Appendix A

Crash Analysis Overview 2011-2013

I-290 Eisenhower Expressway
Cook County, Illinois

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This overview is an examination of the three year crash data from 2011 to 2013 and a comparison to the previous three year crash data from 2006 to 2008 that was documented in the Existing Transportation Systems Performance (ETSP) Report Crash Analysis (July 2010) (which covered the portion of I-290 between I-294/I-88 and Cicero Avenue) and the ECTM Crash Addendum 2 (April 2013) (which covered the I-290 extended Study Area between Cicero and Racine avenues that was added to the I-290 Study following the initial crash analysis).

The 2015 Crash Analysis Report Update will utilize the most current available crash information, from the years 2011 through 2013.

1.0 Influences on Crash Data

In 2009, the state of Illinois raised the threshold for reporting property damage only (PDO) crashes from $500 to $1,500. This new threshold has the effect of lowering the total number of crashes reported since the PDO crashes with damage less than $1,500 will no longer be reported. There were no changes in reporting for fatal and injury crashes.

In 2010, the Eisenhower Expressway was being resurfaced and was under construction zone traffic operations for the majority of the year. As this does not represent the normal operating conditions of the expressway, 2010 crash data was not utilized.

Therefore, the next continuous three years of consistent crash data that was available at the time of this analysis was the period from 2011 through 2013.

2.0 I-290 Mainline Overview

For the 2011-2013 reporting period, the total number of mainline crashes for the project was 5,365; this compares to 6,173 crashes for 2006-2008 reporting period; representing a 13 percent overall reduction in total reported crashes. The reduction in the three-year reported PDO crash rate can be partially attributed to the change in the reporting cost threshold. However, it is also noted that K and A type crashes, as well as all injury crashes (Types K, A, B and C), also declined during the same period even though the reporting methods did not change[1]. These K, A, B and C crashes went down from 95 in 2006-2008 to 79 in 2011-2013, a 19 percent reduction. There was an increase in overall and PDO crashes each year in the 2011-2013 period; however, there was no consistent pattern to the K and A crashes, as they varied each year in the 2011-2013 period, just as they did in 2006-2008 except in the following locations:

[1] Type K crashes include a fatality. Type A crashes include an incapacitating injury. Type B crashes include a visible, non-incapacitating injury. Type C crashes include no visible injury, but a complaint of pain.

- Eastbound (EB): Clusters of Type A crashes occurred sections near Kostner, Western and Ashland avenues

- Westbound (WB): A cluster of Type A crashes occurred near Central Avenue in the westbound direction.

There was one more Type K crash in 2011-2013 than there was in 2006-2008, and there were 17 less Type A crashes in 2011-2013 than there were in 2006-2008.

The general decrease in overall, PDO, injury, and K and A crashes from 2006-2008 to 2011-2013 may be partially explained in the context of the overall statewide crash experience in Illinois. For instance, in 2006, there were 408,670 crashes, 106,918 injuries, and 1,254 deaths reported for Illinois highways. By 2011, those numbers had been reduced statewide to 281,788 crashes, 84,172 injuries, and 918 fatalities[2]. As indicated previously, the decrease in total crash number is partially explained by the increase in PDO threshold, but the injury and fatality data also show declines of 21percent and 27 percent, respectively, over the five-year period.

It is noted that IDOT's Strategic Highway Safety Plan was implemented in cooperation with the Federal Highway Administration as a result of the 2005 federal SAFETEA-LU legislation, with emphasis on the "4 E's" - engineering, education, enforcement, and emergency medical services, with ten targeted emphasis areas. Continuing efforts to reduce the number and severity of crashes and injuries as part of that plan are reflected in the lower overall crash experience over its course, as indicated in IDOT's 2011 SHSP Progress Report[3]. In addition, crash frequencies may have been influenced by decreased travel during the Great Recession of late 2007 to early 2009 and the following economic recovery. The FHWA reports that as of July 2015, national vehicle miles of travel (VMT), which peaked in 2007 and then regressed to a lower level in 2009-2010, have climbed back to a level similar to 2007[4].

3.0 Trends within Segments of the I-290 Mainline

The July 2010 ETSP Report included a breakdown of crash data for nine EB and WB logical segments within the I-290 mainline from west of Wolf Road to Kostner Avenue. These segments were established to determine the relationship between crash rate, severity, type, time of day and the characteristics of the roadway, and were chosen on

[2] Illinois Crash Data 2006-2010 and 2007-2011, retrieved at http://www.idot.illinois.gov/transportation-system/safety/Illinois-Roadway-Crash-Data on February 25, 2015.

[3] Strategic Highway Safety Plan Progress Report, IDOT, July 2011 http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/SHSP/SHSPProgressReport2011.pdf

[4] FHWA, July 2015 Traffic Volume Trends, retrieved at http://www.fhwa.dot.gov/policyinformation/travel_monitoring/15jultvt/page2.cfm on October 21, 2015.

the basis of direction of travel, consistent number of lanes, similar shoulder widths and by locations between major crossroads. With the Study Area now extending east to Racine Avenue, breakdowns were expanded to 20 logical segments (the original nine, plus 11 more extending from Kostner Avenue to Racine Avenue). The 2006-2008 and 2011-2013 reporting periods, as well as a combined 2006-2008 and 2011-2013 six-year reporting period, are both included for comparison purposes in Appendix A-1. Each EB and westbound segment is ranked for "all crashes", "injury crashes", and "number of injuries" with further information and breakdowns on crash rate and overall ranking (EB and WB included).

In comparing the 2011-2013 data to the 2006-2008 data, the relative highest crash segments are in similar locations.

- Ashland Avenue to Racine Avenue (EB) – This segment had the highest EB and second highest overall crash rate in 2006-2008, the highest overall crash rate in 2011-2013, and the highest injury crash rate for both periods (EB and overall). There are queues that form in the EB direction due to a lack of interchange capacity, with rear end crashes being the predominant type. It is noted that the ongoing improvements to the Jane Byrne (formerly Circle) Interchange are expected to improve capacity and safety along this segment.

Other locations that have relatively high crash rates and injury crashes include:

- Westchester Boulevard to 25th Avenue (EB) – This segment had the second highest EB crash rate in both study periods. The crash experience is related to the loss of mainline traffic capacity at the EB lane drop at 25th Avenue and the resulting queues and difficulty in making weaving movements.

- Austin Boulevard to Laramie Avenue (WB) – This segment had the highest overall WB crash rate in both study periods. The crash experience is related to the left-hand ramps and the WB lane drop at Austin Boulevard. The presence of left-hand ramps results in entering and exiting traffic needing to make weaving movements for access and slower-speed ramp users mixing with higher-speed through users. The loss of mainline traffic capacity at the WB lane drop results in queues and difficulty in making weaving movements.

- CSX Railroad to East Avenue (WB) - This segment had the third highest WB crash rate in both study periods, and is within the influence area of the left-hand ramps at Harlem Avenue.

