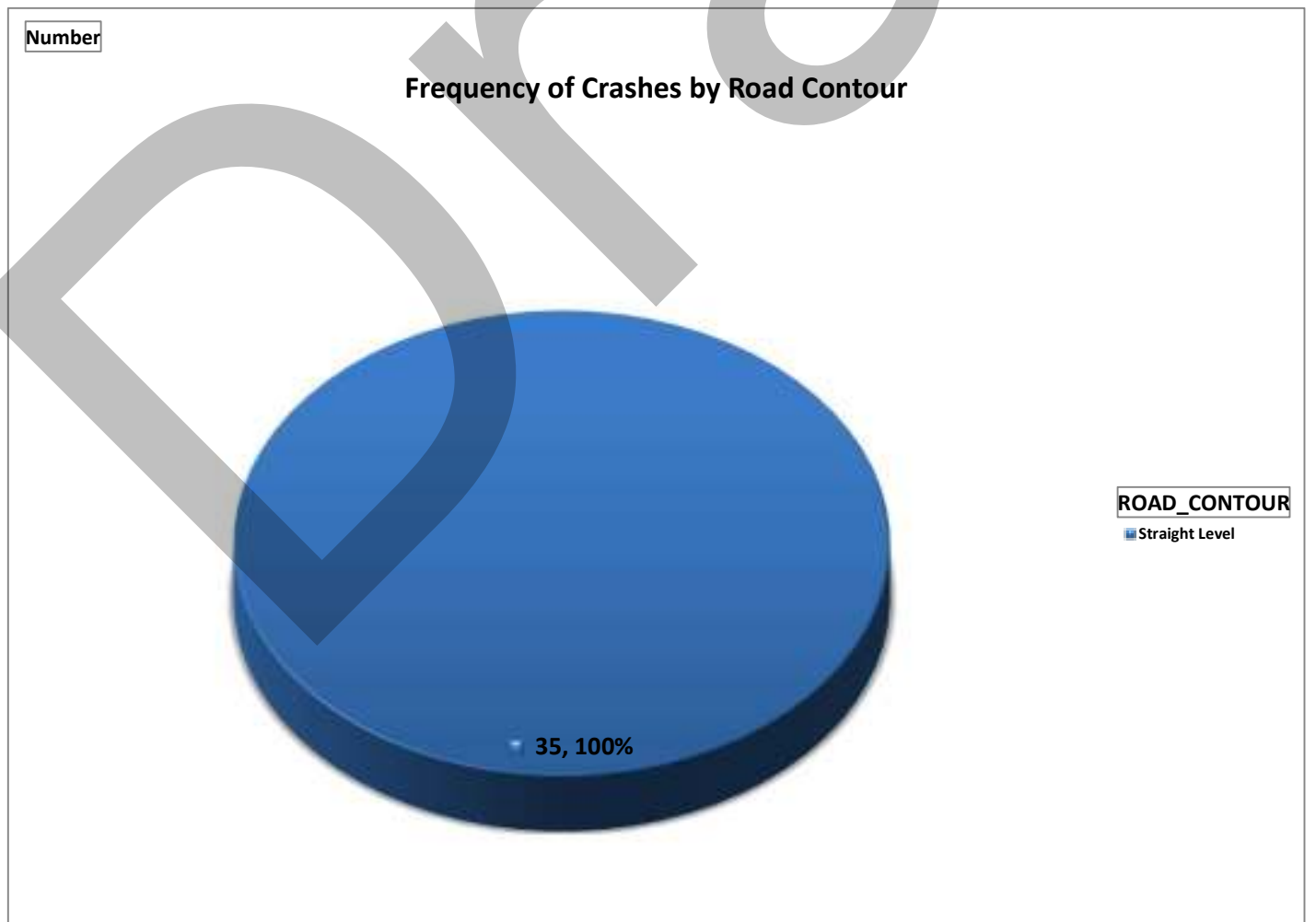
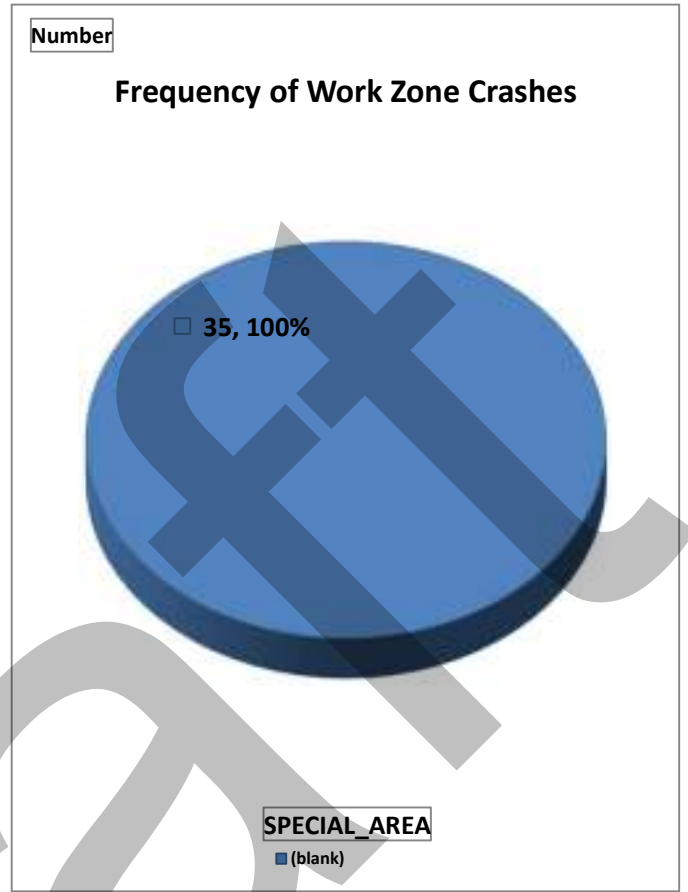
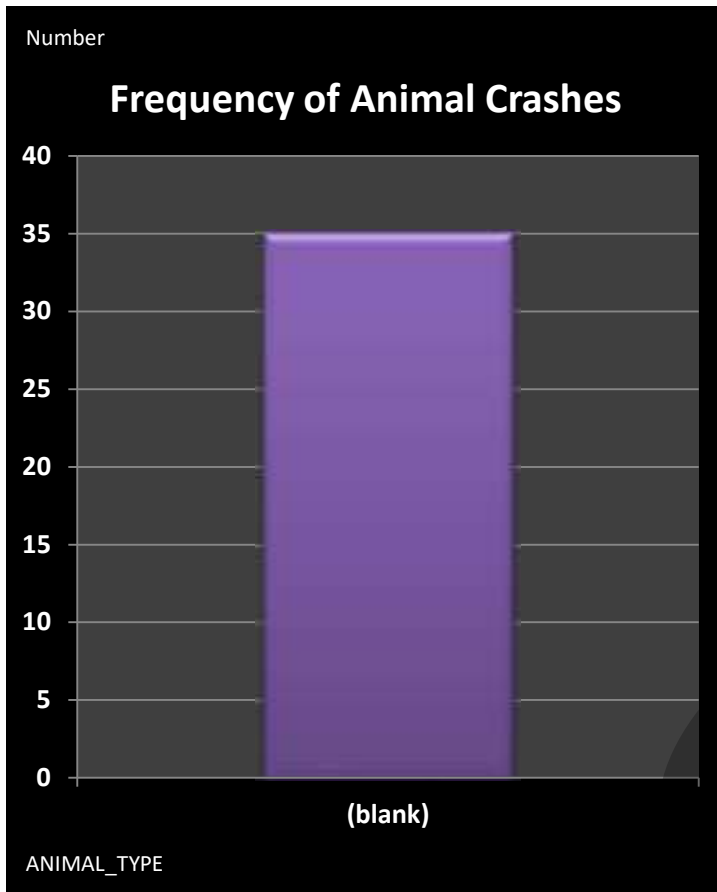
Kenwood Rd After Median



