RURAL CHAMPAIGN COUNTY AREA SAFETY PLAN

December 2019

rpc CHAMPAIGN COUNTY REGIONAL PLANNING COMMISSION

CUUATS

EXECUTIVE SUMMARY

The Rural Champaign County Area Safety Plan (RCCASP) serves as a foundation for safety improvements for safety stakeholders and the public in the study area. It provides an opportunity for the public and other stakeholders to participate in the effort to reduce fatalities and A-injuries (serious injuries) on roadways. Champaign County follows the state goal set forth in the Illinois Strategic Highway Safety Plan 2017 (ILSHSP)[1] to reduce roadway crash fatalities to zero. In an effort to meet this goal, RCCASP serves as a guidance document to identify and plan safety programs and projects in the rural Champaign County area.

The RCCASP presents analysis of crash trends, identifies emphasis areas based on a data-driven approach, and outlines strategies for each of the emphasis areas. The strategies are based on four categories: Education, Enforcement, Engineering, and Emergency Medical Services.

In the rural Champaign County study area, comparing the five-year average crashes between the 2007-2011 study period and the 2012-2016 study period, there was a 13 percent decrease in the total number of crashes, a 14 percent increase in fatalities, and a 21 percent decrease in A-injuries. In the 2012-2016 study period, a high of 11 fatalities occurred in 2016, five more fatalities than in 2015. The number of A-injuries has consistently decreased, from a peak of 68 in 2012 to a low of 40 in 2016.

In the 2012-2016 study period, the percentage of crashes at intersections was six percentage points higher than the percentage of crashes on roadway segments. More crashes occurred for fixed object, rear end, angle and turning collision types. It was found that speed, impaired driving, and failure to yield at intersections and roadways were major factors of crashes in the study area.

More male drivers than female drivers were involved in crashes, by a difference of 20 percentage points. More than 14 percent of drivers involved in crashes were between the ages of 20 and 24. Four percent of drivers involved in fatal or A-injury type crashes were impaired at the time of the crash; even though this number is relatively small, impaired driver related crashes tended to be more severe than crashes not related to driver impairment.

The following emphasis areas were identified in the rural Champaign County study area: Roadway Departure, Intersections, and Impaired Driving. Each emphasis area was studied by crash severity, weather condition, lighting condition, road surface condition, driver age and sex, and time of the day. Strategies were identified for each of the emphasis areas. In addition, high-priority intersections were identified based on crash frequency and equivalent crashes. High-priority roadway segments, excluding interstates, were identified based on crash frequency, equivalent crashes, and crash frequency by length. Since the most recent five-year crash data from which high-priority intersections and segments were identified was 2012- 2016, a list of recent improvements to the high-priority intersections is provided.

This study is based on a data-driven approach to identify emphasis areas and high-priority locations. The next step will be to develop a systemic approach to safety. This systemic approach will identify potential risk factors and crash locations. Future improvements will be able to be implemented by understanding the correlation between high-risk roadway features and specific severe crash types. This approach provides a more comprehensive method for safety planning and implementation that supplements and complements traditional site analysis. This approach also helps agencies broaden their traffic safety efforts and consider risk as well as crash history when identifying where to make low-cost safety improvements.[2]

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① INTRODUCTION

Motor vehicle crashes are one of the leading causes of death in the United States[3]. There were 37,461 motor vehicle fatalities in 2016; 50 percent of these fatalities occurred in rural areas. However, only 10 percent of the U.S. population lived in rural areas in 2016, and rural areas accounted for only 30 percent of the total vehicle miles traveled (VMT) in 2016[4]. It is important to understand this disparity of fatalities between urban and rural areas and populations. Urban and rural areas have different socioeconomic and demographic characteristics: the study of crash distribution by these characteristics will be the first step toward reducing the number of crashes.

In October 2016, the National Safety Council, in partnership with the U.S. Department of Transportation, launched the Road to Zero initiative with the goal of eliminating road traffic deaths in the United States by 2050[5]. The State of Illinois is also committed to the nationwide goal of zero fatalities on Illinois roadways[1]. The Illinois Strategic Highway Safety Plan 2017 (ILSHSP) identifies emphasis areas by understanding the statewide crash numbers. Champaign County is also working toward the statewide safety goal of zero roadway fatalities. Local staff understand the disparity of urban and rural characteristics; safety stakeholders from the rural Champaign County area and from the Champaign-Urbana urban area will partner to achieve the long-term goal of zero fatalities.

This safety study focuses on the rural Champaign County area. The rural Champaign County area is the area between the Metropolitan Planning Area (MPA) boundary and the Champaign County boundary (Map 1). The most recent five-year crash data available for this study was from the 2012-2016 study period. This data was acquired from the Illinois Department of Transportation (IL DOT).

RCCASP Vision – Zero Fatalities

Champaign County has a long-term vision of zero fatalities due to roadway crashes. The safety stakeholders in Champaign County are committed to taking immediate actions to reduce fatalities and injury severities due to crashes on Champaign County roadways. The safety stakeholders from rural Champaign County and the Champaign-Urbana urban area are working toward achieving the "Zero Fatalities" goal in Champaign County.

RCCASP Mission

The RCCASP mission is to develop a data-driven practice for multiple stakeholders to improve roadway users' behavior, vehicle performance, and road characteristics to reduce fatalities and injury severities due to crashes on roadways in the rural Champaign County area.

RCCASP Goal

The RCCASP goal is to consistently reduce fatalities and injury severities using a data-driven, strategic approach that includes enforcement, education, engineering, and emergency response.

RCCASP Objectives

The RCCASP objectives were set based on the trend analysis done for the study area.

- Reduce the five-year rolling average of number of fatalities by 2 percent (from 8 to less than 7) by 2025 based on 2016 in the rural Champaign County area.

- Reduce the five-year rolling average of number of A-injuries by 2 percent (from 53 to less than 45) by 2025 based on 2016 in the rural Champaign County area.

Legend
- CUUATS MPA
- SCIL Jurisdiction
- Champaign County

Map 1 *Location and extent of the rural Champaign County area*
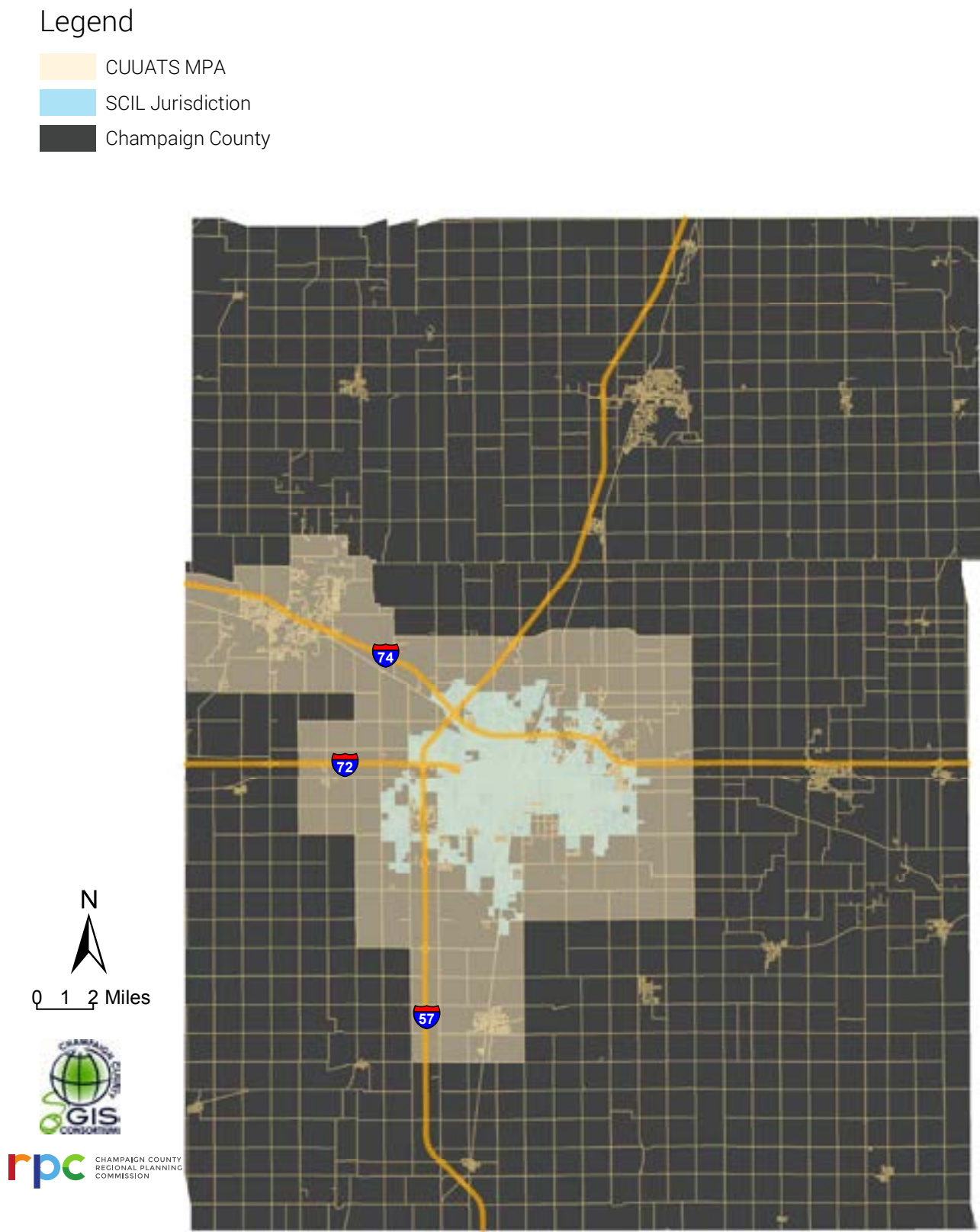
RURAL SAFETY ANALYSIS STEPS

The RCCASP's data-driven approach is based on five years of geolocated crash data. The most recent crash data from 2012-2016 was obtained from IDOT*. This crash data also includes person- and vehicle-level information. The crash data was cleaned to be uniform across the crash-, person- and vehicle-level information. Crashes occurring at intersections were identified as "Intersection" crashes, while "Interstates" and "Segment" crashes were also identified by location type.

Crashes from 2012-2016 that occurred outside the Champaign-Urbana MPA boundary and within the Champaign County area were considered in this study. The crash data analysis includes trend analysis that compares crashes in Illinois with crashes in the rural Champaign County study area. In addition, crash severities and other crash factors, including but not limited to collision type and driver condition, were studied. This analysis was further extended to identify emphasis areas, which were analyzed based on roadway condition, weather condition, lighting condition, driver age, and time of day. Staff identified strategies for each of these emphasis areas. Strategies were based on four categories: Education, Enforcement, Engineering, and Emergency Medical Services. High-priority intersections and segments were also identified. Figure 1 presents this multi-step approach.

*DISCLAIMER: The motor vehicle crash data referenced herein was provided by the Illinois Department of Transportation. Any conclusions drawn from analysis of the aforementioned data are the sole responsibility of the data recipient(s). Additionally, for coding years 2015 to present, the Bureau of Data Collection uses the exact latitude/longitude supplied by the investigating law enforcement agency to locate crashes. Therefore, location data may vary in previous years since data prior to 2015 was physically located by bureau personnel.