3.1 Type K and A Crashes

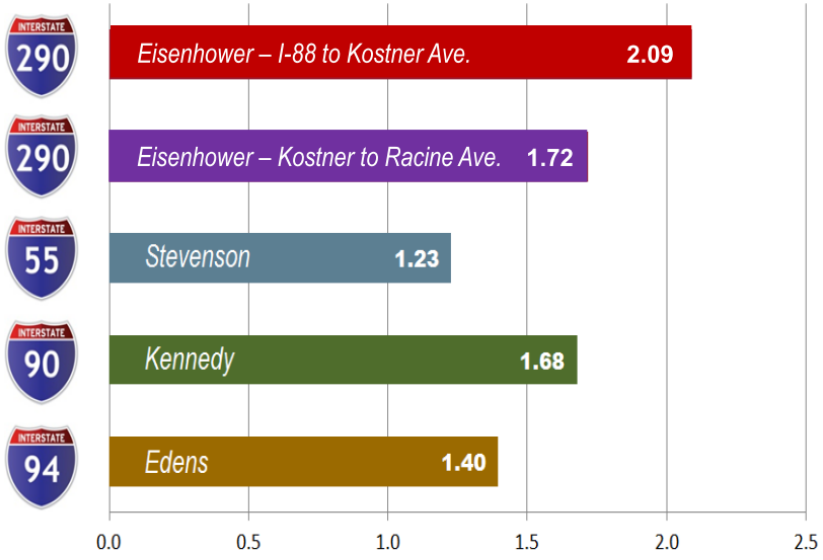
Generally, Type K and A crashes do not seem to follow a similar pattern within the 2006-2008 and the 2011-2013 study periods. Specific areas with somewhat similar groupings of Type A crashes include sections near Kostner, Western and Ashland avenues in the EB direction and Central Avenue in the WB direction. There was one

more Type K crash in 2011-2013 than there was in 2006-2008, and there were 17 less Type A crashes in 2011-2013 than there were in 2006-2008.

3.2 Crash Rate Trends with Comparative Expressways

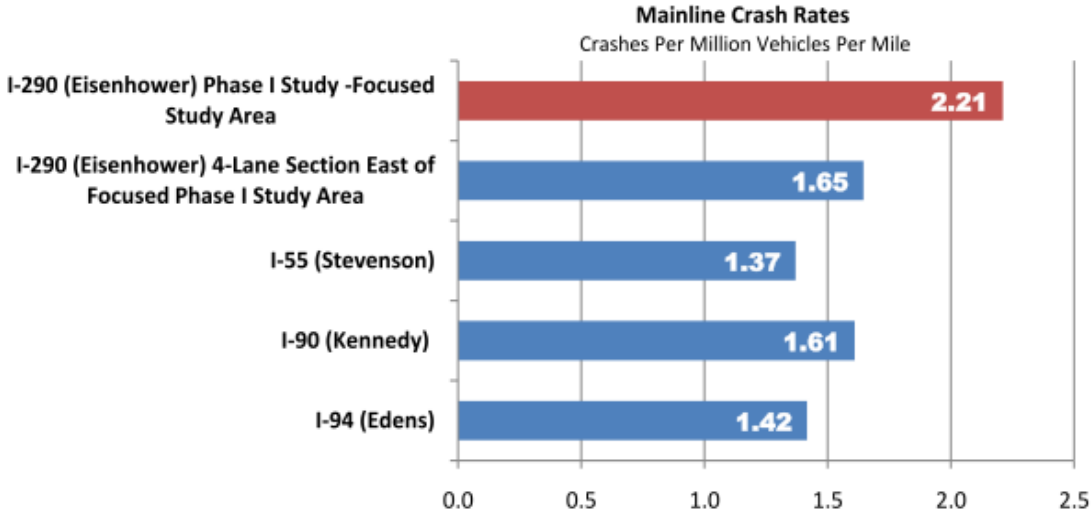
I-290 crash data and traffic volumes were compared to other Chicago area expressway sections on I-90, I-94 and I-55. The results are shown in Figure 3-1. Crashes per million vehicles per mile were calculated for each section of the local expressways using the crash data and traffic volumes from both of the three-year study periods (2006-2008 and 2011-2013). The Eisenhower Expressway reconstruction area, I-294/I-88 to Kostner Avenue, had the highest crash rate of all the Chicago area expressways segments that were studied. Further, the Eisenhower section from Kostner Avenue to the Jane Byrne Interchange had the second highest crash rate. The crash rates for the extended study period are similar to those presented in the ESTP Report Crash Analysis (July 2010) in Figure 3-2, which also showed the Eisenhower Expressway reconstruction area (shown as Focused Study Area) having the highest crash rate among the same comparative expressway sections.

Figure 3-1. Comparative Crash Rates – Chicago Area Expressways (2006-2008, 2011-2013)



Note: Values Calculated as Crashes per Million Vehicle Miles
Source: WSP Parsons Brinckerhoff, 2015

Figure 3-2. Comparative Crash Rates – Chicago Area Expressways (2006-2008) from June 2010 ESTP Crash Analysis



Source: WSP Parsons Brinckerhoff, 2010

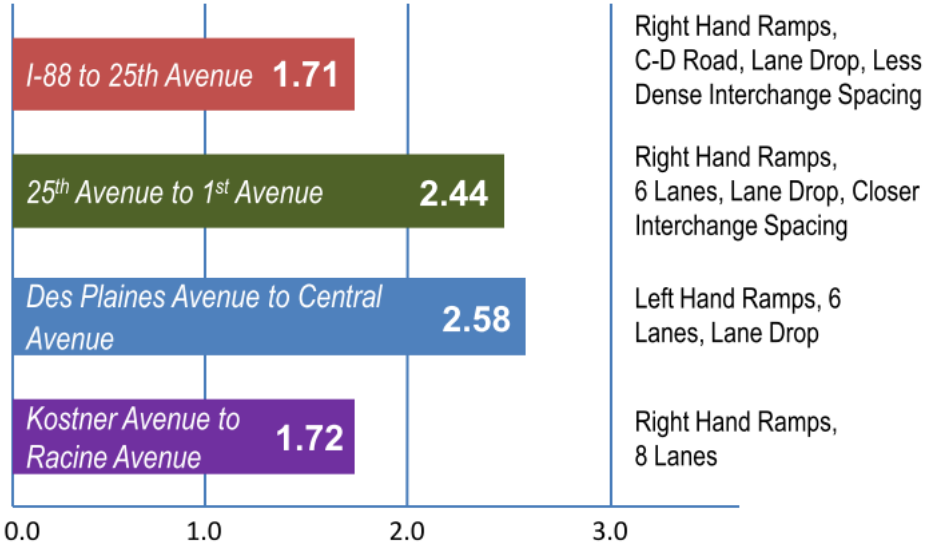
3.3 Crash Rate Trends within Comparative Sections of I-290

To follow up on the section analysis above, sections with similar geometric characteristics were grouped. This analysis found that there are variations in the crash experience based on the underlying characteristics of the roadway, as shown in Figure 3-3.

For example, the section between Kostner Avenue and Racine Avenue has eight travel lanes, conventional right-hand ramps and less dense interchange and ramp spacing than the section between 25th Avenue and 1st Avenue, and had a crash rate of 1.72 crashes per million vehicle miles in the combined 2006-2008 and 2011-2013 reporting periods. A higher crash section is located from 25th Avenue to 1st Avenue; this section has four interchanges each direction located within a 1.5 mile distance, six travel lanes, and a lane drop from four to three lanes EB at 25th Avenue; this section has a crash rate of 2.44, which is higher than the average overall crash rate of I-290 from I-294 to Kostner Avenue. The section between DesPlaines Avenue and Central Avenue (which includes the Harlem Avenue and Austin Boulevard interchanges) has an even higher combined crash rate of 2.58; this section contains two interchanges with left-hand ramps, a lane drop from four to three lanes WB at Austin Boulevard, and six travel lanes from DesPlaines Avenue to Austin Boulevard. The section between I-88 and 25th Avenue contains a lane drop from four to three lanes at 25th Avenue in the EB direction; its crash rate is a relatively low 1.71 compared to other sections of I-290, but is relatively higher compared to other expressways in the region.