Kenwood Rd After Median



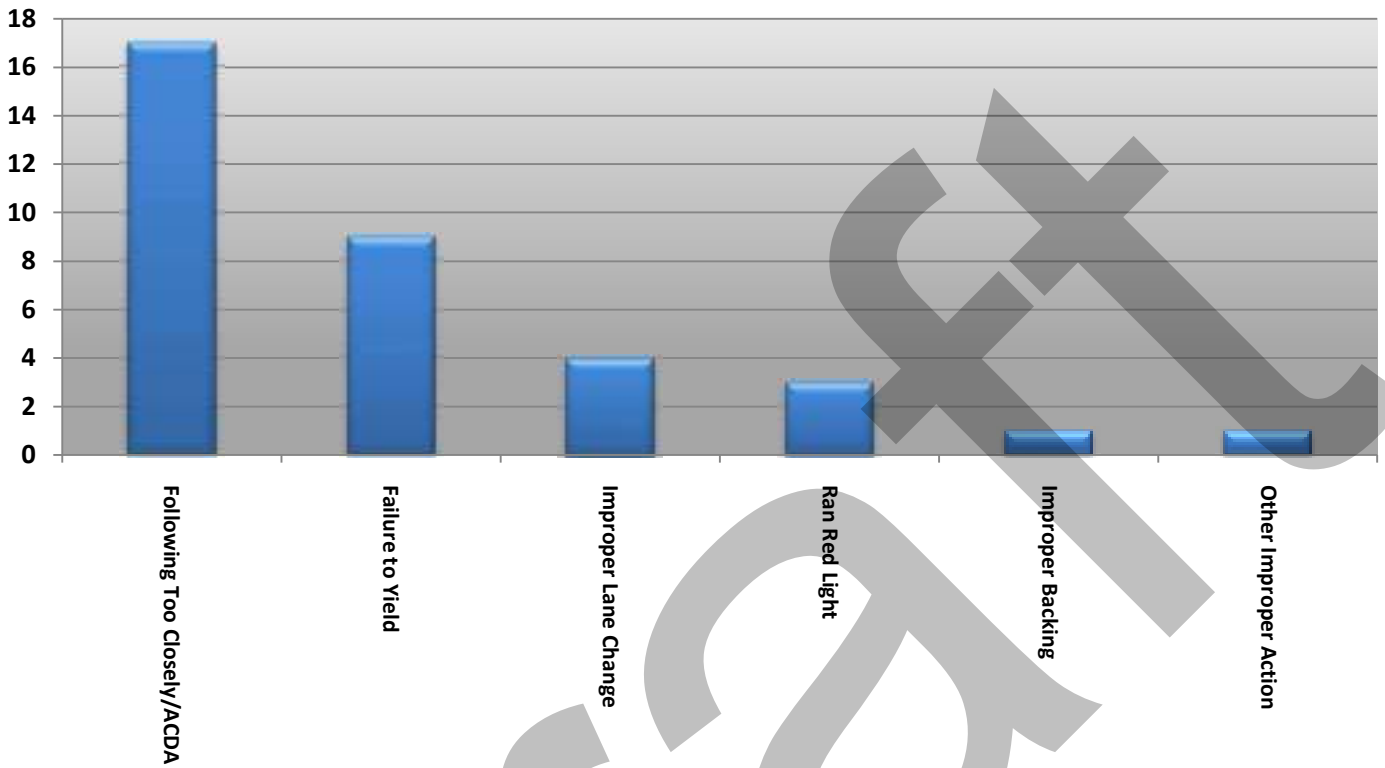
Kenwood Rd After Median



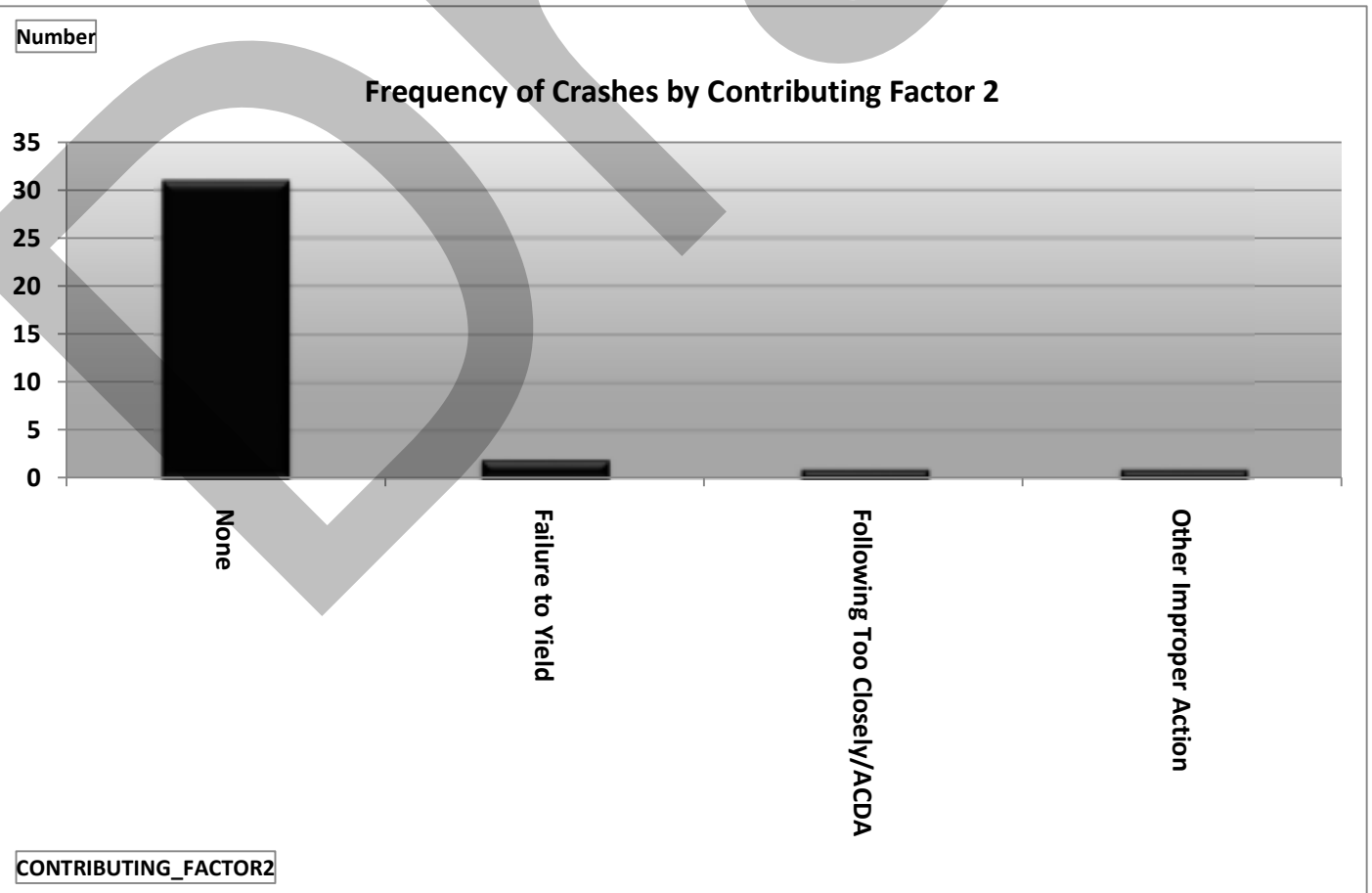
Kenwood Rd After Median



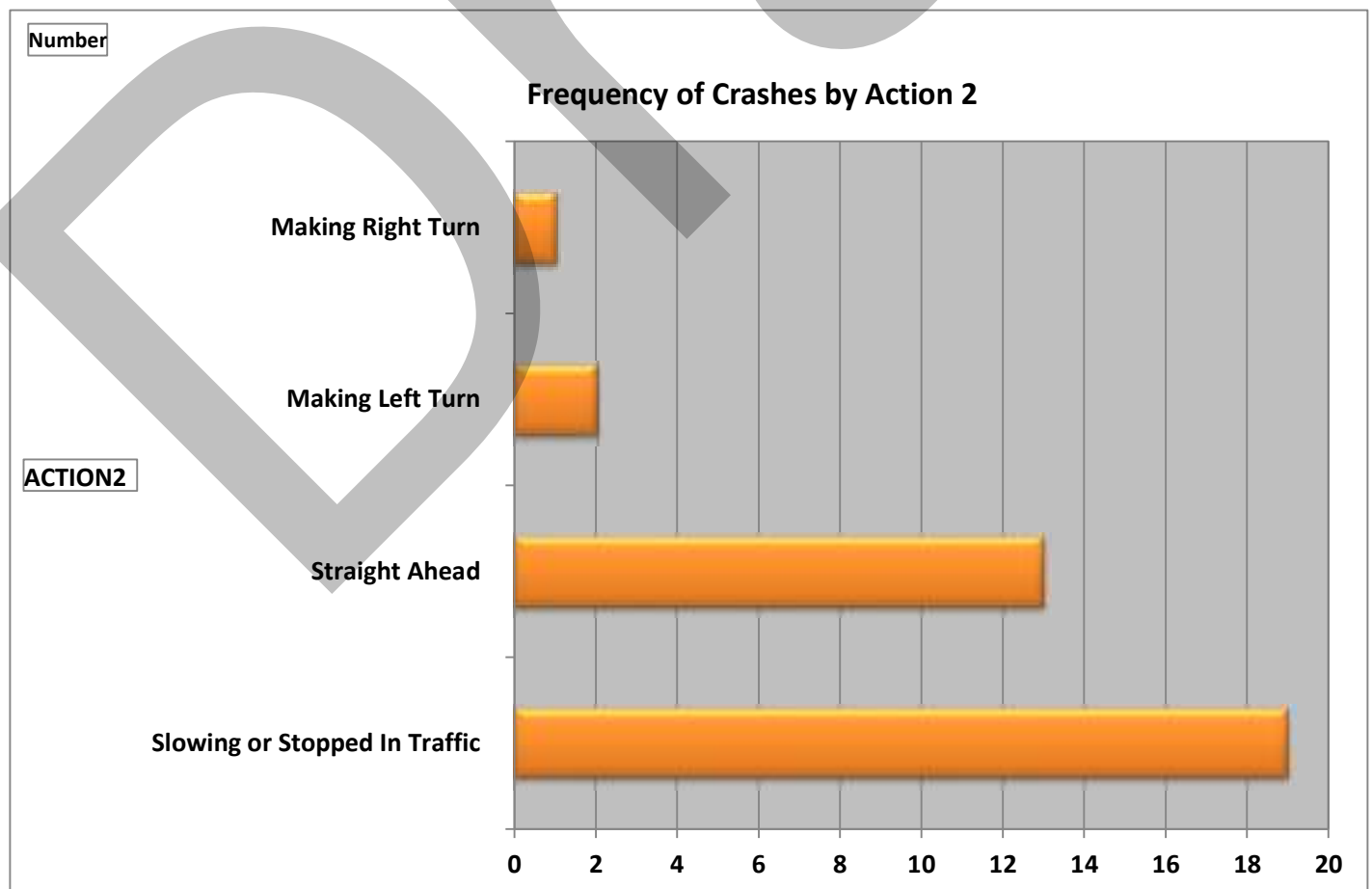
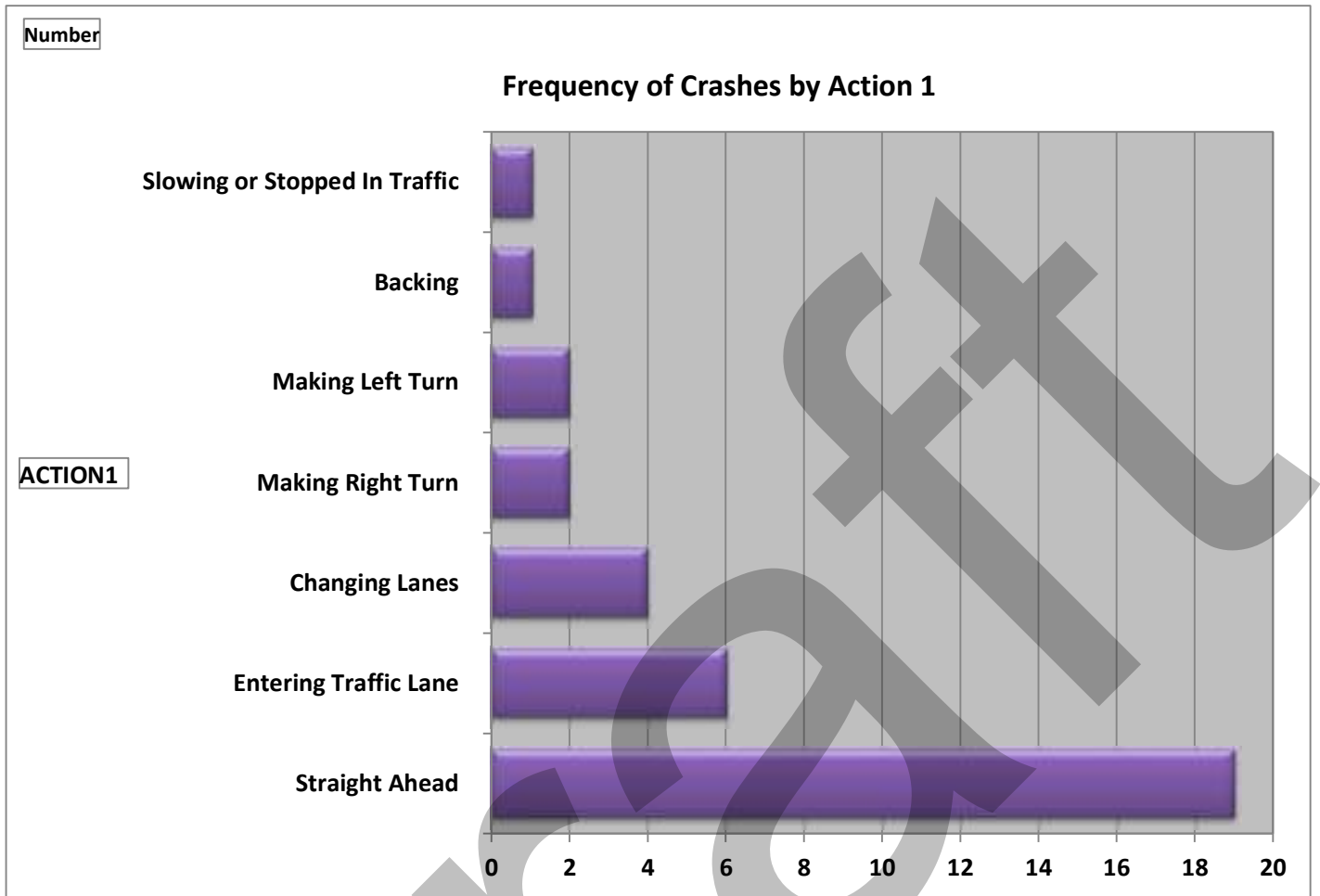
Frequency of Crashes by Contributing Factor 1



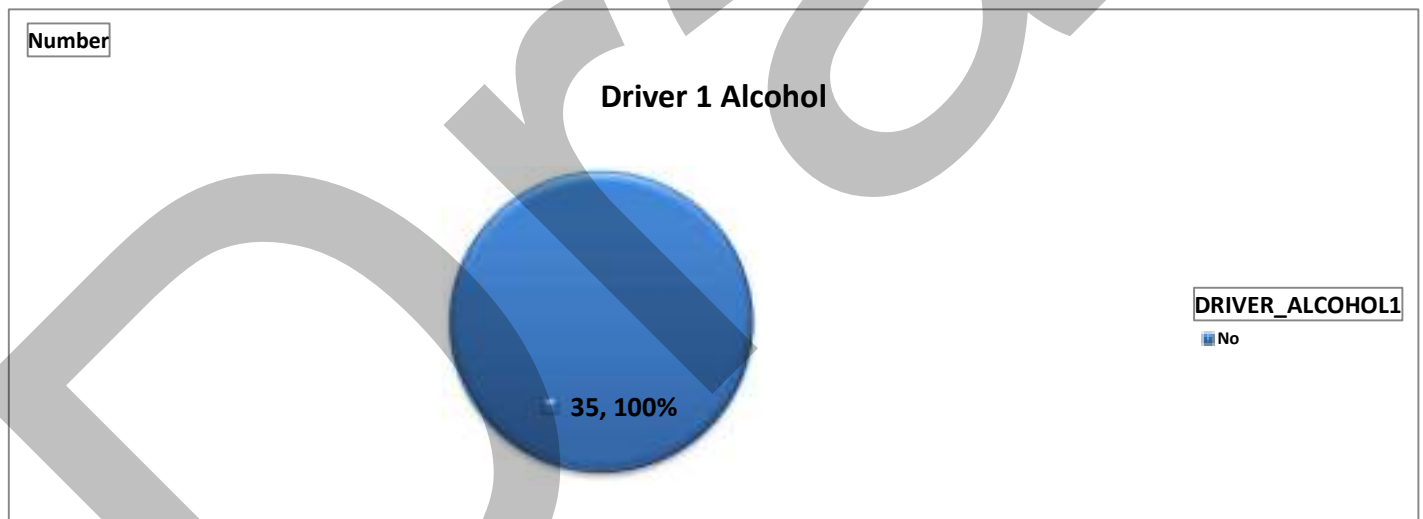
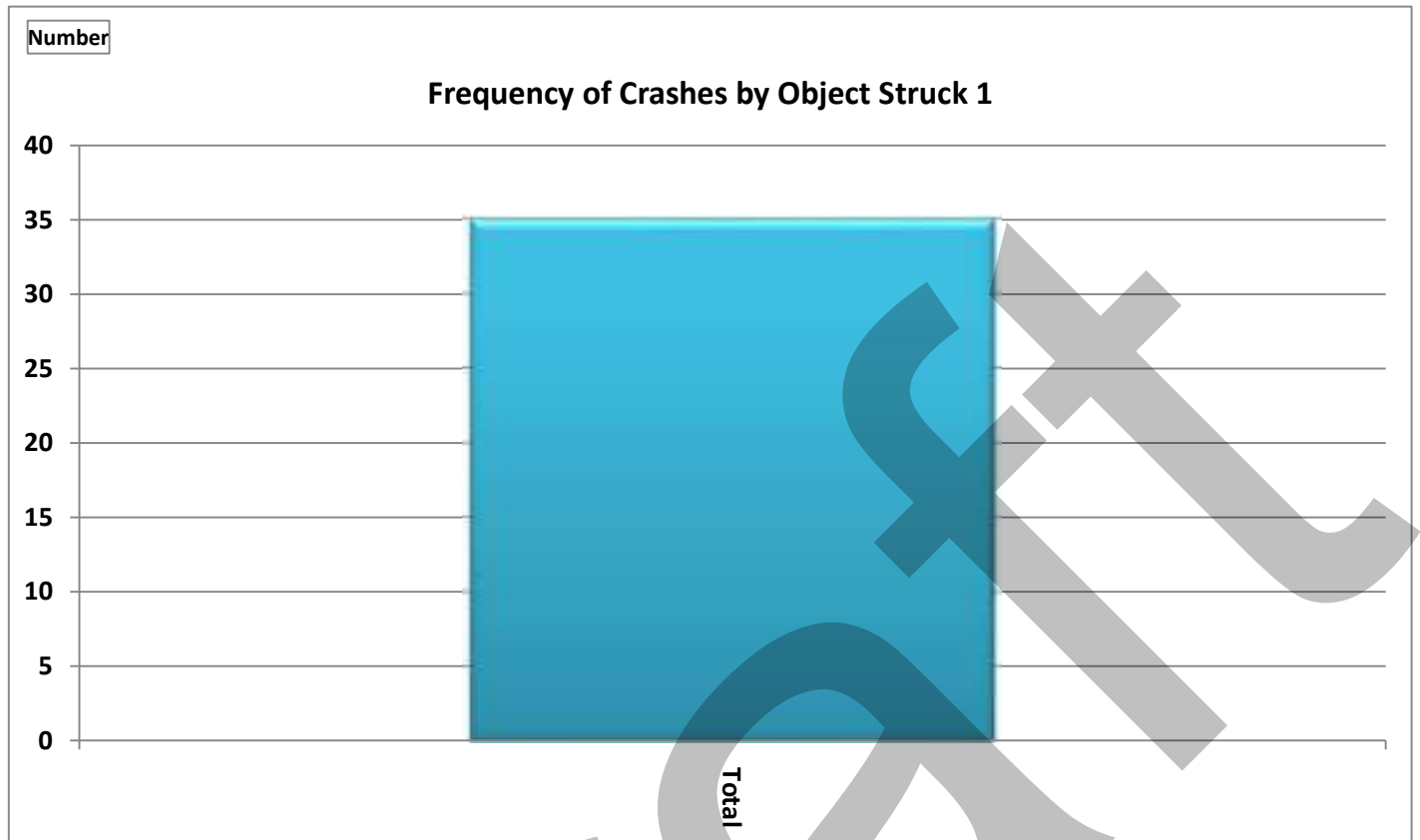
Frequency of Crashes by Contributing Factor 2



Kenwood Rd After Median

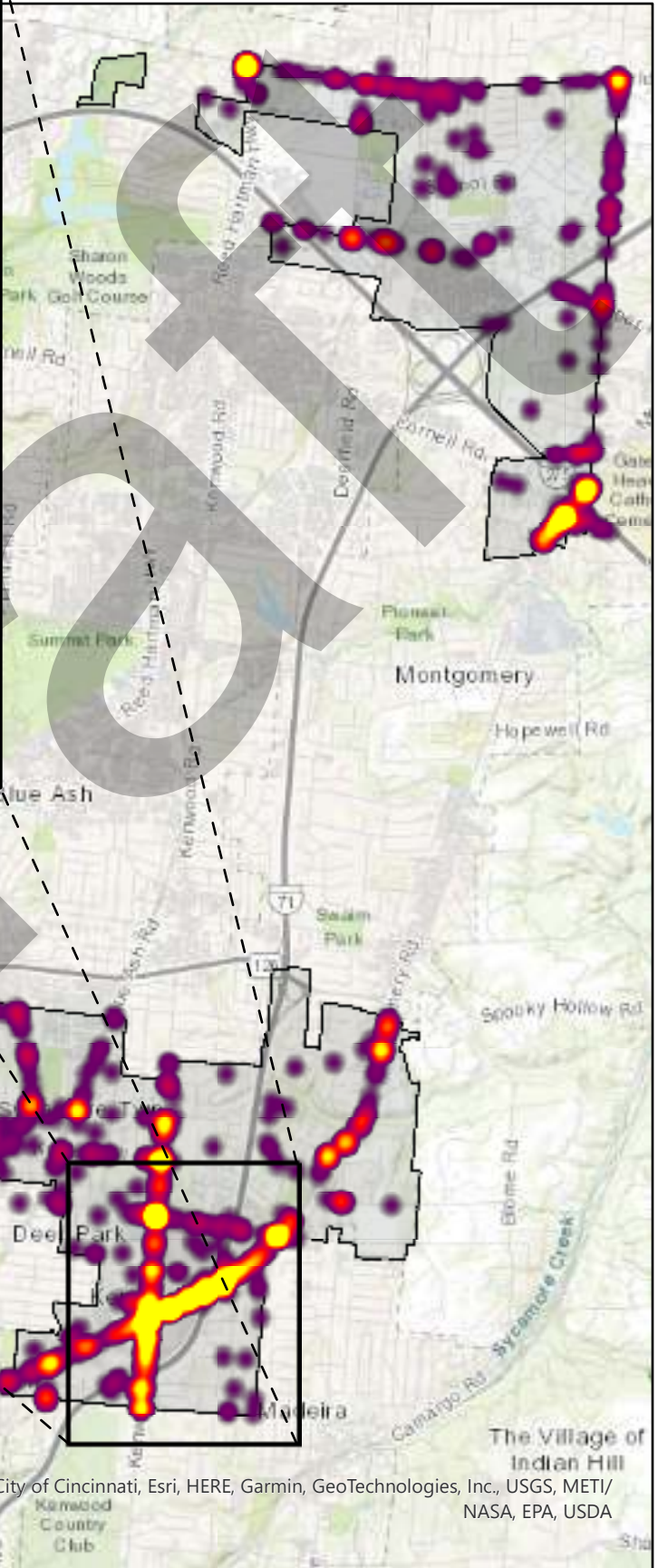
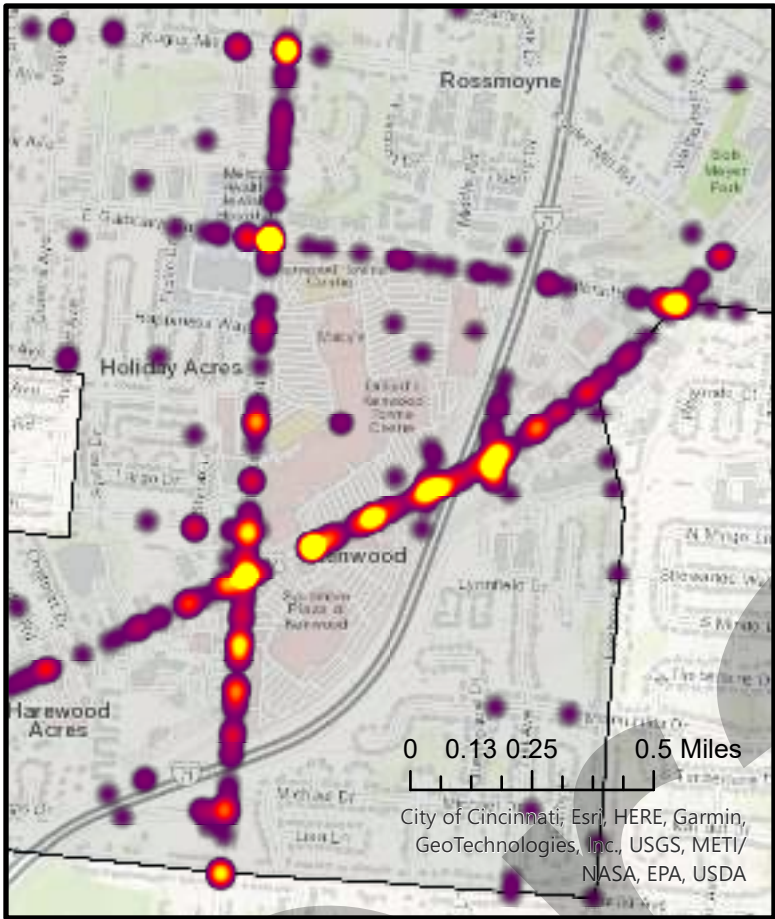


