

# Technical Memorandum

I-290

Preliminary Engineering  
and Environmental (Phase I) Study  
West of Mannheim Road to Racine Avenue

## **Crash Report**

### **Addendum 2**

I-290 Mainline Extended Study Area  
East of Cicero Avenue to Racine Avenue

April 2013

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*Type "C" Crash:* A crash in which there were no visibly apparent injuries, but where a possible injury had occurred because of a complaint of pain by one or more of the vehicle occupants.

*Type "P" (Property Damage Only) Crash:* A crash where there were no injuries, but where property damage occurred to one or more vehicles and/or a roadside object or barrier.

## 2.0 I-290 Mainline Crash Summary

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The exhibit in **Appendix 2-A** presents a plot of the crash totals at every 1/10<sup>th</sup> mile along I-290 and the location of the fatal (Type K) and severe injury (Type A) crashes in the extended study area.

- In the extended study section between east of Cicero Avenue and Racine Avenue, there were 1,596 total crashes from 2006 to 2008. Five were Type K (fatal) crashes containing five fatalities, one fatality on a motorcycle; there were 18 Type A crashes, containing 19 Type A injuries. Again, Type K & A crashes represented less than 2% of all crashes in the extended study area.
- The overall crash rate in the eight lane section of I-290 between Kostner Avenue and Racine Avenue is 1.6 crashes/million vehicle miles traveled; this compares to a crash rate of 2.2 crashes/million vehicles miles traveled along I-290 in the six lane section between I-294 and east of Cicero Avenue, which is approximately 38% higher than in the eight lane section.
- Predominant Crash Types on the eight lane section of I-290 between east of Cicero Avenue and Racine Avenue included 885 rear end crashes (55% of total), 389 sideswipe same direction (24% of total) and 254 fixed object (16% of total). This compares to the western section of the I-290 mainline between I-294/I-88 and Kostner Avenue of 1,407 rear end crashes (63% of total), 463 sideswipe same direction crashes (21% of total) and 264 fixed object crashes (12% of total) within the three year period of 2006-2008.
- Crashes occurred at an elevated rate of 2.7 crashes per million vehicle miles traveled in the westbound direction between Independence Avenue and Kostner Avenue, as compared to an crash rate of 1.6 crashes/million vehicles per mile in the eastbound section, and overall on I-290 between east of Cicero Avenue and Racine Avenue.
- 62% of westbound crashes in the Independence-Kostner section were rear-end crashes, and 90% of the rear end crashes are associated with the typically congested daytime conditions. The congestion in this section is attributed to the lane drop immediately downstream at Austin Boulevard.
- The Illinois State Police indicated that in their experience, there seems to be a higher than usual run off road crash occurrence in the eastbound direction just west of Kostner Avenue where I-290 curves to the right. Crash data indicates 28% of all crashes are fixed object crashes, which is nearly double the overall study extended study area average fixed object crash rate of 16%. 68% of all fixed object crashes in this section occur during clear weather conditions and 52% of them occur during the over-night off-peak periods. A review of the roadway geometry in this location found that the existing superelevation is less than required and the tangent length between the reverse curves is slightly less than required (3% shorter than required). Superelevation is typically designed to accommodate large,

heavy commercial trailer trucks, and although this superelevation is substandard, only 7 crashes in three years involved a semi with a trailer, and only one of the semi crashes was a fixed object crash which occurred during snow conditions. The combination of adequate existing design, lack of fixed object truck crashes, and the majority of fixed object crashes occurring in clear, off-peak conditions indicate that these run off road crashes are likely due to a combination of speed and lack of being prepared for the turn as this 33 degree left hand curve occurs after a long, relatively straight section of highway. A suggested countermeasure for this location would be to install road curve signs in advance of and through the curve to alert motorists.

- There is no tangent between the two mainline reverse curves located between Ogden Avenue and Paulina Street. A review of the crashes in this location did not reveal any patterns that suggest these reverse curves are contributing to crashes. For example, fixed object crashes in this location comprised about 7% of the total crashes, which is less than half the average fixed object crash rate of 16% for the extended study area.
- Two areas stand out within the extended study area section for improvements to address crashes where they occur with the greatest frequency – in the eastbound direction approaching Racine Avenue, and in the westbound direction from Independence Avenue to Kostner Avenue approaching the lane drop at Austin Boulevard. Potential countermeasures include traffic improvements that promote more free-flow of traffic and reduce the potential for stop and go traffic that contributes to rear end crashes. In the eastbound direction, the congestion reducing countermeasures are being investigated by the Circle Interchange Study.

### 3.0 I-290 Ramp Crash Summary

Within the extended study area there are 26 ramps, consisting of 13 exit ramps and 13 entrance ramps. During the years 2006, 2007, and 2008, there were 57 crashes reported on 22 of the 26 ramps, with no fatalities and 2 Type A injury crashes. **Table 3-1** summarized the ramp crash data in the extended study area.

**Table 3-1- I-290 Ramp Crash Summary**

Ramp		Aux Lane	Substandard Departure Angle	# of Crashes	% of total	
Eastbound I-290	Entrance	Ashland to EB I-290	✓	⊗	2	3.5%
		California to EB C-D Road	✓	⊗	1	1.8%
		Damen to EB I-290	✓	⊗	2	3.5%
		Homan to EB I-290	✓	⊗	2	3.5%
		Independence to EB I-290		⊗	2	3.5%
		Kostner Avenue to EB I-290		⊗	2	3.5%
		Oakley to EB I-290	✓	⊗	1	1.8%
	Exit	EB C-D Road to Western	✓		3	5.3%
		EB I-290 to Independence		⊗	4	7.0%
		EB I-290 to Paulina	✓	⊗	3	5.3%
		EB I-290 to Racine	✓		4	7.0%
		EB I-290 to Sacramento	✓		1	1.8%
EB I-290 to Damen	✓		0	0.0%		
West bound I-290	Entrance	Damen to WB I-290	✓	⊗	10	17.5%
		Independence to WB I-290		⊗	7	12.3%
		Paulina to WB I-290	✓	⊗	0	0.0%
		Sacramento to WB I-290	✓	⊗	1	1.8%
		Western to WB C-D Road	✓	⊗	2	3.5%
	Exit	WB C-D Road to California	✓		2	3.5%
		WB I-290 to Ashland	✓		1	1.8%
		WB I-290 to Homan	✓		2	3.5%
		WB I-290 to Independence		⊗	2	3.5%
		WB I-290 to Kostner Avenue			3	5.3%
		WB I-290 to Oakley	✓	⊗	0	0.0%
		WB I-290 to Damen	✓	⊗	0	0.0%
		<b>Total Crashes</b>				<b>57</b>
Eastbound				27	47%	
Westbound				30	53%	
Exit				25	44%	
Entrance				32	56%	

Generally, ramp crashes were evenly distributed between the westbound and eastbound direction, and between exit and entrance ramp types. Most of the ramps (19 out of 26) in the extended study are connected to an auxiliary lane (noted by a ✓ in **Table 3-1**), which is an extra lane that connects an entrance and exit ramp along the regular through lanes. A comparison between the average number of crashes that occurred at ramps with an auxiliary lane to those

without an auxiliary lane, suggest that the ramps without an auxiliary lane have a approximately 70% higher crash occurrence. Ramps with substandard entrance or exit ramp departure angles were also evaluated.

Two westbound entrance ramps experienced a relatively elevated crash rate, Damen to WB I-290 and Independence to WB I-290. All 11 crashes that occurred on the Damen to WB I-290 ramp were rear end crashes that occurred in clear, dry conditions, during the day on a week day. The type and time of day of these crashes suggests that congestion was a key factor. The WB exit ramp to Oakley Avenue is located 500' downstream via an auxiliary lane. This suggests that weaving maneuvers between entering and exiting vehicles in this location may also be a factor that contributes to crashes on this ramp. Similarly, all 7 crashes that occurred on the Independence to WB I-290 Ramp were rear end crashes. All but one crash occurred in clear, dry, daytime conditions. This ramp has a very high entrance angle of over 7.4 degrees, which is over five times greater than the current BDE standard of 1.146 degrees. This ramp is also one of the higher volume ramps in the extended study area with over 10,000 ADT. The combination of high ramp volumes, sharp entrance angle, and lack of an auxiliary lane likely contribute to the crash rate at this location, especially during more congested daytime conditions when most of these crashes occurred.

## 4.0 I-290 Mainline Type K & A Crash Analysis

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In 2005, the federal Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) transportation bill was enacted. As part of that bill, the Federal Highway Administration (FHWA) was authorized to enact a Highway Safety Improvement Program (HSIP) that formulates safety policy and provides funding for safety improvements to the various states. Special emphasis was placed on targeting fatal and serious injury crashes as a part of HSIP. The administrative law following the SAFETEA-LU act states that each State shall develop, implement, and evaluate on an annual basis a HSIP that has the overall objective of significantly reducing the occurrence of and the potential for fatalities and serious injuries resulting from crashes on all public roads<sup>1</sup>.

DUI-Related Crashes: Driving Under the Influence (DUI) of alcohol (blood alcohol content of 0.08% or greater in Illinois), is a contributing factor in many severe crashes. Nationwide, 31.4% of the 34,017 fatal crashes were identified as DUI-related in 2008. In Illinois, 362 of 1,043 highway fatalities (34.7%) were DUI-related. The trend nationwide and in Illinois is toward lower overall fatalities and lower percentages of DUI related fatalities over the last several years. For instance, in Illinois, overall highway fatalities declined 30% from 1,355 in 2004 to 1,043 in 2008, and DUI-related fatalities decreased 27% from 2004 to 2008 in actual numbers (458 to 362) but increased slightly as a percentage of all fatalities (33.8% to 34.7%). Fatal DUI crashes usually occur in nighttime or early dawn conditions; for the year 2008 in Illinois, 39% of overall fatal crashes occurred between the hours of 9 P.M and 6 A.M., but 68% of all DUI-related fatal crashes occurred within the same hours. On the I-290 mainline, 3 of the 29 (10%) fatal or incapacitating injury crashes were identified as DUI-related.

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<sup>1</sup> 23 CFR 924, Federal Highway Administration, December 24, 2008

Further discussion of DUI crashes is given in the following detailed analysis of severe crashes in the I-290 extended study area.

## 4.1 5% Crash Locations

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An inventory of the 5% of highways with the most pressing safety needs is prepared annually by each state per the requirements of HSIP. These highway segments and spot locations represent a minimum of 5% of the statewide highway inventory, and were selected by a formula that weights Type K and A crashes more heavily than minor crashes. The Five Percent Report (Federal Highway Administration Highway Safety Improvement Program, Illinois Department of Transportation, September 2009) was referenced for 5% crash locations, which included locations identified within the I-290 study area.

There are no 5% locations from MP 24.67 (Cicero Avenue) to MP 29.2 (Racine Avenue) for the year 2009.

## 4.2 Type K Injury Crashes

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There were five Type K crashes involving five fatalities in the 2006-2008 reporting period in the extended study area. The I-290 Extended Study Area Crash Plot exhibit in **Appendix 2-A** presents a plot of three-year crash totals at every 1/10th mile along I-290 and identifies the locations of the fatal (Type K) and severe injury crashes (type A). See **Appendix 2-B**, Fatality Crash 1/10th Mile Summary Reports, which summarize the overall crash statistics in the vicinity of the fatal crashes.