In the sections with higher crash rates, the presence of lane drops, dense interchange spacing, left hand ramps, and/or less mainline lane capacity contributes to the higher crash experience of those sections.

Figure 3-3. Crash Comparison of I-290 Mainline Sections (2006-2008, 2011-2013)



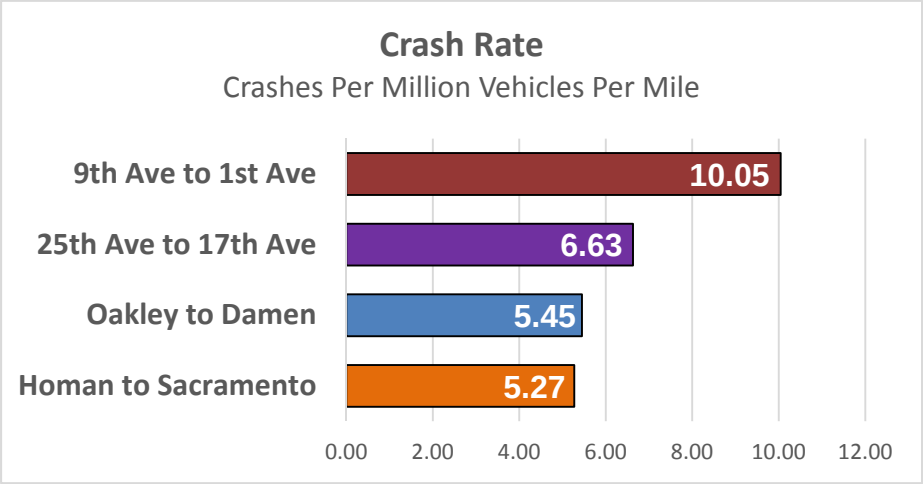
Note: Values Calculated as Crashes per Million Vehicle Miles
Source: WSP Parsons Brinckerhoff, 2015

The six-lane section of I-290 between 25th Avenue and 1st Avenue was also further broken down for purposes on analyzing sections where changes in access were considered (between 25th Avenue and 17th Avenue, and between 9th Avenue and 1st Avenue). These sub-sections have slip ramps connecting parallel frontage roads to I-290. Two sub-sections along the eastern eight-lane section of I-290 that were closest in ramp length and geometry to 9th Avenue and 1st Avenue were selected, at Homan Avenue to Sacramento Avenue and at Oakley Avenue to Damen Avenue. It is noted that the eastern sub-sections benefit from the presence of an additional mainline lane in each direction and an auxiliary lane to aid in weaving maneuvers from ramp to mainline and vice versa, both of which would contribute to a predicted reduction in crashes.

Compared to the remaining two, eight-lane expressway sub-sections, the successive ramps between 9th Avenue and 1st Avenue have a crash rate that is nearly double that of the similar ramp sections to the east. There were no eight-lane sections identified in the east that were found to be similar enough in design to compare to the 25th Avenue and 17th Avenue ramp pair. However, the crash rate between 17th Avenue and 25th Avenue, although elevated, is not as severe as the existing crash rate between 9th

Avenue and 1st Avenue. Figure 3-4 shows a comparison of crash rates at these sub-section locations.[5]

Figure 3-4. Crash Comparison of I-290 Mainline Sub-Sections (2011-2013)



Source: WSP Parsons Brinckerhoff, 2016

3.4 Prevalent Crash Types

For this analysis, the 2006-2008 as well as the 2011-2013 data were combined to determine the comprehensive crash type trends. The overall predominant crash type along I-290 is rear end (66 percent overall on a 24-hour basis) with 88 percent of rear end crashes occurring during the peak period and midday congested travel periods between 6 AM to 11 PM (Figure 3-5 and Figure 3-6). During congested periods, rear-end collisions represent 75 percent of all crashes. National studies, as well as field observation of I-290 within the Study Area, indicate congestion as a primary cause of rear-end crashes due to erratic, stop and go traffic conditions with reduced space (headway) between vehicles that requires increased driver attentiveness to react to those conditions.

The other two prevalent crash types on the I-290 mainline are same-direction sideswipe and fixed object collisions off the roadway, which represent approximately 20 percent and 10 percent of overall crashes, respectively. Many same-direction sideswipes correlate to areas where there are numerous lane-changing and weaving movements, such as near entrance and exit ramps. Most of the same-direction sideswipes are also occurring during congested conditions.

[5] Comparative Safety Analysis, 25th Avenue to 1st Avenue Ramp Configuration, WSP Parsons Brinckerhoff, 2016

Figure 3-5. Overall Crash Type (2006-2008, 2011-2013

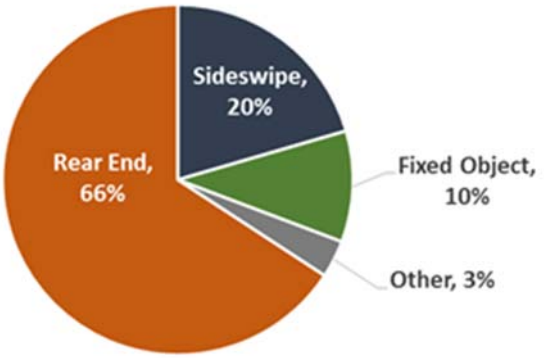
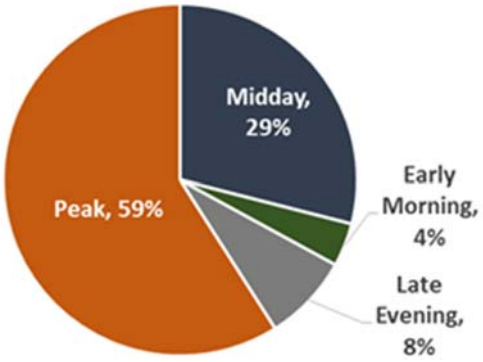


Figure 3-6. Rear End Crash – Time of Day (2006-2008, 2011-2013)



Source: WSP Parsons Brinckerhoff, 2015

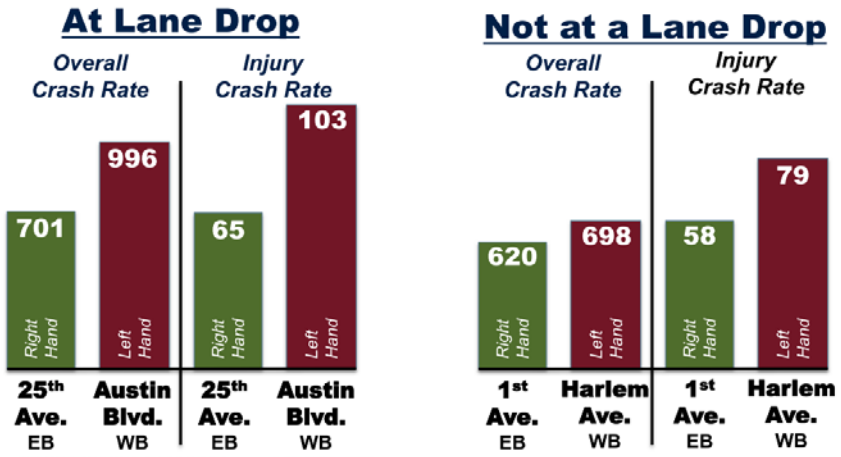
4.0 Lane Drop and Left Hand Ramp Analysis

An analysis was also done of the relationship between left hand ramps, lane drops and crashes in both directions along the I-290 Mainline for both study periods (Figure 4-1). Four locations were studied: 25th Avenue and 1st Avenue EB and Austin Boulevard and Harlem Avenue WB.

