Annual Traffic Crash Analysis 2017

This report comprises the Lake Forest Police Department Annual Traffic Crash Analysis, providing city-wide overviews and detailed top five crash intersection statistics

Deborah Chrobak, M.A.
Lake Forest Police – Management Analyst

ANNUAL TRAFFIC CRASH ANALYSIS: 2017

I. INTRODUCTION

At the direction of Police Chief Karl Walldorf, a comprehensive analysis was undertaken of all traffic crashes occurring in Lake Forest during 2017. Individual traffic crash reports were examined to extract informational and actionable data resulting in the first edition of the "Annual Traffic Crash Analysis" report. This study seeks to support patrol operations strategies as well as provide an overview of crash events for police, city and elected officials.

A two-level inquiry approach was conducted; the first one examines all crash incidents city-wide for over-arching patterns, followed by a second more detailed analysis of the five intersections identified as our most active locations. The initial macro level city-wide review includes analysis by:

- Total crashes
- Patrol beat
- Quarter of year
- Month of occurrence
- Day of the week
- Hour of day
- Patrol shift and Special studies
- Collision type
- Primary violation
- Contributory cause
- Resident impacts

The second tier analysis provides an in-depth examination of the *Top Five Crash Locations* (TFCL) in the city, reviewing intersection photos, traffic volumes, injury types, crash rates and other pertinent data.

II. CITY-WIDE CRASH DATA OVERVIEW

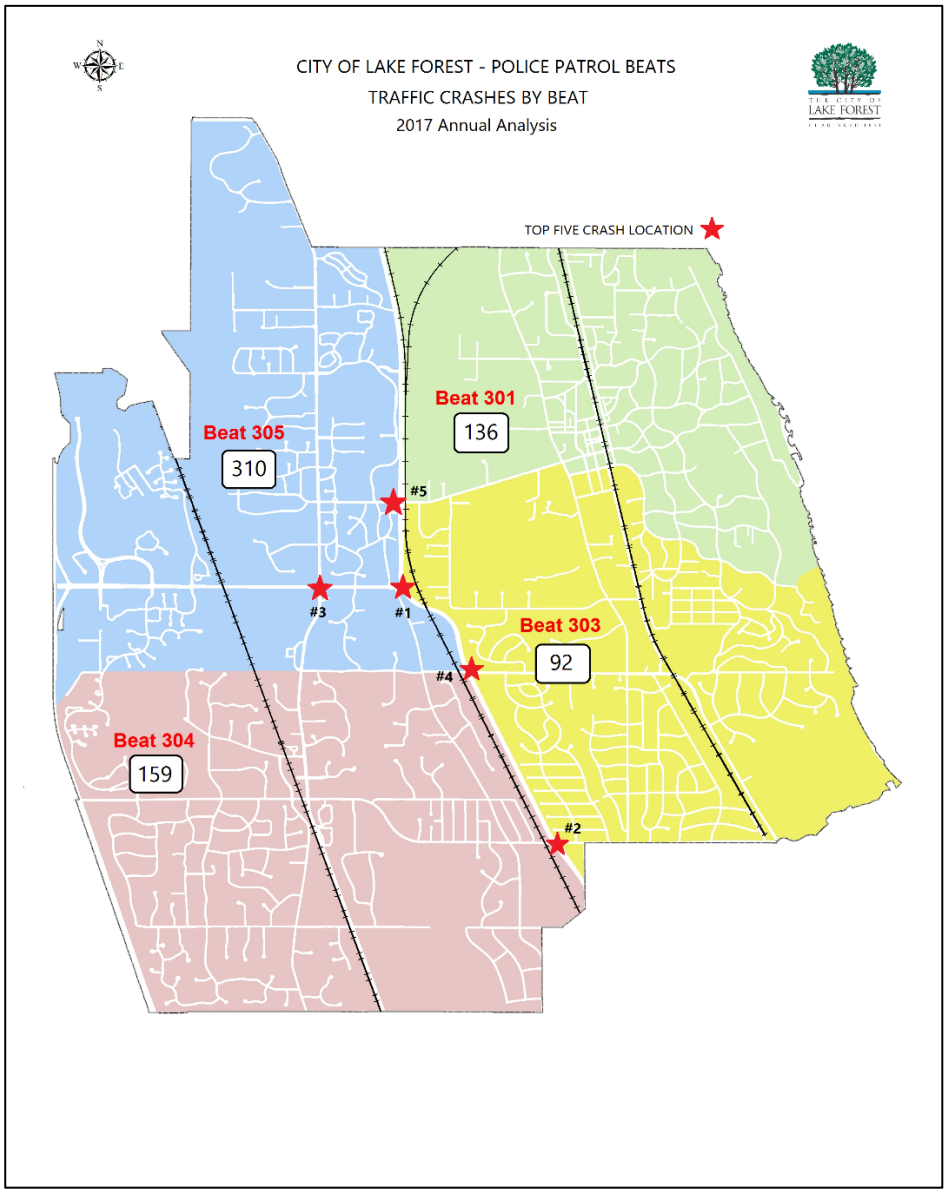
2017 ALL TRAFFIC CRASHES			
CRASH TYPE	**ROAD**	**PRIV PROP**	**TOTAL**
ALL	**599**	**98**	**697**
PROP DAMAGE	507	91	**598**
INJURY	92	7	**99**
FATALITY	0	0	**0**
SPECIAL STUDIES			
HIT & RUN	39	26	**65**
DUI	11	2	**13**

III. CITY-WIDE DATA SEGMENTS

A. *OCCURRED BY PATROL BEAT:* The City is divided into four police patrol beats to produce an effective handling of incidents and logical dispersion of personnel. This analysis highlights the number and percentage of crashes occurring within each patrol beat in table and map form.

FINDINGS. The significant volume of traffic crashes in Beat 305 is generated primarily by three major roadways traversing the beat: Route 60, Route 41 and Route 43 (Waukegan). These three thoroughfares accounted for 221 of the 310 crashes in this beat (71%).

LFPD Patrol Beats	*Number of crashes*	*Percentage of crashes*
Beat 301	136	19.5%
Beat 303	92	13.2%
Beat 304	159	22.8%
Beat 305	310	44.5%



B. *ROADWAY AND INJURY TYPE BY PATROL BEAT:* A broad definition of crash location provides that crashes occur either on private property, such as a parking lot or driveway (PRIV), or on a public roadway (ROAD). The Illinois Department of Transportation (IDOT) requires the coding of any traffic related injuries into one of five categories on every crash report. The injury codes range in severity from fatality (K) down to no indication of injury (O). Table 1 lists injury descriptors and coding utilized by IDOT, while Table 2 provides a detailed look at the police beat of occurrence, roadway type, severity of injuries, crash totals and crash percentages.

TABLE 1.

INJURY CODE	IDOT DESCRIPTION
K	Fatality (Killed)
A	Incapacitating injury
B	Non-incapacitating injury
C	Reported injury, not evident
O	No indication of injury

FINDINGS. We were fortunate to record no traffic crash fatalities during 2017. *Roadway, non-injury* crashes (507) accounted for 73% of all crashes. Adding in *private property, non-injury* crashes (91) to this total reveals that 86% of all crashes city-wide are *non-injury*, *property damage* only incidents.

Roadway, injury crashes (92) with IDOT codes A, B or C accounted for 13% of all crashes. Reviewing only *roadway, serious injury,* code A & B crashes (54), results in the injury crash percentage dropping to 8% of the total. *Private property, injury* crashes (7) accounted for 1% of all crashes.

Beat 305 with 59 events experienced 64% of all *roadway, injury* crashes. Beat 304 was next with 24% and 22 total events.

There were seven *private property, injury crashes*; four Type B and three Type C events.

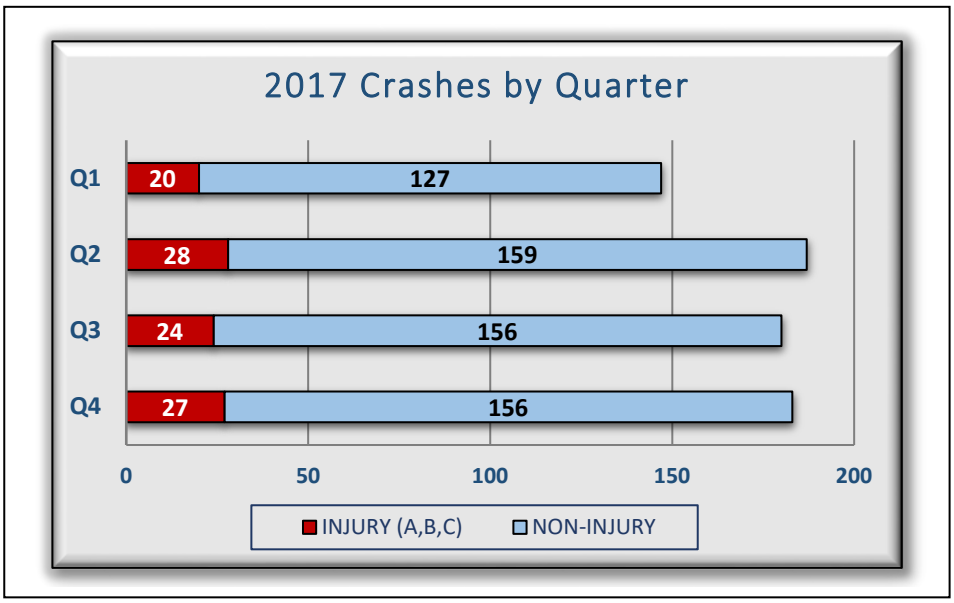
Beat 305 recorded the largest percentage of injury to total crashes at 20% with 63 of the total 310 crashes resulting in some type of injury. Beat 304 was next at 14% with 22 of 159 crashes resulting in injuries.

TABLE 2.