Crash Data Cleaning

Acquire the most recent five-year (2012-2016) crash-, person-, and vehicle-level data from IDOT

Clean the data

Classify "Intersection," "Interstate," and "Segment" crashes based on their geo location

Crash Data Analysis

Perform the existing conditions analysis for crashes occurring within the Champaign County rural area

Analyze trends by factors such as crash severity, collision type, driver condition, driver age and sex

Emphasis Area Identification

Identify emphasis areas from existing conditions analysis

For each emphasis area, perform further crash analysis based on roadway condition, weather condition, lighting condition, driver age and sex, and time of the day

Strategies Identification

For each emphasis area, identify strategies in terms of the 4 Es (education, enforcement, engineering, and emergency response)

Assign responsible agencies for each strategy

Critical Intersections and Segments

Identify critical intersections and segments

Figure 1 *Multi-step approach to Rural Safety Analysis*

Percentage of Number of Crashes
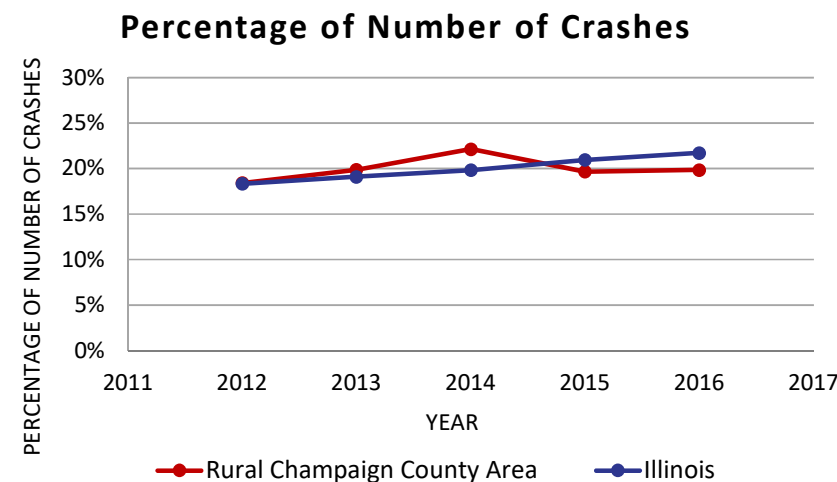
Figure 2   *Comparison of percentage of number of crashes in the rural Champaign County area and Illinois*

- The number of crashes statewide in Illinois increased between 2012 and 2016.

- The number of crashes in the rural Champaign County area increased between 2012 and 2014, decreased in 2015, then increased slightly in 2016.

Percentage of Number of Fatalities
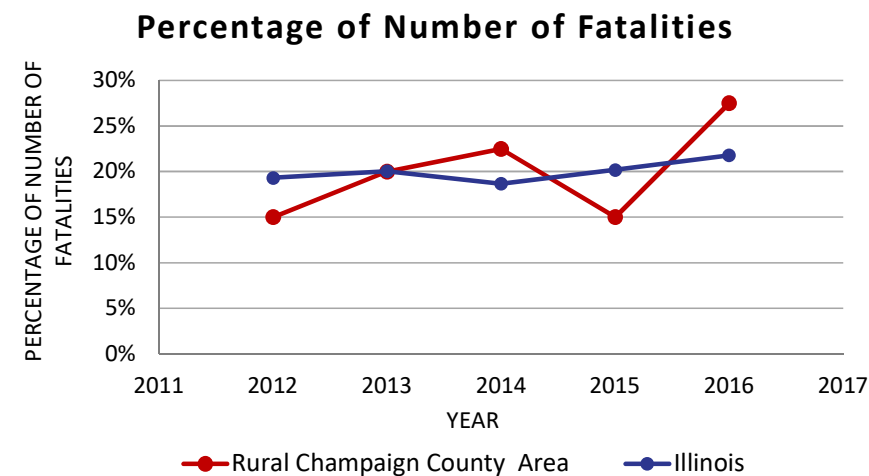
Figure 3   *Comparison of percentage of number of fatalities in the rural Champaign County area and Illinois*

- The percentage of fatalities in Illinois increased slightly between 2014 and 2016.

- The percentage of fatalities in the rural Champaign County area sharply increased in 2016.

Percentage of Number of A-Injuries
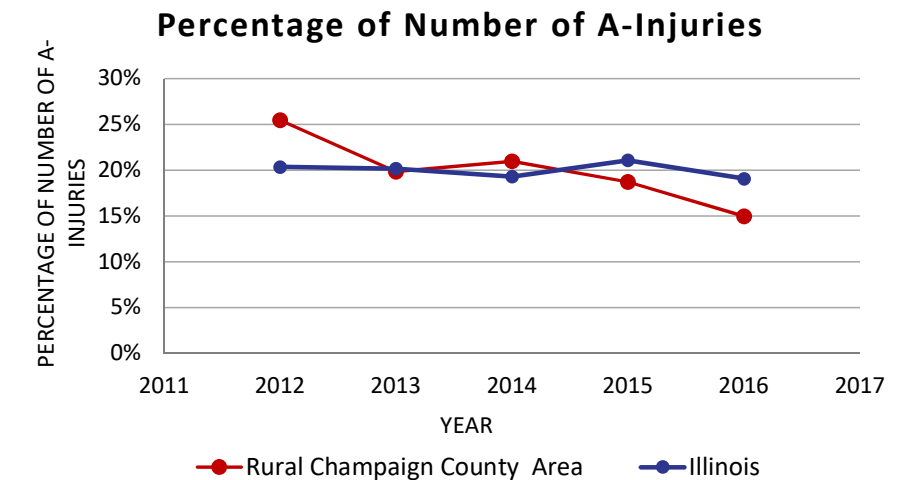
Figure 4   *Comparison of percentage of number of A-injuries (serious injuries) in the rural Champaign County area and Illinois*

- A-injuries are injuries where a person is incapacitated due to a crash. A-injuries are also referred to as serious injuries.

- The percentage of A-injuries in Illinois was generally stable between 2012 and 2015, then decreased in 2016.

- The percentage of A-injuries in the rural Champaign County area showed a decreasing trend between 2012 and 2016.

3 CRASH SEVERITY ANALYSIS

The severity of a crash is determined by the type of the most severe injury of a person in that crash. The crashes are classified in KABCO scale[6,7]: K representing fatal, A as incapacitating injury also referred as serious injury, B as non-incapacitating injury, C as reported/not evident, and O as no indication of injury and only property damage.

- There were five more fatal crashes in the rural Champaign County area in 2016 than there were in 2015; fatal crashes accounted for 1.2 percent of all crashes in the rural Champaign County area during the study period.

- The number of A-injury crashes in the rural Champaign County area decreased from 48 in 2012 to 29 in 2016. A-injury crashes made up 6.3 percent of all crashes in the rural Champaign County area during the study period.

- In 2016, there were 97 B-injury crashes in the rural Champaign County area, an increase from the 83 B-injury crashes in the area in 2015. B-injury crashes made up 15 percent of all crashes in the rural Champaign County area during the study period, the largest percentage of crashes with any injuries or fatalities.

- The number of C-injury crashes in the rural Champaign County area increased from 23 in 2012 to 39 in 2016, accounting for 5.1 percent of all crashes during the study period, a lesser percentage than both A- and B-injury crashes.

- Crashes that caused no injuries and caused only property damage increased from 381 in 2012 to 412 in 2016 in the rural Champaign County area, and comprised 72.3 percent of all crashes in the area during the study period.

Table 1   *Number of crashes by severity type in the five-year study period (2012-2016) in the rural Champaign County area*

Number of Crashes by Severity Type in rural Champaign County area							
Crash Severity	2012	2013	2014	2015	2016	Total	Percent
Fatal	6	7	7	5	10	35	1.2%
A-injury	48	39	37	33	29	186	6.3%
B-Injury	87	91	87	83	97	445	15.0%
C-Injury	23	19	38	33	39	152	5.1%
No Injury	381	432	486	428	412	2,139	72.3%
Total Injuries	545	588	655	582	587	2,957	100.0%
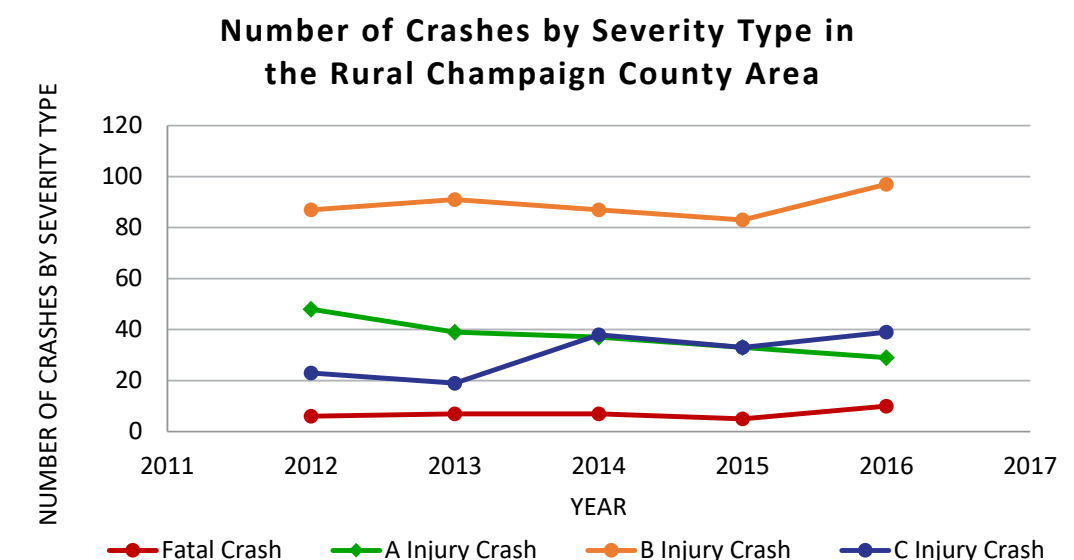
Figure 5   *Number of crashes by severity type in the five-year study period (2012-2016) in the rural Champaign County area*