The analysis shows that, for locations where there is a left hand ramp, the crash rate and injury rates (normalized to a per-mile rate) are higher than a comparable right hand ramp location, either at a lane drop or not.

- At Austin Boulevard WB, where there is a lane drop as well as left hand ramps, the crash rate and injury rate were 996 and 103, respectively.
- At 25th Avenue EB, where there is a lane drop but not left hand ramps, the crash rate and injury rate were somewhat lower than Austin Boulevard's results at 701 and 65, respectively.
- At Harlem Avenue WB, where there are left hand ramps, the crash rate and injury rate were 698 and 79, respectively.

Figure 4-1. Left Lane Drop/No Lane Drop and Left Hand/Right Hand Crash Rates (2006-2008, 2011-2013)



Note: Values Calculated as Crashes/Injury Crashes per Mile
Source: WSP Parsons Brinckerhoff, 2015

- At 1st Avenue EB, an interchange between 25th and Harlem avenues with neither a lane drop nor a left hand ramp, the crash rate and injury rates were the lowest of the four locations studied. The crash rate and injury rate at this location were 620 and 58, respectively.

5.0 Hot Spot Analysis

Three I-290 mainline crash "hot spots" were identified from the 2006-2008 data and a detailed analysis of crashes was performed at these locations. Individual crash reports were reviewed for all crashes to identify any other potential trends due to distracted driving, glare, lane position, and more. The same analysis was completed for 2011-2013 (Appendix A-2).

In the EB direction, the hot spot from Mannheim Road to 17th Avenue exhibits these comparisons between 2006-2008 and 2011-2013:

- Generally the same trends in 2011-13 as in 2006-2008
- A majority of crashes happen during peak hours (66 percent)
- The top three causes of accidents remain the same:
  - Failure to reduce speed to avoid crash,
  - Following too closely, and
  - Improper lane usage.

- Age distribution is almost identical
- Crashes in the left and right lanes are higher than in the center lane

In the WB direction, the hot spot at Harlem Avenue and Austin Boulevard exhibit these comparisons between 2006-2008 and 2011-2013:

- Generally the same trends in 2011-2013 as in 2006-2008
- A majority of crashes happen during peak hours (74 percent at both locations)
- The top three causes of accidents remain the same:
  - Failure to reduce speed to avoid crash,
  - Following too closely, and
  - Improper lane usage.
- Age distribution is almost identical
- Nearly half of the crashes at Harlem Avenue and at Austin Boulevard were in the left (innermost) lane, where a lane position was reported.

The two highest concentrations of crashes in the WB direction are along the sections of I-290 approaching the Austin Boulevard and Harlem Avenue interchanges, and the highest crash rate within the project limits is the WB approach to Austin Boulevard (539 crashes per mile for 2006-2008, 459 crashes per mile for 2011-2013). This is substantially higher than the next highest location at the EB approach to the Ashland Avenue interchange (390 crashes per mile for 2006-2008, 368 crashes per mile for 2011-2013).

In addition, of the crashes that had an identified lane position in the police reports, 74 percent (2006-2008) and 77 percent (2011-2013) were in the inner two lanes at Austin Boulevard, and 47 percent (2006-2008) and 45 percent (2011-2013) were in the inside lane at Harlem Avenue. This crash experience can be attributed to the inside lanes on an expressway typically serving higher speed, longer distance travel; the inside ramps introduce merging and speed changes.

6.0 Cross Road Analysis

Cross roads are those roads that traverse I-290 in the Study Area via a grade separation. As part of this study, the crossroads between I-88 and Racine Avenue were examined. The crossroads east of Cicero Avenue are being evaluated as part of a separate improvement study and are not documented in this report. The following general observations are made (Table 6-1):

Table 6-1. 2006-2008, 2011-2013 Crossroad Crash Summary I-290 from I-294/I-88 to Cicero Avenue

Cross Street	Eval. Length (miles)	I-290 Access	Crashes			Injuries		Predominant Crash Factors							
			Total	Crash Rate	RANK		Injury Rate	Crash Type		Weather		Road Condition		Time Period	
25TH Ave	0.30	Full - Direct/Slip Ramps	169	563	3	51	170	Rear end	49%	Clear	80%	Dry	74%	Midday	39%
17TH Ave	0.06	Full - Slip Ramp	67	1117	10	13	217	Rear end	36%	Clear	78%	Dry	67%	Midday	34%
9TH Ave	0.05	Partial - Slip Ramp	73	1460	9	18	360	Angle	42%	Clear	68%	Dry	68%	Midday	38%
5TH Ave	0.04	No Access	36	900	12	11	275	Angle	42%	Clear	69%	Dry	64%	AM Rush	33%
1ST Ave (IL 171)	0.13	Full - Slip Ramp	166	1277	4	22	169	Rear end	39%	Clear	74%	Dry	72%	Midday	27%
Des Plaines Ave	0.11	Partial - Diamond	74	673	8	28	255	Rear end	47%	Clear	74%	Dry	59%	Midday	38%
Circle Ave	0.33	No Access	22	67	14	8	24	Angle	59%	Clear	82%	Dry	64%	PM Rush	45%
Harlem Ave	0.15	Full - Single Point	300	2000	1	43	287	Rear end	42%	Clear	79%	Dry	74%	Midday	30%
Oak Park Ave	0.06	No Access	48	800	11	18	300	Rear end	29%	Clear	79%	Dry	71%	Midday	38%
East Ave	0.05	No Access	21	420	15	6	120	Angle	43%	Clear	71%	Dry	67%	PM Rush	48%
Ridgeland Ave	0.10	No Access	28	280	13	6	60	Rear end	36%	Clear	71%	Dry	71%	Midday	46%
Lombard Ave	0.05	No Access	8	160	16	1	20	Angle	63%	Clear	63%	Dry	63%	PM Rush	50%
Austin Blvd	0.03	Full - Single Point	211	7033	2	51	1700	Turning	36%	Clear	73%	Dry	70%	PM Rush	27%
Central Ave	0.08	Full - Diamond	97	1213	6	23	288	Rear end	30%	Clear	79%	Dry	75%	Midday	32%
Laramie Ave	0.06	Partial - Slip Ramp	89	1483	7	26	433	Turning	40%	Clear	85%	Dry	78%	Midday	42%
Cicero Ave (IL 50)	0.16	Partial - Slip Ramp	166	1038	4	34	213	Turning	49%	Clear	75%	Dry	70%	Midday	39%
Crossroad Total		**1.76 Miles**	**1575**			**359**		**Rear end**	**33%**	**Clear**	**76%**	**Dry**	**71%**	**Midday**	**32%**

Notes:

1. Study Area crossroads east of Cicero to Racine Avenue not evaluated.
2. 1st Avenue and Cicero Avenue are tied at #4 in crash rank, having 166 crashes at each crossroad; crash rank continues at #6 (Central Avenue).