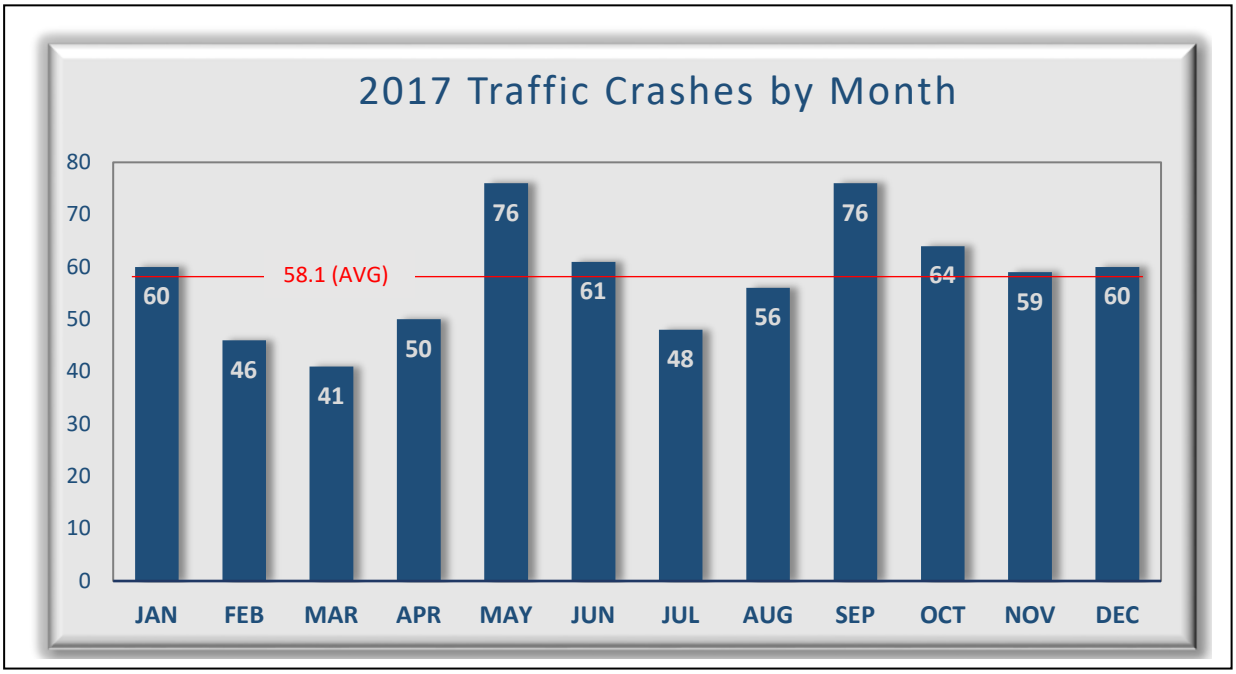
2017 TOTAL CRASHES				
BEAT/LOC	**INJURY CLASS**	**TOTAL CRASHES**	**BEAT %**	**TOTAL %**
301		**136**	**100.0%**	**19.5%**
ROAD	A	1	0.7%	0.1%
	B	2	1.5%	0.3%
	C	2	1.5%	0.3%
	O	107	78.7%	15.4%
PRIV	C	2	1.5%	0.3%
	O	22	16.2%	3.2%
303		**92**	**100.0%**	**13.2%**
ROAD	B	5	5.4%	0.7%
	C	1	1.1%	0.1%
	O	73	79.3%	10.5%
PRIV	B	1	1.1%	0.1%
	O	12	13.0%	1.7%
304		**159**	**100.0%**	**22.8%**
ROAD	A	2	1.3%	0.3%
	B	9	5.7%	1.3%
	C	11	6.9%	1.6%
	O	116	73.0%	16.6%
PRIV	O	21	13.2%	3.0%
305		**310**	**100.0%**	**44.5%**
ROAD	A	7	2.3%	1.0%
	B	28	9.0%	4.0%
	C	24	7.7%	3.4%
	O	211	68.1%	30.3%
PRIV	B	3	1.0%	0.4%
	C	1	0.3%	0.1%
	O	36	11.6%	5.2%
Grand Total		**697**		**100.0%**

C. *CRASHES BY QUARTER.* Reviewing crashes in quarterly groupings assists in looking at larger patterns across the year.

FINDINGS. Looking at averages across the four quarters we learn that there were: 24.75 injury crashes, 149.50 property damage crashes and 174.25 total crashes per quarter during the year. Total crash volumes from April through December remained remarkably consistent.

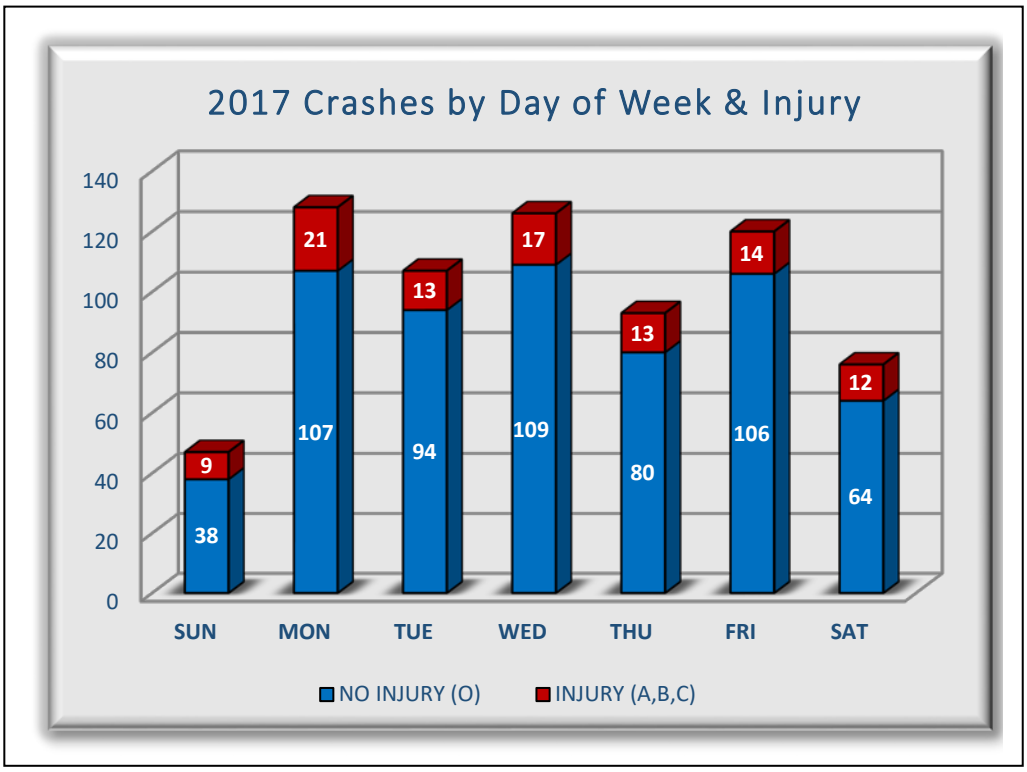


D. *MONTH OF OCCURRENCE:* This section depicts the total number of crashes by month for the year.



FINDINGS. 2017 averaged 58.1 crashes per month during the year. May and September tied for the highest volume at 76 crashes a piece, while March presented the lowest activity at 41 events.

E. *DAY OF WEEK AND INJURY:* Extracting day of the week data assists in refining patrol deployment decisions. Table 1 provides the five mandatory codes used by IDOT for describing traffic related injuries.



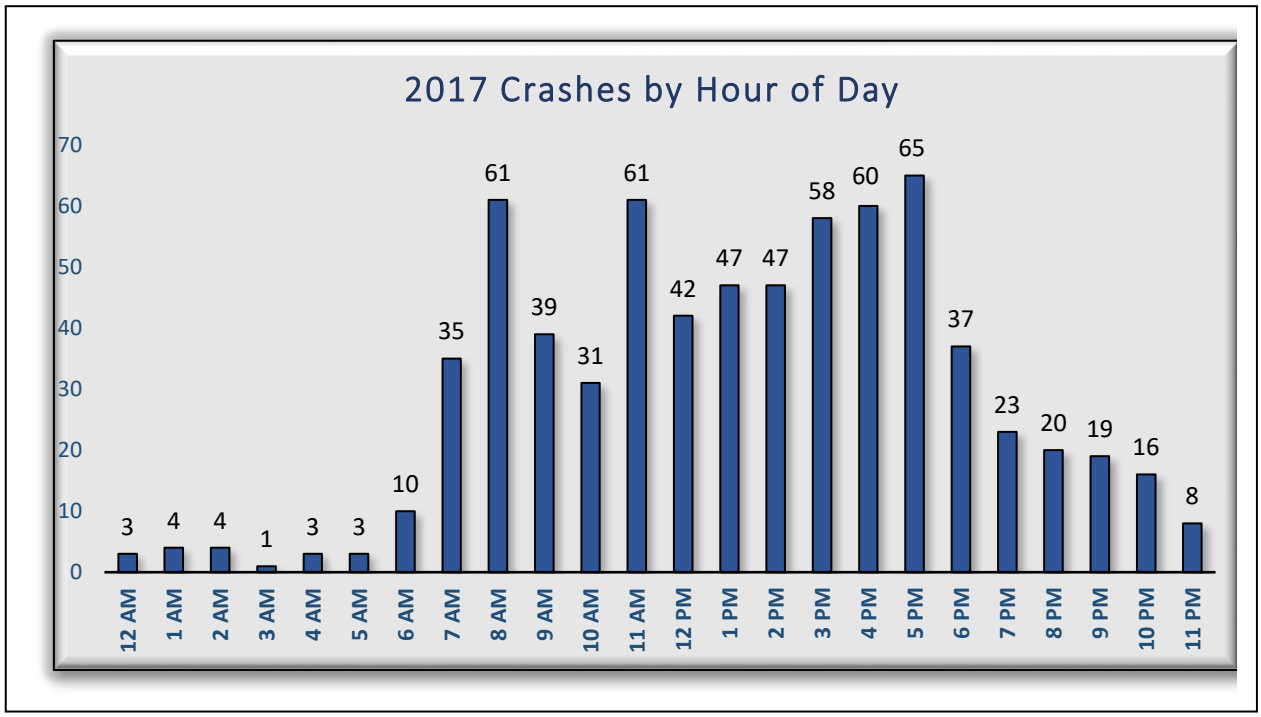
FINDINGS. At the top end of the totals were Monday, Wednesday and Friday all recording crash totals at 120 events or more each. Interestingly, Friday also provided the lowest percentage of injury crashes to total crashes at 12%.