Kenwood Rd After Median

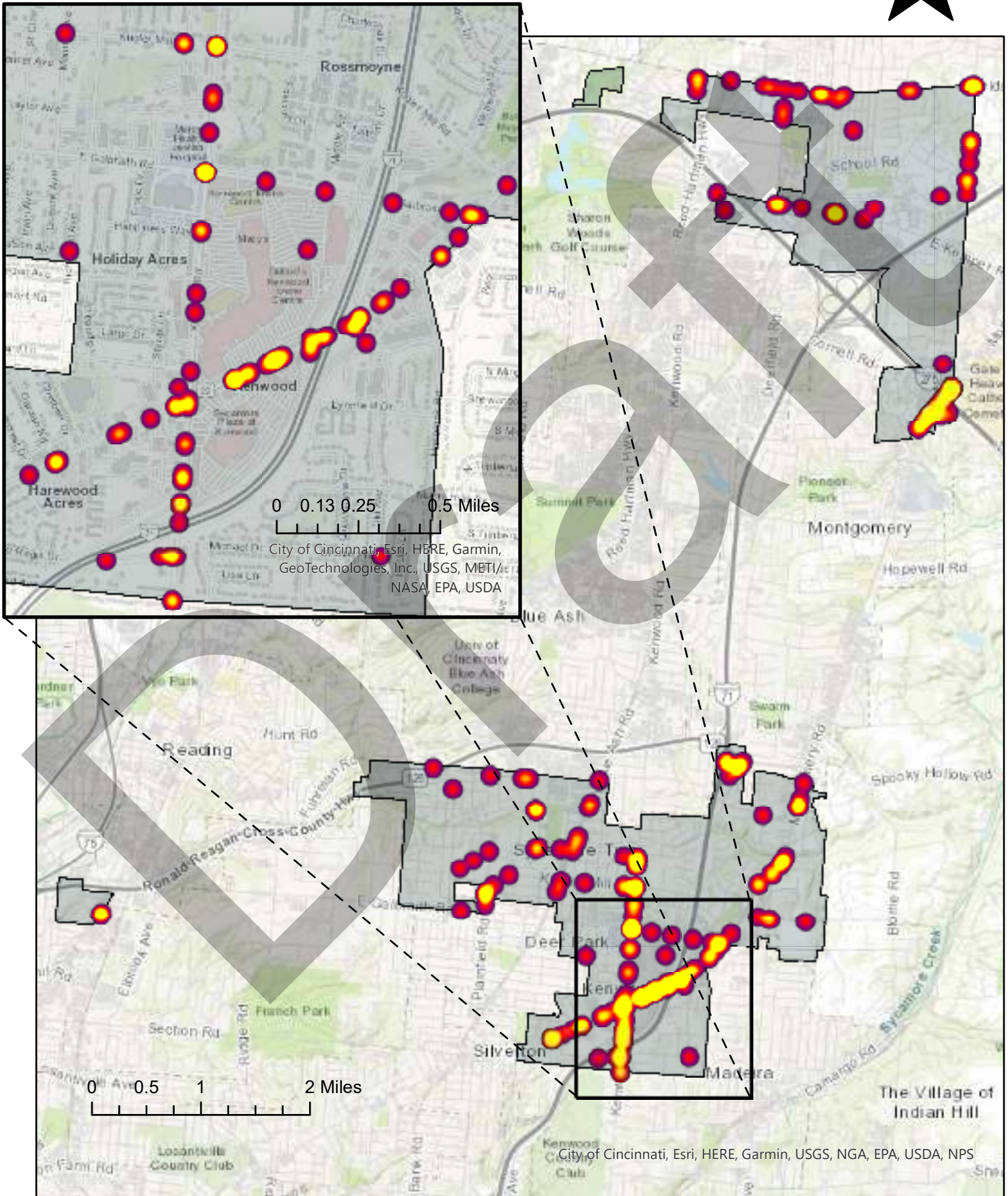


APPENDIX C: CRASH DIAGRAMS

Sycamore Township All Crash Data 2019-2021



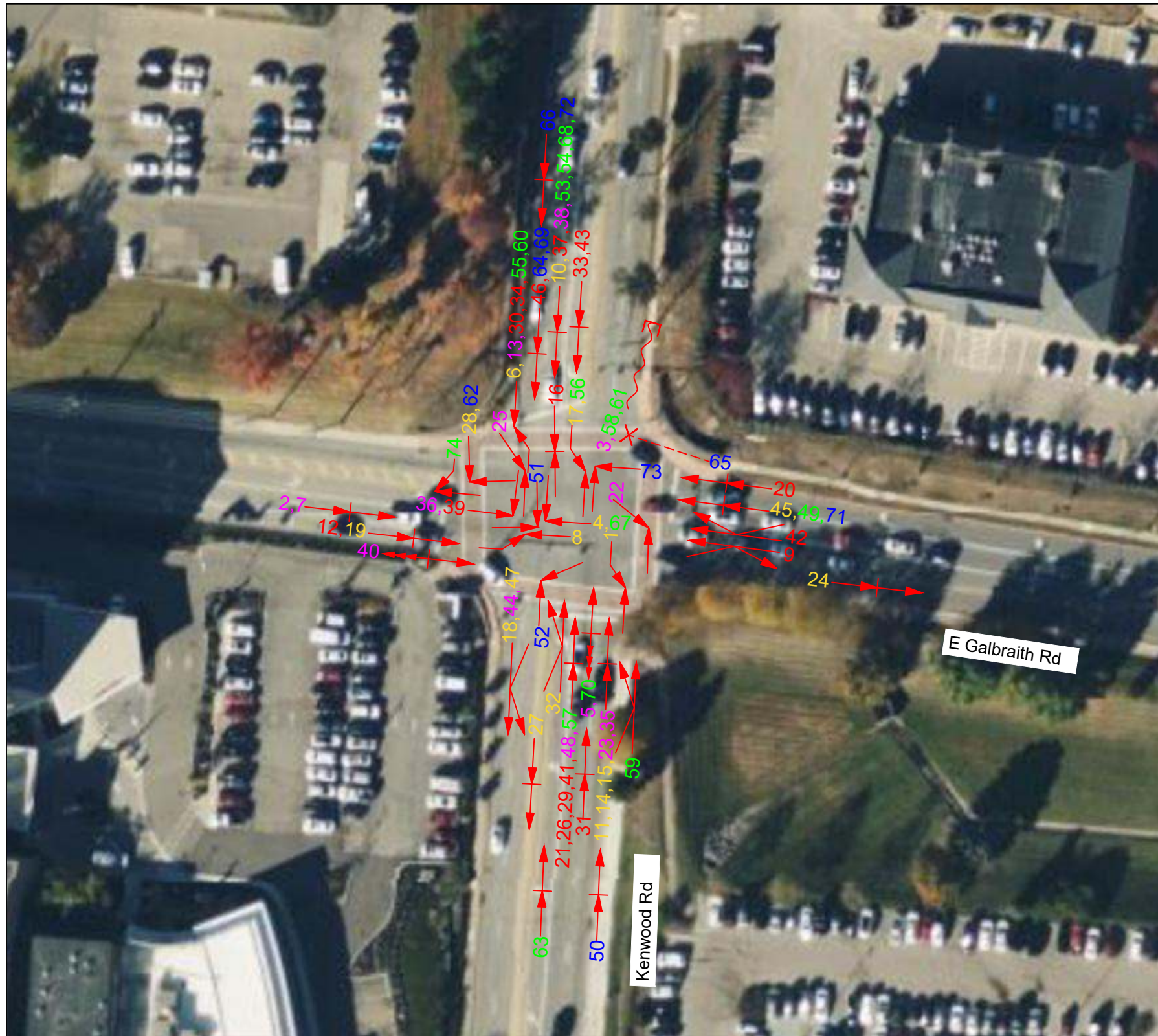
Sycamore Township Injury Crash Data 2019-2021



0 0.13 0.25 0.5 Miles
City of Cincinnati, Esri, HERE, Garmin,
GeoTechnologies, Inc., USGS, METI/
NASA, EPA, USDA

0 0.5 1 2 Miles

City of Cincinnati, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

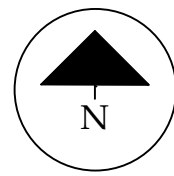


CRASH LIST

1. 09/08/2021_PDO_C_D	37. 06/22/2019_PDO_CL_D	73. 02/20/2018_PDO_C_D
2. 02/17/2020_PDO_CL_D	38. 02/17/2020_PDO_C_D	74. 12/29/2017_PDO_SN_S
3. 11/28/2020_PDO_C_D	39. 09/15/2019_PDO_C_D	
4. 08/18/2021_INJ_C_D	40. 08/18/2020_PDO_CL_W	
5. 02/12/2020_PDO_R_W	41. 04/19/2019_PDO_R_W	
6. 02/23/2021_INJ_C_D	42. 09/09/2019_PDO_C_D	
7. 08/04/2020_PDO_C_D	43. 01/24/2019_PDO_CL_I	
8. 10/07/2021_PDO_C_D	44. 12/27/2020_PDO_CL_D	
9. 09/17/2019_PDO_C_D	45. 12/28/2021_PDO_CL_D	
10. 07/08/2021_PDO_CL_D	46. 04/15/2019_PDO_CL_D	
11. 10/17/2021_PDO_C_D	47. 03/20/2021_PDO_CL_D	
12. 09/17/2019_PDO_C_D	48. 09/08/2020_PDO_C_D	
13. 01/10/2020_INJ_R_W	49. 04/26/2017_PDO_C_D	
14. 01/19/2021_PDO_C_D	50. 11/02/2018_INJ_CL_W	
15. 03/11/2021_PDO_R_W	51. 03/30/2018_INJ_CL_W	
16. 07/08/2019_INJ_C_D	52. 11/02/2018_PDO_CL_D	
17. 08/23/2020_INJ_C_D	53. 08/08/2017_PDO_C_D	
18. 02/05/2021_PDO_C_D	54. 05/25/2017_PDO_R_W	
19. 05/03/2021_INJ_C_D	55. 10/16/2017_PDO_C_D	
20. 09/06/2019_PDO_C_D	56. 08/10/2017_INJ_C_D	
21. 04/15/2019_PDO_CL_D	57. 07/18/2017_INJ_CL_D	
22. 01/16/2020_PDO_CL_D	58. 01/13/2017_PDO_CL_D	
23. 09/03/2020_PDO_C_D	59. 02/25/2017_PDO_C_W	
24. 01/05/2021_PDO_CL_D	60. 02/28/2017_PDO_R_W	
25. 04/03/2020_INJ_C_D	61. 12/11/2017_INJ_CL_D	
26. 04/19/2019_PDO_R_W	62. 01/31/2018_INJ_C_D	
27. 05/10/2021_INJ_C_D	63. 10/03/2017_PDO_C_D	
28. 12/17/2021_PDO_R_W	64. 08/14/2018_INJ_CL_D	
29. 03/28/2019_PDO_C_D	65. 11/12/2018_INJ_CL_D	
30. 10/27/2019_PDO_C_D	66. 11/21/2018_INJ_C_D	
31. 09/04/2020_PDO_C_D	67. 06/03/2017_PDO_C_D	
32. 07/01/2021_PDO_CL_W	68. 04/12/2017_PDO_C_D	
33. 01/24/2019_PDO_CL_I	69. 02/26/2018_PDO_C_D	
34. 01/19/2019_PDO_SN_I	70. 03/17/2017_PDO_CL_W	
35. 08/06/2020_PDO_CL_D	71. 04/02/2018_PDO_CL_D	
36. 11/01/2020_INJ_C_D	72. 10/03/2018_PDO_CL_D	

COLLISION DESCRIPTION = ID.DATE_SEVERITY_WEATHER-ROAD
 EX: (1. 03/20/2016_PDO_C_D)

WEATHER CONDITIONS:
 C=CLEAR CL=CLOUDY R=RAIN F/S=FOG,SMOG,SMOKE SN=SNOW
 ROAD CONDITIONS:
 D=DRY W=WET S=SNOW I=ICE M = MUD/DIRT/OIL



ACCIDENT SUMMARY

Property Damage Accidents	56
Vehicular Injury Accidents	18
TOTAL ACCIDENTS	74

SYMBOLS

	MOVING VEHICLE
	BACKING VEHICLE
	PEDESTRIAN
	PARKED VEHICLE
	FIXED OBJECT
	ANIMAL CRASH

TYPES OF COLLISIONS

	REAR END
	HEAD ON
	SIDESWIPE-PASSING
	SIDESWIPE-MEETING
	OUT OF CONTROL
	ANGLE
	LEFT TURN
	RIGHT TURN

Collision Diagram



Galbraith Rd & Kenwood Rd
 Sycamore, OH
 January 2017 – December 2021

NOTES

GREEN -- 2017
 BLUE -- 2018
 RED -- 2019
 MAGENTA -- 2020
 YELLOW -- 2021

Not to Scale

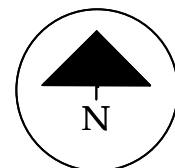


CRASH LIST

1. 09/26/2019_PDO_C_D
2. 11/11/2021_PDO_R_W
3. 12/21/2021_PDO_C_D
4. 05/12/2019_PDO_CL_W
5. 09/21/2020_PDO_C_D
6. 02/27/2021_PDO_C_D
7. 11/07/2019_PDO_CL_D
8. 06/11/2017_PDO_C_D
9. 08/03/2019_PDO_C_D
10. 09/26/2021_PDO_C_D
11. 02/09/2019_PDO_C_D
12. 02/10/2021_PDO_SN_SN
13. 08/04/2021_INJ_CL_D
14. 10/13/2017_PDO_C_D
15. 07/22/2018_INJ_C_D
16. 06/30/2017_PDO_CL_D
17. 04/14/2017_PDO_C_D
18. 08/27/2018_PDO_C_D
19. 07/14/2017_PDO_C_D
20. 10/26/2018_PDO_R_W
21. 12/27/2018_PDO_R_W
22. 06/13/2017_PDO_UKN_W
23. 11/17/2017_PDO_C_D
24. 07/21/2018_PDO_CL_D
25. 10/26/2018_PDO_R_W
26. 07/26/2017_PDO_C_D
27. 02/27/2018_PDO_C_D
28. 03/08/2017_PDO_C_D

COLLISION DESCRIPTION = ID.DATE_SEVERITY_WEATHER-ROAD
 EX: (1. 03/20/2016.PDO.C.D)

WEATHER CONDITIONS:
 C=CLEAR CL=CLOUDY R=RAIN F/S=FOG,SMOG,SMOKE SN=SNOW
 ROAD CONDITIONS:
 D=DRY W=WET S=SNOW I=ICE M = MUD/DIRT/OIL



ACCIDENT SUMMARY

Property Damage Accidents	26
Vehicular Injury Accidents	2
TOTAL ACCIDENTS	28

SYMBOLS

- MOVING VEHICLE
- BACKING VEHICLE
- PEDESTRIAN
- PARKED VEHICLE
- FIXED OBJECT
- ANIMAL CRASH

TYPES OF COLLISIONS

- REAR END
- HEAD ON
- SIDESWIPE-PASSING
- SIDESWIPE-MEETING
- OUT OF CONTROL
- ANGLE
- LEFT TURN
- RIGHT TURN

Collision Diagram

By:



Orchard Ln & Kenwood Rd
 Sycamore, OH
 January 2017 – December 2021

NOTES

GREEN -- 2017
 BLUE -- 2018
 RED -- 2019
 MAGENTA -- 2020
 YELLOW -- 2021

Not to Scale

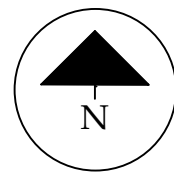


CRASH LIST

1. 01/23/2017_PDO_CL_W	37. 05/26/2018_PDO_R_W	73. 12/22/2017_INJ_R_W
2. 02/28/2018_PDO_CL_D	38. 11/12/2019_PDO_C_D	74. 11/11/2019_PDO_SN_W
3. 10/23/2020_PDO_C_D	39. 12/16/2019_PDO_R_W	75. 07/08/2020_PDO_C_D
4. 09/11/2021_PDO_C_D	40. 03/22/2021_PDO_C_D	76. 08/28/2020_PDO_CL_D
5. 04/19/2021_PDO_C_D	41. 08/13/2021_PDO_C_D	77. 09/29/2017_PDO_C_D
6. 08/01/2017_PDO_C_D	42. 09/22/2017_PDO_C_D	78. 11/10/2021_PDO_C_D
7. 11/08/2017_PDO_C_D	43. 10/29/2021_PDO_R_W	79. 08/11/2017_PDO_C_D
8. 07/20/2017_PDO_C_D	44. 02/21/2020_PDO_CL_D	80. 09/12/2017_INJ_CL_W
9. 12/11/2018_PDO_C_D	45. 05/20/2021_PDO_C_D	81. 09/07/2017_INJ_C_D
10. 03/31/2018_PDO_C_D	46. 08/17/2021_PDO_C_D	82. 09/03/2018_PDO_UKN_D
11. 06/11/2021_PDO_C_D	47. 08/12/2017_PDO_C_D	83. 11/17/2019_PDO_CL_D
12. 05/04/2021_PDO_CL_W	48. 10/18/2021_PDO_C_D	84. 02/05/2021_INJ_C_D
13. 03/17/2019_PDO_CL_D	49. 05/15/2021_PDO_C_D	85. 08/24/2021_PDO_C_D
14. 06/19/2019_INJ_CL_D	50. 05/21/2021_PDO_C_D	86. 08/24/2020_PDO_C_D
15. 09/02/2020_PDO_CL_D	51. 07/01/2017_PDO_C_D	87. 03/23/2018_PDO_C_D
16. 11/29/2021_PDO_C_D	52. 09/27/2017_INJ_C_D	88. 08/22/2017_PDO_CL_D
17. 08/28/2017_PDO_C_D	53. 06/15/2018_PDO_C_D	89. 07/26/2018_PDO_C_D
18. 03/11/2021_PDO_R_W	54. 11/02/2018_PDO_CL_D	90. 02/02/2020_PDO_C_D
19. 11/09/2017_PDO_C_W	55. 08/17/2021_INJ_CL_D	91. 11/24/2018_PDO_CL_W
20. 10/19/2018_PDO_C_D	56. 11/12/2017_PDO_R_W	92. 02/24/2021_INJ_CL_W
21. 12/22/2017_PDO_R_W	57. 09/08/2017_PDO_C_D	93. 12/18/2021_PDO_CL_D
22. 07/07/2017_PDO_C_D	58. 12/23/2019_PDO_C_D	
23. 12/22/2017_INJ_CL_D	59. 11/27/2017_PDO_C_D	
24. 04/23/2019_INJ_CL_D	60. 09/09/2020_PDO_C_D	
25. 05/13/2018_PDO_CL_D	61. 01/23/2017_PDO_R_W	
26. 09/28/2018_PDO_CL_D	62. 09/02/2017_INJ_R_W	
27. 05/24/2019_PDO_CL_D	63. 12/09/2017_INJ_CL_S	
28. 05/15/2017_PDO_C_D	64. 08/19/2019_PDO_C_D	
29. 10/19/2017_PDO_C_D	65. 08/10/2021_PDO_C_D	
30. 07/13/2017_PDO_CL_W	66. 07/16/2017_PDO_C_D	
31. 10/23/2017_PDO_R_W	67. 09/13/2017_PDO_R_W	
32. 01/15/2018_PDO_SN_W	68. 11/25/2017_PDO_C_D	
33. 08/11/2018_PDO_CL_D	69. 05/22/2019_PDO_CL_D	
34. 01/01/2019_PDO_CL_D	70. 01/27/2017_PDO_CL_W	
35. 12/28/2019_PDO_C_D	71. 04/09/2019_PDO_C_D	
36. 02/06/2017_PDO_C_D	72. 02/14/2017_INJ_C_D	

COLLISION DESCRIPTION = ID.DATE.SEVERITY.WEATHER-ROAD
 EX: (1. 03/20/2016_PDO_C_D)

WEATHER CONDITIONS:
 C=CLEAR CL=CLOUDY R=RAIN F/S=FOG,SMOG,SMOKE SN=SNOW
 ROAD CONDITIONS:
 D=DRY W=WET S=SNOW I=ICE M = MUD/DIRT/OIL



ACCIDENT SUMMARY

Property Damage Accidents	80
Vehicular Injury Accidents	13
TOTAL ACCIDENTS	93

SYMBOLS

	MOVING VEHICLE
	BACKING VEHICLE
	PEDESTRIAN
	PARKED VEHICLE
	FIXED OBJECT
	ANIMAL CRASH

TYPES OF COLLISIONS

	REAR END
	HEAD ON
	SIDESWIPE-PASSING
	SIDESWIPE-MEETING
	OUT OF CONTROL
	ANGLE
	LEFT TURN
	RIGHT TURN

Collision Diagram



Montgomery Rd & Kenwood Rd
 Sycamore, OH
 January 2017 – December 2021

NOTES

GREEN -- 2017
 BLUE -- 2018
 RED -- 2019
 MAGENTA -- 2020
 YELLOW -- 2021

Not to Scale

APPENDIX D: PROJECT DRAWINGS

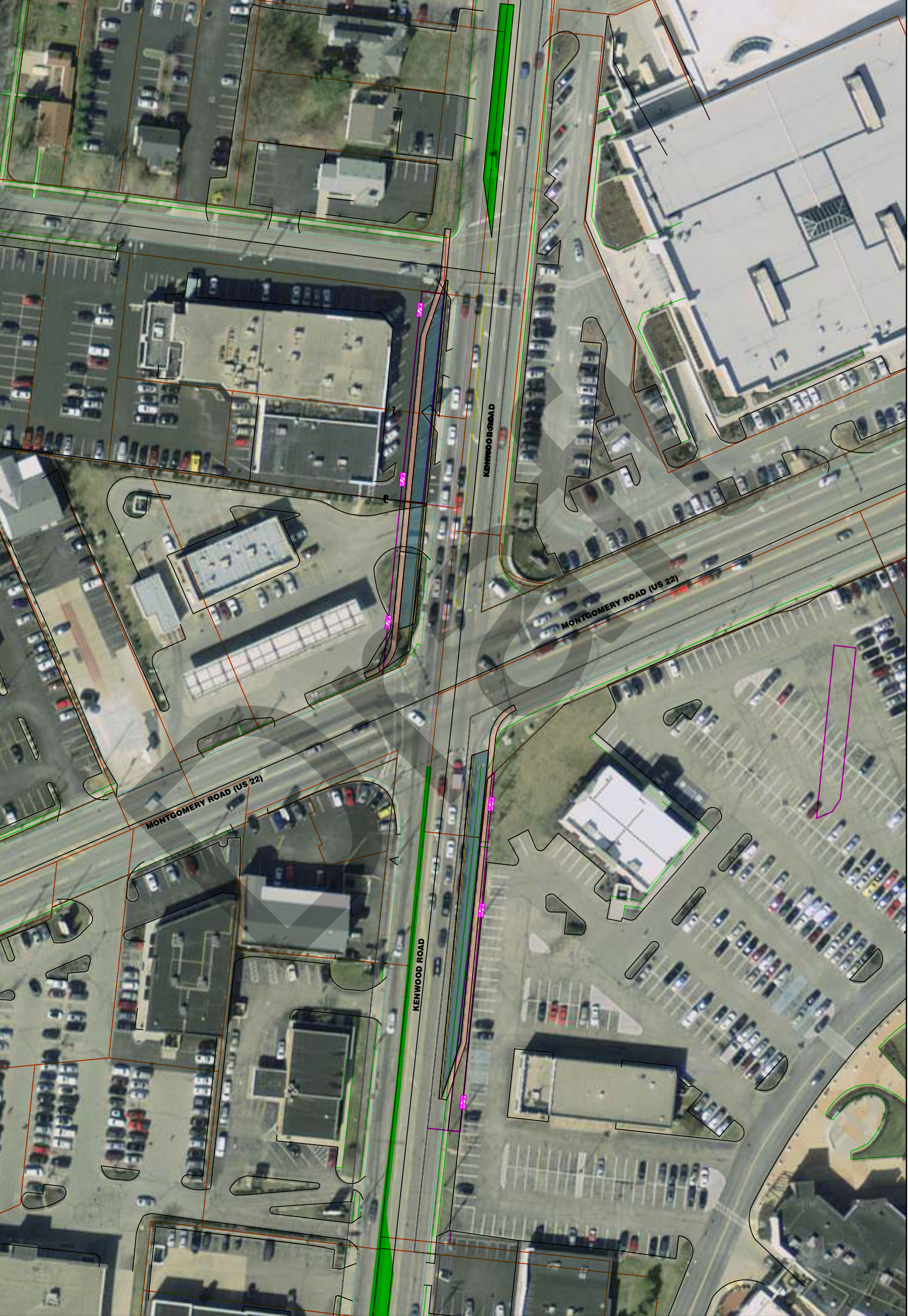


SYCAMORE TWP

**KENWOOD ROAD AT MONTGOMERY ROAD
SBL, SBR, NBR**

CALCULATED
KLL
CHECKED
ERW

HORIZONTAL
SCALE IN FEET



MONTGOMERY ROAD (US 22)

KENWOOD B-CROSSROAD

KENWOOD ROAD

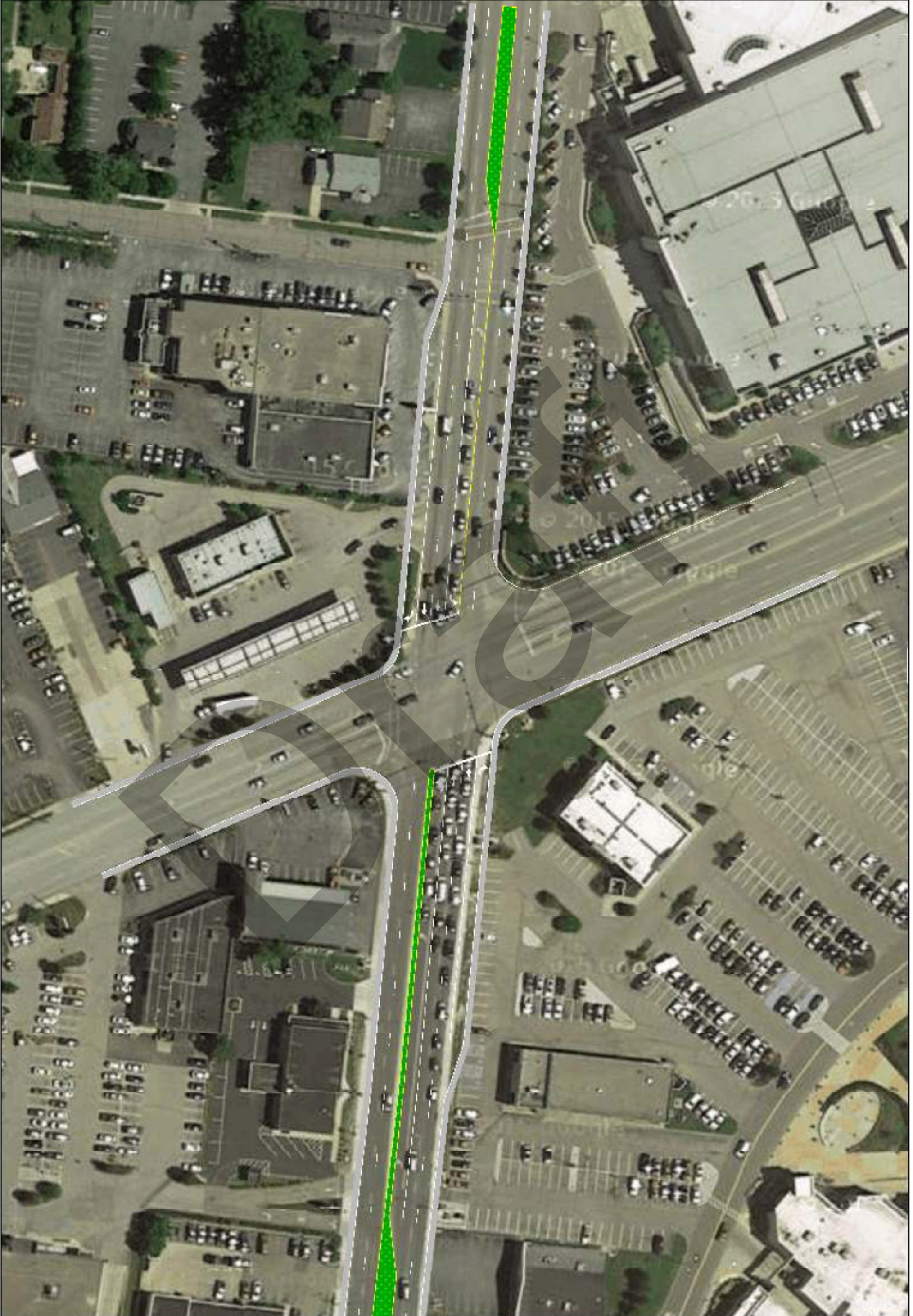


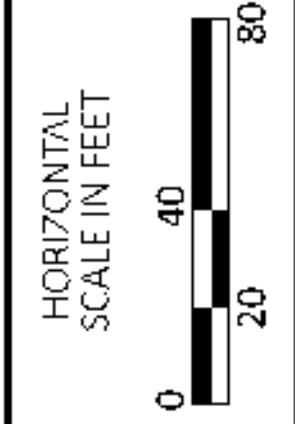
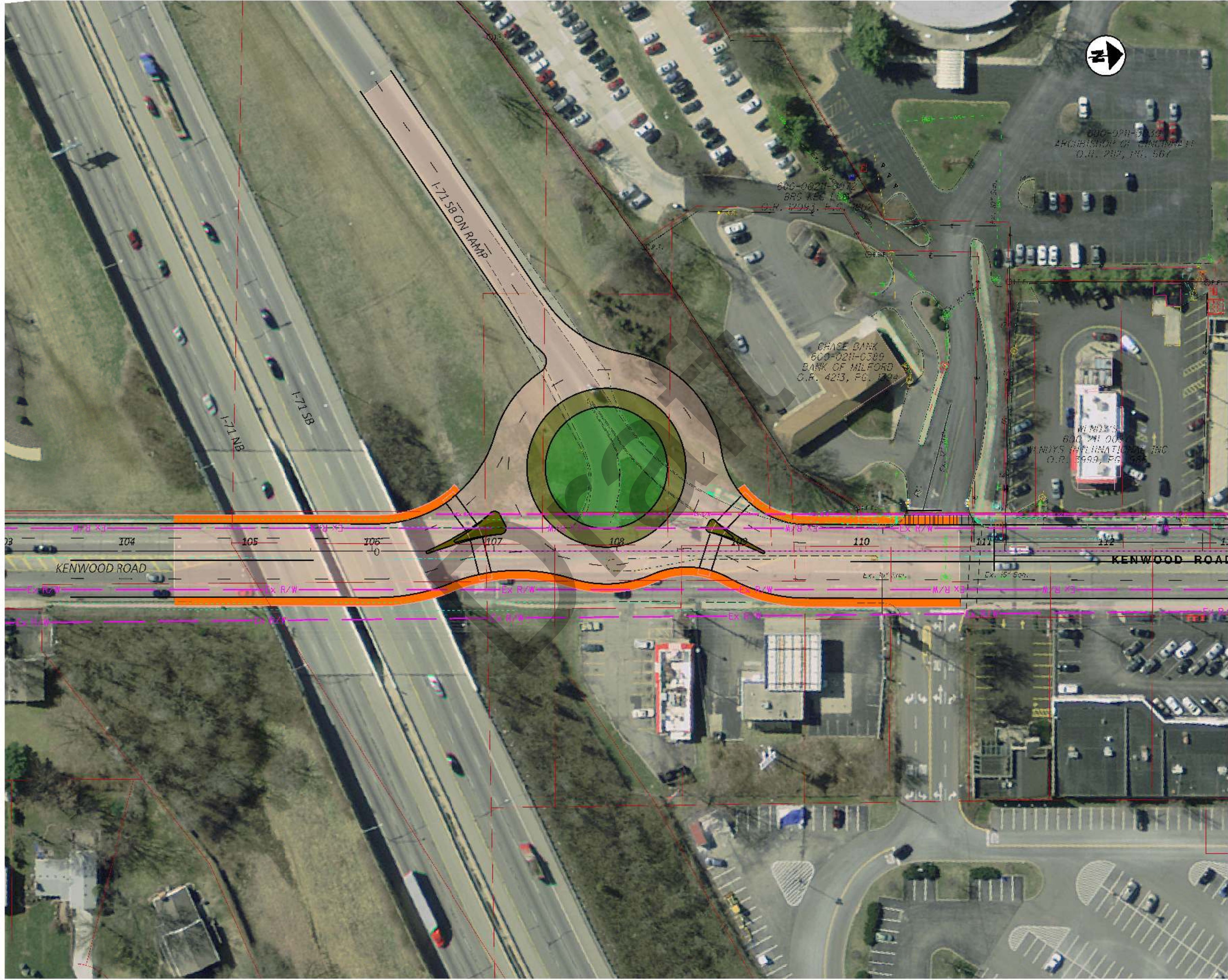
SYCAMORE TWP