Legend

Crashes by Severity Type (2012-2016)
- 🔴 Fatal
- 🟡 A-Injury
- 🟢 B-Injury
- 🔵 C-Injury
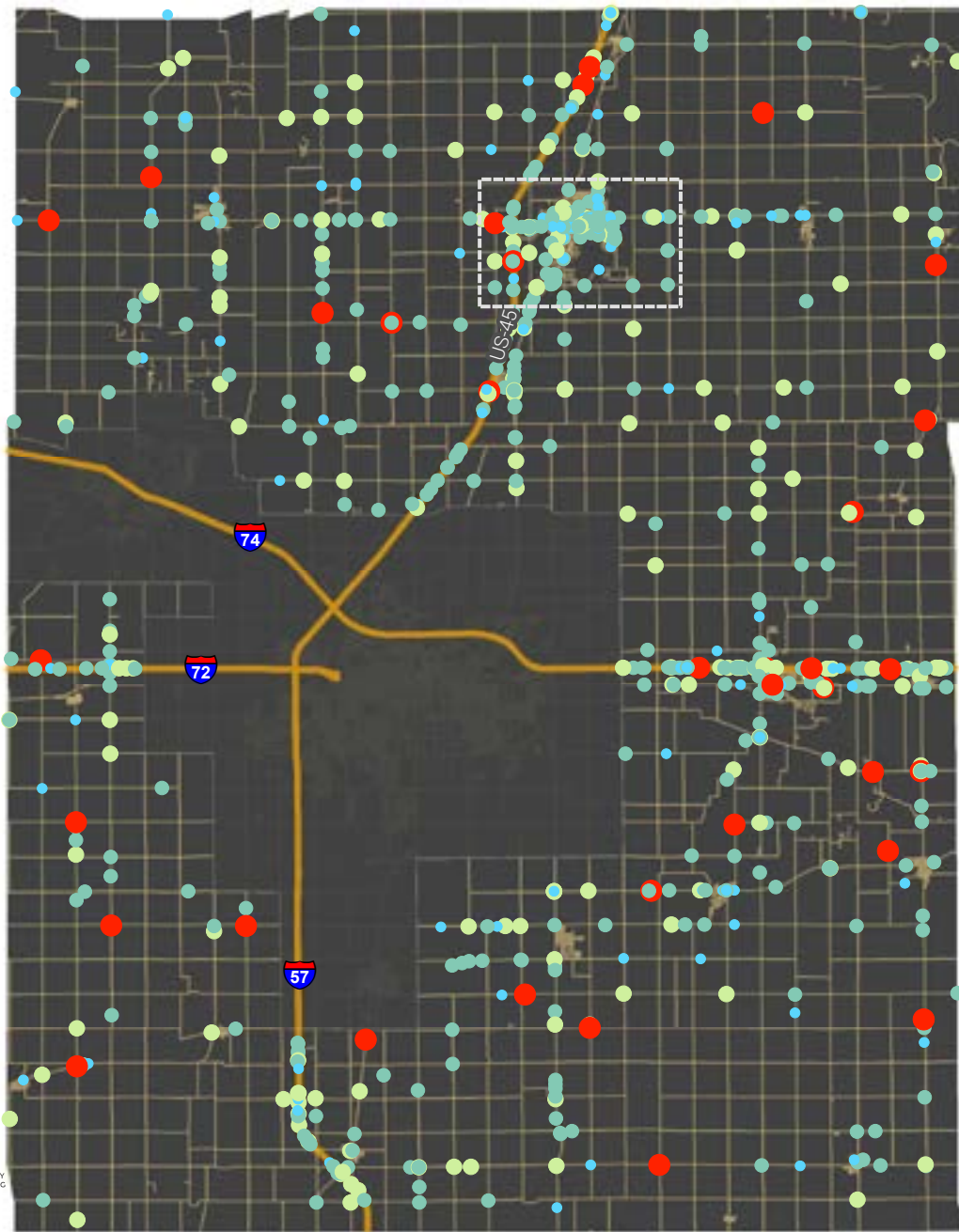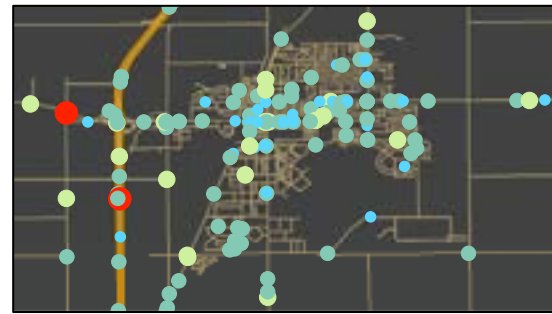
Map 2 *Location of crashes by severity type in the five-year study period (2012-2016) in the rural Champaign County area*
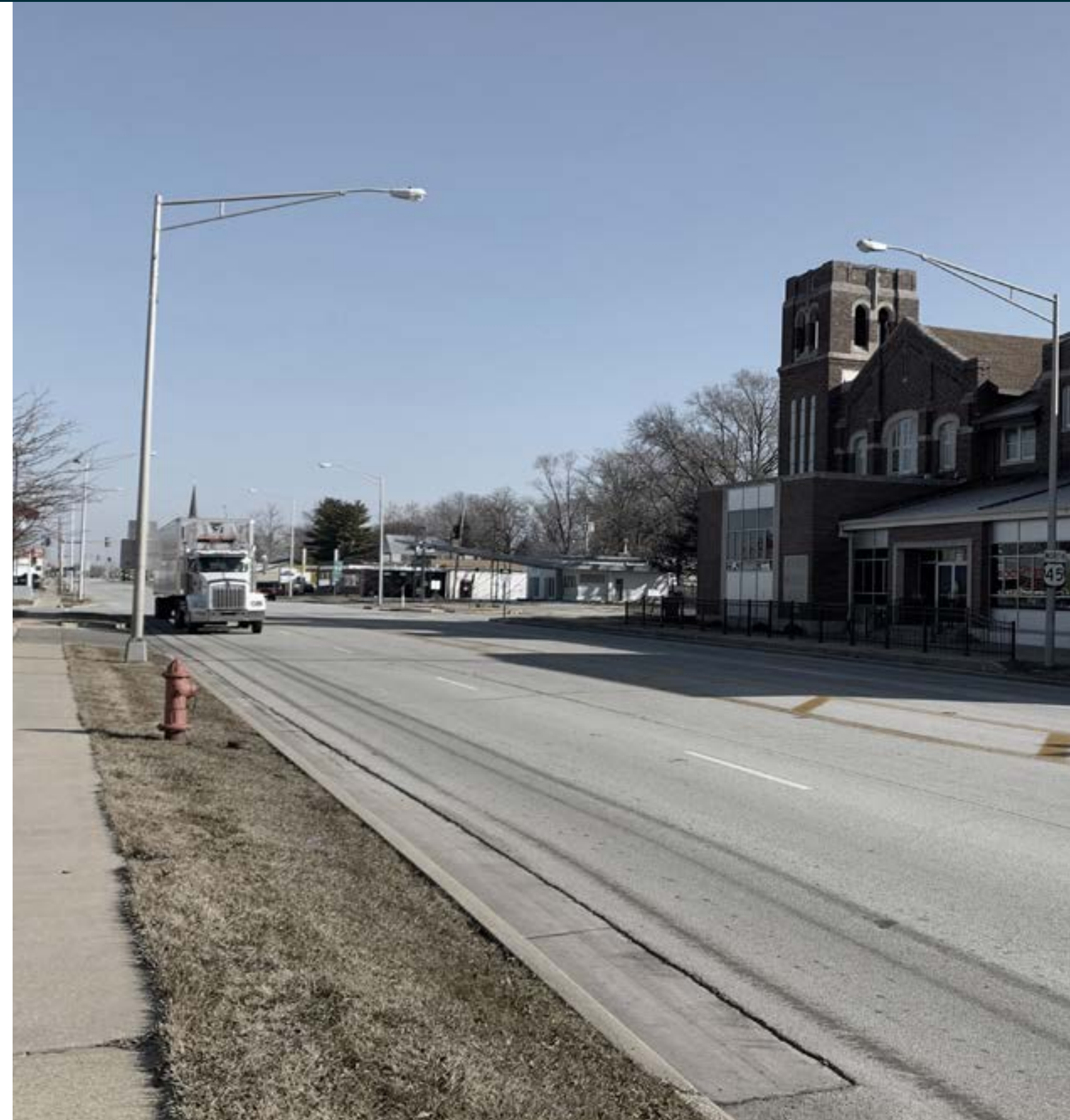
4 FATAL CRASH ANALYSIS

Fatal crashes are defined as crashes in which there is at least one fatality. The five-year average of fatalities is 14 percent higher in 2012-2016 than in 2007-2011. Currently, there is an increasing trend in the number of fatalities in the rural Champaign County area. The objective of RCCASP is to:

- Reduce the five-year rolling average of number of fatalities by 2 percent (from 8 to less than 7) by 2025 based on 2016 in the rural Champaign County area.

Figure 6 shows the trend for number of fatalities in the rural Champaign County area between 2005 and 2016, as well as possible trend projections from 2017 to 2035.

Fatalities in Rural Champaign County Area from 2005 to 2016

Legend:
- Actual Fatalities
- 5-Yr Rolling Avg
- Linear Last 12 Yr
- Linear Last 5 Yr
- 5% Reduction from 5 Yr Rolling Avg
- 2% Reduction from 5 Yr Rolling Avg
- 20% Reduction by 2020

Figure 6 *Trend for number of fatalities in the rural Champaign County area between 2005 and 2016 and possible trend projections for 2017 to 2035*

Legend

Fatal Crashes (2012-2016)
- Intersection
- Segment
- Interstate

N

0 1 2 Miles

Map 3 *Location of fatal crashes in the five-year study period (2012-2016) in the rural Champaign County area*

The 2012-2016 crash data in the rural Champaign County study area was considered in this study.
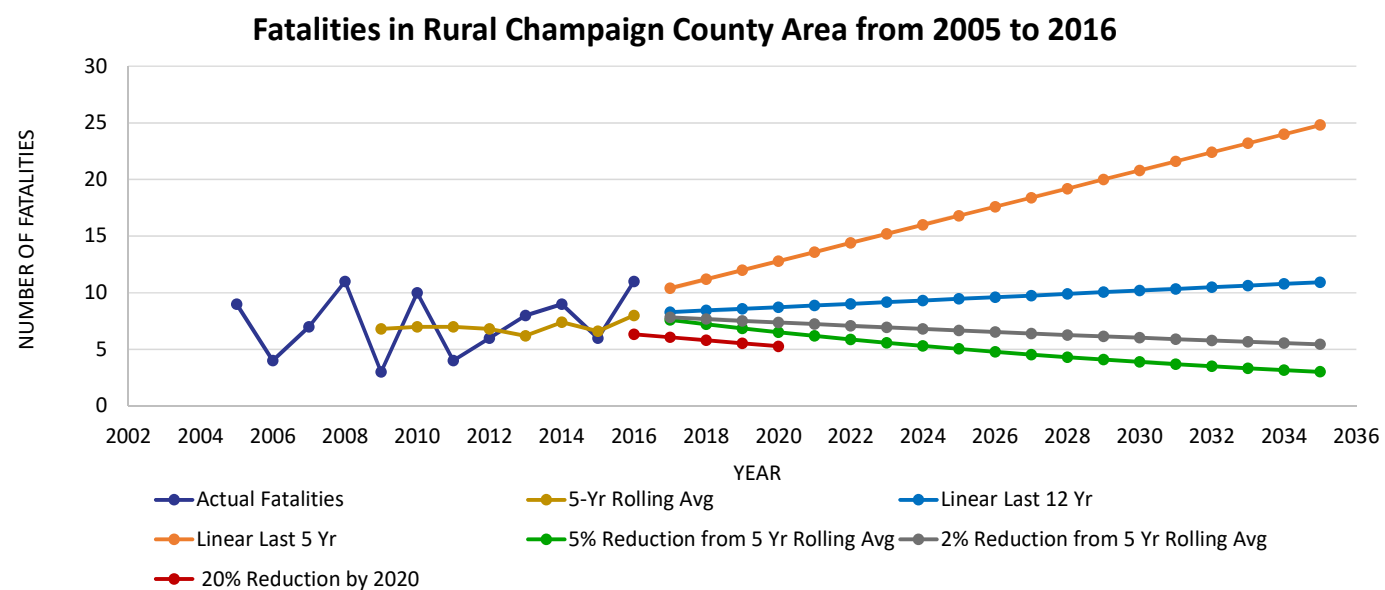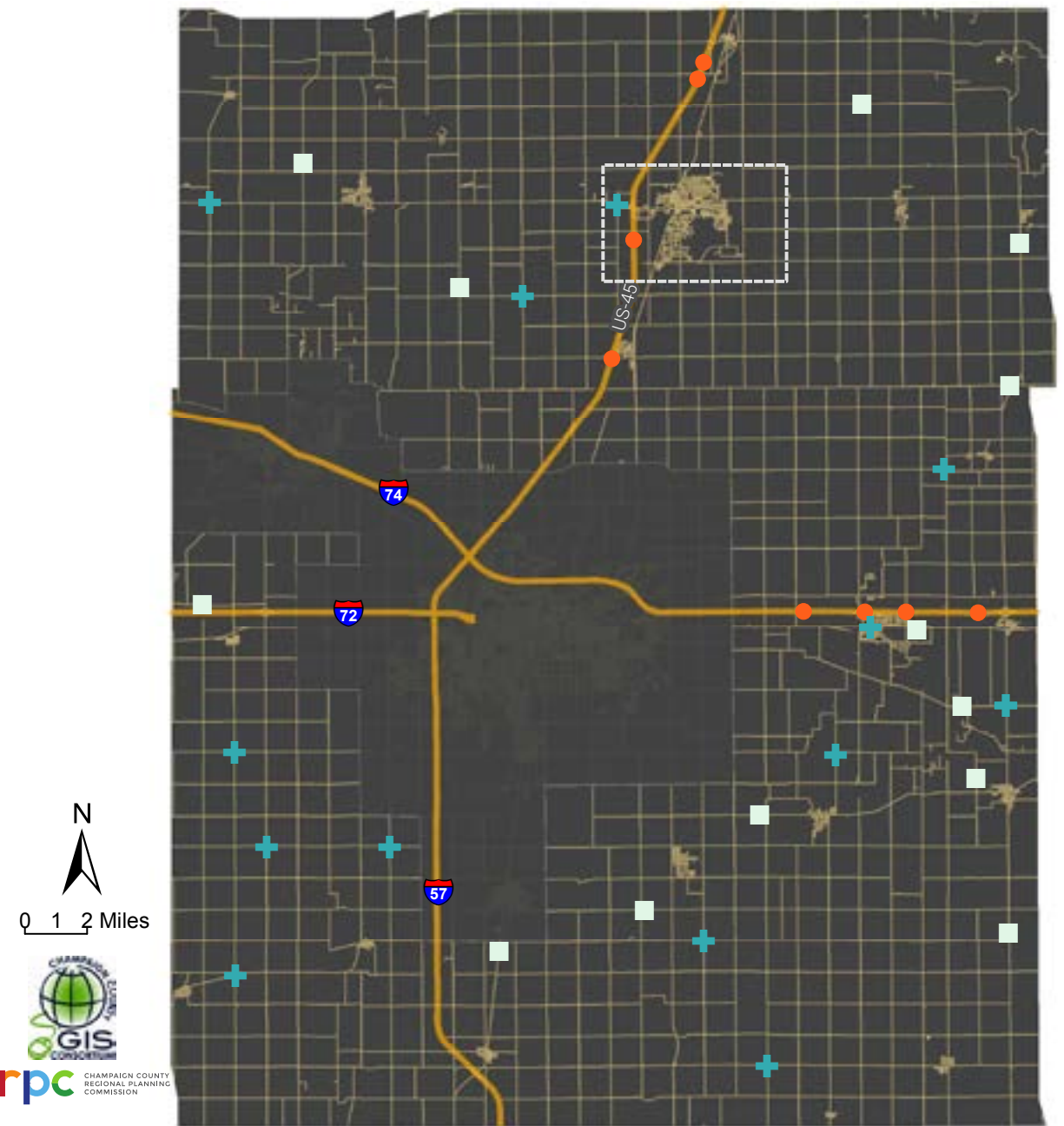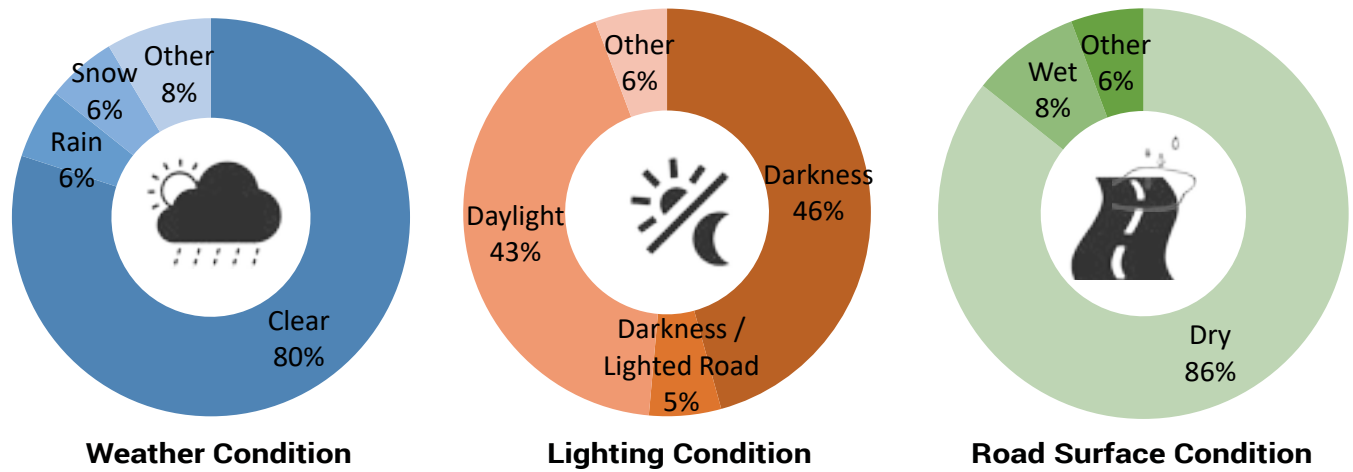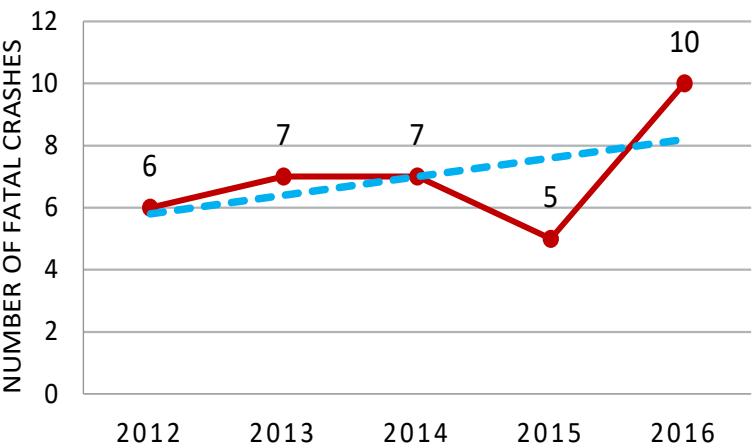
Fatal crashes are defined as crashes in which there is at least one fatality. The five-year average of fatalities is 14 percent higher in 2012-2016 than in 2007-2011. Currently, there is an increasing trend in the number of fatalities in rural Champaign County area.