The fewest crashes occurred on Sunday with 47 total events, not quite reaching one per week for the year. However, Sunday did provide the highest percentage of injury crashes to total crashes at 19%.

F. *HOUR OF DAY:* Time of occurrence of a crash is an integral component for patrol development strategies. Each single time point on the graph covers all crashes occurring within that hour; for example the 6 a.m. time point encompasses all crashes occurring from 6 a.m. through 6:59 a.m. If a time point had no crash activity it is not depicted. The top four activity points are highlighted in red.

FINDINGS. As shown on the following graph, a fairly expected hourly array of crash events occurred paralleling prevalent traffic patterns; weekday morning and evening rush hours and lunch time.

The three most prolific crash hour ranges and ties, in order of volume were: 5 p.m., 8 a.m., 11 a.m. and 4 p.m. When combining morning (7:00 a.m. - 9:00 a.m.) and evening rush hours (3:00 p.m. - 5:00 p.m.), these six hours accounted for 46% of all crashes across 25% of the total time. Reviewing the lunch time uptick at 11 a.m. of 61 crashes, we see that the one hour time frame accounts for 4% of total time across the day, but this slot experienced 8% of the traffic crashes.



G. *CRASHES BY PATROL SHIFT & SPECIAL STUDIES:* The Lake Forest Police Department provides continuous 24-hour coverage, 365 days a year by operating three patrol shifts divided into 8-hour work periods each.

LFPD Patrol Shifts	*Times*	*Number of Crashes Handled*	*Percentage Crashes Handled*
Midnight Shift	23:00 – 06:59	36	5%
Day Shift	07:00 – 14:59	363	52%
Afternoon Shift	15:00 – 22:59	298	43%

FINDINGS. Sorting all 697 crashes in the city, Day shift handled the most with 363 events in addition to 56% of all injury crashes. Afternoon shift handled 298 crashes and 38% of all injury crashes.

A quick look at "Special Studies" data (see chart under Section II, City-wide Crash Data Overview) captured under "Hit and Run" and "DUI" reveals the following statistics. There were 13 DUI traffic crashes for the year with seven handled by Afternoon shift (54%), four on Midnight shift (31%) and the remaining two were Day shift events. Six DUI crashes resulted in an injury, and all six were Type B events; the remaining seven were non-injury.

Hit and run crashes (65) accounted for 9% of the total crashes, with 60% occurring on the roadway and the remaining 40% on private property. Day shift handled 51%, Afternoon shift 40% and Midnight shift 9% of these crashes. There were 10 injury hit and run crashes, with nine recording Type B and one reporting Type C injuries.

H. <u>*COLLISION TYPES AND INJURIES:*</u> The purpose of the 15 codes within the *IDOT Collision Type* data field, is to identify what type of event caused the first damage or injury in a crash. This code is more easily understood as a factor involving the vehicle or conveyance contact. Only those codes utilized in completing 2017's crash reports are listed.

FINDINGS. During the year, 14 of the 15 collision type codes were utilized to describe crash incidents; the only code not utilized was *train*. Table 3 reveals *rear end* crashes (308) as the most prolific collision type in the city, accounting for 44% of all incidents. These crashes also recorded injuries 15% of the time. Data from the National Highway Traffic Safety Administration indicates 28-32% of all collisions nationally are *rear end* crashes.

TABLE 3.

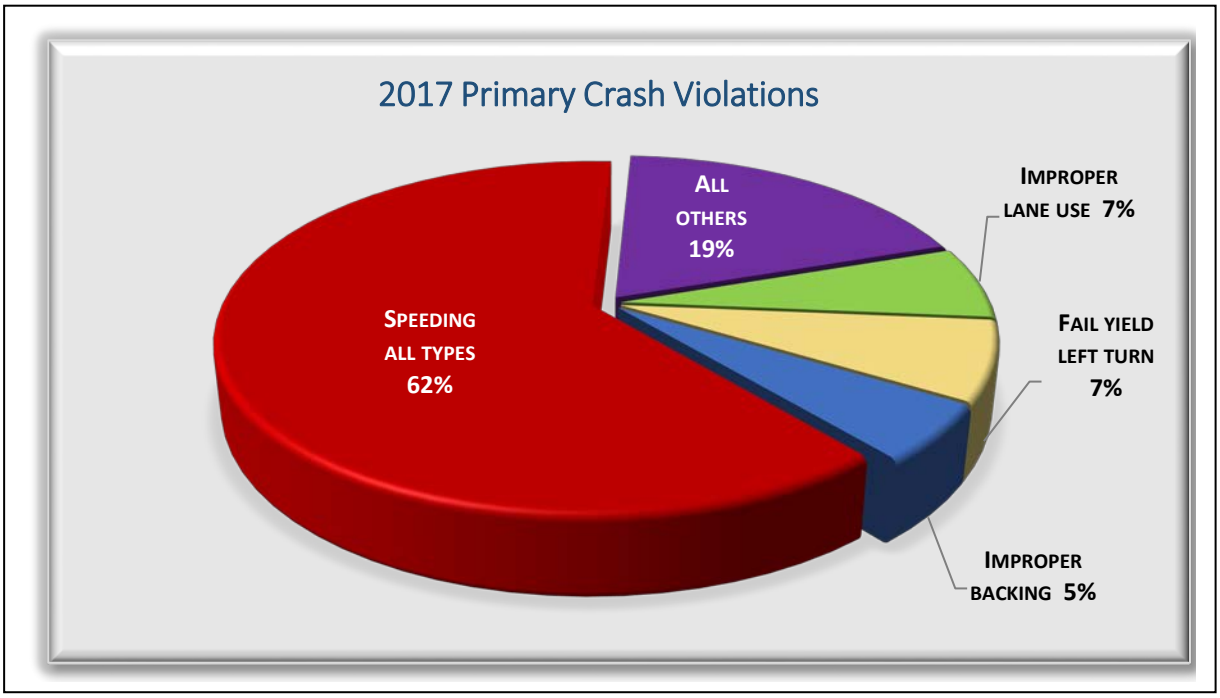
	INJURY TYPE				
COLLISION TYPE	**A**	**B**	**C**	**O**	**Grand Total**
Angle	1	5	2	90	**98**
Animal				12	**12**
Fixed Object		8	5	51	**64**
Head on	1	2		7	**10**
Other Non-Collision				8	**8**
Other Object		1		12	**13**
Overturned		1			**1**
Parked Motor Vehicle			1	70	**71**
Pedalcyclist		3		1	**4**
Pedestrian	1	4	1		**6**
Rear End	4	14	28	262	**308**
Sideswipe opposite direction	1	2		13	**16**
Sideswipe same direction		2	2	54	**58**
Turning	2	6	2	18	**28**
Grand Total	**10**	**48**	**41**	**598**	**697**

The next two most often recorded collision types were *angle* events with 98 occurrences and 71 marked as *parked motor vehicle*. These top three collision types accounted for 68% of all crashes.

Injuries were recorded with all collision types, except two; *animal* and *other non-collision*. For collision types experiencing more than 25 events, the highest percentage of injuries occurred within turning (36%) and fixed object (20%) crashes.

Reviewing the three collision types most often associated with potential morbidity values: *head on, pedal cyclist* and *pedestrian* we see 20 total crashes combined. These reported no fatalities, but elicited 12 injury crashes with two Type A, nine Type B and one Type C events. As might be expected, *pedestrian* and *pedalcyclist* collisions experienced the highest percentage of injuries at 100% and 75% respectively, but the sample size of six and four events was small.

I. *PRIMARY VIOLATIONS:* Traffic tickets written at crash scenes are issued in accordance with Illinois Vehicle Code statutes and local city ordinances. Vehicle debris, points of impact, driver and witness statements, officer observations and other relevant factors are assessed prior to a ticket being issued.



FINDINGS. Of the 697 crashes, 440 resulted in the issuance of at least one traffic ticket (63%). There were four main categories for the citations written. The most recurrent infraction was *speeding all types*, with 272 citations issued, making it far and away the most prolific violation at 62%. The *speeding all types* violations cover a variety of infractions at the state and local levels including *too fast for conditions, speeding* and *failure to reduce speed to avoid a crash.*

The next three top violations in order were: *failure to yield on a left turn* (32), *improper lane use* (29) and *improper backing* (23). Reviewing the 272 crash tickets written for *speeding* "all types" reveals 65 were issued to Lake Forest residents (24%), with the remaining 207 issued to non-residents (76%).

J. *CONTRIBUTORY CAUSES:* The Contributory Cause listing provided by IDOT currently contains 38 codes. These codes identify which element was most significant in causing the crash as determined by officer investigation, witness and driver statements and evidence. This code is more easily understood as a factor involving driver actions or issues faced. Only those codes utilized in completing 2017's crash reports are listed.

FINDINGS. As seen in Table 4 there were 32 different codes utilized to convey the contributory causes for all 697 crashes. The three most frequently occurring events were *failure to reduce speed to avoid a crash* (215), *improper backing* (83) and *failure to yield right-of-way* (82). These top three contributory causes combined accounted for 380 events and 55% of all crashes city-wide.

Some items of note include a look at *animal* and *evasive action due to an animal*, which were causative factors in 14 crash events. Deer and dogs were mentioned as the two animals most often involved.

The *weather* factor accounting for 27 crashes was reported as most often due to snow, ice, rain and wind.