**KENWOOD LANE OPTION
SBL, SBR, NBR**

1/20/20

SCALE 1" = 40'





KENWOOD RD
PROPOSED ROUNDABOUT

DESIGN AGENCY
TEC
TEC Engineering, Inc.
PLAN PREPARED BY
VMG
7289 Central Park Blvd.
Mason, OH 45040

DESIGNER
VMG

REVIEWER
K. VILWLR

PROJECT ID
22102

SHEET	TOTAL
P.1	1
























APPENDIX E: CAPACITY ANALYSIS

Draft

2025 AM
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Future Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	385	49	158	303	156	108	556	174	127	434	97
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	582	1442	182	575	1623	846	277	620	193	238	699	155
Arrive On Green	0.08	0.45	0.44	0.08	0.46	0.45	0.15	0.47	0.43	0.03	0.08	0.07
Sat Flow, veh/h	1781	3174	401	1781	3554	1585	1781	2666	832	1781	2891	641
Grp Volume(v), veh/h	151	214	220	158	303	156	108	370	360	127	265	266
Grp Sat Flow(s),veh/h/ln	1781	1777	1798	1781	1777	1585	1781	1777	1721	1781	1777	1755
Q Serve(g_s), s	5.2	9.0	9.2	5.4	6.1	6.1	5.3	22.9	23.2	6.4	17.4	17.6
Cycle Q Clear(g_c), s	5.2	9.0	9.2	5.4	6.1	6.1	5.3	22.9	23.2	6.4	17.4	17.6
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.48	1.00		0.37
Lane Grp Cap(c), veh/h	582	807	817	575	1623	846	277	413	400	238	430	424
V/C Ratio(X)	0.26	0.27	0.27	0.27	0.19	0.18	0.39	0.90	0.90	0.53	0.62	0.63
Avail Cap(c_a), veh/h	878	807	817	620	1623	846	298	435	422	270	463	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.99	0.99	0.99	1.00	1.00	1.00	0.96	0.96	0.96	0.99	0.99	0.99
Uniform Delay (d), s/veh	14.3	20.3	20.5	14.3	19.4	14.5	29.3	30.8	31.7	35.0	49.8	50.1
Incr Delay (d2), s/veh	0.2	0.8	0.8	0.3	0.3	0.5	0.9	19.4	20.5	1.8	2.2	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.8	3.9	2.1	2.5	2.3	2.2	9.6	9.7	3.0	8.5	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	21.1	21.3	14.5	19.6	15.0	30.1	50.1	52.3	36.9	52.0	52.4
LnGrp LOS	B	C	C	B	B	B	C	D	D	D	D	D
Approach Vol, veh/h		585			617			838			658	
Approach Delay, s/veh		19.5			17.1			48.5			49.3	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	58.7	13.6	33.7	14.1	58.6	14.8	32.5				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	11.2	7.3	19.6	7.2	8.1	8.4	25.2					
Green Ext Time (p_c), s	0.1	1.7	0.0	1.6	0.5	1.9	0.1	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			35.2									
HCM 6th LOS			D									
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Future Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	385	49	158	303	156	108	556	174	127	434	97
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	618	1573	199	613	1769	915	245	682	372	252	584	129
Arrive On Green	0.08	0.50	0.48	0.08	0.50	0.49	0.15	0.38	0.35	0.03	0.07	0.06
Sat Flow, veh/h	1781	3174	401	1781	3554	1585	1781	3554	1585	1781	2891	641
Grp Volume(v), veh/h	151	214	220	158	303	156	108	556	174	127	265	266
Grp Sat Flow(s),veh/h/ln	1781	1777	1798	1781	1777	1585	1781	1777	1585	1781	1777	1755
Q Serve(g_s), s	4.7	8.3	8.5	4.9	5.6	5.5	5.5	16.8	10.2	6.7	17.6	17.8
Cycle Q Clear(g_c), s	4.7	8.3	8.5	4.9	5.6	5.5	5.5	16.8	10.2	6.7	17.6	17.8
Prop In Lane	1.00		0.22	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	618	881	891	613	1769	915	245	682	372	252	359	354
V/C Ratio(X)	0.24	0.24	0.25	0.26	0.17	0.17	0.44	0.82	0.47	0.50	0.74	0.75
Avail Cap(c_a), veh/h	920	881	891	665	1769	915	262	871	456	279	463	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.99	0.99	0.99	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.1	17.4	17.6	12.0	16.5	11.9	32.4	35.1	30.7	37.4	52.9	53.1
Incr Delay (d2), s/veh	0.2	0.7	0.7	0.2	0.2	0.4	1.2	4.6	0.9	1.6	4.5	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	3.4	3.6	1.9	2.3	2.0	2.3	6.2	3.4	3.2	8.9	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	18.0	18.2	12.2	16.8	12.3	33.6	39.7	31.6	38.9	57.4	58.1
LnGrp LOS	B	B	B	B	B	B	C	D	C	D	E	E
Approach Vol, veh/h		585			617			838			658	
Approach Delay, s/veh		16.6			14.5			37.2			54.1	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	63.7	13.9	28.9	13.7	63.5	15.2	27.6				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	10.5	7.5	19.8	6.7	7.6	8.7	18.8					
Green Ext Time (p_c), s	0.2	1.7	0.0	1.5	0.5	1.9	0.1	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			31.7									
HCM 6th LOS			C									
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Future Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	385	49	158	303	156	108	556	174	127	434	97
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	582	1442	182	575	1623	846	303	620	193	238	859	460
Arrive On Green	0.08	0.45	0.44	0.08	0.46	0.45	0.15	0.47	0.43	0.03	0.08	0.07
Sat Flow, veh/h	1781	3174	401	1781	3554	1585	1781	2666	832	1781	3554	1585
Grp Volume(v), veh/h	151	214	220	158	303	156	108	370	360	127	434	97
Grp Sat Flow(s),veh/h/ln	1781	1777	1798	1781	1777	1585	1781	1777	1721	1781	1777	1585
Q Serve(g_s), s	5.2	9.0	9.2	5.4	6.1	6.1	5.3	22.9	23.2	6.4	14.1	6.4
Cycle Q Clear(g_c), s	5.2	9.0	9.2	5.4	6.1	6.1	5.3	22.9	23.2	6.4	14.1	6.4
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	582	807	817	575	1623	846	303	413	400	238	859	460
V/C Ratio(X)	0.26	0.27	0.27	0.27	0.19	0.18	0.36	0.90	0.90	0.53	0.51	0.21
Avail Cap(c_a), veh/h	878	807	817	620	1623	846	324	435	422	270	927	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.99	0.99	0.99	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.3	20.3	20.5	14.3	19.4	14.5	28.8	30.8	31.7	35.0	48.3	38.9
Incr Delay (d2), s/veh	0.2	0.8	0.8	0.3	0.3	0.5	0.7	19.4	20.5	1.9	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.8	3.9	2.1	2.5	2.3	2.1	9.6	9.7	3.0	6.8	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	21.1	21.3	14.5	19.6	15.0	29.5	50.1	52.3	36.9	48.8	39.1
LnGrp LOS	B	C	C	B	B	B	C	D	D	D	D	D
Approach Vol, veh/h		585			617			838			658	
Approach Delay, s/veh		19.5			17.1			48.4			45.1	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	58.7	13.6	33.7	14.1	58.6	14.8	32.5				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	11.2	7.3	16.1	7.2	8.1	8.4	25.2					
Green Ext Time (p_c), s	0.1	1.7	0.0	2.0	0.5	1.9	0.1	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			34.2									
HCM 6th LOS			C									
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Future Volume (veh/h)	134	343	44	141	270	139	96	495	155	113	386	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	385	49	158	303	156	108	556	174	127	434	97
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	618	1573	199	613	1769	915	271	682	372	252	717	391
Arrive On Green	0.08	0.50	0.48	0.08	0.50	0.49	0.15	0.38	0.35	0.03	0.07	0.06
Sat Flow, veh/h	1781	3174	401	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	151	214	220	158	303	156	108	556	174	127	434	97
Grp Sat Flow(s),veh/h/ln	1781	1777	1798	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.7	8.3	8.5	4.9	5.6	5.5	5.5	16.8	10.2	6.7	14.3	6.5
Cycle Q Clear(g_c), s	4.7	8.3	8.5	4.9	5.6	5.5	5.5	16.8	10.2	6.7	14.3	6.5
Prop In Lane	1.00		0.22	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	618	881	891	613	1769	915	271	682	372	252	717	391
V/C Ratio(X)	0.24	0.24	0.25	0.26	0.17	0.17	0.40	0.82	0.47	0.50	0.60	0.25
Avail Cap(c_a), veh/h	920	881	891	665	1769	915	288	871	456	279	927	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.99	0.99	0.99	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.1	17.4	17.6	12.0	16.5	11.9	31.9	35.1	30.7	37.4	51.3	42.1
Incr Delay (d2), s/veh	0.2	0.7	0.7	0.2	0.2	0.4	0.9	4.6	0.9	1.6	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	3.4	3.6	1.9	2.3	2.0	2.3	6.2	3.4	3.2	6.9	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	18.0	18.2	12.2	16.8	12.3	32.9	39.7	31.6	38.9	52.2	42.5
LnGrp LOS	B	B	B	B	B	B	C	D	C	D	D	D
Approach Vol, veh/h		585			617			838			658	
Approach Delay, s/veh		16.6			14.5			37.1			48.2	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	63.7	13.9	28.9	13.7	63.5	15.2	27.6				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	10.5	7.5	16.3	6.7	7.6	8.7	18.8					
Green Ext Time (p_c), s	0.2	1.7	0.0	2.0	0.5	1.9	0.1	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			30.2									
HCM 6th LOS			C									
Notes												
User approved changes to right turn type.												

MOVEMENT SUMMARY

 Site: 101 [2025 AM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	497	3.0	0.528	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	35.9
8	T1	959	3.0	0.528	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	37.6
Approach		1455	3.0	0.528	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	37.0
North: Kenwood Rd												
4	T1	308	3.0	0.355	8.2	LOS A	1.6	41.0	0.60	0.57	0.60	33.6
14	R2	346	3.0	0.399	8.9	LOS A	2.0	51.8	0.62	0.63	0.68	32.0
Approach		653	3.0	0.399	8.6	LOS A	2.0	51.8	0.61	0.60	0.64	32.7
All Vehicles		2109	3.0	0.528	8.3	LOS A	2.0	51.8	0.19	0.19	0.20	35.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB.sip8

MOVEMENT SUMMARY

 Site: 101 [2025 AM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	497	3.0	0.528	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	35.9
8	T1	959	3.0	0.528	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	37.6
Approach		1455	3.0	0.528	8.1	LOS A	0.0	0.0	0.00	0.00	0.00	37.0
North: Kenwood Rd												
4	T1	308	3.0	0.355	8.2	LOS A	1.6	41.0	0.60	0.57	0.60	33.6
14	R2	346	3.0	0.399	8.9	LOS A	2.0	51.8	0.62	0.63	0.68	32.0
Approach		653	3.0	0.399	8.6	LOS A	2.0	51.8	0.61	0.60	0.64	32.7
All Vehicles		2109	3.0	0.528	8.3	LOS A	2.0	51.8	0.19	0.19	0.20	35.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB SB Turn Lane.sip8

Draft

2025 MID

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	388	106	174	398	172	170	497	209	249	490	157
Future Volume (veh/h)	193	388	106	174	398	172	170	497	209	249	490	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	203	408	112	183	419	181	179	523	220	262	516	165
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	475	1043	283	520	1327	791	314	627	263	323	759	241
Arrive On Green	0.21	0.76	0.72	0.10	0.37	0.37	0.03	0.08	0.08	0.04	0.09	0.09
Sat Flow, veh/h	1781	2762	750	1781	3554	1585	1781	2441	1023	1781	2652	844
Grp Volume(v), veh/h	203	261	259	183	419	181	179	380	363	262	345	336
Grp Sat Flow(s),veh/h/ln	1781	1777	1735	1781	1777	1585	1781	1777	1686	1781	1777	1718
Q Serve(g_s), s	8.9	6.6	7.1	7.8	10.9	8.4	9.3	27.4	27.6	13.3	24.4	24.6
Cycle Q Clear(g_c), s	8.9	6.6	7.1	7.8	10.9	8.4	9.3	27.4	27.6	13.3	24.4	24.6
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.61	1.00		0.49
Lane Grp Cap(c), veh/h	475	671	655	520	1327	791	314	456	433	323	508	492
V/C Ratio(X)	0.43	0.39	0.40	0.35	0.32	0.23	0.57	0.83	0.84	0.81	0.68	0.68
Avail Cap(c_a), veh/h	542	671	655	661	1327	791	381	525	498	338	523	506
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.93	0.93	0.93	0.90	0.90	0.90
Uniform Delay (d), s/veh	18.5	10.7	11.5	20.3	28.9	18.4	34.2	56.7	57.0	35.1	53.1	53.3
Incr Delay (d2), s/veh	0.6	1.7	1.7	0.4	0.6	0.7	1.5	9.3	10.1	12.1	3.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	2.4	2.5	3.3	4.7	3.2	4.5	14.3	13.7	7.4	12.1	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	12.4	13.2	20.7	29.6	19.1	35.8	66.0	67.1	47.2	56.1	56.6
LnGrp LOS	B	B	B	C	C	B	D	E	E	D	E	E
Approach Vol, veh/h		723			783			922			943	
Approach Delay, s/veh		14.6			25.1			60.6			53.8	
Approach LOS		B			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.8	53.3	18.1	41.9	17.7	52.3	22.0	38.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	20.5	30.5	16.5	36.5	16.1	34.9	16.5	36.5				
Max Q Clear Time (g_c+I1),s	9.8	9.1	11.3	26.6	10.9	12.9	15.3	29.6				
Green Ext Time (p_c), s	0.4	2.0	0.3	2.1	0.3	2.6	0.1	1.9				
Intersection Summary												
HCM 6th Ctrl Delay			40.6									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
























HCM Signalized Intersection Capacity Analysis
 11: Kenwood Road & Montgomery Road

09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	193	388	106	174	398	172	170	497	209	249	490	157	
Future Volume (vph)	193	388	106	174	398	172	170	497	209	249	490	157	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.2	4.2		3.8	3.8	4.7	4.6	4.6	6.5	4.7	4.7		
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3425		1770	3539	1583	1770	3539	1583	1770	3411		
Flt Permitted	0.43	1.00		0.37	1.00	1.00	0.16	1.00	1.00	0.24	1.00		
Satd. Flow (perm)	796	3425		680	3539	1583	306	3539	1583	445	3411		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	203	408	112	183	419	181	179	523	220	262	516	165	
RTOR Reduction (vph)	0	16	0	0	0	89	0	0	111	0	26	0	
Lane Group Flow (vph)	203	504	0	183	419	92	179	523	109	262	655	0	
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA		
Protected Phases	5	2		1	6	7	3	8	1	7	4		
Permitted Phases	2			6		6	8		8	4			
Actuated Green, G (s)	59.8	46.7		59.4	46.5	62.5	42.4	28.4	41.3	46.4	30.4		
Effective Green, g (s)	64.4	49.0		64.8	49.2	66.1	46.2	30.3	41.3	50.0	32.2		
Actuated g/C Ratio	0.50	0.38		0.50	0.38	0.51	0.36	0.23	0.32	0.38	0.25		
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	509	1290		469	1339	862	287	824	582	352	844		
v/s Ratio Prot	c0.05	0.15		0.05	0.12	0.01	0.08	0.15	0.02	c0.10	c0.19		
v/s Ratio Perm	c0.15			0.15		0.04	0.14		0.05	0.18			
v/c Ratio	0.40	0.39		0.39	0.31	0.11	0.62	0.63	0.19	0.74	0.78		
Uniform Delay, d1	19.0	29.6		18.7	28.5	16.6	31.6	44.9	32.2	30.2	45.5		
Progression Factor	0.97	0.96		1.00	1.00	1.00	0.92	0.99	3.04	1.46	0.73		
Incremental Delay, d2	0.5	0.9		0.5	0.6	0.1	4.0	1.5	0.1	7.9	4.3		
Delay (s)	18.8	29.2		19.3	29.1	16.7	33.0	46.0	98.1	51.9	37.4		
Level of Service	B	C		B	C	B	C	D	F	D	D		
Approach Delay (s)		26.3			23.9			55.9			41.4		
Approach LOS		C			C			E			D		
Intersection Summary													
HCM 2000 Control Delay			38.1									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			130.0									Sum of lost time (s)	20.0
Intersection Capacity Utilization			72.4%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	388	106	174	398	172	170	497	209	249	490	157
Future Volume (veh/h)	193	388	106	174	398	172	170	497	209	249	490	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	203	408	112	183	419	181	179	523	220	262	516	165
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	517	1198	326	581	1527	893	318	705	291	344	816	470
Arrive On Green	0.20	0.87	0.83	0.09	0.43	0.42	0.04	0.07	0.06	0.05	0.08	0.07
Sat Flow, veh/h	1781	2762	750	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	203	261	259	183	419	181	179	523	220	262	516	165
Grp Sat Flow(s),veh/h/ln	1781	1777	1735	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.1	3.6	4.1	7.1	9.9	7.3	10.1	18.8	17.8	14.5	18.3	11.7
Cycle Q Clear(g_c), s	8.1	3.6	4.1	7.1	9.9	7.3	10.1	18.8	17.8	14.5	18.3	11.7
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	517	771	753	581	1527	893	318	705	291	344	816	470
V/C Ratio(X)	0.39	0.34	0.34	0.32	0.27	0.20	0.56	0.74	0.76	0.76	0.63	0.35
Avail Cap(c_a), veh/h	594	771	753	731	1527	893	375	1050	445	344	1047	573
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.93	0.93	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	5.1	5.7	16.5	24.0	14.0	38.6	57.5	58.2	38.4	54.7	43.0
Incr Delay (d2), s/veh	0.5	1.2	1.2	0.3	0.4	0.5	1.4	1.5	3.7	9.6	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	1.3	1.5	2.9	4.2	2.7	4.9	9.1	7.9	7.8	8.9	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.7	6.3	7.0	16.8	24.4	14.5	40.1	58.9	61.9	48.0	55.6	43.4
LnGrp LOS	B	A	A	B	C	B	D	E	E	D	E	D
Approach Vol, veh/h		723			783			922			943	
Approach Delay, s/veh		9.2			20.3			56.0			51.3	
Approach LOS		A			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	60.6	18.8	34.5	17.0	59.7	23.0	30.4				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	20.5	30.5	16.5	36.5	16.1	34.9	16.5	36.5				
Max Q Clear Time (g_c+l1),s	9.1	6.1	12.1	20.3	10.1	11.9	16.5	20.8				
Green Ext Time (p_c), s	0.5	2.0	0.2	2.8	0.3	2.6	0.0	3.1				
Intersection Summary												
HCM 6th Ctrl Delay			36.4									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												