The five fatal crashes were distributed throughout the extended study area with two of the fatal crashes occurring near Damen Avenue, one in the eastbound direction and one in the westbound direction. The five fatal crashes occurred with three fatalities in the eastbound direction and two in the westbound direction. There were three fixed object collisions and two rear end collisions. It is notable that the predominant type of crash along the extended study area section of I-290 is rear-end collision (55% overall were of this type), and two of the Type K crashes were rear-end collisions (which represents 40% of all Type K crashes). One of the five Type K crashes was identified as DUI-related.

### 4.2.1 Fatal Crashes in 5% Segments

Since there are no 5% segments in the extended study area, there were no corresponding Type K crashes.

### 4.2.2 Fatal Crash Patterns

To determine if there was an overall pattern of crashes at a particular K crash site, all crashes that occurred within a 1/10<sup>th</sup> mile segment centered on the K crash site were reviewed. None of the fatal crashes occurred at a location that experienced a high cluster of crashes (greater than 50 crashes within 0.05 mile in each direction of the K). Of the four non-DUI related fatal crashes, three involved fixed object collisions (75%) compared to the overall percentage of 35% fixed object crashes on the I-290 mainline between east of Cicero Avenue and Racine Avenue. One fatality involved a motorcycle.



A review of the police reports for each fatal crash indicated no correlation to an existing roadway design or condition issue as a factor in these crashes. With the exception of one crash that occurred during the day, the majority of the fatal crashes occurred during dry, clear conditions at night when driving speeds are higher. Crashes that occur at higher speeds are more likely to result in higher severity injuries. The review of the police reports also indicate that all but one fatal crashes (which was categorized as unknown) were related to either speeding, reckless driving, DUI, or driver skill.

A detailed listing of Type K crashes on I-290 from 2006-2008 is provided in Table 1-2 and Table 1-3 below.

**Table 4-1- I-290 Eastbound Type K Crashes**

Mile Station	Date & Time	Weather	Road condition	Type of Crash	DUI	Lighting	No. of K's	No. of Vehicles	1/10 Mile Cluster*
25.79	9/17/07 7:08 PM	Clear	Dry	Rear end	No	Darkness, Lighted road	1	2	25
28.39	6/20/06 11:22 AM	Clear	Dry	Fixed object	No	Daylight	1	1	11
28.81	11/12/07 4:55 PM	Clear	Dry	Fixed object	No	Darkness, Lighted road	1	1	37

**Table 4-2 - I-290 Westbound Type K crashes**

Mile Station	Date & Time	Weather	Road condition	Type of Crash	DUI	Lighting	No. of K's	No. of Vehicles	1/10 Mile Cluster*
27.76	2/10/06 3:07 AM	Clear	Wet	Fixed object	No	Darkness, Lighted road	1	1	19
28.57	3/6/07 12:17 AM	Clear	Dry	Rear end	<b>YES</b>	Darkness, Lighted road	1	3	11

\*Number of crashes that occurred in a 1/10 mile length centered on the Type K crash.

### 4.3 I-290 Mainline Type A Injury Crashes

There were 18 Type A crashes, containing 18 Type A injuries, in the 2006-2008 reporting period along the I-290 mainline within the extended study area. The I-290 Extended Study Area Crash Plot exhibit in **Appendix 2-A** indicates the location of the Type A crashes in the extended study area.

The 18 Type A crashes (8 eastbound and 10 westbound) were evenly distributed throughout the extended study area with little apparent overall locational pattern or clustering. Moreover, the extended study area section had lower peaks of crash activity than the original study section to the west, with none of the 1/10 mile segments having 60 or more crashes within the 3-year study period (in comparison, the original study area to the east had 31 one-tenth mile segments with over 60 crashes (See **Appendix 2-C**, Type A Crash 1/10th Mile Summary Reports, which

summarize the overall crash statistics in the one-tenth of a mile centered on each fatal and severe injury crash). Within the extended study area, there were 5 rear end crashes with 6 Type A injuries, 8 same-direction sideswipes crashes with 8 Type A injuries, 3 collisions with fixed objects resulting in 3 Type A injuries, and 2 overturned crashes resulting in 2 Type A injuries.

It is notable that the predominant type of crash on I-290 in the extended study area is rear-end collision (55% were of this type), while only 27% of the Type A crashes involved a rear-end collision, suggesting that the majority of rear end crashes occur at lower speeds. Same direction sideswipe collisions represented 42% of the Type A crashes in this section. Two of the 18 (11%) Type A mainline crashes were identified as DUI-related.

#### *4.3.1 Type A Crashes in 5% Segments*

Since there are no 5% segments in the extended study area, there were no corresponding Type A crashes.

#### *4.3.2 Type A Crashes Patterns*

The 18 Type A crashes that occurred along the I-290 mainline in the extended study area were examined along with all crashes that occurred in a 3 year period within a 1/10 mile segment, centered on the crash site, to determine if there was an overall pattern of crashes at a particular site. Because crash rates were lower in the extended study area as compared to the six lane section to the west, locations where there were greater than 50 crashes within a 0.10 mile section centered over the crash location was considered a high cluster crash location (vs. 60 that was used to evaluate the 3-lane segment).

Four Type A crashes occurred within high crash cluster locations in the extended study area: the two crashes in the eastbound direction occurred just west of the Ashland Avenue eastbound on ramp where traffic is entering and weaving into the mainline through lanes. The two westbound crashes occurred just east of the Kostner Avenue overpass, where a horizontal curve in the I-290 mainline begins. A review of the existing geometry in this location did not identify any substandard design that these crashes could be attributed to. A suggested countermeasure for this location would be to install road curve signs in advance of and through the curve to alert motorists.

Further evaluation was performed to determine if there was any correlation of crashes to any particular cause.

**Eastbound:** Both of the Type A crashes (at EB 28.71 and 28.75) were sideswipe same-direction, which is not the predominant crash type within their respective 1/10<sup>th</sup> mile segment. Both of the Type A crashes occurred at night, during clear and dry conditions, along a straight section of expressway between Ashland Avenue and Loomis Street. Given that only 36% of all crashes occur in this location at night, under the prevailing uncongested conditions occurring during the night, higher nighttime speeds combined with traffic merging from the Ashland Avenue on-ramp may have contributed to the cause and severity of the crashes.

**Table 4-3 - I-290 Eastbound Type A Crashes**

Mile Station	Date & Time	Weather	Road Condition	Lighting	Type of Crash	DUI**	Primary Cause	1/10 Mile Cluster*
25.3	4/23/08 6:30 AM	Clear	Dry	Daylight	Sideswipe same direction	NO	Improper lane usage	15
25.45	11/21/06 6:00 AM	Clear	Dry	Daylight	Rear end	NO	Improper Lane usage	22
25.75	8/2/07 4:50 PM	Clear	Dry	Daylight	Sideswipe same direction	NO	Improper lane usage	24
26.71	10/26/06 9:35 PM	Rain	Wet	Darkness/lighted road	Sideswipe same direction	NO	Improper overtaking passing	21
26.76	4/29/07 4:41 AM	Clear	Dry	Daylight	Fixed object	YES	Had been drinking	21
27.6	11/12/06 3:50 AM	Clear	Dry	Darkness/lighted road	Rear end	YES	Failing to reduce speed to avoid crash	20
28.71	5/16/08 10:20 PM	Clear	Dry	Darkness/lighted road	Sideswipe same direction	NO	Improper overtaking/passing	59
28.75	4/5/06 3:50 AM	Clear	Dry	Darkness/lighted road	Sideswipe same direction	NO	Failing to reduce speed to avoid crash	56

\* Number of crashes that occurred in the 1/10 mile segment centered on the particular Type A crash

**Westbound:** Two of the westbound Type A crashes occurred in high crash cluster locations (WB 25.21, 25.24, and 25.25). One crash (MP 25.21), a passenger vehicle, occurred in the early afternoon, during wet and icy conditions, according to the police and weather reports for that date. This crash was a rear end crash type that is typical for icy and wet conditions, and is the predominant crash type in this location. Only 15% of crashes in this location occurred in wet or icy conditions, so it is likely that this crash was caused by a combination of weather conditions and driver error.

The second Type A crash (MP 25.25) was also a rear-end crash, which is the predominant crash type (rear end) in this location. This crash occurred at night when traffic volumes are at their lowest, and under clear and dry conditions, and the primary cause of the crash was listed as excessive speed. The type A injury occurred to the driver of the primary vehicle which was a motorcycle. It is likely that a combination of higher speeds that can occur at night time and the vehicle type were contributing factors of the severity of this injury.

**Table 4-4 - I-290 Westbound Type A Crashes**

Mile Station	Date & Time	Weather	Road Condition	Lighting	Type of Crash	DUI**	Primary Cause	1/10 Mile Cluster
25.21	1/26/08 1:45 PM	Clear	Wet	Daylight	Rear end	NO	Failing to reduce speed to avoid crash	55
25.25	9/3/07 10:35 PM	Clear	Dry	Darkness/ lighted road	Rear end	NO	Exceeded authorized speed limit	52
25.47	3/3/07 2:20 AM	Clear	Wet	Darkness/ lighted road	Fixed object	NO	Equipment/Vehicle Condition	32
25.84	9/4/08 5:05 AM	Rain	Wet	Darkness	Sideswipe same direction	NO	Failing to reduce speed to avoid crash	34
25.89	11/1/07 4:40 PM	Clear	Dry	Daylight	Sideswipe same direction	NO	Physical Condition of driver	43
26.11	4/21/07 9:47 PM	Clear	Dry	Darkness/ lighted road	Overtuned	NO	Improper lane usage	9
26.18	6/29/08 1:35 AM	Rain	Wet	Darkness/ lighted road	Sideswipe same direction	NO	Exceeding safe speed for conditions	13
26.41	7/10/07 4:59 AM	Clear	Dry	Daylight	Overtuned	NO	Improper lane usage	24
26.75	10/17/07 2:40 PM	Clear	Dry	Daylight	Rear end	NO	Following too closely	31
27.48	4/29/07 4:00 AM	Clear	Dry	Darkness/ lighted road	Fixed object	NO	Improper lane usage	7

#### 4.4 Ramps

The I-290 extended study area from east of Cicero Avenue to Racine Avenue contains 26 ramps (13 entrance and 13 exit ramps) serving major crossroads. For the period of 2006 through 2008, there were no Type K and two Type A crashes on the I-290 ramps. The data shows the Type A ramp crashes occurred in different locations and conditions; with only two Type A crashes, there are very few data points to observe any trends or pinpoint problem areas for high severity crashes along the ramps; however, it is noted that both Type A crashes occurred before noon (both in dark conditions under roadway lighting), and that both crashes were fixed object. Location information to determine 1/10 mile crash clusters was not available from the ramp data.

**Table 4-5- I-290 Ramp Type A Crashes**

Ramp Name	Time	Peak Hours	Weather	Road Condition	Type of Crash	Lighting	Ramp	No. of A's	No. of Vehicles	Ramp Direction
EB C-D Road to Western	2:20 AM	N	Clear	Dry	Fixed Object	Darkness, Lighted Road	Exit	1	1	EB
WB I-290 to Ashland	8:00 AM	Y	Snow	Slush or Snow	Fixed Object	Darkness, Lighted Road	Exit	1	1	WB

## 4.5 Type B & C Injury Crash Summary

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There were 33 Type B injuries and 111 Type C injuries associated with crashes along I-290 within the extended study area during the 2006-2008 reporting period.