Source: WSP Parsons Brinckerhoff, 2015

- The number of injuries on the cross roads is very similar for both time periods (187 in 2006-2008 as compared to 172 in 2011-2013).

- 251 less cross road crashes occurred in 2011-2013 than in 2006-2008. This is likely due in part to the PDO cost adjustment.

- The highest ranked crash locations in number of crashes (#1 through #10) were at crossroads where there was also interchange access to I-290. This trend is also apparent when crash rate is considered, with only Oak Park Avenue, a no access location, having a higher crash rate than two crossroad locations with interchange access (25th Avenue and DesPlaines Avenue). These elevated number and rate of crashes can be attributed to increased traffic, congestion and conflicting traffic movements at interchange access locations as compared to no access locations.

The greatest number of crashes for the combined 2006-2008 and 2011-2013 study period were at Harlem Avenue (highest) and Austin Boulevard (second highest), and these cross roads also had the highest crash rates. There was a substantial drop in number of crashes at 25th Avenue. At the Harlem Avenue and Austin Boulevard locations, queues due to insufficient intersection capacity and inefficient signal phasing and green time allocation due to the geometric constraints of the intersection and ramps were contributing factors.

7.0 Frontage Road Analysis

Frontage roads are those roads that serve local traffic and run parallel to and adjacent to I-290. Frontage roads within the Study Area between I-88 and Cicero Avenue were examined to determine any comparative differences in the crash experience among the 2006-2008 and 2011-2013 study periods. Since no geometric or traffic management changes to the frontage roads east of Cicero Avenue are included as part of this study, the crash experience of those frontage roads is not examined here. The following observations are made (Table 7-1).

- Crashes with parked motor vehicles were the most predominant crash type.

- Other predominant crash types include rear end and sideswipe crashes.

Indian Joe Drive, Beach Street and Lexington Street, which form a continuous route and also serve to carry traffic from the EB off-ramp for 25th Avenue, are ranked first, third and second highest in crash rate respectively for the combined 2006-2008 and 2011-2013 study period. Contributing factors to crashes along these segments include mixing ramp through traffic with local traffic (which is further complicated by the stop-control intersection where the EB off-ramp intersects with Indian Joe Drive and Gardner Road, stop sign placement is not ideal because of the geometry, and EB vehicles from the ramp conflict with two-way traffic), and the 90° bends where Indian Joe Drive meets Beach

Street and where Beach Street meets Lexington Street, which have posted 20 mph advisory speed limits in an otherwise 30 mph posted speed zone.

Table 7-1. 2006-2008, 2011-2013 Frontage Road Crash Summary I-290 from I-294/88 to Cicero Avenue

Frontage Road	From Street To Street	Segment	One/Two Way	Length	Crashes			Injuries		Predominant Crash Factors									
					Total	Rate (per mile)	RANK	Total	Rate (per mile)	Crash Type		Weather		Road Condition		Time Period		Cause	
				(Mile)															
Harrison Street	Bellwood Ave 25th Ave	A	2 Way	0.78	28	36	10	9	11.5	Sideswipe opposite direction	28%	Clear	71%	Dry	61%	AM Peak	39%	Fail to reduce speed to avoid	18%
Harrison Street	24th Ave 1st Ave	B	1 Way, (WB)	1.46	37	25	12	11	7.6	Rear end	29%	Clear	86%	Dry	76%	AM Peak	27%	Fail to reduce speed to avoid	19%
Wedgewood Dr.	Suffolk Drive I-290 ramp	C	2 Way	0.25	3	12	13	0	0.0	Rear end	67%	Clear	100%	Dry	67%	AM Peak	33%	Fail to reduce speed to avoid	33%
Indian Joe Dr.	I-290 ramp N. of Beach Street	D	2 Way	0.13	14	110	1	5	39.2	Rear end	57%	Clear	86%	Dry	86%	PM Peak	36%	Fail to reduce speed to avoid	21%
Beach Street	Indian Joe Dr. Lexington	E	2 Way	0.10	8	81	3	0	0.0	Rear end	20%	Clear	50%	Dry	38%	Midday	50%	Driving skill	13%
Lexington St.	Beach Street 25th Ave	F	2 Way	0.12	11	89	2	2	16.2	Turning	36%	Clear	82%	Dry	73%	AM Peak	55%	Improper turning/no	18%
Bataan Drive	23rd Ave 1st Ave	G	1 Way, (EB)	1.39	44	32	11	6	4.3	Sideswipe same direction	28%	Clear	79%	Dry	72%	PM Peak	36%	Fail to reduce speed to avoid	11%
Lehmer St	Elgin Ave Lathrop	H	2 Way	0.50	1	2	15	0	0.0	Fixed object	100%	Clear	100%	Dry	100%	Early Morning	100%	DUI	100%
Harrison Street	Harlem Ave DesPlaines Ave.	I	2 Way	0.59	26	44	8	9	15.3	Rear end	36%	Clear	81%	Dry	65%	Midday	35%	Following too closely	15%
Harrison Street	Maple Ave Austin Blvd	J	2 Way	1.51	86	57	5	5	3.3	Parked motor vehicle	36%	Clear	80%	Dry	67%	PM Peak	33%	Fail to yield right-of-way	27%
Flournoy Street	Highland Ave Humphrey St.	K	2 Way	0.28	2	7	14	1	3.5	None	0%	None	0%	None	0%	None	0%	None	0%
Flournoy Street	Central Ave Kilpatrick Ave	L	1 Way, (WB)	1.13	64	56	6	7	6.2	Rear end	27%	Clear	89%	Dry	70%	Midday	36%	Following too closely	6%
Garfield Street	Harlem Ave Austin Blvd	M	2 Way	1.57	88	56	7	17	10.9	Parked motor vehicle	35%	Clear	76%	Dry	59%	Midday	33%	Fail to reduce speed to avoid	19%
Railroad St	Austin Blvd Menard Ave	N	2 Way	0.25	10	40	9	0	0.0	Fixed object	30%	Clear	50%	Dry	50%	AM Peak	40%	Exceeding safe speed	10%
Lexington St.	Long Ave Kostner	O	1 Way, (EB)	1.22	85	70	4	16	13.1	Parked motor vehicle	31%	Clear	76%	Dry	66%	Midday	35%	Fail to yield right-of-way	8%
Total		**11.28 Miles**			**507**	**45**		**88**	**8.8**	**Parked motor vehicle**	**24%**	**Clear**	**76%**	**Dry**	**67%**	**Midday**	**29%**	**Fail to reduce**	**13%**

Note: Study Area frontage roads east of Cicero to Racine Avenue not evaluated.
Source: WSP Parsons Brinckerhoff, 2015

APPENDIX A-1

Crash Data Tables

Table A1-1. I-290 Full Corridor Crash Summary 2006-2008

I-290 Full Corridor - Crash Summary
2006 Thru 2008 (3 Years)