MOVEMENT SUMMARY

 Site: 101 [2025 MID]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	163	3.0	0.399	6.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.2
8	T1	936	3.0	0.399	6.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.8
Approach		1099	3.0	0.399	6.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
North: Kenwood Rd												
4	T1	426	3.0	0.360	6.5	LOS A	1.9	48.4	0.38	0.25	0.38	34.4
14	R2	443	3.0	0.375	6.7	LOS A	2.0	51.3	0.39	0.25	0.39	33.0
Approach		870	3.0	0.375	6.6	LOS A	2.0	51.3	0.38	0.25	0.38	33.7
All Vehicles		1968	3.0	0.399	6.5	LOS A	2.0	51.3	0.17	0.11	0.17	35.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB.sip8

MOVEMENT SUMMARY

 Site: 101 [2025 MID]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	163	3.0	0.399	6.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.2
8	T1	936	3.0	0.399	6.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.8
Approach		1099	3.0	0.399	6.3	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
North: Kenwood Rd												
4	T1	426	3.0	0.360	6.5	LOS A	1.9	48.4	0.38	0.25	0.38	34.4
14	R2	443	3.0	0.375	6.7	LOS A	2.0	51.3	0.39	0.25	0.39	33.0
Approach		870	3.0	0.375	6.6	LOS A	2.0	51.3	0.38	0.25	0.38	33.7
All Vehicles		1968	3.0	0.399	6.5	LOS A	2.0	51.3	0.17	0.11	0.17	35.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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



















Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB SB Turn Lane.sip8

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2025 PM

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Future Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	215	573	139	222	498	231	154	543	226	220	647	170
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	466	1137	275	423	1438	820	249	595	247	293	749	197
Arrive On Green	0.07	0.27	0.25	0.11	0.40	0.39	0.19	0.48	0.45	0.04	0.09	0.08
Sat Flow, veh/h	1795	2860	692	1795	3582	1598	1795	2468	1024	1795	2807	737
Grp Volume(v), veh/h	215	358	354	222	498	231	154	394	375	220	413	404
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1701	1795	1791	1753
Q Serve(g_s), s	8.7	22.0	22.2	9.0	12.6	10.7	8.1	26.4	26.8	11.5	29.6	29.6
Cycle Q Clear(g_c), s	8.7	22.0	22.2	9.0	12.6	10.7	8.1	26.4	26.8	11.5	29.6	29.6
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.60	1.00		0.42
Lane Grp Cap(c), veh/h	466	712	700	423	1438	820	249	431	410	293	478	468
V/C Ratio(X)	0.46	0.50	0.51	0.52	0.35	0.28	0.62	0.91	0.92	0.75	0.86	0.86
Avail Cap(c_a), veh/h	729	712	700	574	1438	820	295	446	424	319	478	468
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.96	0.96	0.96	1.00	1.00	1.00	0.94	0.94	0.94	0.97	0.97	0.97
Uniform Delay (d), s/veh	19.8	36.8	37.1	20.5	27.0	18.0	31.2	32.4	33.6	36.6	56.9	57.1
Incr Delay (d2), s/veh	0.7	2.4	2.5	1.0	0.7	0.9	2.7	21.5	23.0	8.6	14.6	15.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	10.5	10.5	3.7	5.4	4.1	3.3	11.3	11.3	6.2	16.2	15.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	39.3	39.6	21.5	27.7	18.9	34.0	53.9	56.6	45.2	71.5	72.1
LnGrp LOS	C	D	D	C	C	B	C	D	E	D	E	E
Approach Vol, veh/h		927			951			923			1037	
Approach Delay, s/veh		35.0			24.1			51.7			66.2	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.1	55.9	16.7	39.4	17.9	56.0	20.1	35.9				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1), s	11.0	24.2	10.1	31.6	10.7	14.6	13.5	28.8				
Green Ext Time (p_c), s	0.6	2.3	0.2	0.4	0.7	2.7	0.2	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			44.7									
HCM 6th LOS			D									
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Future Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	215	573	139	222	498	231	154	543	226	220	647	170
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	494	1262	305	468	1593	898	260	707	426	324	806	470
Arrive On Green	0.10	0.44	0.42	0.10	0.44	0.44	0.19	0.39	0.37	0.04	0.07	0.07
Sat Flow, veh/h	1795	2860	692	1795	3582	1598	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	215	358	354	222	498	231	154	543	226	220	647	170
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	8.1	18.2	18.4	8.3	11.7	9.6	8.5	17.1	14.6	12.2	23.1	11.9
Cycle Q Clear(g_c), s	8.1	18.2	18.4	8.3	11.7	9.6	8.5	17.1	14.6	12.2	23.1	11.9
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	494	790	777	468	1593	898	260	707	426	324	806	470
V/C Ratio(X)	0.43	0.45	0.46	0.47	0.31	0.26	0.59	0.77	0.53	0.68	0.80	0.36
Avail Cap(c_a), veh/h	766	790	777	628	1593	898	300	893	509	340	945	532
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.96	0.96	0.96	1.00	1.00	1.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	25.4	25.8	17.0	23.3	14.6	33.3	36.8	31.3	38.7	57.3	43.1
Incr Delay (d2), s/veh	0.6	1.8	1.8	0.7	0.5	0.7	2.2	3.0	1.0	5.1	4.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	7.9	8.0	3.4	4.9	3.6	3.5	6.4	4.7	6.3	11.6	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	27.2	27.6	17.7	23.8	15.3	35.5	39.7	32.3	43.8	61.7	43.6
LnGrp LOS	B	C	C	B	C	B	D	D	C	D	E	D
Approach Vol, veh/h		927			951			923			1037	
Approach Delay, s/veh		24.9			20.3			37.2			54.9	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.4	61.6	17.1	34.0	17.3	61.6	20.8	30.3				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1),s	10.8	20.4	10.5	25.1	10.1	13.7	14.2	19.1				
Green Ext Time (p_c), s	0.6	2.6	0.1	2.4	0.7	2.8	0.1	2.8				
Intersection Summary												
HCM 6th Ctrl Delay					34.8							
HCM 6th LOS					C							
Notes												
User approved changes to right turn type.												























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Future Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	215	573	139	222	498	231	154	543	226	220	647	170
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	472	1161	281	429	1469	836	246	832	488	352	726	191
Arrive On Green	0.07	0.27	0.26	0.11	0.41	0.40	0.19	0.46	0.44	0.08	0.17	0.16
Sat Flow, veh/h	1795	2860	692	1795	3582	1598	1795	3582	1598	1795	2807	737
Grp Volume(v), veh/h	215	358	354	222	498	231	154	543	226	220	413	404
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1598	1795	1791	1753
Q Serve(g_s), s	8.6	21.9	22.1	8.8	12.4	10.5	8.1	15.1	12.9	11.6	29.3	29.4
Cycle Q Clear(g_c), s	8.6	21.9	22.1	8.8	12.4	10.5	8.1	15.1	12.9	11.6	29.3	29.4
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	472	727	715	429	1469	836	246	832	488	352	463	453
V/C Ratio(X)	0.46	0.49	0.49	0.52	0.34	0.28	0.63	0.65	0.46	0.63	0.89	0.89
Avail Cap(c_a), veh/h	737	727	715	581	1469	836	291	893	515	375	473	462
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(l)	0.96	0.96	0.96	1.00	1.00	1.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	36.1	36.4	19.9	26.3	17.3	31.8	30.8	25.8	33.4	51.9	52.2
Incr Delay (d2), s/veh	0.7	2.3	2.3	1.0	0.6	0.8	3.0	1.5	0.6	2.9	18.4	19.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	10.4	10.4	3.7	5.3	4.0	3.4	5.4	4.1	5.6	15.9	15.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	38.3	38.7	20.9	26.9	18.1	34.8	32.2	26.5	36.4	70.3	71.2
LnGrp LOS	B	D	D	C	C	B	C	C	C	D	E	E
Approach Vol, veh/h		927			951			923			1037	
Approach Delay, s/veh		34.2			23.4			31.3			63.5	
Approach LOS		C			C			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	57.0	16.7	38.3	17.8	57.1	20.3	34.8				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1), s	11.0	24.1	10.1	31.4	10.6	14.4	13.6	17.1				
Green Ext Time (p_c), s	0.6	2.3	0.1	0.5	0.7	2.7	0.1	3.0				
Intersection Summary												
HCM 6th Ctrl Delay				38.7								
HCM 6th LOS				D								
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Future Volume (veh/h)	200	533	129	206	463	215	143	505	210	205	602	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	215	573	139	222	498	231	154	543	226	220	647	170
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	466	1136	275	423	1437	820	294	595	247	293	957	545
Arrive On Green	0.07	0.27	0.25	0.11	0.40	0.39	0.19	0.48	0.45	0.12	0.27	0.25
Sat Flow, veh/h	1795	2860	692	1795	3582	1598	1795	2468	1024	1795	3582	1598
Grp Volume(v), veh/h	215	358	354	222	498	231	154	394	375	220	647	170
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1701	1795	1791	1598
Q Serve(g_s), s	8.7	22.0	22.2	9.0	12.6	10.7	8.1	26.4	26.8	11.5	21.0	10.2
Cycle Q Clear(g_c), s	8.7	22.0	22.2	9.0	12.6	10.7	8.1	26.4	26.8	11.5	21.0	10.2
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.60	1.00		1.00
Lane Grp Cap(c), veh/h	466	711	699	423	1437	820	294	431	410	293	957	545
V/C Ratio(X)	0.46	0.50	0.51	0.52	0.35	0.28	0.52	0.91	0.92	0.75	0.68	0.31
Avail Cap(c_a), veh/h	729	711	699	574	1437	820	340	446	424	319	957	545
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	0.96	0.96	0.96	1.00	1.00	1.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	36.8	37.1	20.5	27.1	18.0	29.6	32.4	33.6	33.5	42.6	31.6
Incr Delay (d2), s/veh	0.7	2.4	2.5	1.0	0.7	0.9	1.4	21.5	23.0	8.8	1.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	10.5	10.5	3.7	5.4	4.1	3.2	11.3	11.3	5.7	9.5	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	39.3	39.6	21.5	27.7	18.9	31.0	53.9	56.6	42.3	44.5	31.9
LnGrp LOS	C	D	D	C	C	B	C	D	E	D	D	C
Approach Vol, veh/h		927			951			923			1037	
Approach Delay, s/veh		35.1			24.1			51.2			42.0	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.1	55.8	16.7	39.4	18.0	56.0	20.2	35.9				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1), s	11.0	24.2	10.1	23.0	10.7	14.6	13.5	28.8				
Green Ext Time (p_c), s	0.6	2.3	0.2	2.7	0.7	2.7	0.2	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			38.1									
HCM 6th LOS			D									
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	388	106	174	398	172	170	497	209	249	490	157
Future Volume (veh/h)	193	388	106	174	398	172	170	497	209	249	490	157
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	203	408	112	183	419	181	179	523	220	262	516	165
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	517	1198	326	581	1527	893	318	705	407	344	816	470
Arrive On Green	0.20	0.87	0.83	0.09	0.43	0.42	0.04	0.07	0.06	0.05	0.08	0.07
Sat Flow, veh/h	1781	2762	750	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	203	261	259	183	419	181	179	523	220	262	516	165
Grp Sat Flow(s),veh/h/ln	1781	1777	1735	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.1	3.6	4.1	7.1	9.9	7.3	10.1	18.8	16.2	14.5	18.3	11.7
Cycle Q Clear(g_c), s	8.1	3.6	4.1	7.1	9.9	7.3	10.1	18.8	16.2	14.5	18.3	11.7
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	517	771	753	581	1527	893	318	705	407	344	816	470
V/C Ratio(X)	0.39	0.34	0.34	0.32	0.27	0.20	0.56	0.74	0.54	0.76	0.63	0.35
Avail Cap(c_a), veh/h	594	771	753	731	1527	893	375	1050	561	344	1047	573
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.93	0.93	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	5.1	5.7	16.5	24.0	14.0	38.6	57.5	48.2	38.4	54.7	43.0
Incr Delay (d2), s/veh	0.5	1.2	1.2	0.3	0.4	0.5	1.4	1.5	1.0	9.6	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	1.3	1.5	2.9	4.2	2.7	4.9	9.1	7.0	7.8	8.9	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.7	6.3	7.0	16.8	24.4	14.5	40.1	58.9	49.2	48.0	55.6	43.4
LnGrp LOS	B	A	A	B	C	B	D	E	D	D	E	D
Approach Vol, veh/h		723			783			922			943	
Approach Delay, s/veh		9.2			20.3			53.0			51.3	
Approach LOS		A			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	60.6	18.8	34.5	17.0	59.7	23.0	30.4				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	20.5	30.5	16.5	36.5	16.1	34.9	16.5	36.5				
Max Q Clear Time (g_c+I1)9st	6.1	12.1	20.3	10.1	11.9	16.5	20.8					
Green Ext Time (p_c), s	0.5	2.0	0.2	2.8	0.3	2.6	0.0	3.1				
Intersection Summary												
HCM 6th Ctrl Delay			35.5									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												

MOVEMENT SUMMARY

 Site: 101 [2025 PM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	252	3.0	0.445	6.9	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
8	T1	975	3.0	0.445	6.9	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
Approach		1227	3.0	0.445	6.9	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
North: Kenwood Rd												
4	T1	663	3.0	0.609	11.4	LOS B	6.0	154.6	0.63	0.59	0.82	32.1
14	R2	563	3.0	0.517	9.4	LOS A	3.1	79.8	0.56	0.44	0.56	31.8
Approach		1226	3.0	0.609	10.5	LOS B	6.0	154.6	0.60	0.52	0.70	31.9
All Vehicles		2453	3.0	0.609	8.7	LOS A	6.0	154.6	0.30	0.26	0.35	34.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB.sip8

MOVEMENT SUMMARY

 Site: 101 [2025 PM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	252	3.0	0.445	6.9	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
8	T1	975	3.0	0.445	6.9	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
Approach		1227	3.0	0.445	6.9	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
North: Kenwood Rd												
4	T1	663	3.0	0.609	11.4	LOS B	6.0	154.6	0.63	0.59	0.82	32.1
14	R2	563	3.0	0.517	9.4	LOS A	3.1	79.8	0.56	0.44	0.56	31.8
Approach		1226	3.0	0.609	10.5	LOS B	6.0	154.6	0.60	0.52	0.70	31.9
All Vehicles		2453	3.0	0.609	8.7	LOS A	6.0	154.6	0.30	0.26	0.35	34.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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


















Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB SB Turn Lane.sip8

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HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Future Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	165	422	55	174	333	172	118	611	191	139	476	38
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	551	1363	177	540	1540	815	305	653	204	236	849	68
Arrive On Green	0.09	0.43	0.41	0.09	0.43	0.43	0.16	0.49	0.46	0.03	0.08	0.08
Sat Flow, veh/h	1781	3163	410	1781	3554	1585	1781	2666	832	1781	3334	265
Grp Volume(v), veh/h	165	236	241	174	333	172	118	407	395	139	253	261
Grp Sat Flow(s),veh/h/ln	1781	1777	1797	1781	1777	1585	1781	1777	1721	1781	1777	1823
Q Serve(g_s), s	5.9	10.5	10.6	6.2	7.0	7.1	5.7	25.9	26.1	6.8	16.4	16.5
Cycle Q Clear(g_c), s	5.9	10.5	10.6	6.2	7.0	7.1	5.7	25.9	26.1	6.8	16.4	16.5
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.48	1.00		0.15
Lane Grp Cap(c), veh/h	551	766	774	540	1540	815	305	435	422	236	453	464
V/C Ratio(X)	0.30	0.31	0.31	0.32	0.22	0.21	0.39	0.93	0.94	0.59	0.56	0.56
Avail Cap(c_a), veh/h	834	766	774	573	1540	815	319	435	422	261	463	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.95	0.95	0.95	0.98	0.98	0.98
Uniform Delay (d), s/veh	15.5	22.4	22.6	15.6	21.3	15.9	27.9	29.7	30.6	34.5	48.5	48.6
Incr Delay (d2), s/veh	0.3	1.0	1.0	0.3	0.3	0.6	0.8	26.5	27.6	2.8	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.5	4.6	2.5	2.9	2.7	2.3	11.3	11.4	3.3	8.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.8	23.4	23.7	15.9	21.6	16.5	28.6	56.2	58.2	37.3	49.9	50.0
LnGrp LOS	B	C	C	B	C	B	C	E	E	D	D	D
Approach Vol, veh/h		642			679			920			653	
Approach Delay, s/veh		21.6			18.8			53.6			47.3	
Approach LOS		C			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.8	55.9	14.0	35.3	14.9	55.8	15.3	34.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	12.6	7.7	18.5	7.9	9.1	8.8	28.1					
Green Ext Time (p_c), s	0.1	1.8	0.0	1.6	0.5	2.1	0.1	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			36.9									
HCM 6th LOS			D									
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Future Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	165	422	55	174	333	172	118	611	191	139	476	38
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	584	1491	193	576	1683	884	273	730	404	257	720	57
Arrive On Green	0.09	0.47	0.45	0.09	0.47	0.47	0.16	0.41	0.38	0.03	0.07	0.07
Sat Flow, veh/h	1781	3163	410	1781	3554	1585	1781	3554	1585	1781	3334	265
Grp Volume(v), veh/h	165	236	241	174	333	172	118	611	191	139	253	261
Grp Sat Flow(s),veh/h/ln	1781	1777	1797	1781	1777	1585	1781	1777	1585	1781	1777	1823
Q Serve(g_s), s	5.4	9.7	9.9	5.7	6.5	6.5	6.0	18.5	10.9	7.2	16.7	16.8
Cycle Q Clear(g_c), s	5.4	9.7	9.9	5.7	6.5	6.5	6.0	18.5	10.9	7.2	16.7	16.8
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	584	837	847	576	1683	884	273	730	404	257	384	393
V/C Ratio(X)	0.28	0.28	0.28	0.30	0.20	0.19	0.43	0.84	0.47	0.54	0.66	0.66
Avail Cap(c_a), veh/h	874	837	847	616	1683	884	283	871	467	277	463	475
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	19.3	19.6	13.3	18.3	13.2	30.8	33.5	28.6	36.4	51.4	51.5
Incr Delay (d2), s/veh	0.3	0.8	0.8	0.3	0.3	0.5	1.0	5.9	0.8	1.8	2.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	4.1	4.2	2.2	2.7	2.4	2.4	6.8	3.6	3.4	8.2	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	20.2	20.4	13.6	18.6	13.7	31.9	39.5	29.5	38.2	54.0	54.1
LnGrp LOS	B	C	C	B	B	B	C	D	C	D	D	D
Approach Vol, veh/h		642			679			920			653	
Approach Delay, s/veh		18.5			16.1			36.4			50.7	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.3	60.7	14.3	30.6	14.4	60.6	15.7	29.2				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	11.9	8.0	18.8	7.4	8.5	9.2	20.5					
Green Ext Time (p_c), s	0.1	1.8	0.0	1.5	0.5	2.1	0.1	2.2				
Intersection Summary												
HCM 6th Ctrl Delay			30.9									
HCM 6th LOS			C									
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Future Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	165	422	55	174	333	172	118	611	191	139	476	38
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	551	1363	177	540	1540	815	313	653	204	236	905	491
Arrive On Green	0.09	0.43	0.41	0.09	0.43	0.43	0.16	0.49	0.46	0.03	0.08	0.08
Sat Flow, veh/h	1781	3163	410	1781	3554	1585	1781	2666	832	1781	3554	1585
Grp Volume(v), veh/h	165	236	241	174	333	172	118	407	395	139	476	38
Grp Sat Flow(s),veh/h/ln	1781	1777	1797	1781	1777	1585	1781	1777	1721	1781	1777	1585
Q Serve(g_s), s	5.9	10.5	10.6	6.2	7.0	7.1	5.7	25.9	26.1	6.8	15.4	2.4
Cycle Q Clear(g_c), s	5.9	10.5	10.6	6.2	7.0	7.1	5.7	25.9	26.1	6.8	15.4	2.4
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	551	766	774	540	1540	815	313	435	422	236	905	491
V/C Ratio(X)	0.30	0.31	0.31	0.32	0.22	0.21	0.38	0.93	0.94	0.59	0.53	0.08
Avail Cap(c_a), veh/h	834	766	774	573	1540	815	327	435	422	261	927	500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	22.4	22.6	15.6	21.3	15.9	27.7	29.7	30.6	34.5	48.0	35.7
Incr Delay (d2), s/veh	0.3	1.0	1.0	0.3	0.3	0.6	0.7	26.5	27.6	2.9	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.5	4.6	2.5	2.9	2.7	2.3	11.3	11.4	3.3	7.4	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.8	23.4	23.7	15.9	21.6	16.5	28.4	56.2	58.2	37.4	48.5	35.7
LnGrp LOS	B	C	C	B	C	B	C	E	E	D	D	D
Approach Vol, veh/h		642			679			920			653	
Approach Delay, s/veh		21.6			18.8			53.5			45.4	
Approach LOS		C			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.8	55.9	14.0	35.3	14.9	55.8	15.3	34.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	12.6	7.7	17.4	7.9	9.1	8.8	28.1					
Green Ext Time (p_c), s	0.1	1.8	0.0	1.9	0.5	2.1	0.1	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			36.5									
HCM 6th LOS			D									
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Future Volume (veh/h)	147	376	49	155	296	153	105	544	170	124	424	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	165	422	55	174	333	172	118	611	191	139	476	38
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	584	1491	193	576	1683	884	281	730	404	257	767	423
Arrive On Green	0.09	0.47	0.45	0.09	0.47	0.47	0.16	0.41	0.38	0.03	0.07	0.07
Sat Flow, veh/h	1781	3163	410	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	165	236	241	174	333	172	118	611	191	139	476	38
Grp Sat Flow(s),veh/h/ln	1781	1777	1797	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.4	9.7	9.9	5.7	6.5	6.5	6.0	18.5	10.9	7.2	15.6	2.5
Cycle Q Clear(g_c), s	5.4	9.7	9.9	5.7	6.5	6.5	6.0	18.5	10.9	7.2	15.6	2.5
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	584	837	847	576	1683	884	281	730	404	257	767	423
V/C Ratio(X)	0.28	0.28	0.28	0.30	0.20	0.19	0.42	0.84	0.47	0.54	0.62	0.09
Avail Cap(c_a), veh/h	874	837	847	616	1683	884	291	871	467	277	927	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	19.3	19.6	13.3	18.3	13.2	30.7	33.5	28.6	36.4	50.9	38.7
Incr Delay (d2), s/veh	0.3	0.8	0.8	0.3	0.3	0.5	0.9	5.9	0.8	1.8	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	4.1	4.2	2.2	2.7	2.4	2.4	6.8	3.6	3.4	7.6	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	20.2	20.4	13.6	18.6	13.7	31.6	39.5	29.5	38.2	51.9	38.8
LnGrp LOS	B	C	C	B	B	B	C	D	C	D	D	D
Approach Vol, veh/h		642			679			920			653	
Approach Delay, s/veh		18.5			16.1			36.4			48.2	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.3	60.7	14.3	30.6	14.4	60.6	15.7	29.2				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	45.5	8.5	29.5	27.5	28.5	10.5	27.5					
Max Q Clear Time (g_c+l1),s	11.9	8.0	17.6	7.4	8.5	9.2	20.5					
Green Ext Time (p_c), s	0.1	1.8	0.0	1.8	0.5	2.1	0.1	2.2				
Intersection Summary												
HCM 6th Ctrl Delay			30.3									
HCM 6th LOS			C									
Notes												
User approved changes to right turn type.												

MOVEMENT SUMMARY

 Site: 101 [2035 AM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	546	3.0	0.579	9.0	LOS A	0.0	0.0	0.00	0.00	0.00	35.9
8	T1	1051	3.0	0.579	9.0	LOS A	0.0	0.0	0.00	0.00	0.00	37.6
Approach		1597	3.0	0.579	9.0	LOS A	0.0	0.0	0.00	0.00	0.00	37.0
North: Kenwood Rd												
4	T1	379	3.0	0.434	9.8	LOS A	2.4	62.4	0.65	0.71	0.82	32.8
14	R2	338	3.0	0.434	9.8	LOS A	2.4	62.4	0.65	0.71	0.82	31.6
Approach		717	3.0	0.434	9.8	LOS A	2.4	62.4	0.65	0.71	0.82	32.2
All Vehicles		2314	3.0	0.579	9.3	LOS A	2.4	62.4	0.20	0.22	0.25	35.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB.sip8

MOVEMENT SUMMARY

 Site: 101 [2035 AM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	546	3.0	0.579	9.0	LOS A	0.0	0.0	0.00	0.00	0.00	35.9
8	T1	1051	3.0	0.579	9.0	LOS A	0.0	0.0	0.00	0.00	0.00	37.6
Approach		1597	3.0	0.579	9.0	LOS A	0.0	0.0	0.00	0.00	0.00	37.0
North: Kenwood Rd												
4	T1	379	3.0	0.459	10.3	LOS B	2.8	70.4	0.66	0.74	0.88	32.6
14	R2	338	3.0	0.409	9.4	LOS A	2.1	54.9	0.64	0.68	0.76	31.8
Approach		717	3.0	0.459	9.9	LOS A	2.8	70.4	0.65	0.71	0.82	32.2
All Vehicles		2314	3.0	0.579	9.3	LOS A	2.8	70.4	0.20	0.22	0.25	35.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB SB Turn Lane.sip8

Draft

2035 MID

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Future Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	222	448	122	201	459	199	197	574	241	288	566	181
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	443	946	256	475	1199	747	326	669	280	334	812	259
Arrive On Green	0.23	0.68	0.65	0.11	0.34	0.33	0.04	0.09	0.09	0.09	0.21	0.20
Sat Flow, veh/h	1781	2766	747	1781	3554	1585	1781	2440	1023	1781	2650	845
Grp Volume(v), veh/h	222	287	283	201	459	199	197	418	397	288	379	368
Grp Sat Flow(s),veh/h/ln	1781	1777	1736	1781	1777	1585	1781	1777	1686	1781	1777	1718
Q Serve(g_s), s	10.4	9.8	10.3	9.1	12.8	9.9	10.0	30.1	30.2	14.6	25.7	25.9
Cycle Q Clear(g_c), s	10.4	9.8	10.3	9.1	12.8	9.9	10.0	30.1	30.2	14.6	25.7	25.9
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.61	1.00		0.49
Lane Grp Cap(c), veh/h	443	608	594	475	1199	747	326	487	462	334	544	526
V/C Ratio(X)	0.50	0.47	0.48	0.42	0.38	0.27	0.60	0.86	0.86	0.86	0.70	0.70
Avail Cap(c_a), veh/h	491	608	594	597	1199	747	385	525	498	334	544	526
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.91	0.91	0.91	0.87	0.87	0.87
Uniform Delay (d), s/veh	20.4	15.0	15.9	22.8	32.8	20.8	32.9	56.6	56.8	33.4	46.1	46.4
Incr Delay (d2), s/veh	0.9	2.6	2.7	0.6	0.9	0.9	1.8	11.6	12.4	18.0	3.4	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.5	3.6	3.8	5.6	3.8	4.8	16.0	15.3	8.2	12.3	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	17.6	18.5	23.4	33.7	21.7	34.7	68.2	69.2	51.5	49.4	50.0
LnGrp LOS	C	B	B	C	C	C	C	E	E	D	D	D
Approach Vol, veh/h		792			859			1012			1035	
Approach Delay, s/veh		19.0			28.5			62.1			50.2	
Approach LOS		B			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.1	48.7	18.7	44.5	19.1	47.6	23.0	40.2				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	20.5	30.5	16.5	36.5	16.1	34.9	16.5	36.5				
Max Q Clear Time (g_c+I1),s	11.1	12.3	12.0	27.9	12.4	14.8	16.6	32.2				
Green Ext Time (p_c), s	0.5	2.1	0.3	2.2	0.3	2.8	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay			41.7									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Future Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	222	448	122	201	459	199	197	574	241	288	566	181
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	1089	294	529	1382	828	290	811	471	353	677	216
Arrive On Green	0.22	0.79	0.75	0.10	0.39	0.38	0.04	0.08	0.07	0.05	0.08	0.08
Sat Flow, veh/h	1781	2766	747	1781	3554	1585	1781	3554	1585	1781	2650	845
Grp Volume(v), veh/h	222	287	283	201	459	199	197	574	241	288	379	368
Grp Sat Flow(s),veh/h/ln	1781	1777	1736	1781	1777	1585	1781	1777	1585	1781	1777	1718
Q Serve(g_s), s	9.6	6.6	7.1	8.4	11.8	8.9	10.7	20.5	17.3	15.4	27.3	27.5
Cycle Q Clear(g_c), s	9.6	6.6	7.1	8.4	11.8	8.9	10.7	20.5	17.3	15.4	27.3	27.5
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	479	699	683	529	1382	828	290	811	471	353	454	439
V/C Ratio(X)	0.46	0.41	0.41	0.38	0.33	0.24	0.68	0.71	0.51	0.82	0.84	0.84
Avail Cap(c_a), veh/h	536	699	683	661	1382	828	340	1050	577	353	523	506
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.91	0.91	0.91	0.87	0.87	0.87
Uniform Delay (d), s/veh	17.3	9.1	9.8	19.0	27.9	16.9	37.6	55.9	45.1	36.7	56.8	57.0
Incr Delay (d2), s/veh	0.7	1.7	1.8	0.4	0.6	0.7	4.0	1.4	0.8	12.2	8.9	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	2.3	2.4	3.4	5.1	3.4	5.3	10.0	7.5	8.5	14.2	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	10.8	11.6	19.5	28.5	17.6	41.5	57.3	45.9	48.9	65.7	66.5
LnGrp LOS	B	B	B	B	C	B	D	E	D	D	E	E
Approach Vol, veh/h		792			859			1012			1035	
Approach Delay, s/veh		13.1			23.9			51.5			61.3	
Approach LOS		B			C			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.4	55.4	19.4	37.9	18.4	54.3	23.0	34.3				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	20.5	30.5	16.5	36.5	16.1	34.9	16.5	36.5				
Max Q Clear Time (g_c+I1), s	11.0	9.1	12.7	29.5	11.6	13.8	17.4	22.5				
Green Ext Time (p_c), s	0.5	2.2	0.2	1.9	0.3	2.8	0.0	3.3				
Intersection Summary												
HCM 6th Ctrl Delay					39.6							
HCM 6th LOS					D							
Notes												
User approved pedestrian interval to be less than phase max green.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Future Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	222	448	122	201	459	199	197	574	241	288	566	181
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	443	946	256	475	1199	747	367	669	280	334	1088	617
Arrive On Green	0.23	0.68	0.65	0.11	0.34	0.33	0.04	0.09	0.09	0.09	0.21	0.20
Sat Flow, veh/h	1781	2766	747	1781	3554	1585	1781	2440	1023	1781	3554	1585
Grp Volume(v), veh/h	222	287	283	201	459	199	197	418	397	288	566	181
Grp Sat Flow(s),veh/h/ln	1781	1777	1736	1781	1777	1585	1781	1777	1686	1781	1777	1585
Q Serve(g_s), s	10.4	9.8	10.3	9.1	12.8	9.9	10.0	30.1	30.2	14.6	18.4	11.2
Cycle Q Clear(g_c), s	10.4	9.8	10.3	9.1	12.8	9.9	10.0	30.1	30.2	14.6	18.4	11.2
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.61	1.00		1.00
Lane Grp Cap(c), veh/h	443	608	594	475	1199	747	367	487	462	334	1088	617
V/C Ratio(X)	0.50	0.47	0.48	0.42	0.38	0.27	0.54	0.86	0.86	0.86	0.52	0.29
Avail Cap(c_a), veh/h	491	608	594	597	1199	747	426	525	498	334	1088	617
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	0.67	0.67	0.67
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.91	0.91	0.91	0.87	0.87	0.87
Uniform Delay (d), s/veh	20.4	15.0	15.9	22.8	32.8	20.8	31.3	56.6	56.8	33.4	43.2	31.4
Incr Delay (d2), s/veh	0.9	2.6	2.7	0.6	0.9	0.9	1.1	11.6	12.4	18.0	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.5	3.6	3.8	5.6	3.8	4.7	16.0	15.3	8.2	8.5	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	17.6	18.5	23.4	33.7	21.7	32.4	68.2	69.2	51.5	43.5	31.6
LnGrp LOS	C	B	B	C	C	C	C	E	E	D	D	C
Approach Vol, veh/h		792			859			1012			1035	
Approach Delay, s/veh		19.0			28.5			61.7			43.7	
Approach LOS		B			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.1	48.7	18.7	44.5	19.1	47.6	23.0	40.2				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	20.5	30.5	16.5	36.5	16.1	34.9	16.5	36.5				
Max Q Clear Time (g_c+I1),s	11.1	12.3	12.0	20.4	12.4	14.8	16.6	32.2				
Green Ext Time (p_c), s	0.5	2.1	0.3	3.1	0.3	2.8	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay				39.8								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Future Volume (veh/h)	211	426	116	191	436	189	187	545	229	274	538	172
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	222	448	122	201	459	199	197	574	241	288	566	181
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	490	1134	306	546	1440	854	322	760	445	343	850	499
Arrive On Green	0.21	0.82	0.78	0.10	0.41	0.40	0.04	0.07	0.07	0.05	0.08	0.07
Sat Flow, veh/h	1781	2766	747	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	222	287	283	201	459	199	197	574	241	288	566	181
Grp Sat Flow(s),veh/h/ln	1781	1777	1736	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.3	5.6	6.1	8.1	11.5	8.6	10.9	20.6	17.5	15.8	20.1	12.6
Cycle Q Clear(g_c), s	9.3	5.6	6.1	8.1	11.5	8.6	10.9	20.6	17.5	15.8	20.1	12.6
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	490	728	712	546	1440	854	322	760	445	343	850	499
V/C Ratio(X)	0.45	0.39	0.40	0.37	0.32	0.23	0.61	0.76	0.54	0.84	0.67	0.36
Avail Cap(c_a), veh/h	551	728	712	681	1440	854	368	1050	575	343	1047	587
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(l)	0.98	0.98	0.98	1.00	1.00	1.00	0.91	0.91	0.91	0.87	0.87	0.87
Uniform Delay (d), s/veh	16.4	7.4	8.1	17.9	26.4	15.8	37.5	57.1	46.5	38.2	54.8	41.6
Incr Delay (d2), s/veh	0.6	1.6	1.6	0.4	0.6	0.6	2.2	1.9	0.9	15.0	1.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	2.0	2.1	3.3	4.9	3.2	5.3	10.1	7.5	8.9	9.8	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	9.0	9.7	18.3	27.0	16.4	39.6	59.0	47.5	53.2	55.8	42.0
LnGrp LOS	B	A	A	B	C	B	D	E	D	D	E	D
Approach Vol, veh/h		792			859			1012			1035	
Approach Delay, s/veh		11.5			22.5			52.5			52.7	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.1	57.5	19.6	35.8	18.1	56.5	23.0	32.4				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	20.5	30.5	16.5	36.5	16.1	34.9	16.5	36.5				
Max Q Clear Time (g_c+I1),s	11.0	8.1	12.9	22.1	11.3	13.5	17.8	22.6				
Green Ext Time (p_c), s	0.5	2.2	0.2	3.0	0.3	2.8	0.0	3.3				
Intersection Summary												
HCM 6th Ctrl Delay			36.8									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												