There were 16 Type B injuries and 6 Type C injuries associated with crashes along ramps within the extended study area during the 2006-2008 reporting period.

## 5.0 Crash Causes and Factors

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There are a multitude of potential contributing factors to each crash, and one cannot automatically attribute a single contributing factor to a crash unless detailed and accurate information points the analysis in that direction. The actions of the driver are directly or indirectly implicated as a contributing factor in over 90% of all crashes according to national studies<sup>2</sup>. The condition and characteristics of the vehicle or vehicles usually can be attributed to a small fraction of all crashes. As stated previously in the study methodology, the roadway environment (including the physical roadway and external environmental conditions) contributes in whole or in part to about 28% of all crashes. Law enforcement, driver training, implementation of vehicle safety features, mobilization and access to trauma facilities, and other improvements are critical to improving safety, and programs exist at the local, state and national levels to address these safety factors that are not directly related to the roadway environment. This section will briefly focus on those elements of the roadway environment that are likely to have contributed to the crashes that occurred on I-290 and its ramps in the extended study area during the 2006-2008 reporting period.

### Observations:

- The dominant crash type along I-290 in the expanded study area is rear end (55% overall), most of the rear end crashes (91%) occurred mostly in the times of congested travel between 6 AM to 11 PM. National studies<sup>3</sup>, as well as local observance of the I-290 corridor, can correlate this high frequency and percentage of rear-end crashes with stop and go conditions where traffic can be at a standstill and then open up, requiring increased driver attentiveness to react to those conditions. Also, vehicles tend to have reduced headway (space between vehicles) during congested conditions, requiring quicker driver reaction times than would be required if vehicles were adequately spaced for safety. The roadway environment's contribution to rear end crashes in congested conditions is likely the lack of available capacity to accommodate the travel volumes, thus resulting in Level of Service E or F where approaching breakdown or breakdown conditions occur.
- In the uncongested period between 11 PM and 6 AM, travel speeds tend to be higher and the mix of crashes changes from a dominance of rear-end crashes to a mixture of fixed object (42%), sideswipe (27%) and rear end crashes (23%).

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<sup>2</sup> Rumar (1985)

<sup>3</sup> Zhou and Sisiopiku (1997); Golob and Recker (2001).

- Most of the serious injuries and fatalities (Type K and A crashes) were *not* associated with the predominant rear end crash type. Of the 25 K and A crashes, 12 crashes involved a vehicle leaving the roadway, and seven were rear end collisions. The presence of fixed objects within the roadway clear zone, improperly designed barriers or non-breakaway sign posts, or the lack of barriers to shield objects were likely contributing factors to fixed object crashes.
- Signage, lighting and roadway geometry can be roadway environment factors for crashes in advance of an interchange. Roadway geometry and signage does appear to be a crash factor in the east bound direction just west of Kostner Avenue where I-290 curves to the left. Although the roadway design is considered to be adequate, the curve is not well signed and may catch some drivers unaware. Additional curve signage is recommended.
- Most of the serious injuries and fatalities occurred under clear weather and dry roadway conditions, so there was not a clear pattern of roadway surface or weather conditions contributing to severe crashes.
- 14 of the 25 Type K and A crashes (56%) occurred during the uncongested period between 10 PM and 6 AM. The occurrence of a majority of severe crashes during darkness may be a contributing factor, although the I-290 corridor is relatively well lit and the reports for Type K and A crashes on the I-290 mainline indicated lighting was present at the crash site.
- Of the 25 mainline and ramp severe injury Type K & A crashes reported, 3 (12%) crashes involved DUI as a contributing factor. The incidence of DUI in these types of crashes was entirely during the late evening and early morning hours, with all three DUI's having occurred between 11 PM and 6 AM. The incidence of DUI in severe crashes and during late evening and early morning hours followed state and national trends, although it should be noted that the percentage of identified DUI involvement in severe crashes on I-290 appears to be lower than state or national experience<sup>4</sup>.

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<sup>4</sup> NHTSA FARS Encyclopedia report

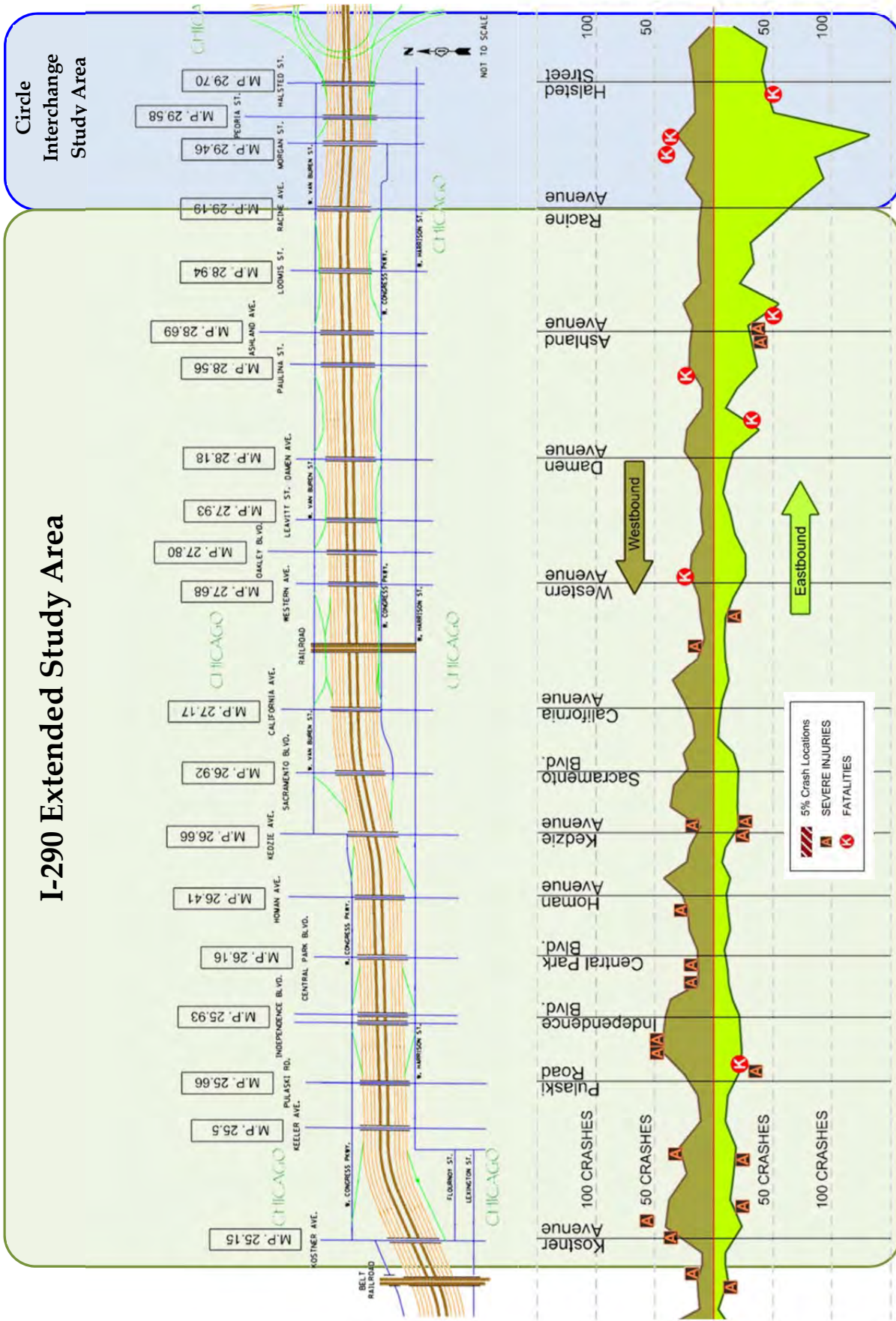
# Appendix 2-A

## Extended Study Area Crash Plot

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# 1/10 Mile 2006-2008 Crash Totals

EASTBOUND WESTBOUND

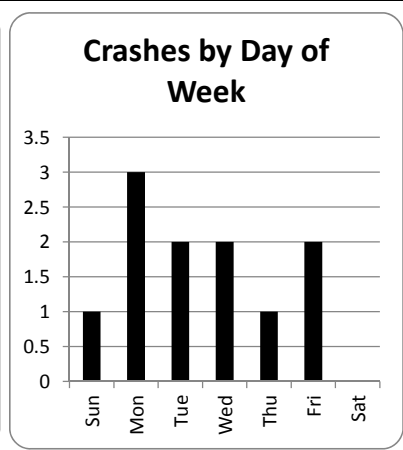
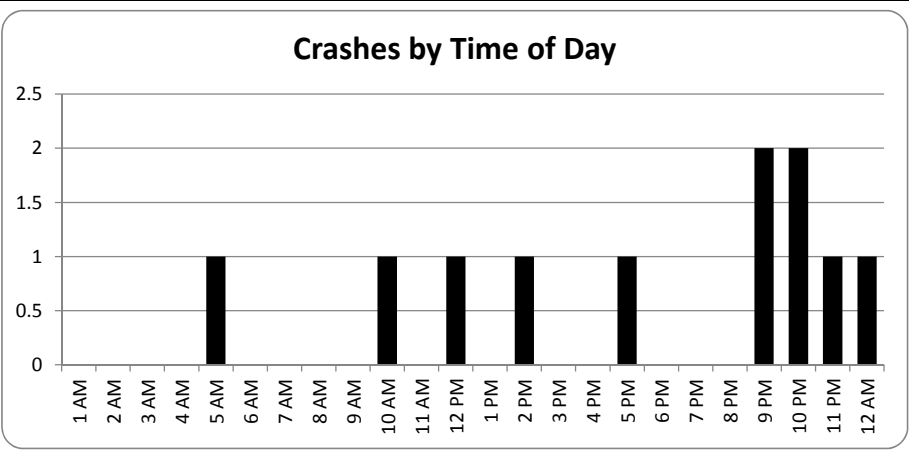




# Appendix 2-B

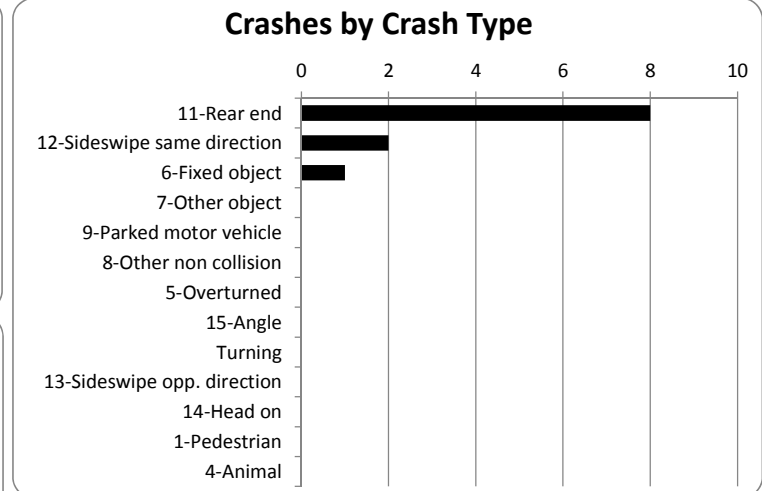
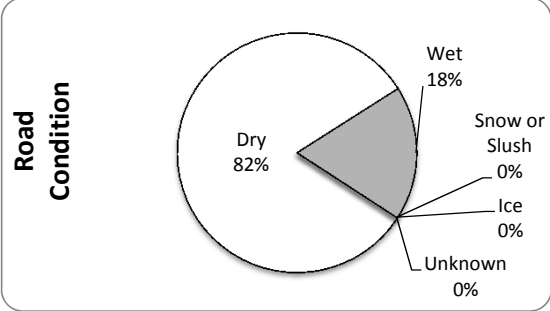
## Fatal Crash 1/10th Mile Summary Reports