Weather Condition

- Other 8%
- Snow 6%
- Rain 6%
- Clear 80%

Lighting Condition

- Other 6%
- Darkness 46%
- Daylight 43%
- Darkness / Lighted Road 5%

Road Surface Condition

- Other 6%
- Wet 8%
- Dry 86%

Six percent of fatal crashes occurred during rainy conditions and another six percent occurred in snowy conditions.

Slightly under half (46 percent) of fatal crashes took place in dark conditions. Five percent of fatal crashes took place in dark conditions with roadway lighting.

The road surface was wet for eight percent of fatal crashes, while 86 percent of fatal crashes occurred on dry road surface condition.

NUMBER OF FATAL CRASHES (line chart 2012–2016)

- 2012: 6
- 2013: 7
- 2014: 7
- 2015: 5
- 2016: 10

NUMBER OF DRIVERS vs AGE (bar chart, Female / Male)

8 out of 10 drivers involved in fatal crashes were Male

Eight drivers involved in fatal crashes in the rural Champaign County area between 2012 and 2016 were between 30 and 34 years old, and eight drivers were between 55 and 59 years old which are more than any other age cohort.

Fifty-eight drivers were involved in a fatal crash in the rural Champaign County area between 2012 and 2016. Of these drivers, 83 percent were male and 17 percent were female.

OBJECTIVE

Reduce the five-year rolling average of number of fatalities by 2 percent by 2025 based on 2016 in the rural Champaign County area.

Time of the Day

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan															1				1					
Feb																						1		
Mar					1										2									1
Apr											1			1										
May																		1				1		1
Jun			1	1																				
Jul	1							1																
Aug			1										2											
Sep							1																	
Oct				1			1							1	1			1				1		
Nov				1				1							1			1						
Dec								1						2	1				1		1			

Number of fatal crashes

Highest — Lowest
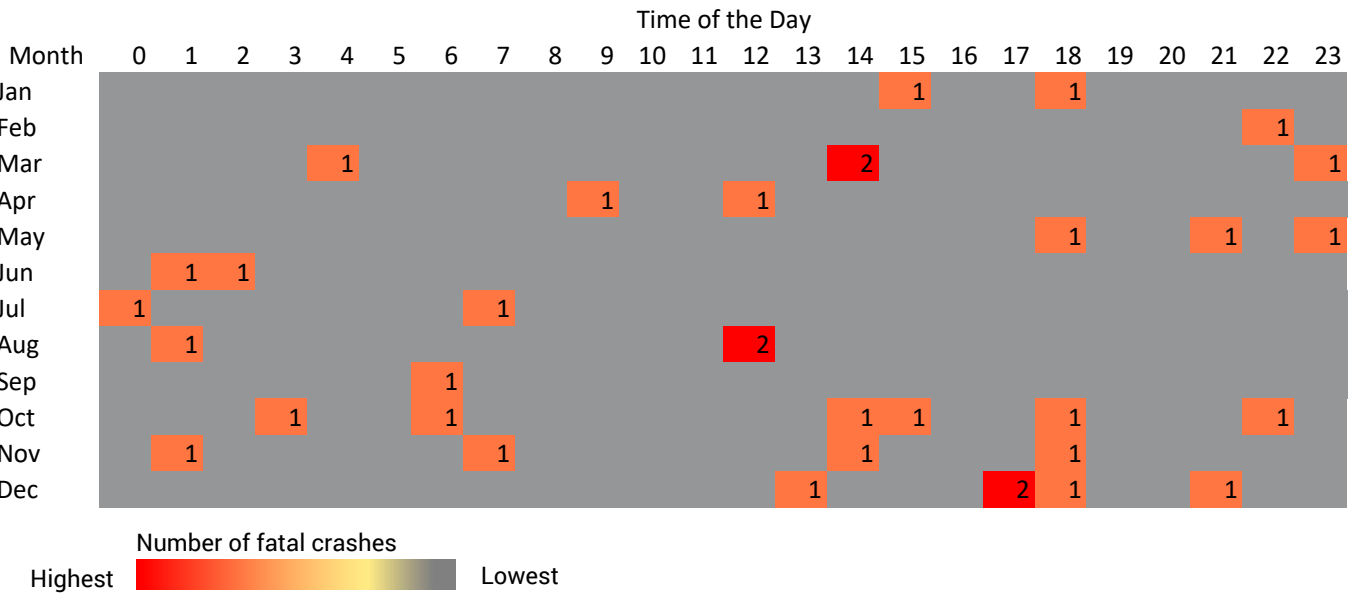
Five fatal crashes occurred in the evening from 6 p.m. to 7 p.m. in the rural Champaign County area between 2012 to 2016. Four fatal crashes took place between 2 p.m. and 3 p.m.

Six fatal crashes occurred in October and five fatal crashes occurred in December. The winter conditions increase the risk of severe crashes making roadways icy or wet with more hours of darkness.

5 A-INJURY CRASH ANALYSIS

A-injuries are injuries where a person is incapacitated by a crash. A-injury crashes are crashes where the most severe injury is an A-injury. In the 2012-2016 study period, a decreasing trend of A-injury crashes was observed. A-injuries are also referred as serious injuries.

The objective of RCCASP is to:

- Reduce the five-year rolling average of number of A-injuries by 2 percent (from 53 to less than 45) by 2025 based on 2016 in the rural Champaign County area.

Figure 7 shows the trend for number of A-injuries in the rural Champaign County area between 2005 and 2016, as well as possible trend projections from 2017 to 2035.

A-Injuries in Rural Champaign County Area from 2005 to 2016

- Actual A-Injuries
- 5-Yr Rolling Avg
- Linear Last 12 Yr
- Linear Last 5 Yr
- 5% Reduction from 5 Yr Rolling Avg
- 2% Reduction from 5 Yr Rolling Avg
- 15% Reduction by 2020

Figure 7 *Trend for number of A-injuries (serious injuries) in the rural Champaign County area between 2005 and 2016 and possible trend projections for 2017 to 2035*

Legend

A-Injury Crashes (2012-2016)

- ✛ Intersection
- ▢ Segment
- ● Interstate

Map 4 *Location of A-injury crashes in the five-year study period (2012-2016) in the rural Champaign County area*

The 2012-2016 crash data in the rural Champaign County study area was considered in this study.