	Mile post				Length	Crashes	Crash Rate	All Crashes			Injury Crashes					# of Injuries				
								EB & WB Rank	EB Overall Rank	WB Overall Rank	Total	Rate (per mile)	EB & WB Injury Rank	EB Injury Rank	WB Injury Rank	Total	Rate (per mile)	EB & WB Injury Rank	EB Injury Rank	WB Injury Rank
	From	to		Dir	(Mile)															
EASTBOUND	West of Wolf Road	15.49	16.46	Wolf Road	EB	0.97	122	126	33	15		25	26	23	12		36	37	23	13	
	Wolf Road	16.46	17.79	Westchester Blvd	EB	1.33	393	295	10	4		38	29	17	9		54	41	17	9	
	Westchester Blvd	17.79	18.56	25th Avenue	EB	0.77	288	374	3	2		26	34	14	6		31	40	18	10	
	25th Avenue	18.56	20.11	1st Avenue	EB	1.55	510	329	6	3		44	28	18	10		67	43	15	7	
	1st Avenue	20.11	21.29	CSX RR Overpass	EB	1.18	305	258	12	5		34	29	16	8		50	42	16	8	
	CSX RR Overpass	21.29	22.39	East Ave	EB	1.10	240	218	18	8		22	20	30	15		33	30	30	16	
	East Ave	22.39	23.15	Austin Avenue	EB	0.76	78	103	37	18		14	18	32	17		15	20	36	18	
	Austin Avenue	23.15	24.15	Laramie Avenue	EB	1.00	152	152	27	12		19	19	31	16		31	31	28	15	
	Laramie Avenue	24.15	25.15	Kostner Avenue	EB	1.00	132	132	30	13		25	25	25	13		34	34	26	14	
	Kostner Ave	25.15	25.66	Pulaski Ave	EB	0.51	86	168	25	11		19	37	12	4		32	63	8	4	
	Pulaski Ave	25.66	25.93	Independence Ave	EB	0.27	62	230	16	7		10	37	13	5		17	63	7	3	
	Independence Ave	25.93	26.16	Central Park	EB	0.23	29	126	32	14		3	13	39	19		3	13	39	19	
	Central Park	26.16	26.41	Homan	EB	0.25	28	112	35	17		6	24	27	14		10	40	19	11	
	Homan	26.41	26.66	Kedzie	EB	0.25	25	100	38	19		1	4	40	20		3	12	40	20	
	Kedzie	26.66	26.92	Sacremento	EB	0.26	54	208	19	9		10	38	10	2		13	50	13	5	
	Sacremento	26.92	27.17	California	EB	0.25	23	92	39	20		4	16	36	18		5	20	35	17	
	California	27.17	27.68	Western	EB	0.51	59	116	34	16		15	29	15	7		23	45	14	6	
	Western	27.68	28.18	Damen	EB	0.50	86	172	24	10		14	28	19	11		20	40	19	11	
	Damen	28.18	28.69	Ashland	EB	0.51	121	237	14	6		19	37	11	3		33	65	5	2	
	Ashland	28.69	29.19	Racine	EB	0.50	192	384	2	1		27	54	1	1		40	80	3	1	
WESTBOUND	West of Wolf Road	15.49	16.46	Wolf Road	WB	0.97	108	111	36		19	16	16	35		18	29	30	31		15
	Wolf Road	16.46	17.79	Westchester Blvd	WB	1.33	121	91	40		20	22	17	34		17	25	19	37		19
	Mannheim Road	17.79	18.56	25th Avenue	WB	0.77	98	127	31		18	16	21	29		15	22	29	32		16
	25th Avenue	18.56	20.11	1st Avenue	WB	1.55	294	190	22		13	37	24	28		14	55	35	24		11
	1st Avenue	20.11	21.29	CSX RR Overpass	WB	1.18	258	219	17		10	29	25	26		13	38	32	27		13
	CSX RR Overpass	21.29	22.39	East Ave	WB	1.10	387	352	5		3	50	45	3		2	67	61	9		5
	East Ave	22.39	23.15	Austin Avenue	WB	0.76	238	313	7		4	33	43	4		3	52	68	4		3
	Austin Avenue	23.15	24.15	Laramie Avenue	WB	1.00	537	537	1		1	46	46	2		1	64	64	6		4
	Laramie Avenue	24.15	25.15	Kostner Avenue	WB	1.00	298	298	9		6	41	41	6		5	57	57	10		6
	Kostner Ave	25.15	25.66	Pulaski Ave	WB	0.51	146	286	11		7	14	27	21		10	18	35	25		12
	Pulaski Ave	25.66	25.93	Independence Ave	WB	0.27	98	363	4		2	11	41	7		6	14	52	12		8
	Independence Ave	25.93	26.16	Central Park	WB	0.23	53	230	15		9	6	26	22		11	7	30	29		14
	Central Park	26.16	26.41	Homan	WB	0.25	48	192	21		12	10	40	8		7	22	88	1		1
	Homan	26.41	26.66	Kedzie	WB	0.25	75	300	8		5	4	16	36		19	4	16	38		20
	Kedzie	26.66	26.92	Sacremento	WB	0.26	65	250	13		8	11	42	5		4	22	85	2		2
	Sacremento	26.92	27.17	California	WB	0.25	51	204	20		11	10	40	8		7	13	52	11		7
	California	27.17	27.68	Western	WB	0.51	92	180	23		14	9	18	33		16	12	24	33		17
	Western	27.68	28.18	Damen	WB	0.50	69	138	29		17	7	14	38		20	11	22	34		18
	Damen	28.18	28.69	Ashland	WB	0.51	82	161	26		15	13	25	24		12	19	37	22		10
	Ashland	28.69	29.19	Racine	WB	0.50	70	140	28		16	14	28	19		9	19	38	21		9

Source: WSP Parsons Brinckerhoff, 2015

Table A1-2. I-290 Full Corridor Crash Summary 2011-2013

I-290 Full Corridor - Crash Summary
2011 Thru 2013 (3 Years)