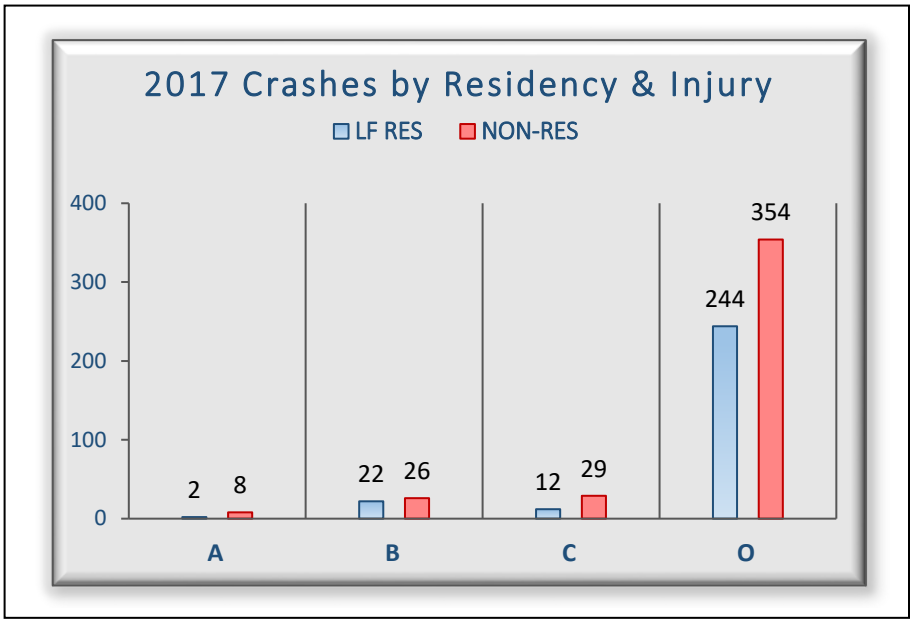
Distracted driving events resulted in 29 crashes caused by several actions covered by *cellphone use - not texting, distraction inside the vehicle, distraction outside the vehicle* and *distraction from other electronic devices - navigation, DVD, etc.*

TABLE 4.

CONTRIBUTORY CAUSE	Number	Percent
Animal	12	2%
Cellphone use-not texting	6	1%
Disregard other traffic signs	1	0%
Disregard stop sign	3	0%
Disregard traffic signals	17	2%
Disregard yield sign	1	0%
Distraction electronic-navi/DVD	3	0%
Distraction-inside vehicle	15	2%
Distraction-outside vehicle	5	1%
Driving skills/knowl/ability	26	4%
Driving wrong side/way	2	0%
DUI-alcohol/drugs	10	1%
Equipment-veh condition	10	1%
Evasive act-due to animal, etc.	2	0%
Exceeding speed limit	2	0%
Fail reduce speed avoid crash	215	31%
Fail yield right of way	82	12%
Follow too closely	33	5%
Improper backing	83	12%
Improper lane use	30	4%
Improper passing	12	2%
Improper turn-no signal	17	2%
Not applicable	9	1%
Operate veh-reckless, careless	4	1%
Physical condition of driver	11	2%
Right turn on red	2	0%
Road construct/maintenance	1	0%
Road engineering/defects	4	1%
Too fast for conditions	13	2%
Unable to determine	34	5%
Vision obscure-signs, limbs, etc.	5	1%
Weather	27	4%
Grand Total	697	100%

K. *LAKE FOREST RESIDENTS - CRASHES, INJURY CRASHES and TICKETS*: A summary of three impacts of traffic crashes on our residents is reviewed. This view looks at the residency of drivers involved in: all crashes, injury crashes and those written traffic violations.

FINDINGS – CRASHES & INJURY CODES.
The following graph reveals that of the 697 traffic crashes reported, 417 involved non-residents only (60%), while the remaining 280 involved a combination of at least one resident and a non-resident, or two or more residents (40%). Of the 99 injury crashes city-wide (Codes A, B, C), 21 involved at least one resident (21%) while 78 were non-residents only (79%).



FINDINGS – TICKETS.
Four hundred forty crashes resulted in the issuance of at least one primary ticket. In some crashes multiple tickets were issued, or both drivers were cited such as when one caused the accident and the other is found to be without insurance. Of the 440 primary crash tickets, 27% were given to Lake Forest residents, with the remaining 73% issued to non-residents.

CRASH TICKET TOTALS	*Tickets*	*Percentage*
LF Resident	119	27%
Non-Resident	321	73%

However, reviewing citation statutes where 20 or more tickets were issued for a single offense type other than *speeding*, we see there are two violations where residents and non-residents were ticketed at relatively similar rates. *Improper left turn* with 14 resident and 12 non-resident tickets and *unsafe backing* displaying 9 resident and 11 non-resident citations, were the two primary groups.

IV. TOP FIVE CRASH LOCATIONS - BACKGROUND

Traffic data provides a plethora of detail for analysis and discussion, but data that is actionable is highly valuable to the four E's of traffic safety: education, engineering, enforcement and EMS. Knowledge of intersection events provides law enforcement, the motoring public and roadway engineers the opportunity to positively affect outcomes. To this end, the top five crash locations (TFCL) will be analyzed in detail.

One intersection evaluation tool is to look at the volume of traffic through it on a daily basis. "Intersection counts are used for timing traffic signals, designing channelization, planning turn prohibitions, computing capacity, analyzing high crash intersections and evaluating congestion" (Homburger, et. al. 1996. *Volume Studies and Characteristics: In Fundamentals of Traffic Engineering.* Berkeley: Institute of Transportation Studies, University of California, Berkeley). The Illinois Department of Transportation provides on-line "Average Daily Traffic Count" maps on their website for these purposes.

The *Top Five Crash Location* (TFCL) analysis reviews data from all crash reports taken during 2017, then compiles those five intersections with the highest number of crashes. The data is then aggregated with additional sources to produce the below listed data sets and rankings for each intersection:

- Google Maps intersection photo
- IDOT average daily traffic volume
- Total intersection crashes
- Crash rate per million vehicles ◦
- Property damage crashes (Type O)
- Injury crashes (Type A, B, C)
- Serious injury crashes (Types A, B)
- Serious injury crash rate per million vehicles ◦
- Crash quadrant
- Day of week and hour of day
- Collision type
- Contributory cause

o (*Crash rate per million entering vehicles* is a statistical tool utilized by the U.S. Department of Transportation, Federal Highway Administration. It provides a national numeric baseline comparison for crashes among various locations expressed as a common unit of exposure (i.e., crash rate per million vehicles)).

V. TOP FIVE CRASH LOCATIONS - DETAILS

2017 - TFCL INTERSECTIONS	*TOTAL CRASHES*	*INJURY CRASHES*
1. Route 41 @ Route 60	86	20
2. Route 41 @ Old Elm	58	6
3. Route 60 @ Route 43	32	7
4. Route 41 @ Westleigh	29	9
5. Route 41 @ Deerpath	28	8

TOP CRASH LOCATION (#1)	ROUTE 41 / ROUTE 60

ACTIVITY	*2017 DATA*	*TFCL RANK**
IDOT Average Daily Traffic Volume	48,500 vehicles	2
12 Month Traffic Volume	17,702,500 vehicles	2
2017 TOTAL CRASHES	86	1
Crash Rate per million vehicles	4.86	1
Property Damage Only Crashes	66	1
Property Damage Crash Percentage	77%	3
All Injury Crashes (Type A, B, C)	20	1
All Injuries Crash Percentage	23%	3
Serious Injury Crashes (Type A, B)	11	1
Serious Injury Crash Percentage	13%	4
Serious Injury Crash Rate per million vehicles	0.62	1

*(*TFCL Rank: Provides 1-5 ranking, with 1 being the highest number or percentage of events and 5 being the lowest. T indicates ties.)*

OBSERVATIONS: Based on traffic volumes compared to the number of crashes, the crash rate per million vehicles (4.86) and serious injury crash rate per million vehicles (0.62) at this location were the highest of the five intersections. This intersection remained the top crash location across each of the four quarters for 2017 and maintained that ranking on the annual review.

QUADRANT: The three-sided T-intersection nature of this location is somewhat unique, given the standard four quadrant nature of most intersections.

FINDINGS. There were 86 crashes at this intersection, revealing two distinct groupings accounting for 83% of crashes; southbound Route 41 and eastbound Route 60.

QUADRANT LOCATION	*CRASHES*	*PERCENTAGE*
SB RT 41	39	45%
EB RT 60	32	37%
NB RT 41	14	16%
WB RT 60	1	1%

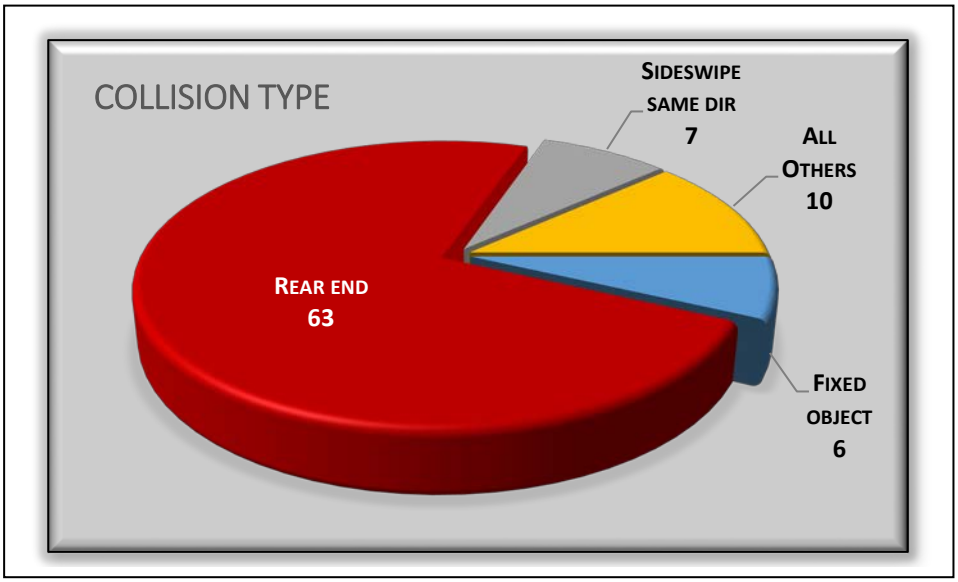
DAY OF WEEK & HOUR OF DAY: Reviewing data clusters such as day and time factors allows more precise personnel deployment. The contiguous grid breaks crashes down to day of week and 1 hour time range. It has also been color coded to provide two larger 12-hour data groupings with yellow DAY and green NIGHT parameters. This allows the viewer to focus on specific days or times, as well as clusters of consecutive data patterns, such as rush hour ranges.