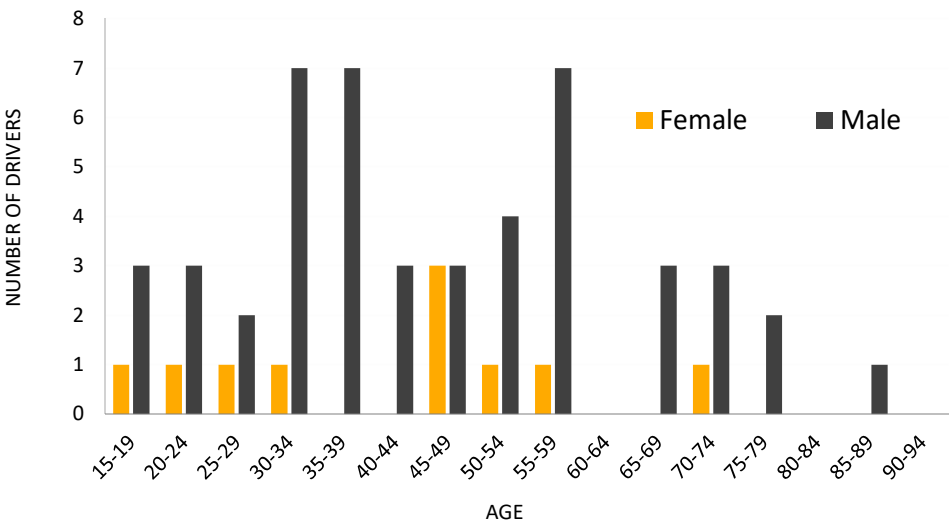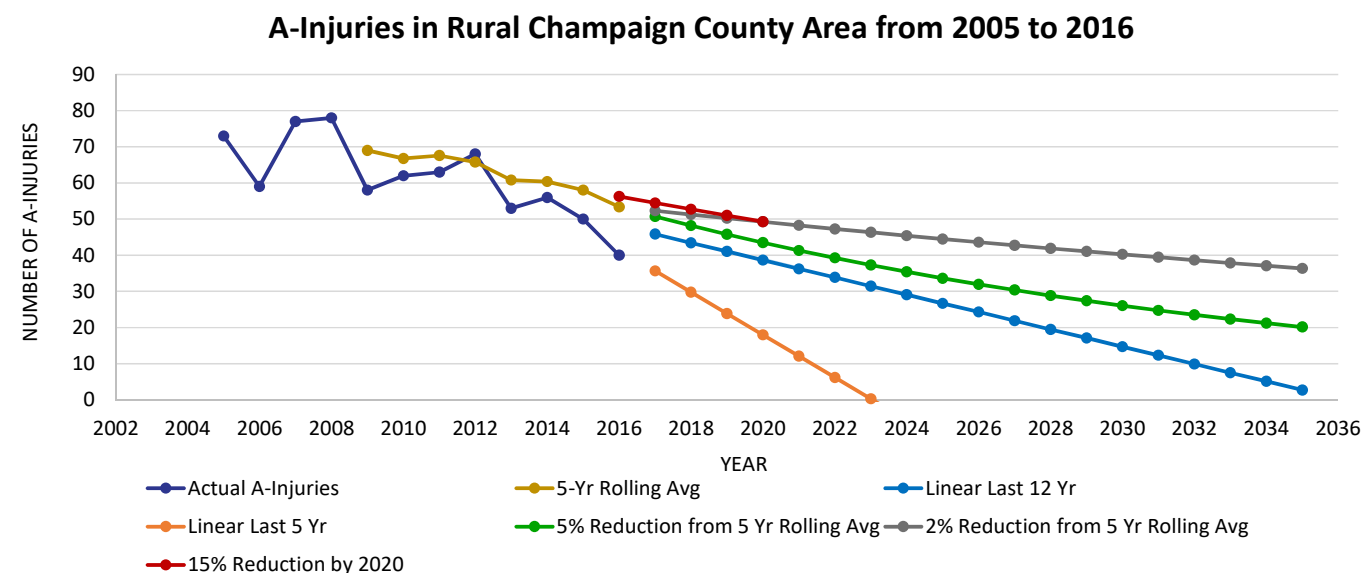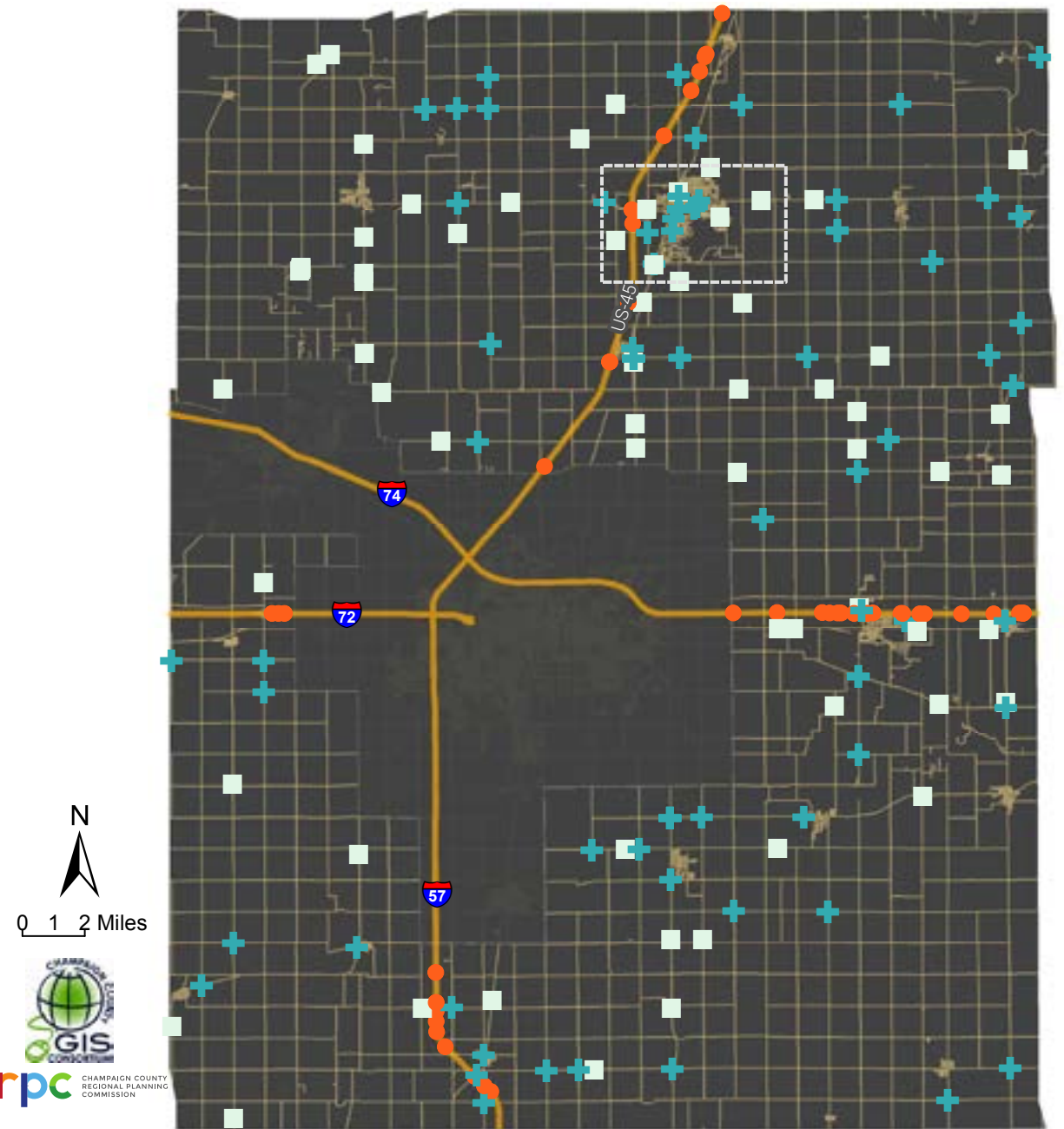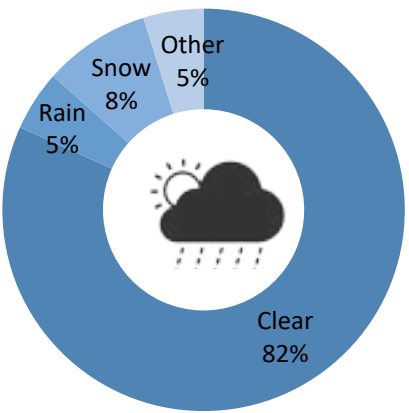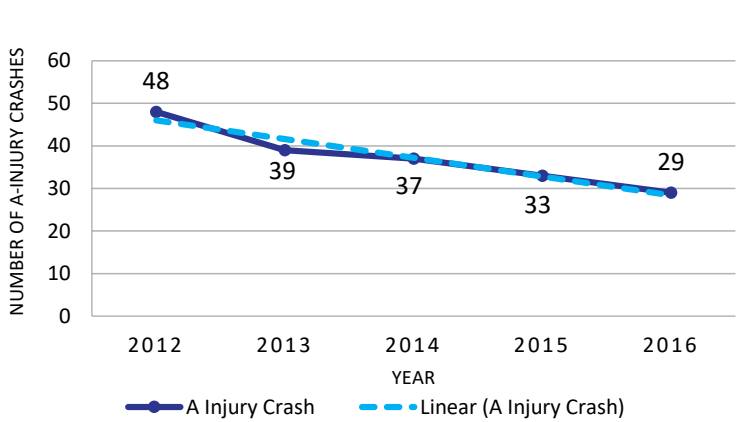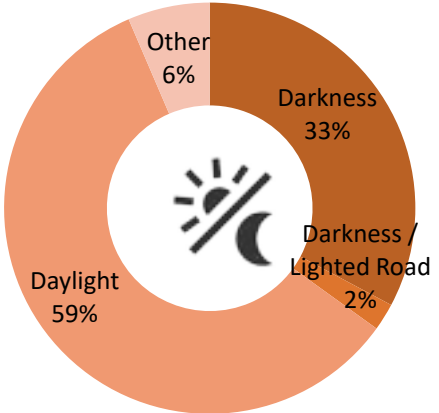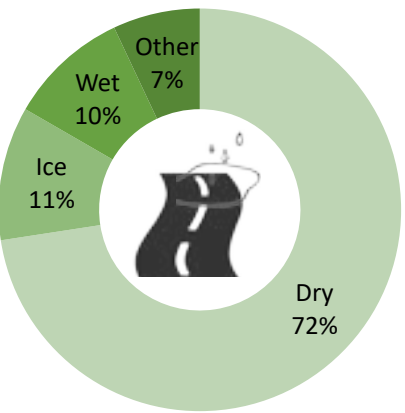A-injuries are injuries where a person is incapacitated by a crash. A-injury crashes are crashes where the most severe injury is an A-injury. A-injuries are also referred as serious injuries.
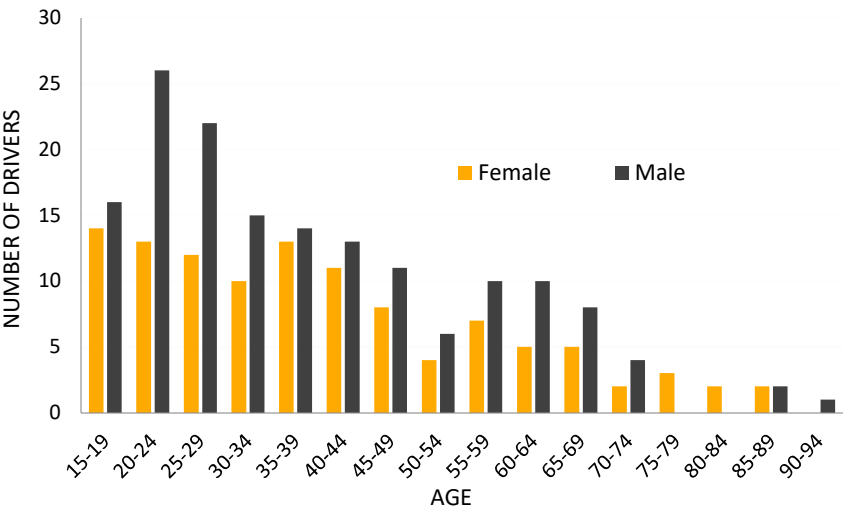
Weather Condition

Other 5%
Snow 8%
Rain 5%
Clear 82%

Lighting Condition

Other 6%
Darkness 33%
Darkness / Lighted Road 2%
Daylight 59%

Road Surface Condition

Other 7%
Wet 10%
Ice 11%
Dry 72%

Eight percent of A-injury crashes occurred in snowy conditions, while five percent occurred in rainy conditions.

Thirty-three percent of A-injury crashes took place in dark conditions. Two percent of A-injury crashes took place in dark conditions with roadway lighting.

Eleven percent of A-injury crashes occurred on an icy road surface, and 10 percent occurred on a wet road surface.