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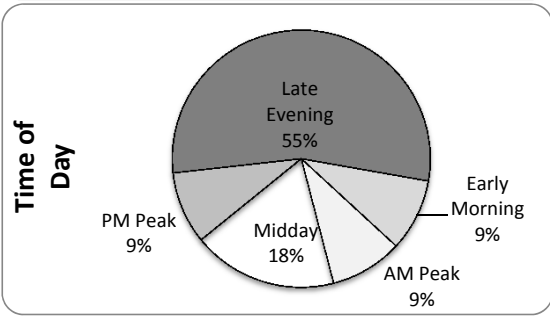
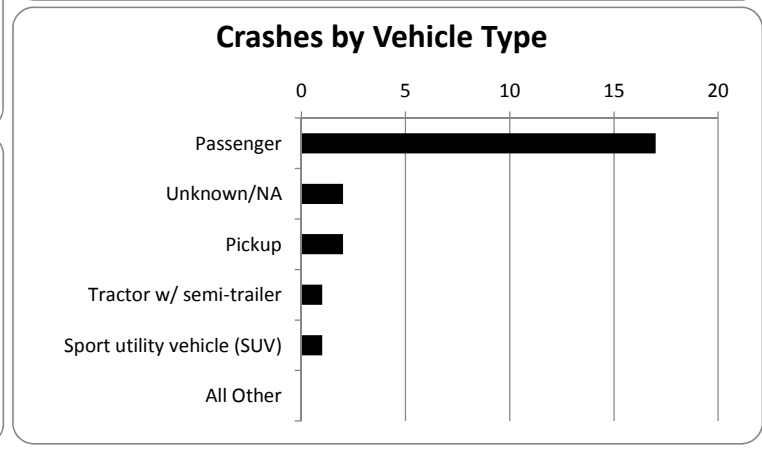
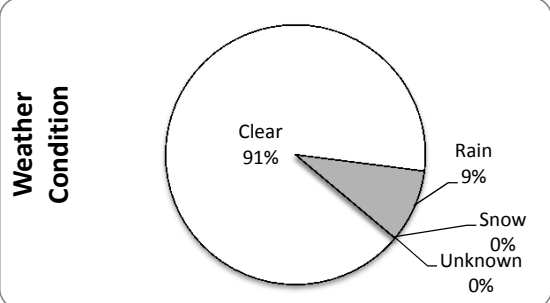
Type K Crash	
70361035	
<b>28.57</b>	<b>WESTBOUND</b>
Crash Type:	11-Rear end
Weather Condition:	Clear
Road Condition:	Dry
Lighting Condition:	Darkness/Lighted road
Time of Day:	12:17 AM
Vehicle Type:	Passenger

Milepost From	28.52	0.10 Miles
Milepost To	28.62	
<b>Total Crashes</b>	<b>11</b>	
<b>Crash Rate</b>	<b>109.9</b> crashes/mile	



### Injury Statistics

Fatal	1
A Injury	0
B & C Injury	1
<b>Total Injuries</b>	<b>2</b>
<b>Injury Rate</b>	<b>20.0</b> Injuries/mile



### Predominant Crash Factors

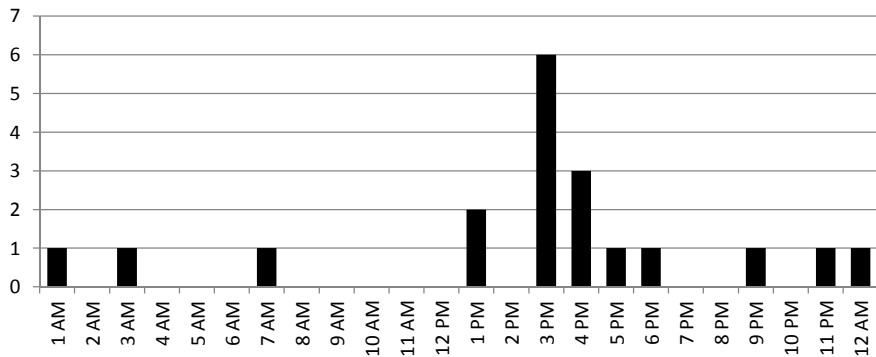
Crash Type:	11-Rear end	73%
Weather Condition:	Clear	91%
Road Condition:	Dry	82%
Lighting Condition:	Darkness/Lighted road	45%
Time of Day:	Late Evening	55%
Vehicle Type:	Passenger	74%

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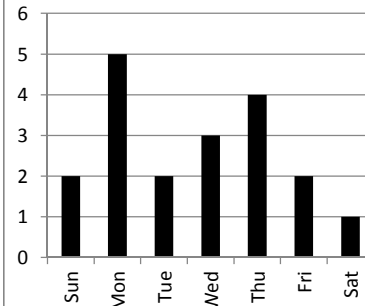
## Three Year Crash Statistics

2006, 2007, 2008

**Crashes by Time of Day**



**Crashes by Day of Week**



**Type K Crash**

**60000858**

**27.76**

**WESTBOUND**

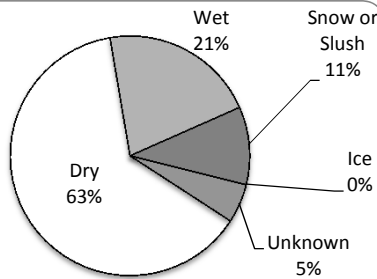
Crash Type: 6-Fixed object  
 Weather Condition: Clear  
 Road Condition: Wet  
 Lighting Condition: Darkness/Lighted road  
 Time of Day: 3:07 AM  
 Vehicle Type: Passenger

Milepost From: 27.71  
 Milepost To: 27.81  
 0.10 Miles

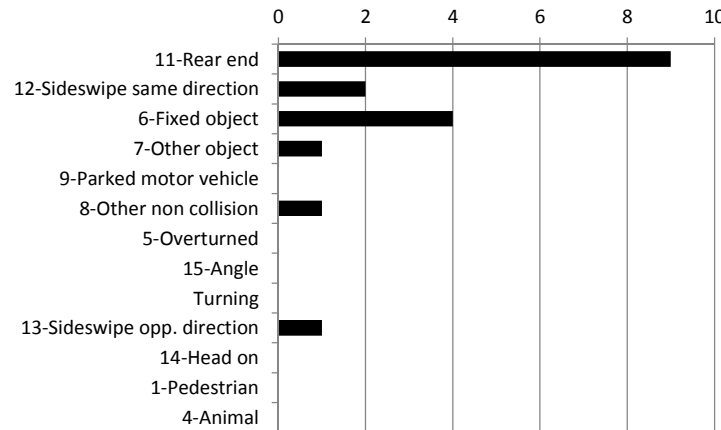
**Total Crashes** 19

**Crash Rate** 189.8  
 crashes/mile

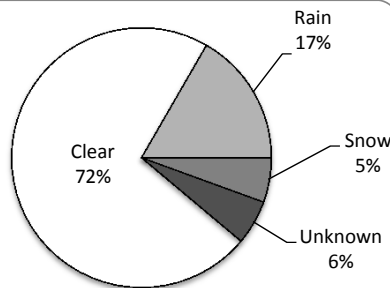
**Road Condition**



**Crashes by Crash Type**



**Weather Condition**



**Injury Statistics**

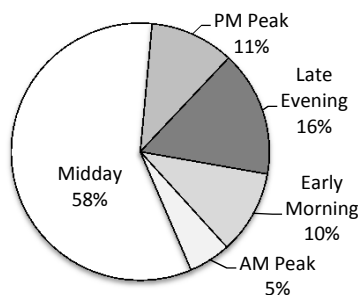
Fatal	1
A Injury	0
B & C Injury	1
<b>Total Injuries</b>	<b>2</b>

**Injury Rate** 20.0  
 Injuries/mile

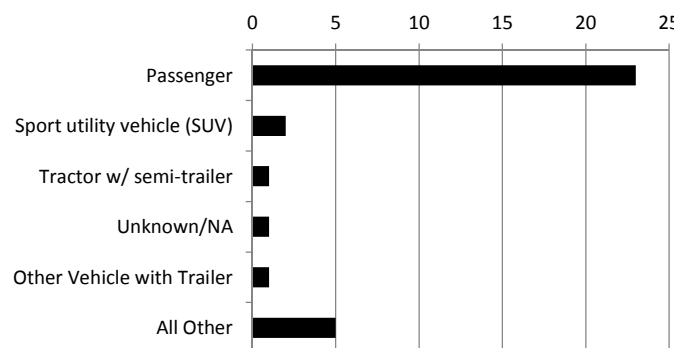
**Predominant Crash Factors**

Crash Type: 11-Rear end 50%  
 Weather Condition: Clear 72%  
 Road Condition: Dry 63%  
 Lighting Condition: Daylight 68%  
 Time of Day: Midday 58%  
 Vehicle Type: Passenger 82%

**Time of Day**



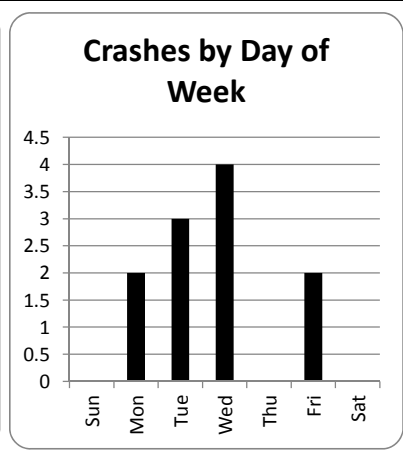
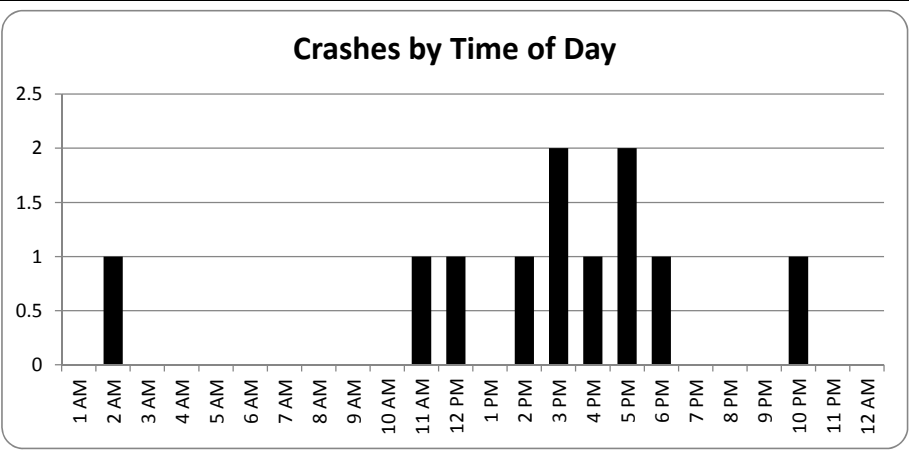
**Crashes by Vehicle Type**