FINDINGS. There were 71 crashes which occurred during the DAY grouping (83%). The majority of the 15 NIGHT grouping crashes (10) occurred Tuesday through Friday between 7:00 p.m. – 11:59 p.m.

Individually, Monday and Friday were the busiest days with 19 and 15 crashes a piece. Sunday was the only day of the week to show zero events during the NIGHT grouping.

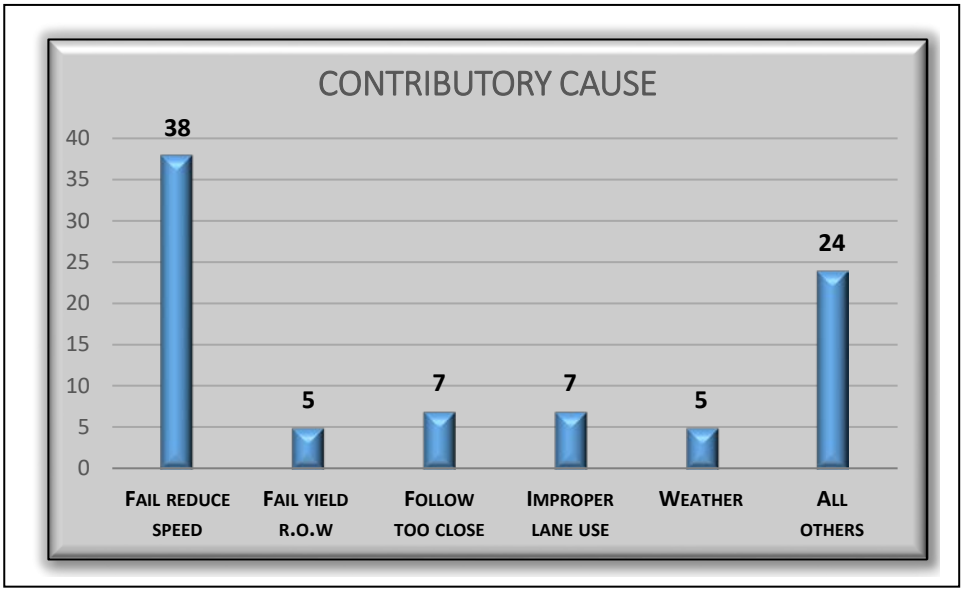
TIME/DAY	SUN	MON	TUE	WED	THU	FRI	SAT
12 AM							
1 AM							
2 AM							
3 AM							
4 AM							
5 AM		1					
6 AM		1	2				
7 AM		3	1	2	2	1	
8 AM	1	1	1				1
9 AM		4					
10 AM		1			1		
11 AM			1			2	
12 PM		2		2		2	
1 PM		1		1	1	1	3
2 PM	1		4		1	2	
3 PM	1	1		1	1	1	1
4 PM	2	3	3		1	3	
5 PM		1		2	3		1
6 PM			1				1
7 PM				1		1	
8 PM							1
9 PM				1		1	
10 PM				1	3	1	
11 PM			1				

COLLISION TYPE: The purpose of the 15 codes within the IDOT Collision Type data field, is to identify what type of event caused the first damage or injury in a crash. This code is more easily understood as a factor usually involving the vehicle or conveyance.



FINDINGS. There were 10 collision type codes reported at this location. The top three types have been charted. *Rear end* crashes are the most prolific event accounting for 73% of all crashes. The next highest frequency was *sideswipe same direction* incidents, providing 8% of the total. The seven remaining individually uncharted collision codes responsible for 10 total events were grouped into *all others* and are: *angle, other non-collision, other object, overturned, parked vehicle, sideswipe opposite direction* and *turning,* accounting for one or two events each. This location had the highest number of *rear end* crashes among the TFCL's.

CONTRIBUTORY CAUSES: *Contributory Cause* codes are used to indicate which factors are the most significant in causing the crash. IDOT supplies 38 separate codes to indicate this type. This code is more generally understood as a factor involving the driver.



FINDINGS. There were 17 contributory causes reported at this location. The top five contributory causes have been graphed. *Failure to reduce speed to avoid an accident* accounted for 44% of all crashes. The top five contributory causes combined were responsible for 72% of all crashes. The remaining twelve causes totaling 24 collisions provided between one and four crash events each, with the majority in the one to two range. These causes were included under *all others* and are: *disregard traffic signals, distraction inside vehicle, distraction outside vehicle, driver's skills or ability, vehicle equipment or condition, improper backing, improper passing, no turn signal, right turn on red, roadway defects, too fast for conditions* and *unable to determine.*

TOP CRASH LOCATION (#2)	ROUTE 41 / OLD ELM

ACTIVITY	*2017 DATA*	*TFCL RANK**
IDOT Average Daily Traffic Volume	42,200 vehicles	4
12 Month Traffic Volume	15,403,000 vehicles	4
2017 TOTAL CRASHES	58	2
Crash Rate per million vehicles	3.77	2
Property Damage Only Crashes	52	2
Property Damage Crash Percentage	90%	1
All Injury Crashes (Type A, B, C)	6	5
All Injuries Crash Percentage	10%	5
Serious Injury Crashes (Type A, B)	1	5
Serious Injury Crash Percentage	1%	5
Serious Injury Crash Rate per million vehicles	0.06	5

*(*TFCL Rank: Provides 1-5 ranking, with 1 being the highest number or percentage of events and 5 being the lowest. T indicates ties.)*

OBSERVATIONS: While this intersection ranked second in total number of crashes, it ranked fifth in all injury and serious injury crashes. There was a significant percentage of difference of 39% in the number of crashes between TFCL #1 (86) and TFCL #2 (58).

QUADRANT: This intersection is unique, in that an exit ramp from northbound Route 41 adds a surplus layer of traffic to the standard four-way intersection, and there are additional stop signals and stop lines for the railroad crossing on the west side of the intersection.

FINDINGS. The 58 crashes at this intersection revealed Route 41, including the exit ramp, logged 53 crashes accounting for 91% of all crashes there.

QUADRANT LOCATION	*CRASHES*	*PERCENTAGE*
NB RT 41	32	55%
SB RT 41	21	36%
WB OLD ELM	3	5%
EB OLD ELM	2	3%

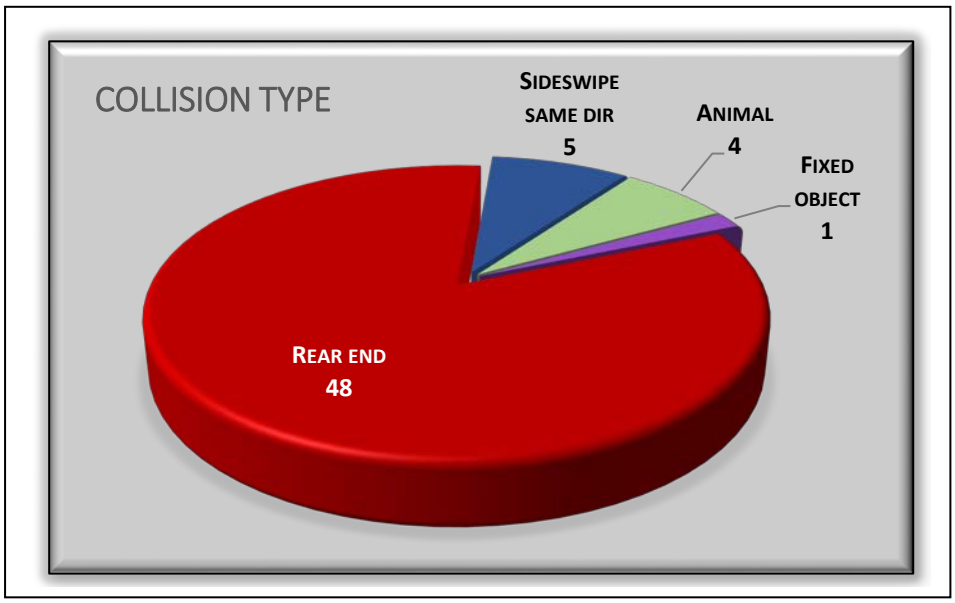
DAY OF WEEK & HOUR OF DAY: Reviewing data clusters such as day and time factors allows more precise personnel deployment. The contiguous grid breaks crashes down to day of week and 1 hour time range. It has also been color coded to provide two larger 12-hour data groupings with yellow DAY and green NIGHT parameters. This allows the viewer to focus on specific days or times, as well as clusters of consecutive data patterns, such as rush hour ranges.

FINDINGS. There were 58 total crashes at this intersection, with 43 events occurring during the DAY grouping (74%). The majority of the 15 NIGHT grouping crashes (12) occurred between 7:00 p.m. – 11:59 p.m.

Individually, Tuesday and Saturday were the busiest days with 13 and 11 crashes a piece. Every day of the week had some crash activity during the NIGHT grouping. The busiest hour groupings, tied with six crashes each were 9:00 a.m., 5:00 p.m. and 6:00 p.m.