A-injury crash line chart (NUMBER OF A-INJURY CRASHES vs YEAR)

48 (2012), 39 (2013), 37 (2014), 33 (2015), 29 (2016)

Legend: A Injury Crash, Linear (A Injury Crash)

Age/Gender bar chart (NUMBER OF DRIVERS vs AGE)

Legend: Female, Male

6 out of 10 drivers involved in A-injury crashes were **Male**

Thirty-nine drivers involved in A-injury crashes were between the ages of 20 and 24 years old.

Two hundred seventy-two drivers were involved in an A-injury crash. Of these drivers, 59 percent were male and 41 percent were female.

OBJECTIVE

Reduce the five-year rolling average of number of A-injuries by 2 percent by 2025 based on 2016 in the rural Champaign County area.

Time of the Day heat map

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan	1				1			1	6	1		1		2	1						1	2		
Feb	2				1				1			1		2				1	1	1				1
Mar				1			1		2			1	1			1					2			
Apr	1				2		1				2	1	3			1		1		2				
May				1				2		1	1			1	1	2	2			1	4			2
Jun	2			1	1	2			2		1			1		1	2	1	2		2	2		
Jul	1		1		1	1					1	2			2	1	1		1	1	1			1
Aug	1	1		2		1		2		2			1	2	1	1			1	1	2			2
Sep					2			1		1		2	1		4			1	1					2
Oct			1	1				1	1		2	1	3	1	1	1	3							1
Nov								1			1	2	1	2			2	1				1	2	
Dec	1					1	1	1	1		2			2	2	1	2	1	1	1				

Number of A-injury crashes
Highest — Lowest
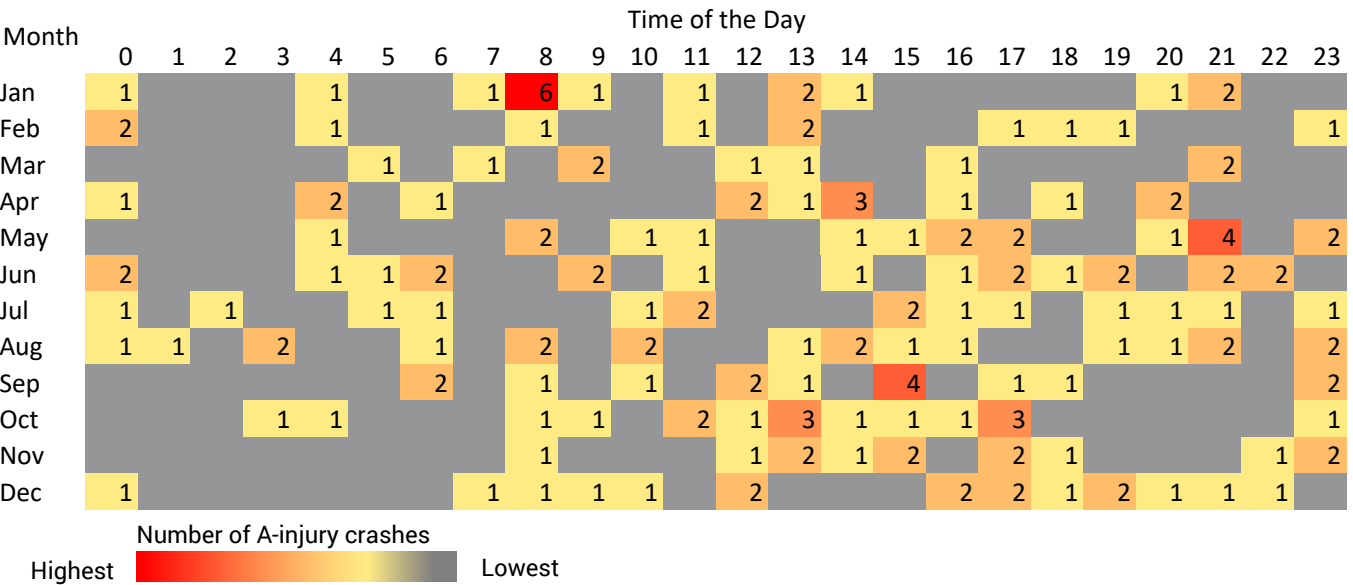
Fifteen A-injury crashes took place between 8 a.m. and 9 a.m. Fourteen A-injury crashes took place between 5 p.m. and 6 p.m., and 14 other A-injury crashes took place between 9 p.m. and 10 p.m.

6 ANALYSIS BY COLLISION TYPE

Table 2 *Number of crashes by collision type from 2012 to 2016 in the rural Champaign County area*

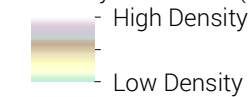| Collision Types	Intersection	Interstate	Segment (Non-Interstate)	Total	Percent
Number of Crashes occurring at Intersections, Segments and Interstates by Collision Types in the rural Champaign County area					
Angle	**229**	**8**	**20**	**257**	**9%**
Animal	72	153	182	407	14%
Fixed Object	**234**	**392**	**297**	**923**	**31%**
Head On	7	2	18	27	1%
Other Non-Collision	23	70	27	120	4%
Other Object	19	20	23	62	2%
Overturned	33	50	106	189	7%
Parked Motor Vehicle	102	4	60	166	6%
Pedalcyclist	10	0	4	14	0%
Pedestrian	13	5	4	22	1%
Rear End	**140**	**127**	**60**	**327**	**11%**
Sideswipe Opposite Direction	13	1	17	31	1%
Sideswipe Same Direction	24	122	21	167	6%
Train	1	0	4	5	0%
Turning	**205**	**2**	**33**	**240**	**8%**
Grand Total	1,125	956	876	2,957	100%

Crashes were categorized by collision type and are listed in Table 2 by percentage. The four most significant collision types were fixed object crashes (31 percent), rear end crashes (11 percent), angle crashes (9 percent), and turning crashes (8 percent). Rear end, angle, and turning crashes were more prevalent at intersections than on road segments. Considering only the intersection- and road segment-related crashes, the significant causes of the crashes for the four collision types identified earlier are listed below:

- For fixed object crashes was exceeding the speed limit, impaired driving, improper lane usage, failing to reduce speed.
- For rear end crashes was failing to reduce speed to avoid a crash.
- For angle crashes was failing to yield the right-of-way.
- For turning crashes was failing to yield the right-of-way.

Failing to reduce speed and failing to yield the right-of-way were common causes for crashes at intersections and road segments in the rural Champaign County area between 2012 and 2016.

Legend

Density of Crashes (2012-2016)

- High Density
- Low Density

Note: The crashes are Fixed Object, Rear End, Angle and Turning Collision types at intersections and road segments

N

0 1 2 Miles
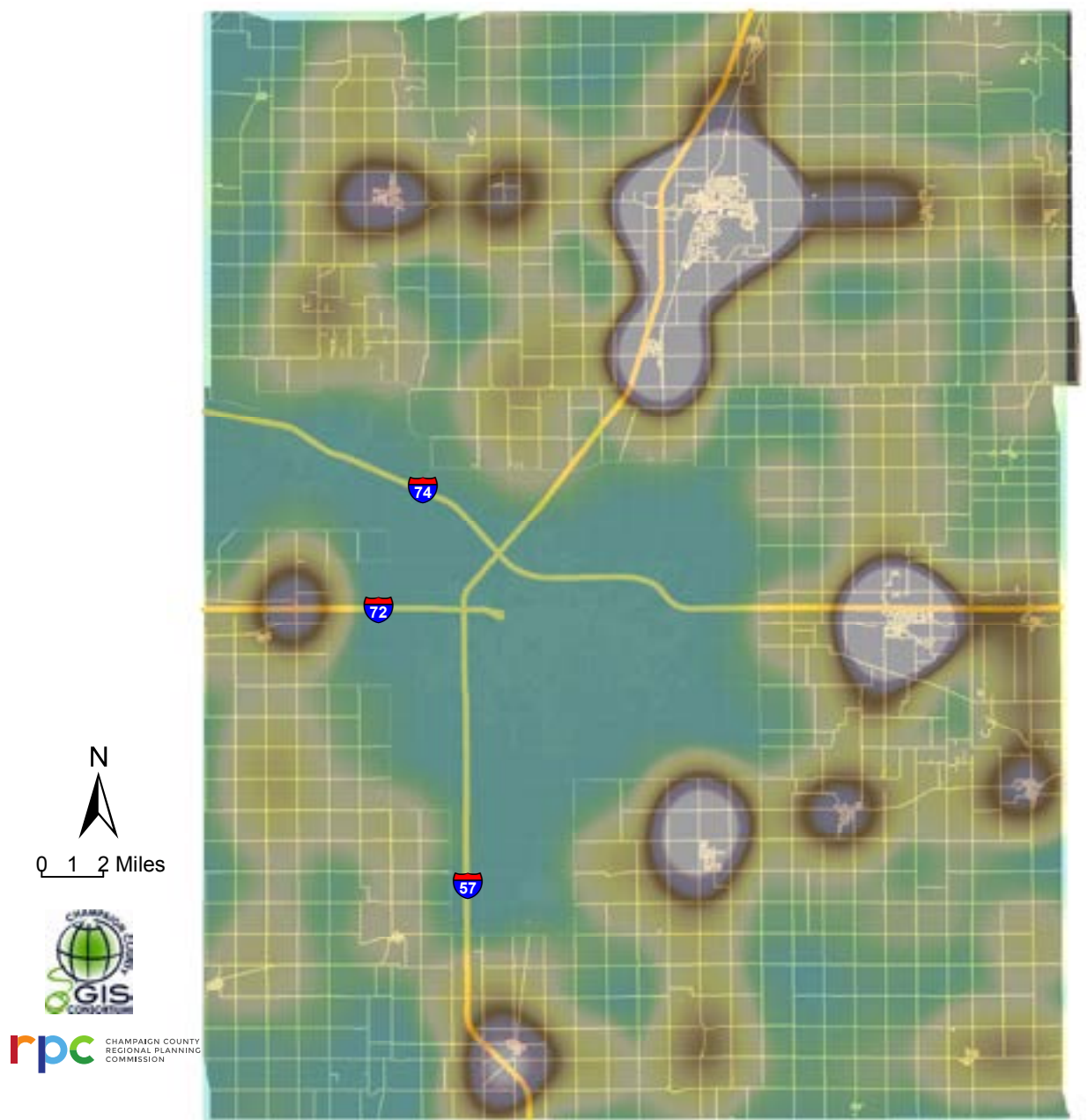
Map 5 *Heat map showing the density of crashes in the five-year study period (2012-2016) in the rural Champaign County area*
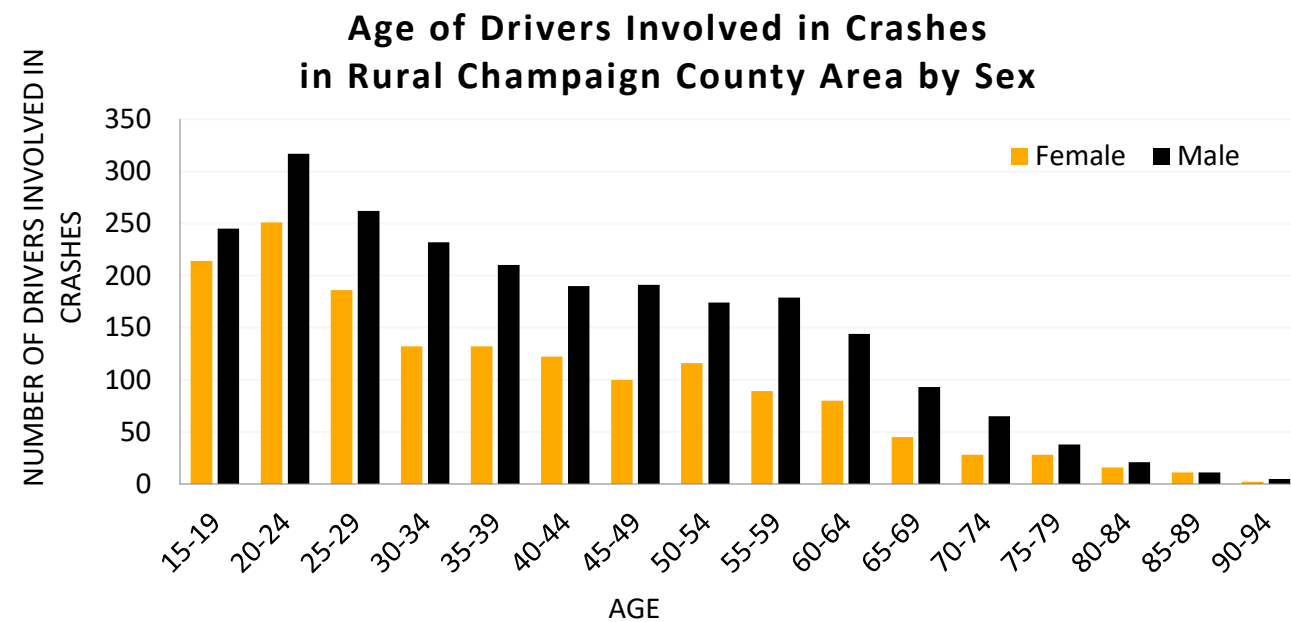
7 ANALYSIS BY DRIVER AGE AND SEX

Age of Drivers Involved in Crashes in Rural Champaign County Area by Sex

Figure 8 *Age of drivers by sex involved in crashes in the five-year study period (2012-2016) in the rural Champaign County area*

All drivers involved in crashes in the rural Champaign County area between 2012 and 2016 were categorized by age and sex.