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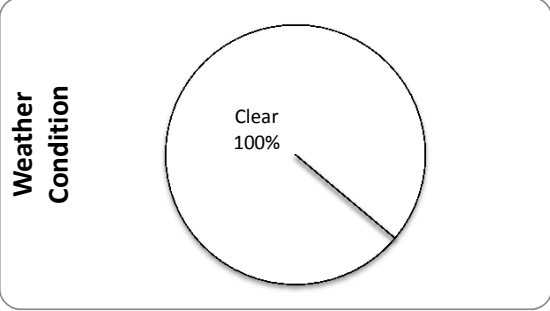
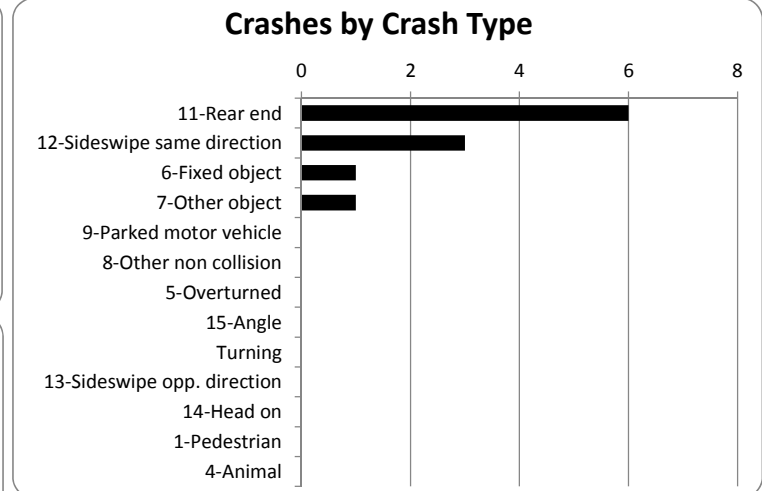
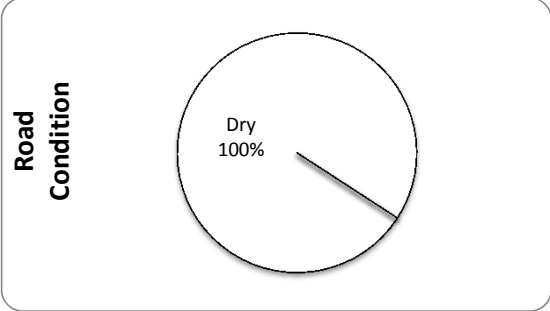
**Three Year Crash Statistics**

2006, 2007, 2008



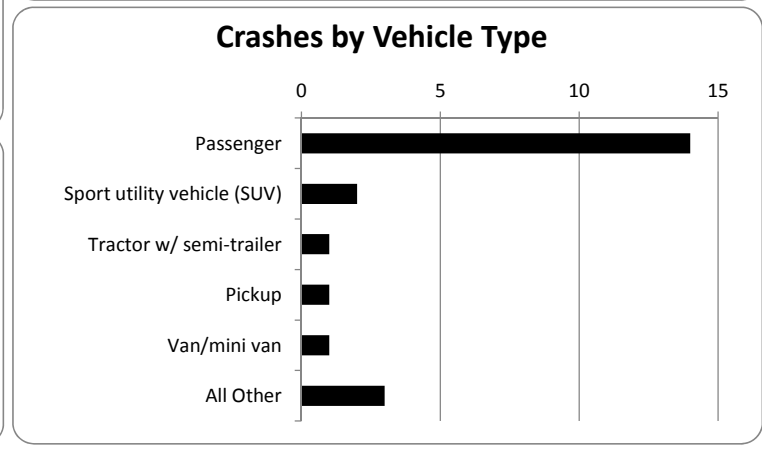
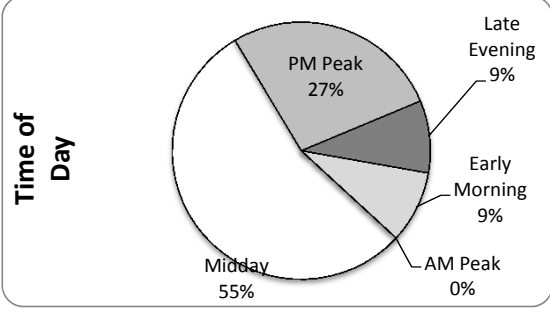
Type K Crash	
60818796	
<b>28.39</b>	<b>EASTBOUND</b>
Crash Type:	6-Fixed object
Weather Condition:	Clear
Road Condition:	Dry
Lighting Condition:	Daylight
Time of Day:	11:22 AM
Vehicle Type:	Passenger

Milepost From	28.34	0.10 Miles
Milepost To	28.44	
<b>Total Crashes</b>	<b>11</b>	
<b>Crash Rate</b>	<b>109.9</b> crashes/mile	



### Injury Statistics

Fatal	1
A Injury	0
B & C Injury	0
<b>Total Injuries</b>	<b>1</b>
<b>Injury Rate</b>	<b>10.0</b> injuries/mile



### Predominant Crash Factors

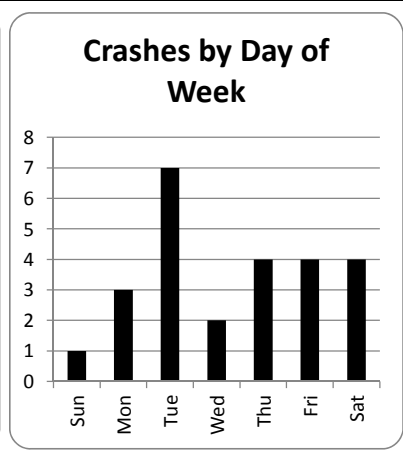
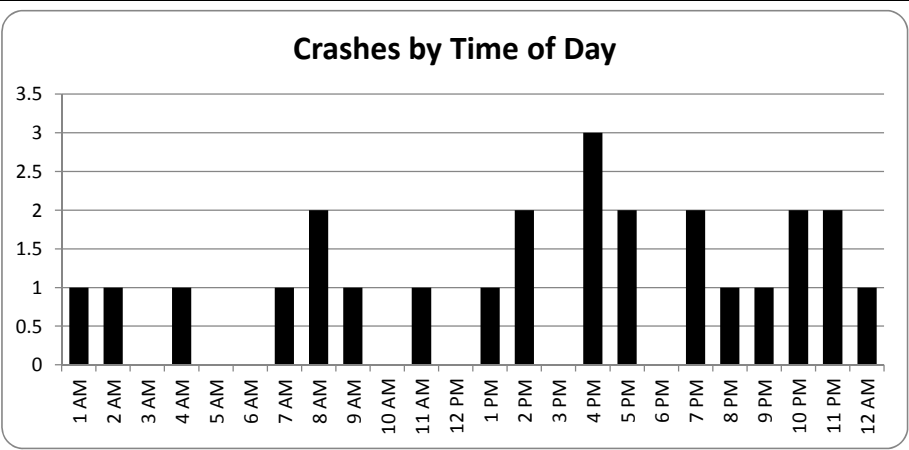
Crash Type:	11-Rear end	55%
Weather Condition:	Clear	100%
Road Condition:	Dry	100%
Lighting Condition:	Daylight	55%
Time of Day:	Midday	55%
Vehicle Type:	Passenger	77%

**Illinois Department of Transportation**

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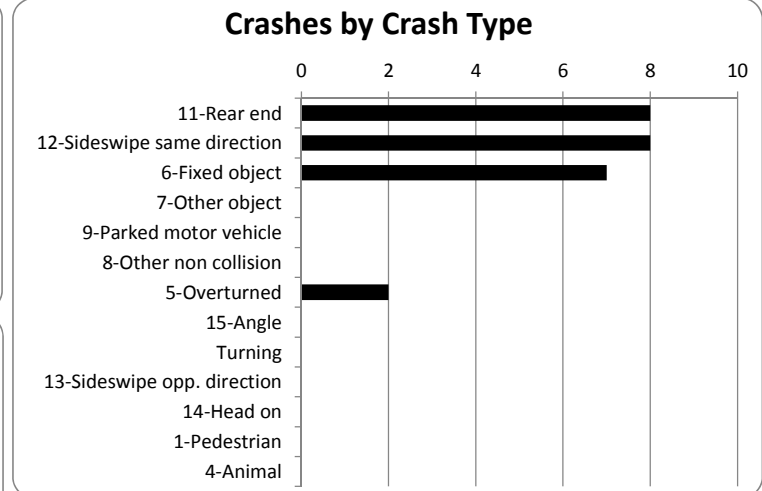
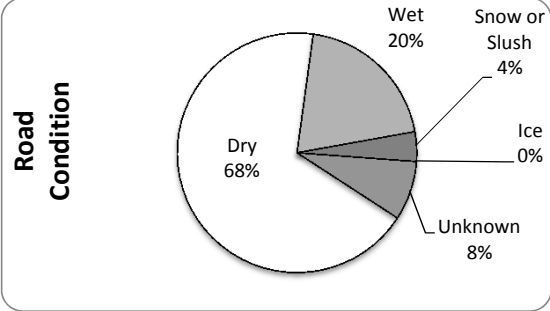
## Three Year Crash Statistics

2006, 2007, 2008



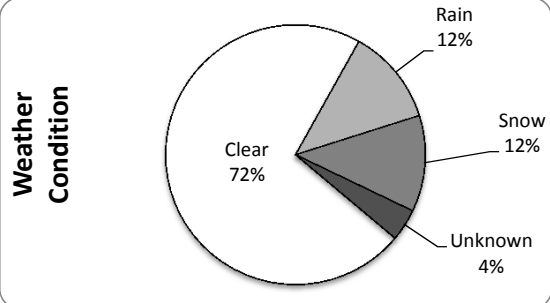
Type K Crash	
73600546	
<b>25.79</b>	<b>EASTBOUND</b>
Crash Type:	11-Rear end
Weather Condition:	Clear
Road Condition:	Dry
Lighting Condition:	Darkness/Lighted road
Time of Day:	7:08 PM
Vehicle Type:	Motorcycle (over 150cc)

Milepost From	25.74	0.10 Miles
Milepost To	25.84	
<b>Total Crashes</b>	<b>25</b>	
<b>Crash Rate</b>	<b>249.8</b> crashes/mile	