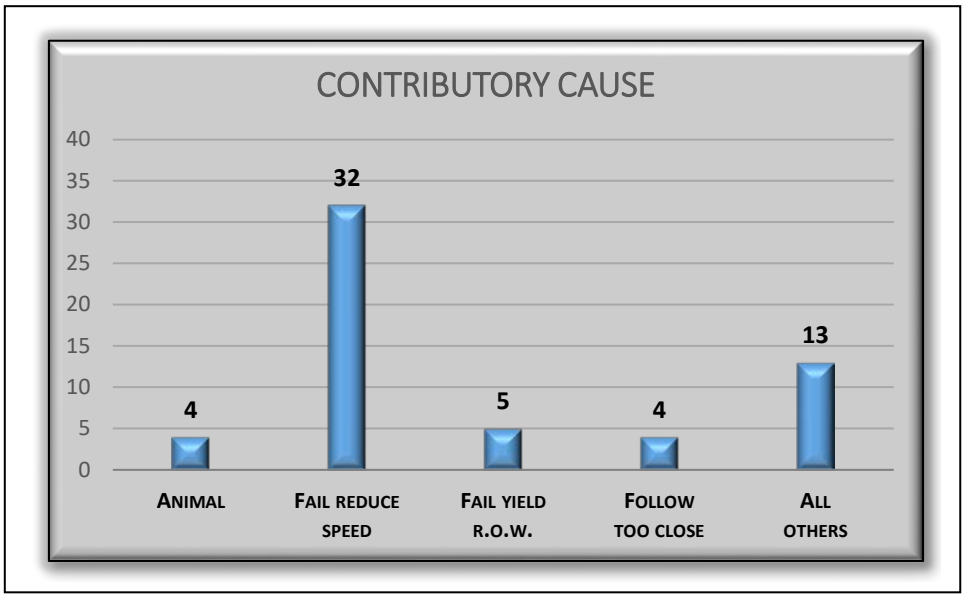
TIME/DAY	SUN	MON	TUE	WED	THU	FRI	SAT
12 AM							
1 AM			1				
2 AM							
3 AM				1			
4 AM							
5 AM							
6 AM							1
7 AM							1
8 AM			2	1			
9 AM	1		3		1	1	
10 AM				1			1
11 AM			2		1	2	
12 PM	1				1		2
1 PM		1			2	1	1
2 PM							
3 PM						2	
4 PM			1		1	1	
5 PM		3		2			1
6 PM		1	2		1	1	1
7 PM	1						1
8 PM	1		1	1			
9 PM		1			1	1	
10 PM			1		1		1
11 PM							1

COLLISION TYPE: The purpose of the 15 codes within the IDOT Collision Type data field, is to identify what type of event caused the first damage or injury in a crash. This code is more easily understood as a factor usually involving the vehicle or conveyance.



FINDINGS. This location had the second highest number of crashes overall, however only four collision types were recorded and all have been graphed. This makes it the TFCL with the smallest number of different collision types. *Rear end* crashes accounted for 83% of all events. This location had the highest percentage of *rear end* crashes of all TFCL's.

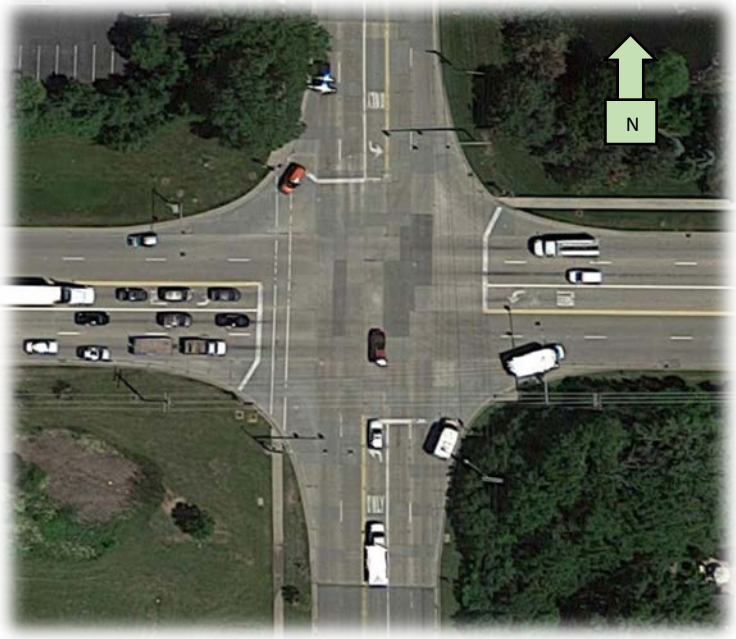
CONTRIBUTORY CAUSES: *Contributory Cause* codes are used to indicate which factors are the most significant in causing the crash. IDOT supplies 38 separate codes to indicate this type. This code is more generally understood as a factor involving the driver.



FINDINGS. There were 13 contributory causes listed for this location. The top four causes have been graphed. *Failure to reduce speed to avoid an accident,* individually accounted for 55% of all crashes.

The remaining eight causes were grouped into *all others* providing from one to three events each. These causes were: *distraction electronics navigation/DVD, distraction inside vehicle, driver's skills or ability, vehicle equipment or condition, improper lane use, improper passing, physical condition of driver, right turn on red light* and *unable to determine.*

TOP CRASH LOCATION (#3)	ROUTE 60 / ROUTE 43 (Waukegan)



ACTIVITY	*2017 DATA*	*TFCL RANK**
IDOT Average Daily Traffic Volume	41,050 vehicles	5
12 Month Traffic Volume	14,983,250 vehicles	5
2017 TOTAL CRASHES	32	3
Crash Rate per million vehicles	2.14	3
Property Damage Only Crashes	25	3
Property Damage Crash Percentage	78%	2
All Injury Crashes (Type A, B, C)	7	4
All Injuries Crash Percentage	22%	4
Serious Injury Crashes (Type A, B)	5	3
Serious Injury Crash Percentage	16%	2
Serious Injury Crash Rate per million vehicles	0.33	2

*(*TFCL Rank: Provides 1-5 ranking, with 1 being the highest number or percentage of events and 5 being the lowest. T indicates ties.)*

OBSERVATIONS: Ranking last in traffic volume, this is the only TFCL without a Route 41 component or a number one ranking in any category.

QUADRANT: This location is a standard, four-way, intersection with Route 60 as the east-west access to Route 41. This TFCL is the only standard four-way intersection not having ramps, railroad tracks or other features.

FINDINGS. The 32 crashes at this intersection revealed that eastbound Route 60 and southbound Route 43 accounted for 72% of the crashes.

QUADRANT LOCATION	*CRASHES*	*PERCENTAGE*
EB RT 60	13	41%
SB RT 43	10	31%
WB RT 60	7	22%
NB RT 43	2	6%

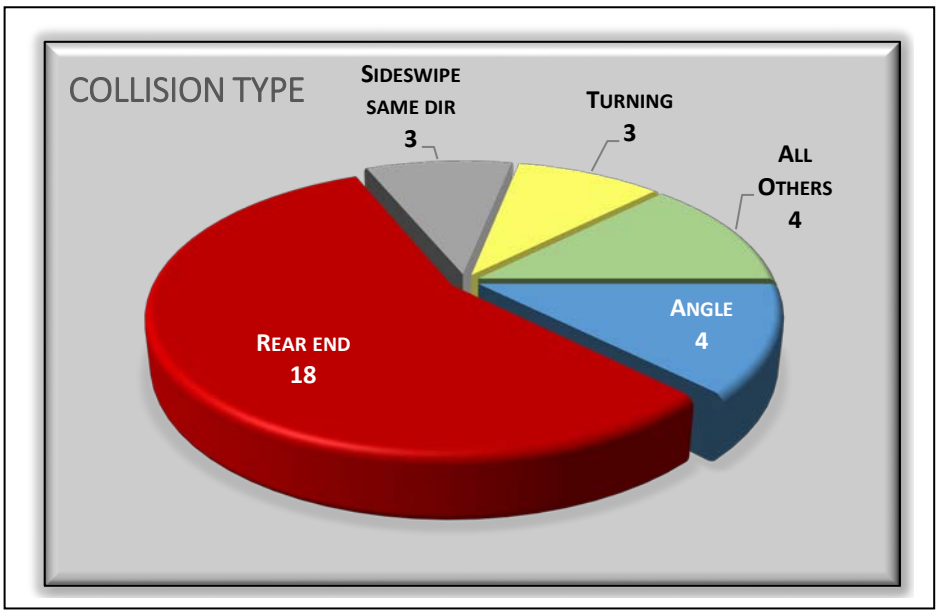
DAY OF WEEK & HOUR OF DAY: Reviewing data clusters such as day and time factors allows more precise personnel deployment. The contiguous grid breaks crashes down to day of week and 1 hour time range. It has also been color coded to provide two larger 12-hour data groupings with yellow DAY and green NIGHT parameters. This allows the viewer to focus on specific days or times, as well as clusters of consecutive data patterns, such as rush hour ranges.

FINDINGS. There were 32 total crashes at this intersection, with 28 events occurring during the DAY grouping (88%). Comparatively, this TFCL displayed the highest volume of DAY grouping crashes. Three of the four NIGHT events were between 9:00 p.m. and 11:59 p.m.

Monday and Wednesday tied for the highest volume with eight each day. There was only one crash on Thursday. The grouping of 7:00 a.m. to 10:00 a.m. accounted for 14 crashes and 44% of the total. Friday during the 2 o'clock hour range was the singular peak crash time with four events.