- In all age cohorts, there were more male drivers involved in crashes than female drivers between 2012 and 2016. Overall, 58 percent of drivers involved in crashes were male, 38 percent were female. The sex of the remaining 4 percent of drivers was unknown.

- More than 580 drivers aged 20-24 years were involved in crashes between 2012 and 2016 (14% of drivers involved in crashes). More than 480 drivers aged 15-19 years and more than 450, drivers aged 25-29 years were involved in crashes between 2012 and 2016 (combined 22 percent of drivers involved in crashes).

Legend
Young Drivers (2012-2016)

Age of Driver

- 15-19 years
- 20-24 years

Map 6 *Location of crashes by age of drivers in the five-year study period (2012-2016) in the rural Champaign County area*

8 ANALYSIS BY DRIVER PHYSICAL CONDITION

Table 3   *Number of drivers by physical condition at the time of the crash in the five-year study period (2012-2016) in the rural Champaign County area*

Number of Drivers by Physical Condition at the Time of the Crash in the rural Champaign County area				
Driver Physical Condition	A-injury Crash	Fatal Crash	Total Crashes	Percent
Normal	144	11	3,472	84%
Impaired	**34**	**14**	**176**	**4%**
Asleep/Fainted/Illness	3	0	38	1%
Medicated	1	0	1	0%
Had been Drinking	2	0	39	1%
Fatigued	2	0	70	2%
Other/ Unknown	6	0	303	7%
Emotional (Added in 2013)	0	0	7	0%
Removal by EMS (Added in 2013)	3	0	6	0%
Total	195	25	4,112	100%

The physical condition of drivers involved in fatal and A-injury crashes in the rural Champaign County area between 2012 and 2016 were considered.

- A large majority (84 percent) of drivers involved in fatal or A-injury crashes in the rural Champaign County area during the study period had a normal physical condition at the time of the crash.

- Four percent of drivers involved in fatal or A-injury crashes were impaired at the time of the crash, meaning that alcohol or drug use had impacted their physical condition.

- Although impaired drivers make up a relatively small percentage of drivers involved in all crashes, the crashes that they are involved tend to be more severe. Nearly 56 percent of all fatal crashes during the study period involved an impaired driver, and over 17 percent of all A-injury crashes during the study period involved an impaired driver.

9 CRASH DISTRIBUTION

Percentage of Crashes by Transportation System in the Rural Champaign County Area

- Intersection
- Interstate
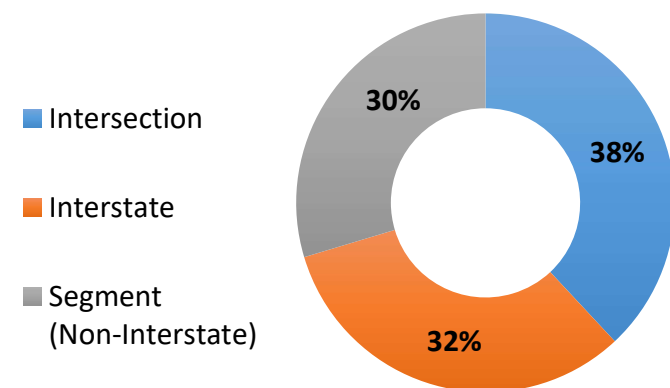- Segment (Non-Interstate)

Figure 9 *Distibution of crashes across transportation system types (intersection, road segments and interstates), in the five-year study period (2012-2016) in the rural Champaign County area*

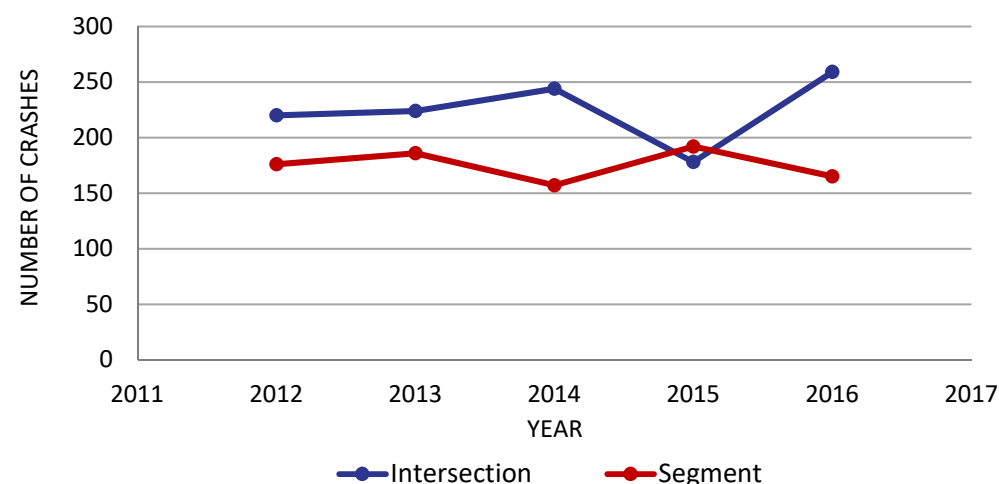**Intersection and Segment Crashes in the Rural Champaign County Area**

Figure 10 *Number of intersection and segment crashes in the five-year study period (2012-2016) in the rural Champaign County area*

The distribution of crashes during the study period across transportation system types in the rural Champaign County area was relatively even.

- Crashes that took place at intersections accounted for 38 percent of all crashes in the rural Champaign County area between 2012 and 2016. The number of crashes that took place at intersections in the rural Champaign County area increased slowly between 2012 and 2014, dropped sharply in 2015, and increased in 2016. A greater number of intersection related crashes took place in 2016 than in any other year in the study period.

- Crashes that took place on interstates accounted for 32 percent of all crashes in the rural Champaign County area between 2012 and 2016.

- Crashes that took place on non-interstate road segments accounted for 30 percent of all crashes in the rural Champaign County area between 2012 and 2016. The number of crashes that took place on non-interstate road segments in the rural Champaign County area fluctuated between approximately 150 and 200 between 2012 and 2016.

Based on the analysis of crash severity, crash distribution, fatal crashes, A-injury crashes, collision types, and driver characteristics, three emphasis areas were identified:

- Roadway Departures
- Intersections
- Impaired Driving

In addition, crashes on roadway segments were analyzed and high-priority segments were identified.

(10) ROAD SEGMENT CRASHES

Crashes that were not intersection or interstate crashes were assumed to be roadway segment crashes.

Table 4 presents the summary of the roadway segment crashes: 1.5 percent of the crashes occurring on road segments were fatal and 7.3 percent were A-injury crashes.
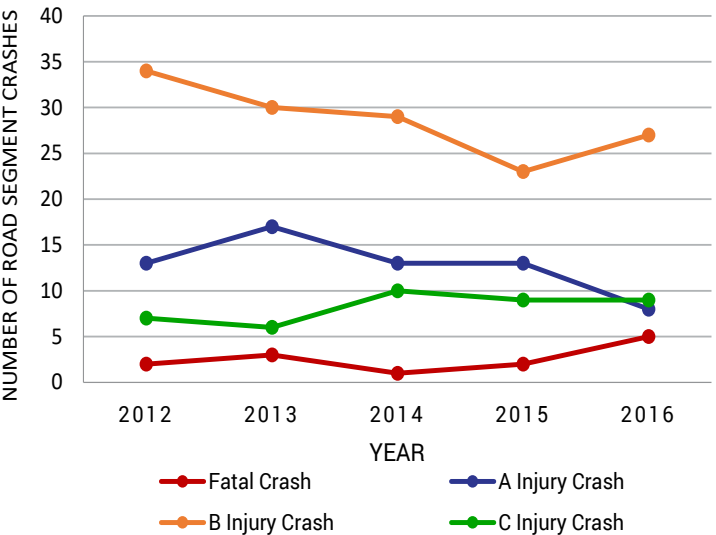
Table 4 *Number of crashes at road segments by severity type in the five-year study period (2012-2016) in the rural Champaign County area*

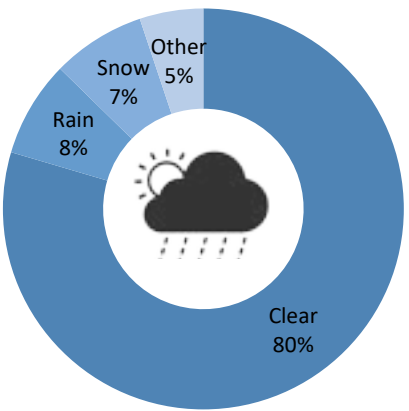| Number of Crashes at Road Segments by Severity Type in the rural Champaign County area							
Crash Severity	2012	2013	2014	2015	2016	Total	Percent
Fatal	2	3	1	2	5	13	1.5%
A-injury	13	17	13	13	8	64	7.3%
B-Injury	34	30	29	23	27	143	16.3%
C-Injury	7	6	10	9	9	41	4.7%
No Injury/ Property Damage Only	120	130	104	145	116	615	70.2%
Total	176	186	157	192	165	876	100.0%

ROAD SEGMENT CRASHES

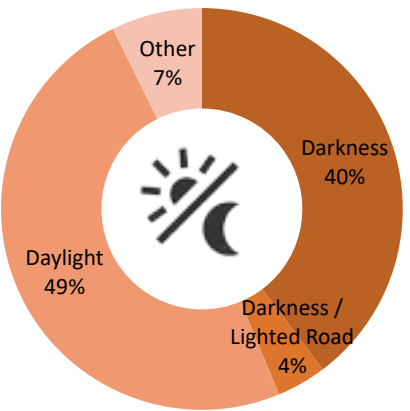The 2012-2016 crash data in the rural Champaign County study area was considered in this study.

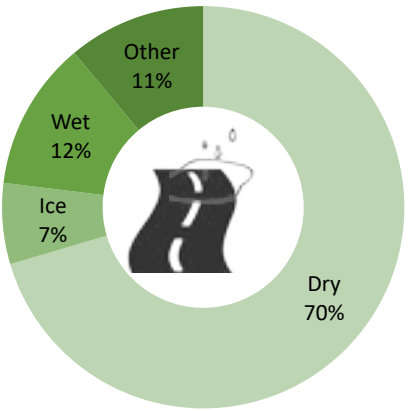Crashes that were not intersection or interstate crashes were assumed to be roadway segments crashes.

Weather Condition

Rain 8%
Snow 7%
Other 5%
Clear 80%

Lighting Condition

Other 7%
Darkness 40%
Daylight 49%
Darkness / Lighted Road 4%

Road Surface Condition

Other 11%
Wet 12%
Ice 7%
Dry 70%

Seven percent of road segment crashes occurred in snowy conditions, while eight percent occurred in rainy conditions.