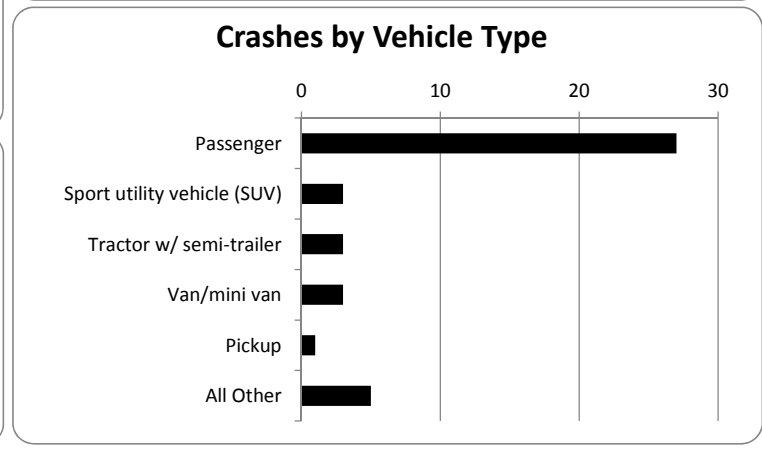
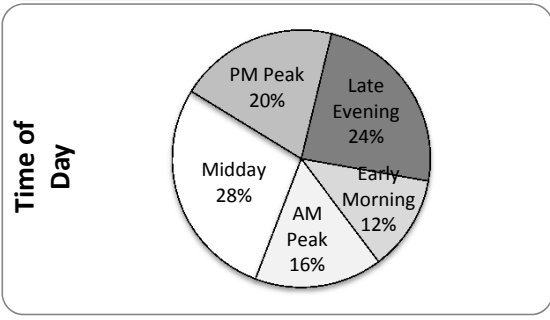
### Injury Statistics

Fatal	1
A Injury	1
B & C Injury	1
<b>Total Injuries</b>	<b>3</b>
<b>Injury Rate</b>	<b>30.0</b> Injuries/mile



### Predominant Crash Factors

Crash Type:	11-Rear end	32%
Weather Condition:	Clear	72%
Road Condition:	Dry	68%
Lighting Condition:	Darkness/Lighted road	48%
Time of Day:	Midday	28%
Vehicle Type:	Passenger	69%

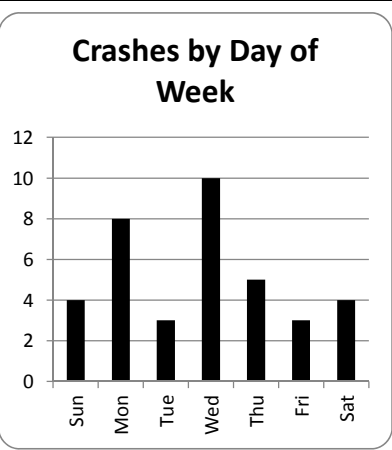
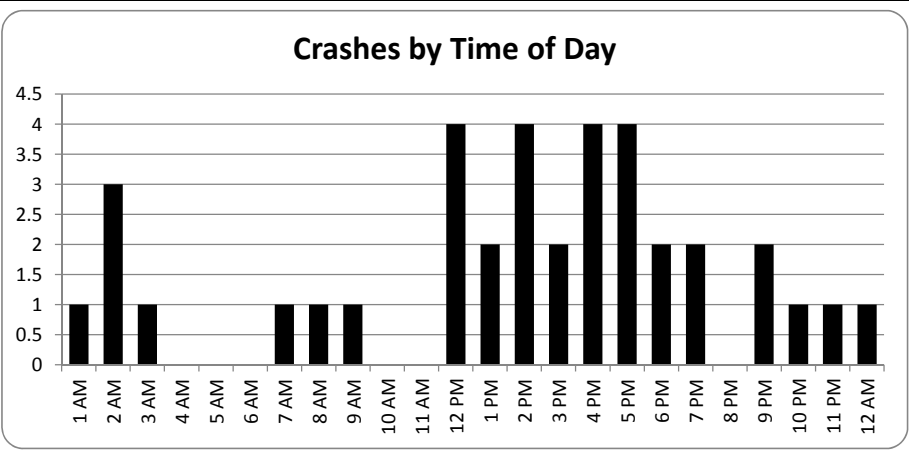


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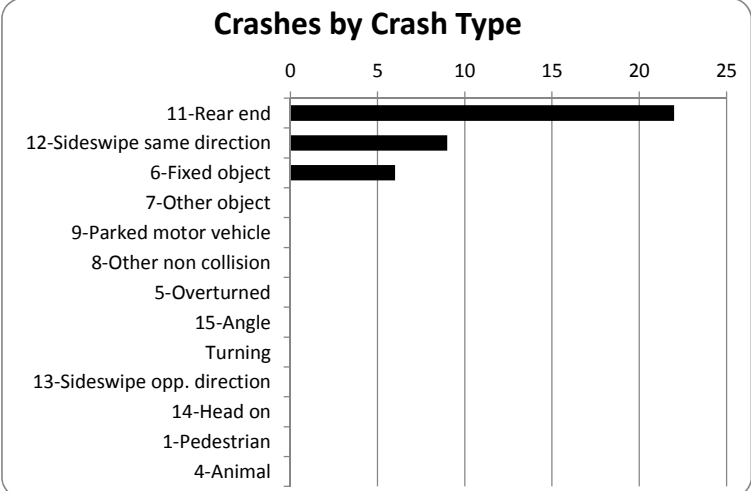
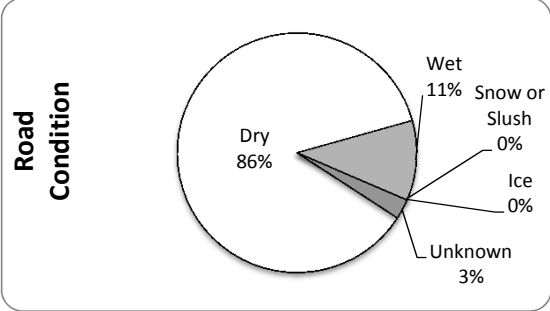
**Three Year Crash Statistics**

2006, 2007, 2008



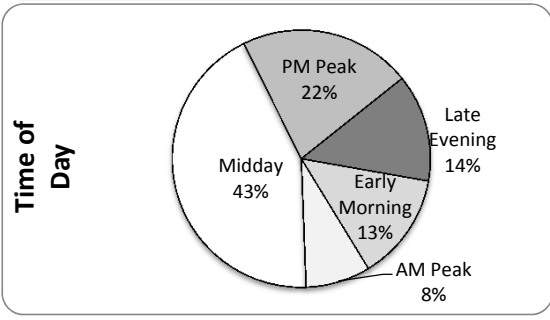
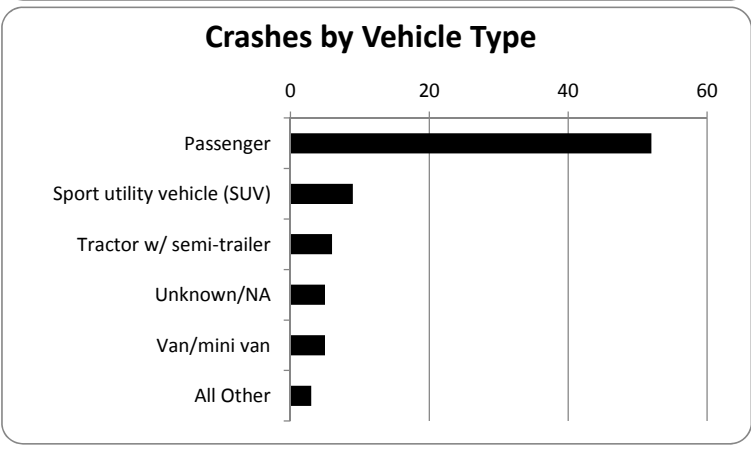
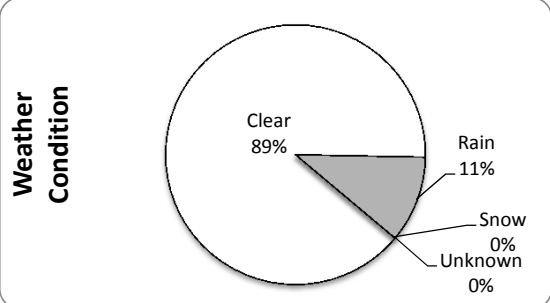
Type K Crash	
74662032	
<b>28.81</b>	<b>EASTBOUND</b>
Crash Type:	6-Fixed object
Weather Condition:	Clear
Road Condition:	Dry
Lighting Condition:	Darkness/Lighted road
Time of Day:	4:55 PM
Vehicle Type:	Passenger

Milepost From	28.76	0.10 Miles
Milepost To	28.86	
<b>Total Crashes</b>	<b>37</b>	
<b>Crash Rate</b>	<b>369.6</b> crashes/mile	



### Injury Statistics

Fatal	1
A Injury	0
B & C Injury	5
<b>Total Injuries</b>	<b>6</b>
<b>Injury Rate</b>	<b>59.9</b> Injuries/mile



### Predominant Crash Factors

Crash Type:	11-Rear end	59%
Weather Condition:	Clear	89%
Road Condition:	Dry	86%
Lighting Condition:	Daylight	59%
Time of Day:	Midday	43%
Vehicle Type:	Passenger	65%

**Illinois Department of Transportation**

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## Three Year Crash Statistics

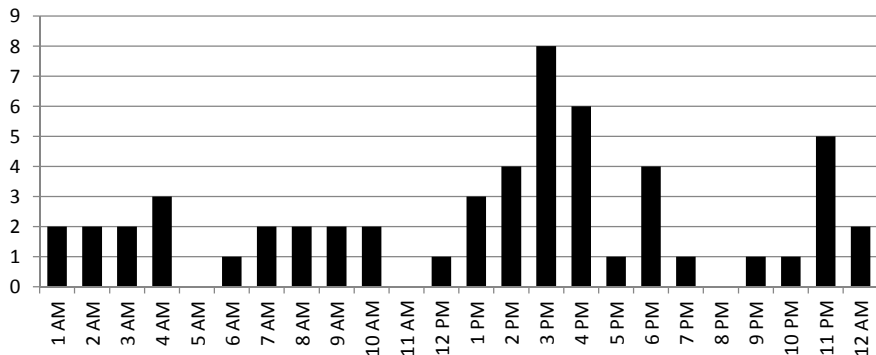
2006, 2007, 2008

# Appendix 2-C

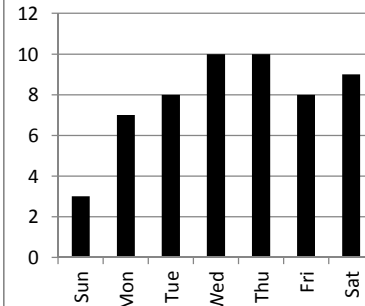
## Type A Crash 1/10th Mile Summary Report for High Crash Clusters

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**Crashes by Time of Day**



**Crashes by Day of Week**



**Type A Crash**

**80062342**

**25.21**

**WESTBOUND**

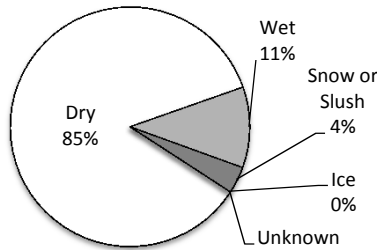
Crash Type: 11-Rear end  
 Weather Condition: Clear  
 Road Condition: Wet  
 Lighting Condition: Daylight  
 Time of Day: 1:45 PM  
 Vehicle Type: Passenger