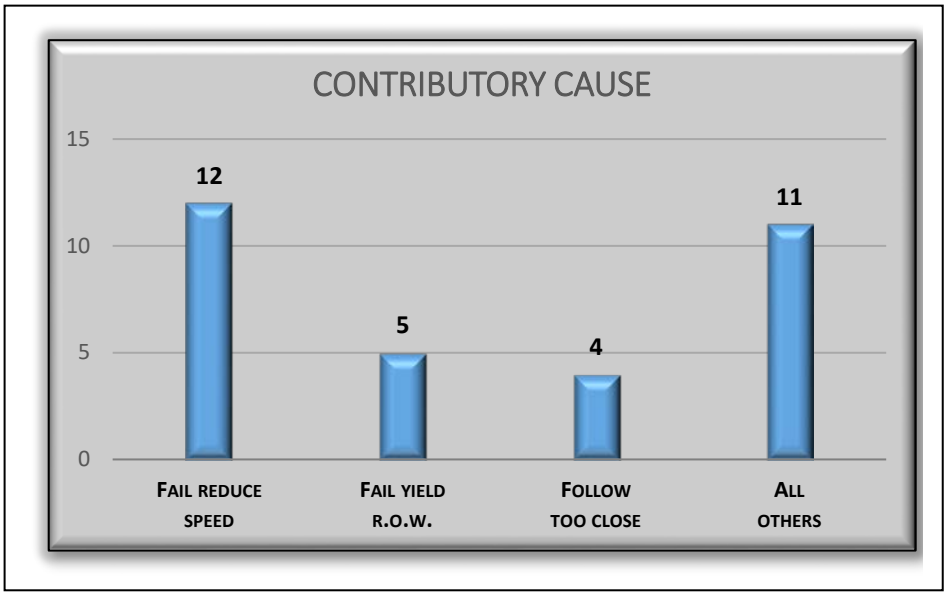
TIME/DAY	SUN	MON	TUE	WED	THU	FRI	SAT
12 AM							
1 AM							
2 AM							
3 AM							
4 AM							
5 AM							
6 AM		1					
7 AM		1		2		1	
8 AM		2		2	1		
9 AM		1		1			
10 AM	1		1	1			
11 AM		1				1	
12 PM				1			
1 PM			1				
2 PM						4	
3 PM							
4 PM	1	1		1			
5 PM			1			1	1
6 PM							
7 PM							
8 PM							
9 PM			1				
10 PM							1
11 PM		1					

COLLISION TYPE: The purpose of the 15 codes within the IDOT Collision Type data field, is to identify what type of event caused the first damage or injury in a crash. This code is more easily understood as a factor usually involving the vehicle or conveyance.



FINDINGS. There were seven collision type codes utilized at this location. The top four have been graphed. The peak activity was provided by *rear end* collisions which accounted for 56% of all crashes. The three remaining uncharted collision codes were grouped into *all others* and are: *head on, sideswipe opposite direction* and *parked vehicle,* with one to two crashes each.

CONTRIBUTORY CAUSES: *Contributory Cause* codes are used to indicate which factors are the most significant in causing the crash. IDOT supplies 38 separate codes to indicate this type. This code is more generally understood as a factor involving the driver.



FINDINGS. There were 10 causes listed as the primary contributory event. The top three causes have been graphed. *Failure to reduce speed to avoid an accident* was the most prolific cause at 12 events and 38% of all crashes.

The remaining seven causes were grouped into *all others* providing from one or two events each. These causes were: *cellphone use-not texting, disregarding traffic signals, driver's skills or ability, improper lane use, improper passing, no turn signal,* and *too fast for conditions.*

TOP CRASH LOCATION (#4)	ROUTE 41 / WESTLEIGH

ACTIVITY	*2017 DATA*	*TFCL RANK**
IDOT Average Daily Traffic Volume	44,525 vehicles	3
12 Month Traffic Volume	16,251,625 vehicles	3
2017 TOTAL CRASHES	29	4
Crash Rate per million vehicles	1.17	5
Property Damage Only Crashes	20	T4
Property Damage Crash Percentage	69%	5
All Injury Crashes (Type A, B, C)	9	2
All Injuries Crash Percentage	31%	1
Serious Injury Crashes (Type A, B)	4	4
Serious Injury Crash Percentage	14%	3
Serious Injury Crash Rate per million vehicles	0.25	4

*(*TFCL Rank: Provides 1-5 ranking, with 1 being the highest number or percentage of events and 5 being the lowest. T indicates ties.)*

OBSERVATIONS: This location had the highest percentage of injury crashes to total crashes, ranking number one in that category. However, it ranked number four in serious injury crashes indicating several minor injury collisions played a part in the initial ranking.

QUADRANT: This intersection provides a standard four-way traffic intersection, plus additional stop signals and stop lines for the railroad crossing and north to south bicycle path on the west side.

FINDINGS. The 29 crashes at this intersection are highlighted by the fact that Route 41 provided 83% of crash activity. Only five combined crashes occurred on the Westleigh portion of the roadway.

QUADRANT LOCATION	*CRASHES*	*PERCENTAGE*
NB RT 41	15	52%
SB RT 41	9	31%
WB WESTLEIGH	4	14%
EB WESTLEIGH	1	3%

DAY OF WEEK & HOUR OF DAY: Reviewing data clusters such as day and time factors allows more precise personnel deployment. The contiguous grid breaks crashes down to day of week and 1 hour time range. It has also been color coded to provide two larger 12-hour data groupings with yellow DAY and green NIGHT parameters. This allows the viewer to focus on specific days or times, as well as clusters of consecutive data patterns, such as rush hour ranges.

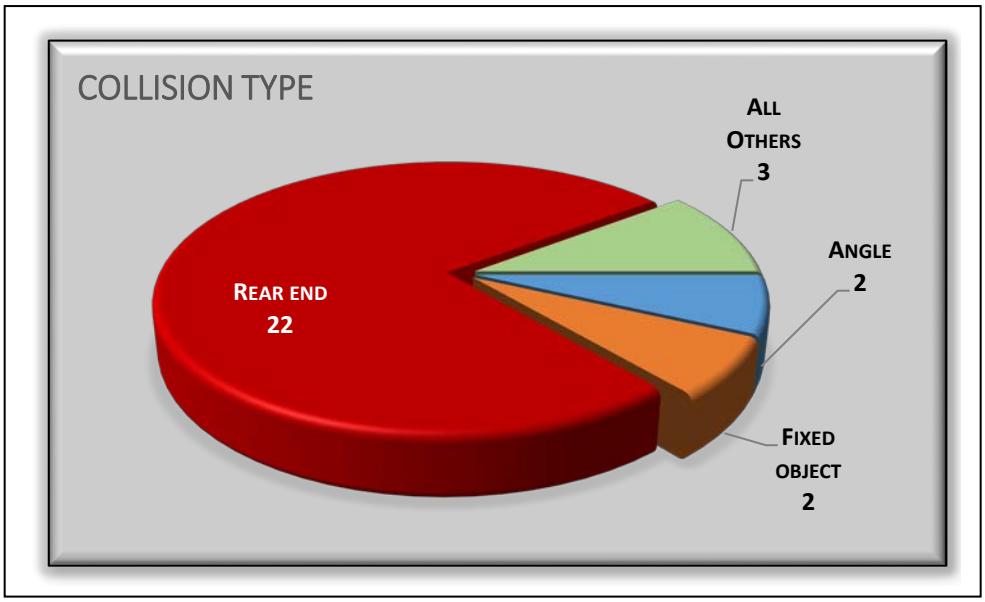
FINDINGS. There were 29 total crashes at this intersection, with 17 events occurring during the DAY grouping (59%) and 12 within the NIGHT category (41%). This was the highest NIGHT grouping crash percentage of all the TFCL's.

Monday and Wednesday tied for the busiest day with seven crash events each.

The hour ranges of 1:00 p.m. to 7:59 p.m. accounted for 16 crashes and 55% of the total.

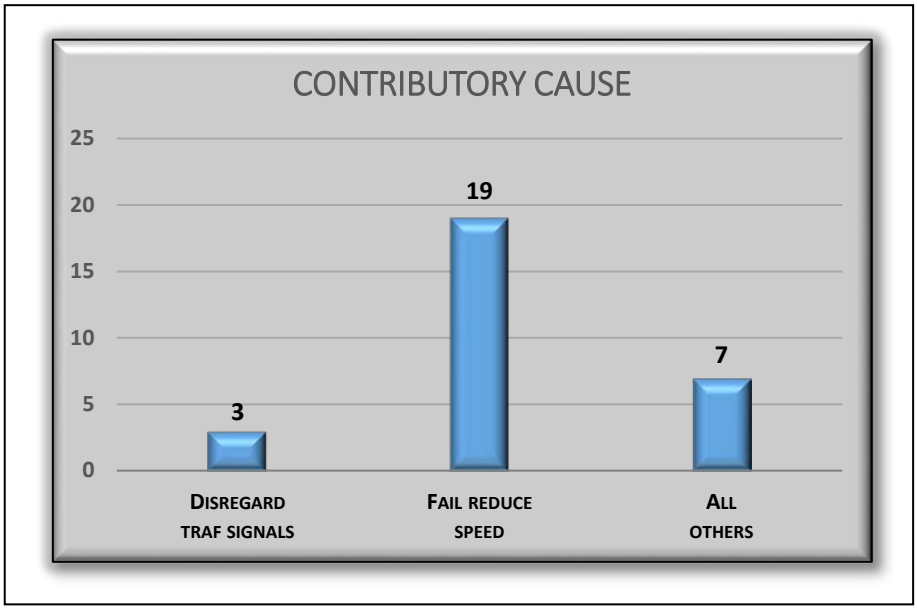
TIME/DAY	SUN	MON	TUE	WED	THU	FRI	SAT
12 AM							
1 AM							
2 AM							
3 AM							
4 AM	1						
5 AM							
6 AM						1	
7 AM		1				1	
8 AM				1			
9 AM						1	
10 AM							
11 AM		1					
12 PM		1					
1 PM				3			
2 PM		1					2
3 PM		1					1
4 PM		1					
5 PM	1						
6 PM		1					
7 PM			1	3	1		
8 PM							
9 PM	1					1	1
10 PM	1						
11 PM			1				

COLLISION TYPE: The purpose of the *IDOT Collision Type* description, of which there are 15 codes, is to identify what type of event caused the first damage or injury in a crash. This code is more easily understood as a factor involving the vehicle and contact.



FINDINGS. There were six collision type codes associated with this intersection, and the top three have been charted. *Rear end* collisions with 22 events were the predominant type at 76%. The three remaining uncharted collision codes were grouped into *all others* and are: *pedestrian, sideswipe same direction* and *turning,* which accounted for one event a piece.