	Mile post From	to		Dir	Length (Mile)	Crashes	Crash Rate	All Crashes: EB & WB Rank	All Crashes: EB Overall Rank	All Crashes: WB Overall Rank	Injury Crashes: Total	Injury Crashes: Rate (per mile)	Injury Crashes: EB & WB Injury Rank	Injury Crashes: EB Injury Rank	Injury Crashes: WB Injury Rank	# of Injuries: Total	# of Injuries: Rate (per mile)	# of Injuries: EB & WB Injury Rank	# of Injuries: EB Injury Rank	# of Injuries: WB Injury Rank
EASTBOUND	West of Wolf Road	15.49	16.46	Wolf Road	EB	0.97	96	99	34	16		12	12	35	18		19	20	38	20	
	Wolf Road	16.46	17.79	Westchester Blvd	EB	1.33	346	260	10	5		39	29	16	9		57	43	15	10	
	Westchester Blvd	17.79	18.56	25th Avenue	EB	0.77	252	327	5	2		24	31	13	7		28	36	20	11	
	25th Avenue	18.56	20.11	1st Avenue	EB	1.55	450	290	8	4		47	30	14	8		72	46	13	8	
	1st Avenue	20.11	21.29	CSX RR Overpass	EB	1.18	169	143	24	12		24	20	24	14		39	33	24	13	
	CSX RR Overpass	21.29	22.39	East Ave	EB	1.10	198	180	20	10		22	20	26	15		30	27	28	16	
	East Ave	22.39	23.15	Austin Avenue	EB	0.76	79	104	30	14		11	14	33	17		22	29	27	15	
	Austin Avenue	23.15	24.15	Laramie Avenue	EB	1.00	107	107	29	13		25	25	19	11		32	32	25	14	
	Laramie Avenue	24.15	25.15	Kostner Avenue	EB	1.00	100	100	32	15		22	22	22	13		36	36	21	12	
	Kostner Ave	25.15	25.66	Pulaski Ave	EB	0.51	44	86	37	19		10	20	28	16		13	25	31	17	
	Pulaski Ave	25.66	25.93	Independence Ave	EB	0.27	49	181	19	9		10	37	9	5		12	44	14	9	
	Independence Ave	25.93	26.16	Central Park	EB	0.23	46	200	16	8		6	26	18	10		11	48	11	7	
	Central Park	26.16	26.41	Homan	EB	0.25	24	96	35	17		6	24	20	12		13	52	9	5	
	Homan	26.41	26.66	Kedzie	EB	0.25	21	84	38	20		3	12	36	19		6	24	32	18	
	Kedzie	26.66	26.92	Sacremento	EB	0.26	58	223	13	7		11	42	7	4		17	65	6	4	
	Sacremento	26.92	27.17	California	EB	0.25	24	96	35	17		3	12	36	19		6	24	32	18	
	California	27.17	27.68	Western	EB	0.51	75	147	23	11		18	35	10	6		26	51	10	6	
	Western	27.68	28.18	Damen	EB	0.50	120	240	12	6		26	52	3	2		37	74	4	3	
	Damen	28.18	28.69	Ashland	EB	0.51	166	325	7	3		25	49	5	3		42	82	3	2	
	Ashland	28.69	29.19	Racine	EB	0.50	289	578	1	1		37	74	1	1		56	112	1	1	
WESTBOUND	West of Wolf Road	15.49	16.46	Wolf Road	WB	0.97	79	81	39		19	14	14	34		17	23	24	35		16
	Wolf Road	16.46	17.79	Westchester Blvd	WB	1.33	93	70	40		20	15	11	39		19	18	14	39		19
	Mannheim Road	17.79	18.56	25th Avenue	WB	0.77	89	116	27		15	15	19	29		13	20	26	30		14
	25th Avenue	18.56	20.11	1st Avenue	WB	1.55	243	157	21		11	30	19	30		14	53	34	23		11
	1st Avenue	20.11	21.29	CSX RR Overpass	WB	1.18	119	101	31		17	10	8	40		20	11	9	40		20
	CSX RR Overpass	21.29	22.39	East Ave	WB	1.10	380	345	4		3	37	34	11		5	52	47	12		5
	East Ave	22.39	23.15	Austin Avenue	WB	0.76	280	368	3		2	25	33	12		6	32	42	16		6
	Austin Avenue	23.15	24.15	Laramie Avenue	WB	1.00	459	459	2		1	51	51	4		2	71	71	5		2
	Laramie Avenue	24.15	25.15	Kostner Avenue	WB	1.00	197	197	17		9	17	17	31		15	22	22	37		18
	Kostner Ave	25.15	25.66	Pulaski Ave	WB	0.51	136	266	9		5	22	43	6		3	31	61	7		3
	Pulaski Ave	25.66	25.93	Independence Ave	WB	0.27	53	196	18		10	8	30	15		7	11	41	18		8
	Independence Ave	25.93	26.16	Central Park	WB	0.23	75	326	6		4	14	61	2		1	20	87	2		1
	Central Park	26.16	26.41	Homan	WB	0.25	32	128	26		14	3	12	36		18	6	24	32		15
	Homan	26.41	26.66	Kedzie	WB	0.25	63	252	11		6	6	24	20		9	9	36	21		10
	Kedzie	26.66	26.92	Sacremento	WB	0.26	55	212	14		7	4	15	32		16	7	27	29		13
	Sacremento	26.92	27.17	California	WB	0.25	50	200	15		8	7	28	17		8	10	40	19		9
	California	27.17	27.68	Western	WB	0.51	55	108	28		16	10	20	27		12	12	24	36		17
	Western	27.68	28.18	Damen	WB	0.50	50	100	32		18	10	20	25		11	16	32	25		12
	Damen	28.18	28.69	Ashland	WB	0.51	78	153	22		12	21	41	8		4	28	55	8		4
	Ashland	28.69	29.19	Racine	WB	0.50	66	132	25		13	11	22	22		10	21	42	17		7

Source: WSP Parsons Brinckerhoff, 2015

Table A1-3. I-290 Full Corridor Crash Summary 2006-2008, 2011-2013

I-290 Full Corridor - Crash Summary
2006 - 2008 and 2011 - 2013 (6 Years)

	Mile post				Length	Crashes	Crash Rate	All Crashes			Injury Crashes					# of Injuries				
								EB & WB Rank	EB Overall Rank	WB Overall Rank	Total	Rate (per mile)	EB & WB Injury Rank	EB Injury Rank	WB Injury Rank	Total	Rate (per mile)	EB & WB Injury Rank	EB Injury Rank	WB Injury Rank
	From	to		Dir	(Mile)															
EASTBOUND	West of Wolf Road	15.49	16.46	Wolf Road	EB	0.97	218	225	34	16		37	38	32	17		55	57	30	17	
	Wolf Road	16.46	17.79	Westchester Blvd	EB	1.33	739	556	10	5		77	58	18	9		111	83	20	10	
	Westchester Blvd	17.79	18.56	25th Avenue	EB	0.77	540	701	3	2		50	65	14	6		59	77	23	11	
	25th Avenue	18.56	20.11	1st Avenue	EB	1.55	960	619	6	3		91	59	16	8		139	90	18	8	
	1st Avenue	20.11	21.29	CSX RR Overpass	EB	1.18	474	402	19	9		58	49	23	11		89	75	24	12	
	CSX RR Overpass	21.29	22.39	East Ave	EB	1.10	438	398	20	10		44	40	30	15		63	57	29	16	
	East Ave	22.39	23.15	Austin Avenue	EB	0.76	157	207	36	18		25	33	36	18		37	49	35	18	
	Austin Avenue	23.15	24.15	Laramie Avenue	EB	1.00	259	259	29	13		44	44	26	14		63	63	27	14	
	Laramie Avenue	24.15	25.15	Kostner Avenue	EB	1.00	232	232	33	15		47	47	25	13		70	70	25	13	
	Kostner Ave	25.15	25.66	Pulaski Ave	EB	0.51	130	254	30	14		29	57	20	10		45	88	19	9	
	Pulaski Ave	25.66	25.93	Independence Ave	EB	0.27	111	411	17	8		20	74	9	5		29	107	11	5	
	Independence Ave	25.93	26.16	Central Park	EB	0.23	75	326	22	11		9	39	31	16		14	61	28	15	
	Central Park	26.16	26.41	Homan	EB	0.25	52	208	35	17		12	48	24	12		23	92	16	7	
	Homan	26.41	26.66	Kedzie	EB	0.25	46	184	39	20		4	16	40	20		9	36	39	20	
	Kedzie	26.66	26.92	Sacremento	EB	0.26	112	431	15	6		21	81	5	3		30	115	5	3	
	Sacremento	26.92	27.17	California	EB	0.25	47	188	38	19		7	28	38	19		11	44	37	19	
	California	27.17	27.68	Western	EB	0.51	134	263	28	12		33	65	15	7		49	96	12	6	
	Western	27.68	28.18	Damen	EB	0.50	206	412	16	7		40	80	6	4		57	114	6	4	
	Damen	28.18	28.69	Ashland	EB	0.51	287	563	7	4		44	86	4	2		75	147	2	2	
	Ashland	28.69	29.19	Racine	EB	0.50	481	962	2	1		64	128	1	1		96	192	1	1	
WESTBOUND	West of Wolf Road	15.49	16.46	Wolf Road	WB	0.97	187	193	37		19	30	31	37		19	52	54	33		16
	Wolf Road	16.46	17.79	Westchester Blvd	WB	1.33	214	161	40		20	37	28	39		20	43	32	40		20
	Mannheim Road	17.79	18.56	25th Avenue	WB	0.77	187	243	31		17	31	40	28		14	42	55	31		14
	25th Avenue	18.56	20.11	1st Avenue	WB	1.55	537	346	21		11	67	43	27		13	108	70	26		13
	1st Avenue	20.11	21.29	CSX RR Overpass	WB	1.18	377	319	24		13	39	33	35		18	49	42	38		19
	CSX RR Overpass	21.29	22.39	East Ave	WB	1.10	767	697	4		2	87	79	7		3	119	108	10		6
	East Ave	22.39	23.15	Austin Avenue	WB	0.76	518	682	5		3	58	76	8		4	84	111	9		5
	Austin Avenue	23.15	24.15	Laramie Avenue	WB	1.00	996	996	1		1	97	97	2		1	135	135	3		1
	Laramie Avenue	24.15	25.15	Kostner Avenue	WB	1.00	495	495	13		8	58	58	17		9	79	79	22		12
	Kostner Ave	25.15	25.66	Pulaski Ave	WB	0.51	282	552	12		7	36	70	10		5	49	96	13		7
	Pulaski Ave	25.66	25.93	Independence Ave	WB	0.27	151	559	8		4	19	70	11		6	25	93	14		8
	Independence Ave	25.93	26.16	Central Park	WB	0.23	128	557	9		5	20	87	3		2	27	117	4		2
	Central Park	26.16	26.41	Homan	WB	0.25	80	320	23		12	13	52	21		11	28	112	7		3
	Homan	26.41	26.66	Kedzie	WB	0.25	138	552	11		6	10	40	29		15	13	52	34		17
	Kedzie	26.66	26.92	Sacremento	WB	0.26	120	462	14		9	15	58	19		10	29	112	8		4
	Sacremento	26.92	27.17	California	WB	0.25	101	404	18		10	17	68	12		7	23	92	16		10
	California	27.17	27.68	Western	WB	0.51	147	288	26		15	19	37	33		16	24	47	36		18
	Western	27.68	28.18	Damen	WB	0.50	119	238	32		18	17	34	34		17	27	54	32		15
	Damen	28.18	28.69	Ashland	WB	0.51	160	314	25		14	34	67	13		8	47	92	15		9
	Ashland	28.69	29.19	Racine	WB	0.50	136	272	27		16	25	50	22		12	40	80	21		11