Milepost From: 25.16  
 Milepost To: 25.26  
 0.10 Miles

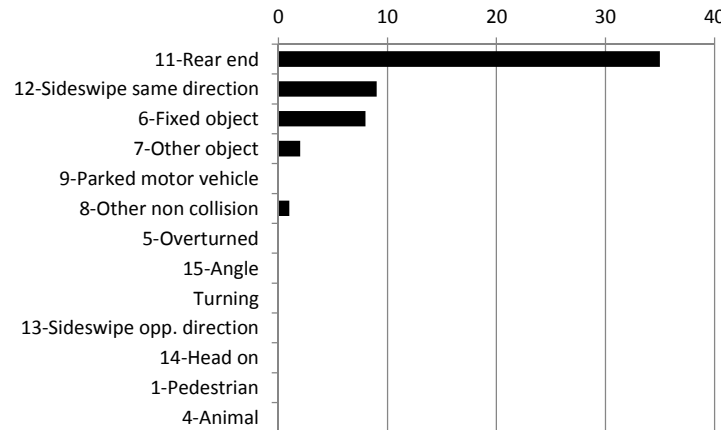
**Total Crashes 55**

**Crash Rate 549.5**  
 crashes/mile

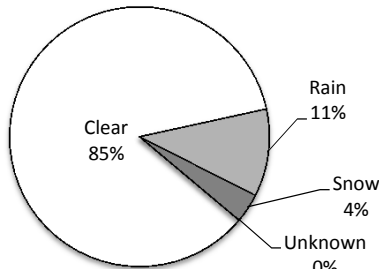
**Road Condition**



**Crashes by Crash Type**



**Weather Condition**



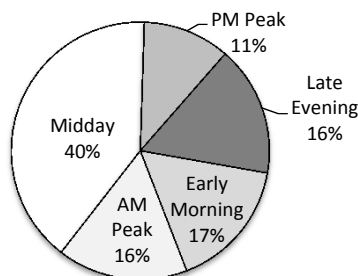
Injury Statistics	Fatal	0
	A Injury	2
	B & C Injury	1
	Total Injuries	3

**Injury Rate 30.0**  
 Injuries/mile

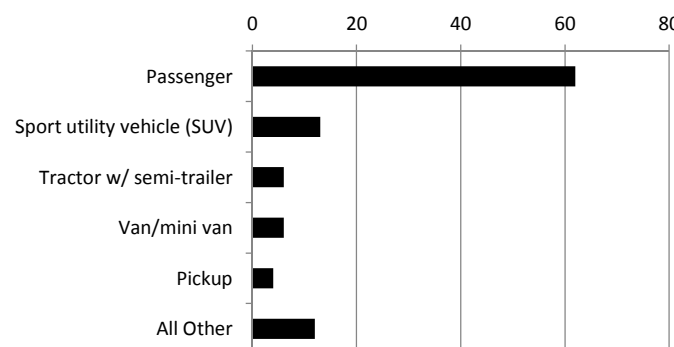
**Predominant Crash Factors**

Crash Type: 11-Rear end 64%  
 Weather Condition: Clear 85%  
 Road Condition: Dry 85%  
 Lighting Condition: Daylight 62%  
 Time of Day: Midday 40%  
 Vehicle Type: Passenger 66%

**Time of Day**



**Crashes by Vehicle Type**



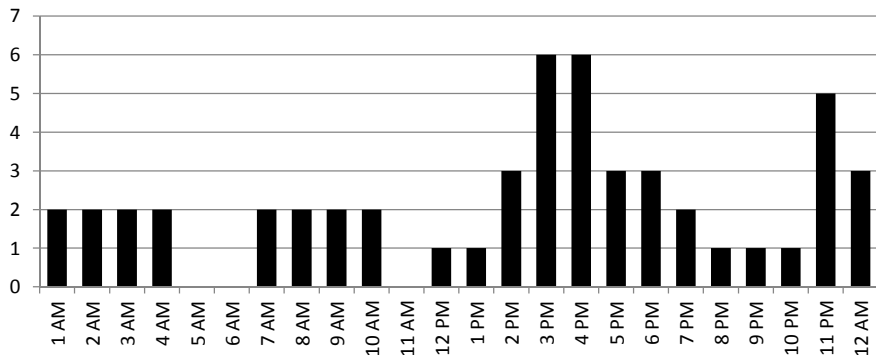
I-290 Preliminary Engineering and Environmental Study (Phase I)

**Three Year Crash Statistics**

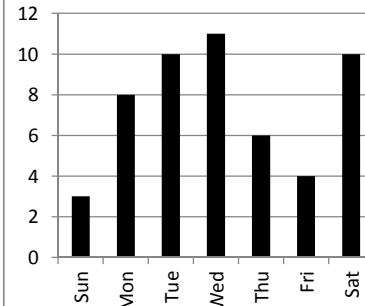
2006, 2007, 2008



**Crashes by Time of Day**



**Crashes by Day of Week**



**Type A Crash**

**72869597**

**25.25**

**WESTBOUND**

Crash Type: 11-Rear end  
 Weather Condition: Clear  
 Road Condition: Dry  
 Lighting Condition: Darkness/Lighted road  
 Time of Day: 10:35 PM  
 Vehicle Type: Motorcycle (over 150cc)

Milepost From: 25.2  
 Milepost To: 25.30  
 0.10 Miles

**Total Crashes 52**

**Crash Rate 519.5**  
crashes/mile

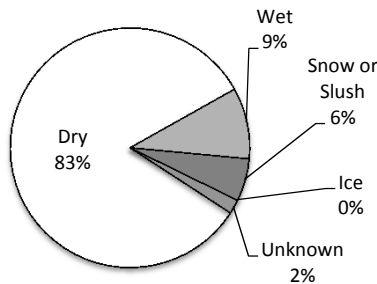
Injury Statistics	Fatal	0
	A Injury	2
	B & C Injury	0
	<b>Total Injuries</b>	<b>2</b>

**Injury Rate 20.0**  
Injuries/mile

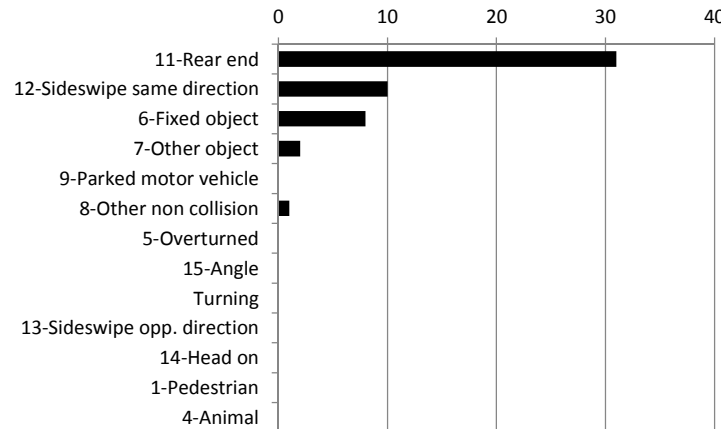
**Predominant Crash Factors**

Crash Type:	11-Rear end	60%
Weather Condition:	Clear	81%
Road Condition:	Dry	83%
Lighting Condition:	Daylight	54%
Time of Day:	Midday	33%
Vehicle Type:	Passenger	67%

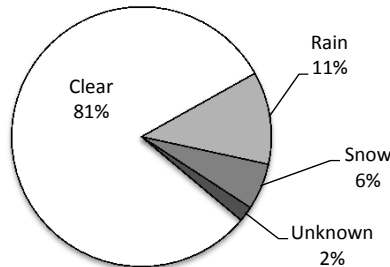
**Road Condition**



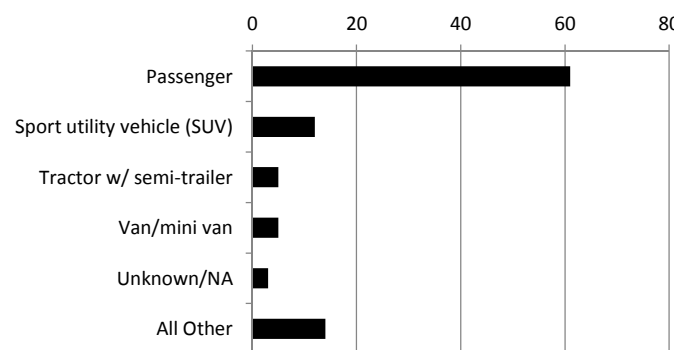
**Crashes by Crash Type**



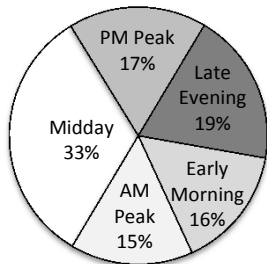
**Weather Condition**



**Crashes by Vehicle Type**



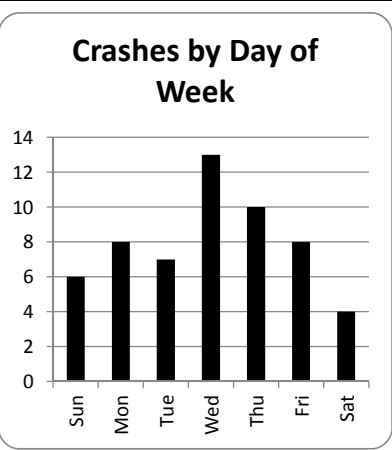
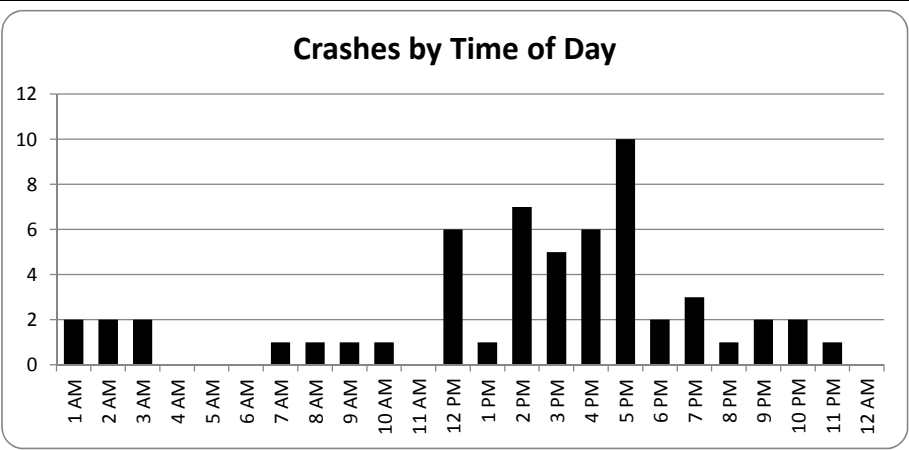
**Time of Day**



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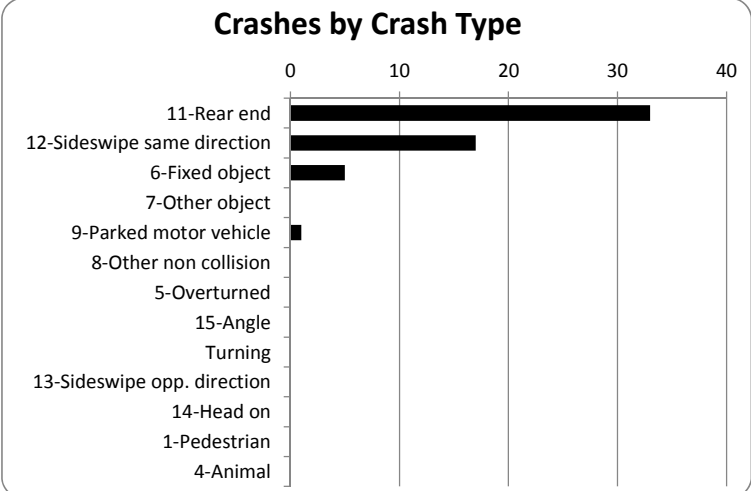
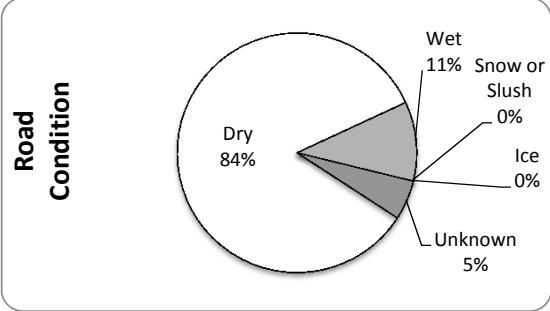
**Three Year Crash Statistics**