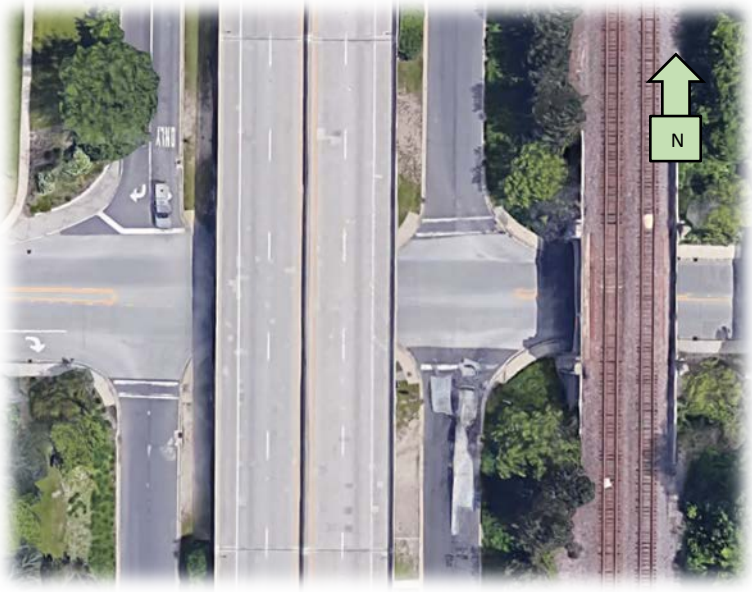
CONTRIBUTORY CAUSES: *Contributory Cause* codes are used to indicate which factors are the most significant in causing the crash. IDOT supplies 38 separate codes to indicate this type. This code is more generally understood as a factor involving the driver.



FINDINGS. Of the nine contributory causes associated with this intersection, there were only two causes showing multiple iterations; *failure to reduce speed to avoid a crash* (66%) and *disregarding traffic signals* (10%).

The remainder of the combined *all others* were single event causes and included: *distraction inside vehicle, vehicle equipment or condition, failure to yield the right-of-way, following too closely, improper lane use, operating a vehicle in a reckless or negligent manner* and *physical condition of the driver.*

TOP CRASH LOCATION (#5)	ROUTE 41 / DEERPATH



ACTIVITY	*2017 DATA*	*TFCL RANK**
IDOT Average Daily Traffic Volume	51,350	1
12 Month Traffic Volume	18,742,750	1
2017 TOTAL CRASHES	28	5
Crash Rate per million vehicles	1.49	4
Property Damage Only Crashes	20	T4
Property Damage Crash Percentage	71%	4
All Injury Crashes (Type A, B, C)	8	3
All Injuries Crash Percentage	29%	2
Serious Injury Crashes (Type A, B)	6	2
Serious Injury Crash Percentage	21%	1
Serious Injury Crash Rate per million vehicles	0.32	3

*(*TFCL Rank: Provides 1-5 ranking, with 1 being the highest number or percentage of events and 5 being the lowest. T indicates ties.)*

OBSERVATIONS: This intersection presented the highest daily and annual traffic volume of all the TFCL's, but ranked fifth in total number of crashes. It did have the highest percentage of serious injury crashes to total crashes overall.

QUADRANT: This location is a very unique, four way intersection; Deerpath is the surface roadway with Route 41 providing an elevated roadway portion with both access and egress ramps. An adjacent elevated railroad track adds to the complexity of the larger intersection, creating the second of two bridge decks.

FINDINGS. The 28 crashes at this intersection reveal a relatively tight statistical grouping between the three quadrants of northbound and southbound Route 41 and westbound Deerpath. Sixty-one percent of the crashes occurred on Route 41 or the ramps.

QUADRANT LOCATION	*CRASHES*	*PERCENTAGE*
NB RT 41	9	32%
SB RT 41	8	29%
WB DEERPATH	7	25%
EB DEERPATH	4	14%

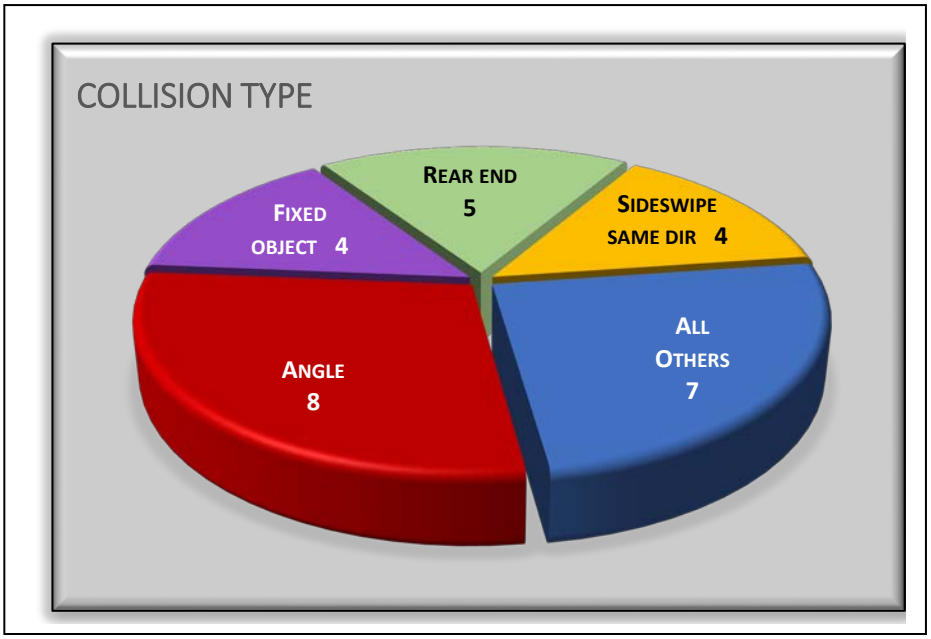
DAY OF WEEK & HOUR OF DAY: Reviewing data clusters such as day and time factors allows more precise personnel deployment. The contiguous grid breaks crashes down to day of week and 1 hour time range. It has also been color coded to provide two larger 12-hour data groupings with yellow DAY and green NIGHT parameters. This allows the viewer to focus on specific days or times, as well as clusters of consecutive data patterns, such as rush hour ranges.

FINDINGS. There were 28 total crashes at this intersection, with 19 occurring during the DAY grouping (68%). The NIGHT grouping totaled nine crashes with six of them occurring between 7:00 p.m. and 8:59 p.m.

There was only one crash between 11:00 p.m. – 7:59 a.m. during the year. Saturday was the single busiest day with eight crashes, making it the only TFCL with a weekend day as the busiest.

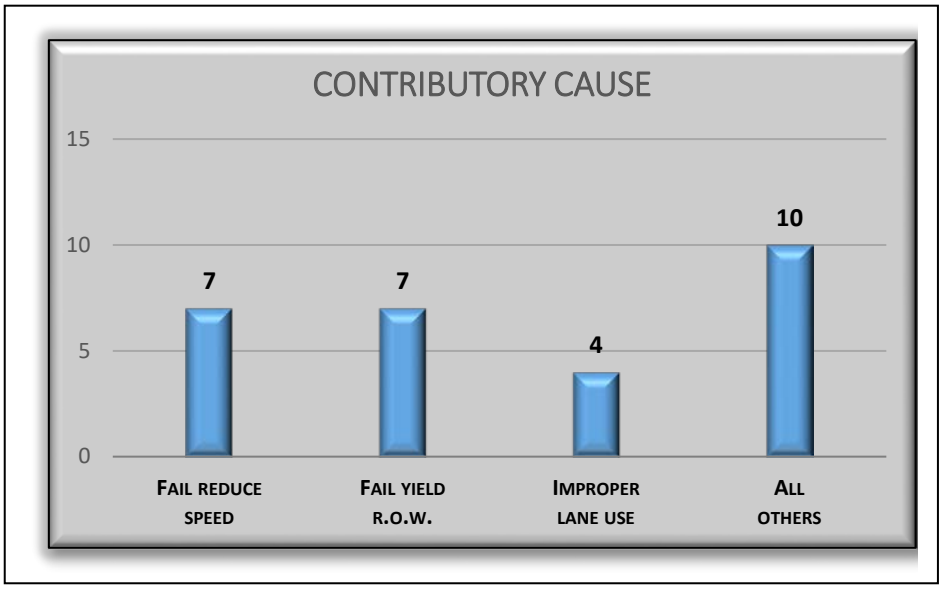
TIME/DAY	SUN	MON	TUE	WED	THU	FRI	SAT
12 AM							
1 AM							
2 AM							
3 AM							
4 AM		1					
5 AM							
6 AM							
7 AM							
8 AM			1	1			2
9 AM							
10 AM							
11 AM					1	1	2
12 PM							
1 PM				1			
2 PM		1					1
3 PM						2	
4 PM		1					2
5 PM			1	1			
6 PM						1	
7 PM	1	2		1		1	
8 PM						1	
9 PM							
10 PM			1				1
11 PM							

COLLISION TYPE: The purpose of the IDOT Collision Type description, of which there are 15 codes, is to identify what type of event caused the first damage or injury in a crash. This code is more easily understood as a factor involving the vehicle or conveyance contact.



FINDINGS. Of the eight collision types present at this intersection, the top four types were charted. *Angle* collisions (8) were the predominant event providing 29% of the total. The four remaining uncharted collision codes were grouped into *all others* and are: *other non-collision, other object, sideswipe opposite direction* and *turning*. These grouped events all accounted for one or two crashes each. This is the only TFCL where *rear end* crashes were not the primary collision type.

CONTRIBUTORY CAUSES: Contributory Cause codes are used to indicate which factors are the most significant in causing the crash. IDOT supplies 38 separate codes to indicate this type. This code is more generally understood as a factor involving the driver.



FINDINGS. There were ten contributory causes applicable at this intersection. The top three causes have been graphed. *Failure to reduce speed to avoid a crash* and *failure to yield the right-of-way* tied for first with seven crashes and 25% of the total each.

The remainder of the seven combined *all other* causes each adding one or two crashes each were responsible for 10 total events and were: *driver's skills or ability, DUI, vehicle equipment or condition, following too closely, no turn signal, physical condition of driver* and *weather.*