Source: WSP Parsons Brinckerhoff, 2015

APPENDIX A-2

Crash Summary Spot Analysis

Table A2-1. 2011-2013 Hot Spot Analysis

Crash Summary Eastbound I-290 from Mannheim Rd. to 17th Ave. (MP 17.52 to 19.04)	
Crash Categories - Top 5	**% of Total**
During Congested Periods	65.8%
Hit and Run Crashes	11.4%
Distraction Inside Vehicle	4.0%
Distraction Outside Vehicle	2.1%
Drowsiness	2.1%
DUI/Controlled Substance	0.8%
Medical (Physical Health of Driver)	0.6%
Crash Due to Weather Conditions	0.6%
Crashes on Shoulders	0.2%
Glare/Sun	0.0%
# K & A Crashes	**% of Total**
K (Fatal)	0.2%
A (Incapacitating Injury)	0.4%
Crash Description - Top 10 Illinois State Police Classification Number	**% of Total**
Failure to reduce speed to avoid crash (28)	53.0%
Following too closely (20)	17.1%
Improper lane usage (3)	13.9%
Driving skills/knowledge/experience (4)	3.0%
Improper overtaking/passing (15)	2.5%
Exceeding safe speed for conditions (10)	1.7%
Operated vehicle in erratic, reckless (2)	1.5%
Failure to yield right of way (27)	1.0%
Evasive action due to animal, object (30)	0.8%
Driving under the influence of alcohol/drugs (50)	0.8%
Improper Backing (8)	0.6%
Weather (40)	0.6%
Equipment - vehicle condition (11)	0.6%
Distraction- from outside vehicle (32)	0.6%
Travel Lane Position	**% of Total**
Left - 1	31.4%
2	22.4%
Right - 3	37.3%
Not Identified	8.9%
Age of Driver	**% of Total**
<=19	5%
20-29	32%
30-39	18%
40-49	16%
50-59	9%
60-69	5%
70-79	2%
>=80	1%
No Age	13%

Source: WSP Parsons Brinckerhoff, 2015

Table A2-2. 2011-2013 Hot Spot Analysis

Crash Summary Westbound I-290 at Austin Boulevard (MP 22.76 to MP 23.6)	
Crash Categories - Top 5	**% of Total**
During Congested Periods	74.4%
Hit and Run Crashes	13.0%
DUI/Controlled Substance	3.4%
Distraction Outside Vehicle	2.8%
Distraction Inside Vehicle	1.9%
# K & A Crashes	**% of Total**
K (Fatal)	0.2%
A (Incapacitating Injury)	0.6%
Crash Description - Top 5 Illinois State Police Classification Number	**% of Total**
Failure to reduce speed to avoid crash (28)	56.7%
Following too closely (3)	14.9%
Improper lane usage (20)	14.3%
Driving skills/knowledge/experience (15)	3.6%
Driving under the influence of alcohol/drugs (8)	2.0%
Travel Lane Position	**% of Total**
Left - 1	37%
2	25%
3	13%
Right - 4	5%
Not Identified	21%
Age of Driver	**% of Total**
<=19	5%
20-29	33%
30-39	19%
40-49	13%
50-59	9%
60-69	6%
70-79	1%
>=80	0%
No Age Given	14%

Source: WSP Parsons Brinckerhoff, 2015

Table A2-3. 2011-2013 Hot Spot Analysis

Crash Summary **Westbound I-290 at Harlem Avenue** **(MP 21.31 to MP 21.98)**	
Crash Categories - Top 5	**% of Total**
During Congested Periods	74.0%
Hit and Run Crashes	9.0%
Distraction Inside Vehicle	5.4%
Distraction Outside Vehicle	2.9%
Drowsiness	2.5%
# K & A Crashes	**% of Total**
K (Fatal)	0.0%
A (Incapacitating Injury)	1.1%
Crash Description - Top 10 Illinois State Police Classification Number	**% of Total**
Failure to reduce speed to avoid crash (28)	57.4%
Following too closely (3)	14.8%
Improper lane usage (20)	12.3%
Driving skills/knowledge/experience (15)	2.5%
Physical condition of driver (17)	2.5%
Exceeded authorized speed limit (1)	2.2%
Driving under the influence of alcohol/drugs (8)	1.8%
Distraction - from inside vehicle (41)	1.4%
Improper overtaking/passing (4)	1.1%
Distraction- from outside vehicle (40)	1.1%
Travel Lane Position	**% of Total**
Left - 1	36%
2	21%
Right - 3	22%
Not Identified	21%
Age of Driver	**% of Total**
<=19	1%
20-29	33%
30-39	21%
40-49	13%
50-59	10%
60-69	5%
70-79	3%
>=80	0%
No Age	13%

Source: WSP Parsons Brinckerhoff, 2015