2006, 2007, 2008

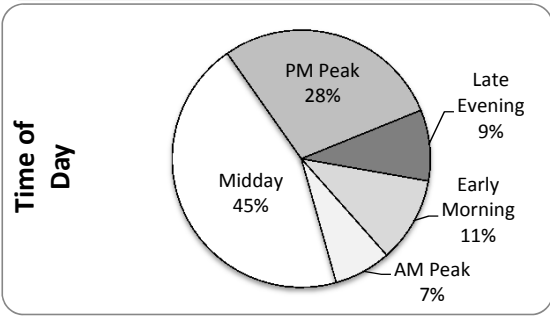
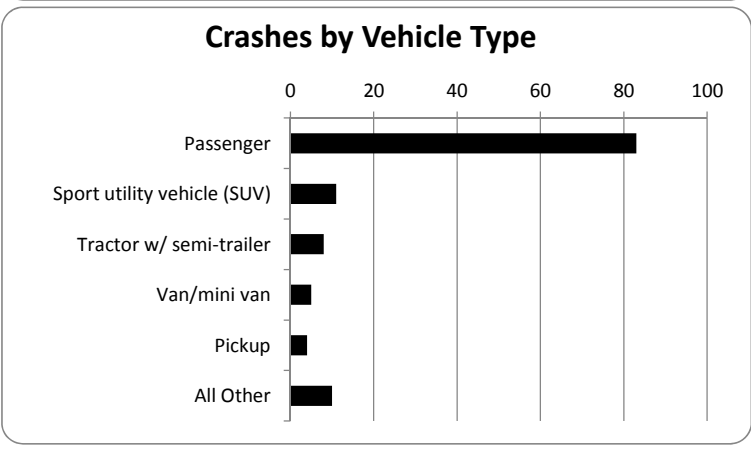
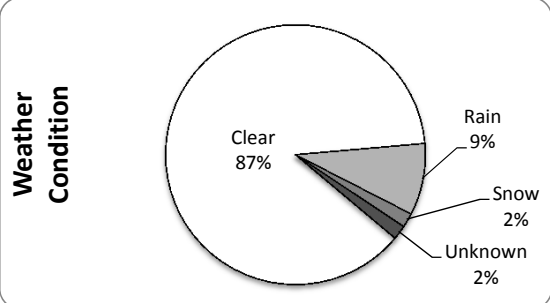


Type A Crash	
61454666	
<b>28.75</b>	<b>EASTBOUND</b>
Crash Type: 12-Sideswipe same direction	
Weather Condition: Clear	
Road Condition: Dry	
Lighting Condition: Darkness/Lighted road	
Time of Day: 3:50 AM	
Vehicle Type: Passenger	

Milepost From	28.7	0.10 Miles
Milepost To	28.80	
<b>Total Crashes</b>	<b>56</b>	
<b>Crash Rate</b>	<b>559.4</b> crashes/mile	



Injury Statistics	Fatal	0
	A Injury	2
	B & C Injury	7
	<b>Total Injuries</b>	<b>9</b>
<b>Injury Rate</b>		<b>89.9</b> injuries/mile



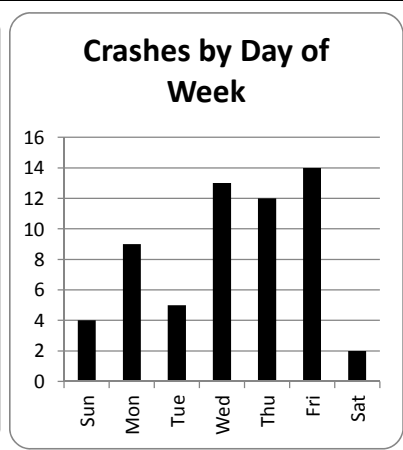
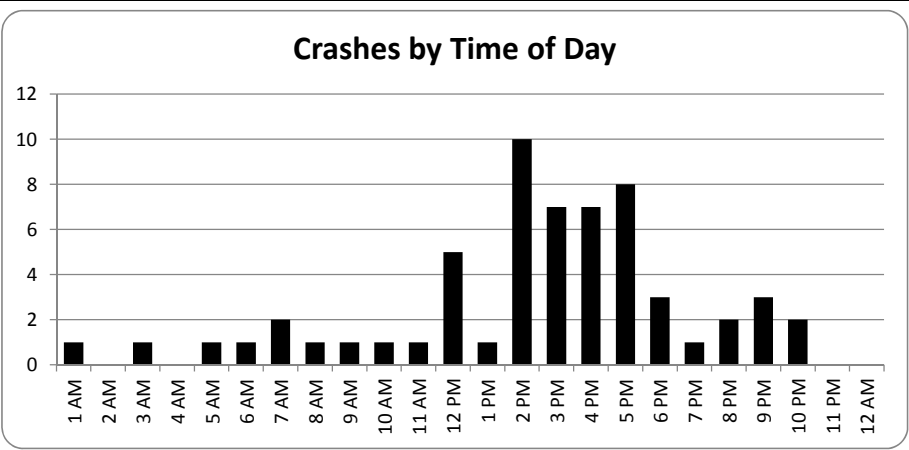
### Predominant Crash Factors

Crash Type:	11-Rear end	59%
Weather Condition:	Clear	88%
Road Condition:	Dry	84%
Lighting Condition:	Daylight	66%
Time of Day:	Midday	45%
Vehicle Type:	Passenger	71%

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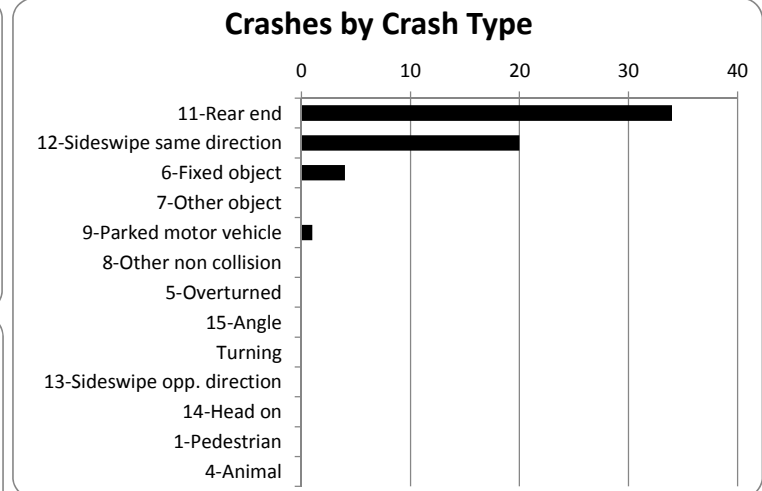
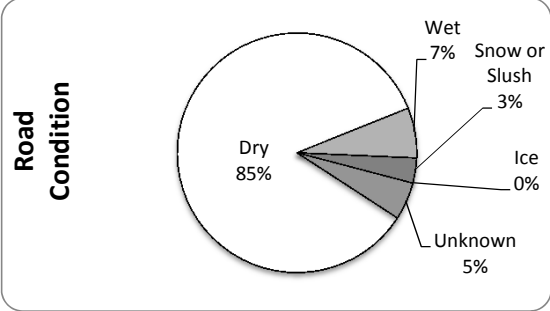
## Three Year Crash Statistics

2006, 2007, 2008



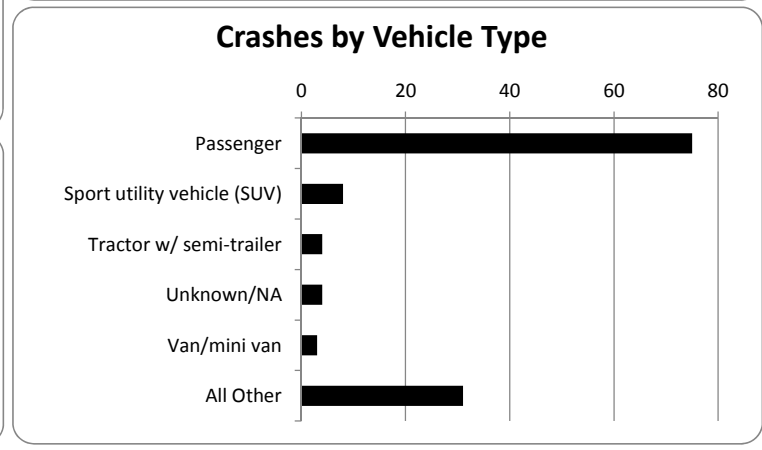
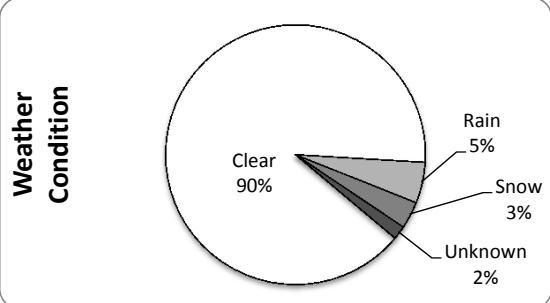
Type A Crash	
81753444	
<b>28.71</b>	<b>EASTBOUND</b>
Crash Type: 12-Sideswipe same direction	
Weather Condition: Clear	
Road Condition: Dry	
Lighting Condition: Darkness/Lighted road	
Time of Day: 10:20 PM	
Vehicle Type: Passenger	

Milepost From	28.66	0.10 Miles
Milepost To	28.76	
<b>Total Crashes</b>	<b>59</b>	
<b>Crash Rate</b>	<b>589.4</b> crashes/mile	



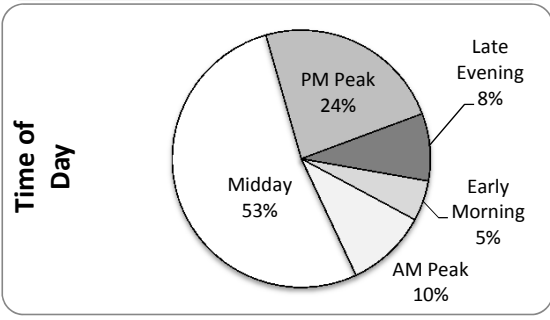
### Injury Statistics

Fatal	0
A Injury	2
B & C Injury	5
<b>Total Injuries</b>	<b>7</b>
<b>Injury Rate</b>	<b>69.9</b> Injuries/mile



### Predominant Crash Factors

Crash Type:	11-Rear end	58%
Weather Condition:	Clear	90%
Road Condition:	Dry	85%
Lighting Condition:	Daylight	75%
Time of Day:	Midday	53%
Vehicle Type:	Passenger	74%



Illinois Department of Transportation

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## Three Year Crash Statistics

2006, 2007, 2008