MOVEMENT SUMMARY

 Site: 101 [2035 MID]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	179	3.0	0.438	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.2
8	T1	1027	3.0	0.438	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.8
Approach		1207	3.0	0.438	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
North: Kenwood Rd												
4	T1	468	3.0	0.402	7.2	LOS A	2.2	56.3	0.42	0.28	0.42	34.1
14	R2	487	3.0	0.418	7.4	LOS A	2.3	59.7	0.43	0.29	0.43	32.7
Approach		955	3.0	0.418	7.3	LOS A	2.3	59.7	0.42	0.29	0.42	33.4
All Vehicles		2162	3.0	0.438	7.0	LOS A	2.3	59.7	0.19	0.13	0.19	35.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB.sip8

MOVEMENT SUMMARY

 Site: 101 [2035 MID]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	179	3.0	0.438	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.2
8	T1	1027	3.0	0.438	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.8
Approach		1207	3.0	0.438	6.8	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
North: Kenwood Rd												
4	T1	468	3.0	0.402	7.2	LOS A	2.2	56.3	0.42	0.28	0.42	34.1
14	R2	487	3.0	0.418	7.4	LOS A	2.3	59.7	0.43	0.29	0.43	32.7
Approach		955	3.0	0.418	7.3	LOS A	2.3	59.7	0.42	0.29	0.42	33.4
All Vehicles		2162	3.0	0.438	7.0	LOS A	2.3	59.7	0.19	0.13	0.19	35.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB SB Turn Lane.sip8

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





















HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Future Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	235	628	152	243	545	254	169	596	248	242	710	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	441	1058	256	386	1341	791	250	615	255	293	782	205
Arrive On Green	0.04	0.12	0.12	0.12	0.37	0.37	0.20	0.50	0.47	0.04	0.09	0.09
Sat Flow, veh/h	1795	2860	691	1795	3582	1598	1795	2467	1025	1795	2808	735
Grp Volume(v), veh/h	235	393	387	243	545	254	169	433	411	242	453	443
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1701	1795	1791	1753
Q Serve(g_s), s	10.0	27.0	27.1	10.3	14.6	12.4	8.8	30.5	30.6	12.7	32.6	32.6
Cycle Q Clear(g_c), s	10.0	27.0	27.1	10.3	14.6	12.4	8.8	30.5	30.6	12.7	32.6	32.6
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.60	1.00		0.42
Lane Grp Cap(c), veh/h	441	662	651	386	1341	791	250	446	424	293	499	488
V/C Ratio(X)	0.53	0.59	0.59	0.63	0.41	0.32	0.68	0.97	0.97	0.83	0.91	0.91
Avail Cap(c_a), veh/h	686	662	651	518	1341	791	286	446	424	303	499	488
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.95	0.95	0.95	1.00	1.00	1.00	0.92	0.92	0.92	0.96	0.96	0.96
Uniform Delay (d), s/veh	22.9	47.8	48.0	23.6	30.0	19.7	30.6	32.1	33.3	37.6	57.4	57.5
Incr Delay (d2), s/veh	1.0	3.7	3.8	1.7	0.9	1.1	4.8	32.9	34.3	15.9	19.7	20.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	13.6	13.5	4.4	6.4	4.8	3.7	14.0	13.9	7.4	18.4	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	51.5	51.8	25.3	30.9	20.8	35.4	65.0	67.6	53.5	77.1	77.6
LnGrp LOS	C	D	D	C	C	C	D	E	E	D	E	E
Approach Vol, veh/h		1015			1042			1013			1138	
Approach Delay, s/veh		45.2			27.1			61.1			72.3	
Approach LOS		D			C			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	52.3	17.4	40.9	19.2	52.5	21.3	37.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1), s	11.2	29.1	10.8	34.6	12.0	16.6	14.7	32.6				
Green Ext Time (p_c), s	0.6	1.9	0.1	0.0	0.8	2.8	0.1	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				51.9								
HCM 6th LOS				D								
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Future Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	235	628	152	243	545	254	169	596	248	242	710	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	450	1103	266	394	1397	816	243	844	509	352	741	194
Arrive On Green	0.04	0.13	0.12	0.12	0.39	0.38	0.20	0.47	0.44	0.09	0.18	0.17
Sat Flow, veh/h	1795	2860	691	1795	3582	1598	1795	3582	1598	1795	2808	735
Grp Volume(v), veh/h	235	393	387	243	545	254	169	596	248	242	453	443
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1598	1795	1791	1753
Q Serve(g_s), s	9.7	26.8	26.9	10.0	14.2	12.0	8.9	17.1	14.3	12.7	32.6	32.6
Cycle Q Clear(g_c), s	9.7	26.8	26.9	10.0	14.2	12.0	8.9	17.1	14.3	12.7	32.6	32.6
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	450	690	679	394	1397	816	243	844	509	352	473	462
V/C Ratio(X)	0.52	0.57	0.57	0.62	0.39	0.31	0.70	0.71	0.49	0.69	0.96	0.96
Avail Cap(c_a), veh/h	699	690	679	530	1397	816	277	893	530	362	473	462
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(l)	0.95	0.95	0.95	1.00	1.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	46.6	46.7	22.6	28.5	18.5	31.4	30.8	25.1	33.4	52.8	53.1
Incr Delay (d2), s/veh	0.9	3.2	3.3	1.6	0.8	1.0	5.9	2.2	0.7	5.2	30.9	31.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	13.5	13.3	4.2	6.2	4.6	3.8	6.0	4.4	6.3	19.1	18.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	49.8	50.0	24.1	29.3	19.5	37.2	33.0	25.8	38.5	83.7	84.4
LnGrp LOS	C	D	D	C	C	B	D	C	C	D	F	F
Approach Vol, veh/h		1015			1042			1013			1138	
Approach Delay, s/veh		43.6			25.7			31.9			74.4	
Approach LOS		D			C			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.2	54.3	17.5	39.0	19.0	54.5	21.3	35.2				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1),s	12.0	28.9	10.9	34.6	11.7	16.2	14.7	19.1				
Green Ext Time (p_c), s	0.6	1.9	0.1	0.0	0.8	2.8	0.1	3.1				
Intersection Summary												
HCM 6th Ctrl Delay			44.7									
HCM 6th LOS			D									
Notes												
User approved changes to right turn type.												
























HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Future Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	235	628	152	243	545	254	169	596	248	242	710	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	442	1063	257	387	1347	791	294	615	255	290	992	577
Arrive On Green	0.04	0.12	0.12	0.12	0.38	0.37	0.20	0.50	0.47	0.13	0.28	0.26
Sat Flow, veh/h	1795	2860	691	1795	3582	1598	1795	2467	1025	1795	3582	1598
Grp Volume(v), veh/h	235	393	387	243	545	254	169	433	411	242	710	186
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1701	1795	1791	1598
Q Serve(g_s), s	9.9	27.0	27.1	10.3	14.6	12.4	8.8	30.5	30.6	12.5	23.2	10.9
Cycle Q Clear(g_c), s	9.9	27.0	27.1	10.3	14.6	12.4	8.8	30.5	30.6	12.5	23.2	10.9
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.60	1.00		1.00
Lane Grp Cap(c), veh/h	442	665	654	387	1347	791	294	446	424	290	992	577
V/C Ratio(X)	0.53	0.59	0.59	0.63	0.40	0.32	0.57	0.97	0.97	0.83	0.72	0.32
Avail Cap(c_a), veh/h	687	665	654	520	1347	791	330	446	424	303	992	577
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	0.95	0.95	0.95	1.00	1.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	47.7	47.8	23.5	29.8	19.7	28.9	32.1	33.3	32.9	42.4	30.0
Incr Delay (d2), s/veh	0.9	3.6	3.7	1.7	0.9	1.1	1.8	32.9	34.3	17.3	2.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	13.6	13.5	4.4	6.3	4.8	3.5	14.0	13.9	6.8	10.5	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	51.3	51.6	25.2	30.7	20.8	30.7	65.0	67.6	50.2	44.8	30.4
LnGrp LOS	C	D	D	C	C	C	C	E	E	D	D	C
Approach Vol, veh/h		1015			1042			1013			1138	
Approach Delay, s/veh		45.0			27.0			60.3			43.6	
Approach LOS		D			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	52.5	17.4	40.7	19.2	52.7	21.1	37.0				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax),s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1),s	11.2	29.1	10.8	25.2	11.9	16.6	14.5	32.6				
Green Ext Time (p_c), s	0.6	1.9	0.1	2.6	0.8	2.8	0.1	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			43.9									
HCM 6th LOS			D									
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
 11: Kenwood Road & Montgomery Road

09/07/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Future Volume (veh/h)	219	584	141	226	507	236	157	554	231	225	660	173
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	235	628	152	243	545	254	169	596	248	242	710	186
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	466	1181	285	421	1494	865	267	747	460	331	851	506
Arrive On Green	0.07	0.28	0.26	0.11	0.42	0.41	0.20	0.42	0.39	0.09	0.16	0.15
Sat Flow, veh/h	1795	2860	691	1795	3582	1598	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	235	393	387	243	545	254	169	596	248	242	710	186
Grp Sat Flow(s),veh/h/ln	1795	1791	1761	1795	1791	1598	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	9.3	24.2	24.3	9.6	13.6	11.3	9.2	18.9	15.8	13.2	25.0	12.3
Cycle Q Clear(g_c), s	9.3	24.2	24.3	9.6	13.6	11.3	9.2	18.9	15.8	13.2	25.0	12.3
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	466	740	727	421	1494	865	267	747	460	331	851	506
V/C Ratio(X)	0.50	0.53	0.53	0.58	0.36	0.29	0.63	0.80	0.54	0.73	0.83	0.37
Avail Cap(c_a), veh/h	721	740	727	563	1494	865	297	893	525	335	945	547
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(l)	0.95	0.95	0.95	1.00	1.00	1.00	0.92	0.92	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	36.3	36.6	20.1	26.0	16.3	32.2	35.5	29.3	36.1	52.2	37.9
Incr Delay (d2), s/veh	0.8	2.6	2.6	1.3	0.7	0.9	3.4	4.0	0.9	7.8	6.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	11.5	11.4	4.0	5.8	4.3	3.8	7.0	5.0	6.7	12.3	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.6	38.9	39.3	21.3	26.7	17.1	35.6	39.5	30.2	43.9	58.2	38.3
LnGrp LOS	B	D	D	C	C	B	D	D	C	D	E	D
Approach Vol, veh/h		1015			1042			1013			1138	
Approach Delay, s/veh		34.6			23.1			36.6			51.9	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.7	57.9	17.8	35.6	18.5	58.0	21.7	31.7				
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5				
Max Green Setting (Gmax), s	22.5	35.5	13.5	32.5	30.5	27.5	15.5	30.5				
Max Q Clear Time (g_c+I1), s	11.6	26.3	11.2	27.0	11.3	15.6	15.2	20.9				
Green Ext Time (p_c), s	0.6	2.3	0.1	2.1	0.8	2.9	0.0	2.8				
Intersection Summary												
HCM 6th Ctrl Delay				36.9								
HCM 6th LOS				D								
Notes												
User approved changes to right turn type.												

MOVEMENT SUMMARY

 Site: 101 [2035 PM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	276	3.0	0.488	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
8	T1	1070	3.0	0.488	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
Approach		1346	3.0	0.488	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
North: Kenwood Rd												
4	T1	727	3.0	0.683	13.8	LOS B	9.7	247.1	0.72	0.81	1.15	31.0
14	R2	617	3.0	0.580	10.8	LOS B	5.2	132.6	0.62	0.59	0.79	31.1
Approach		1345	3.0	0.683	12.4	LOS B	9.7	247.1	0.68	0.71	0.99	31.1
All Vehicles		2690	3.0	0.683	10.0	LOS A	9.7	247.1	0.34	0.35	0.49	34.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB.sip8

MOVEMENT SUMMARY

 Site: 101 [2035 PM]

New Site
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kenwood Rd												
3	L2	276	3.0	0.488	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	36.8
8	T1	1070	3.0	0.488	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	37.7
Approach		1346	3.0	0.488	7.5	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
North: Kenwood Rd												
4	T1	727	3.0	0.683	13.8	LOS B	9.7	247.1	0.72	0.81	1.15	31.0
14	R2	617	3.0	0.580	10.8	LOS B	5.2	132.6	0.62	0.59	0.79	31.1
Approach		1345	3.0	0.683	12.4	LOS B	9.7	247.1	0.68	0.71	0.99	31.1
All Vehicles		2690	3.0	0.683	10.0	LOS A	9.7	247.1	0.34	0.35	0.49	34.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: \\10.1.1.4\Projects\2022 Projects\22102 Sycamore Township\001 Traffic Study - Kenwood & Montgomery\Sidra\Kenwood Rd & I-71SB SB Turn Lane.sip8