Forty percent of road segment crashes took place in dark conditions. Four percent of road segment crashes took place in dark conditions with roadway lighting.

Seven percent of road segment crashes occurred on an icy road surface and twelve percent occurred on a wet road surface.
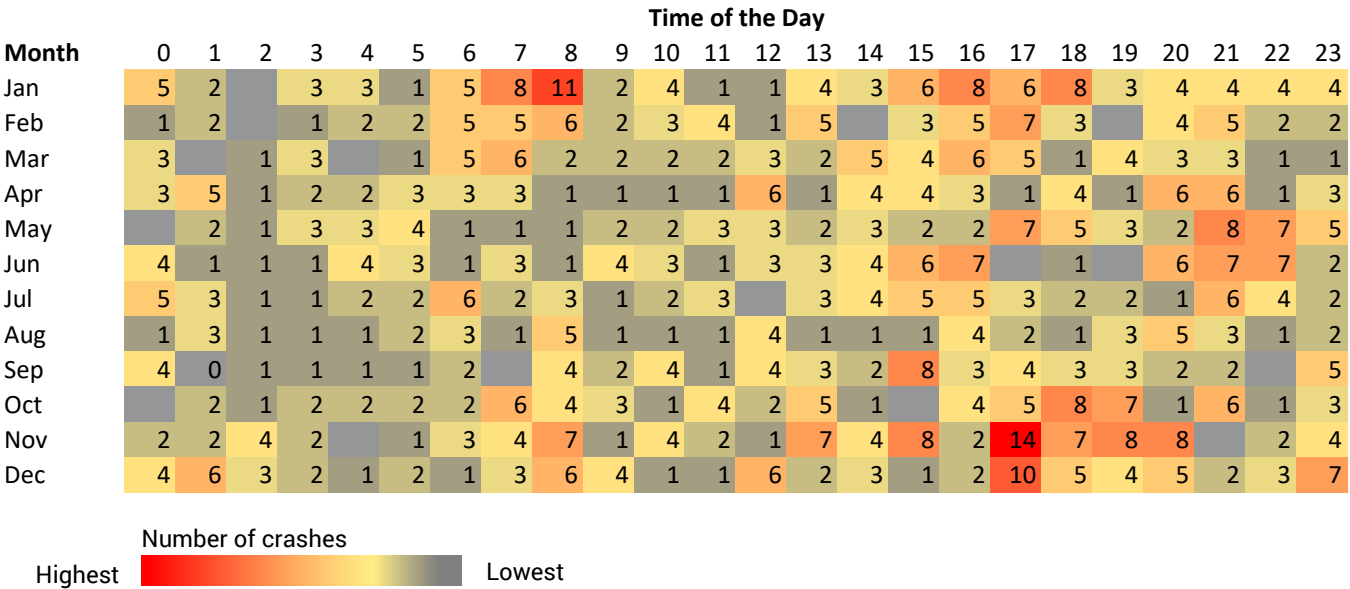

One and half percent of the road segment crashes were **fatal,** while **7.3 percent** and 16.3 percent were **A-injury** and B-injury respectively.
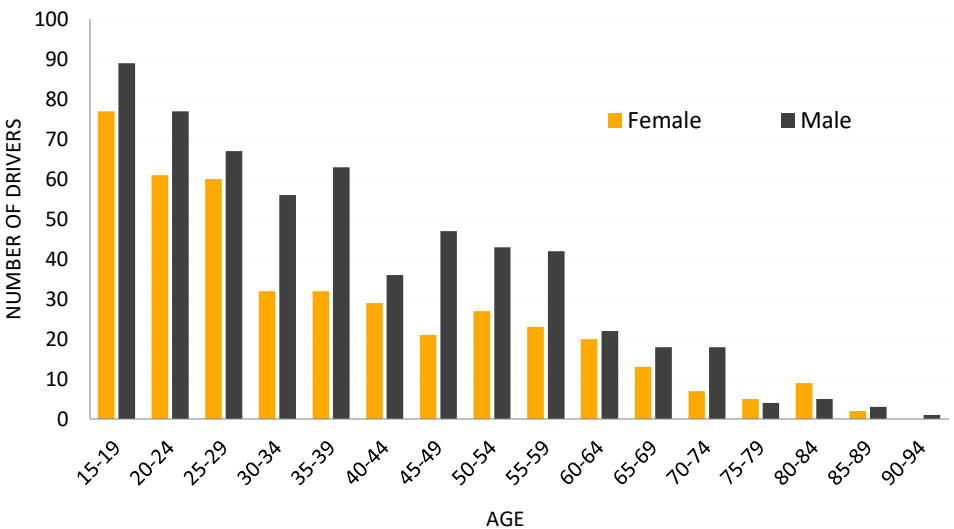
5 out of **10** drivers involved in roadway segment crashes were **Male**

One hundred sixty-six drivers involved in road segment crashes were between the ages of 15 and 19 years old which is more than in any other age cohort. There were 138 drivers between the ages of 20 and 24 years old.

There were 1,058 drivers involved in crashes on road segments in Rural Champaign County Area between 2012 and 2016. Of these 53 percent were male and 42 percent were female. The sex of the remaining 5 percent was unknown.

Time of the Day

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan	5	2		3	3	1	5	8	11	2	4	1	1	4	3	6	8	6	8	3	4	4	4	4
Feb	1	2		1	2	2	5	5	6	2	3	4	1	5		3	5	7	3		4	5	2	2
Mar	3		1	3		1	5	6	2	2	2	2	3	2	5	4	6	5	1	4	3	3	1	1
Apr	3	5	1	2	2	3	3	3	1	1	1	1	6	1	4	4	3	1	4	1	6	6	1	3
May		2	1	3	3	4	1	1	1	2	2	3	3	2	3	2	2	7	5	3	2	8	7	5
Jun	4	1	1	1	4	3	1	3	1	4	3	1	3	3	4	6	7		1		6	7	7	2
Jul	5	3	1	1	2	2	6	2	3	1	2	3		3	4	5	5	3	2	2	1	6	4	2
Aug	1	3	1	1	1	2	3	1	5	1	1	1	4	1	1	1	4	2	1	3	5	3	1	2
Sep	4	0	1	1	1	1	2		4	2	4	1	4	3	2	8	3	4	3	3	2	2		5
Oct		2	1	2	2	2	2	6	4	3	1	4	2	5	1		4	5	8	7	1	6	1	3
Nov	2	2	4	2		1	3	4	7	1	4	2	1	7	4	8	2	14	7	8	8		2	4
Dec	4	6	3	2	1	2	1	3	6	4	1	1	6	2	3	1	2	10	5	4	5	2	3	7

Number of crashes
Highest — Lowest

Peak periods for crashes on road segments in the Rural Champaign County Area between 2012 and 2016 were 8 a.m. to 9 a.m. and 5 p.m. to 6 p.m., each with more than 50 crashes over the course of the study period.

One hundred road segment crashes occurred in January. Ninety-seven crashes in November.

10.1 High-Priority Segments

High-priority segments were identified based on equivalent crashes, crash frequency, and crash frequency per mile. Equivalent crashes were calculated based on crash severity: more severe crashes (e.g., fatal crashes) were weighted more heavily than less severe crashes (e.g., C-injury crashes). Crash frequency is the average number of crashes over the five year study period and crash frequency per mile is the average crashes per mile of the segment. These measures were combined to produce a Priority Index, which is used to identify high-priority road segments in the rural Champaign County area.

Methodology to Identify High Priority Segments:

Equivalent Crashes = $\dfrac{\textit{(25*Fatal Crashes + 10*A-injury Crashes + B-injury Crashes + C-injury Crashes)}}{5}$

Crash Frequency = $\dfrac{\textit{Total Number of Crashes}}{5}$

Crash Frequency Per Mile = $\dfrac{\textit{Total Number of Crashes}}{\textit{5*Length of Segment}}$

High-priority segments were identified based on three factors: Equivalent Crashes, Crash Frequency and Crash Frequency per Mile.

- Equivalent Crashes, Crash Frequency and Crash Frequency per Mile were calculated for each segment based on the equations presented.
- Considering all the segments, a mean and standard deviation for the three factors were calculated.
- For each segment, based on the equivalent crashes, crash frequency and crash frequency per mile values from its mean, an index was assigned.
- The three index values were combined to give a priority index value.
- The higher the priority index value, the higher the priority given to the segment was.
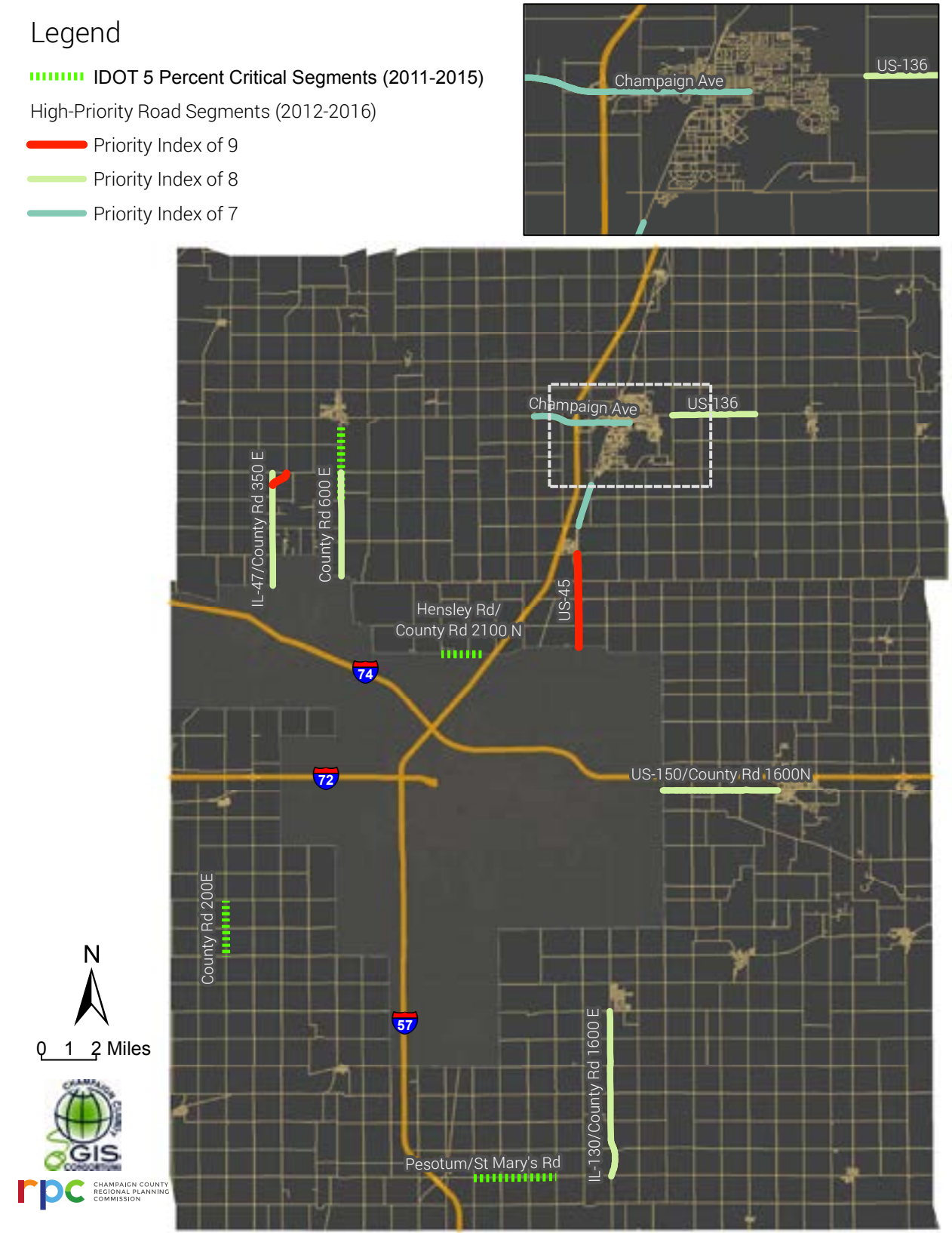- A list of high-priority segments was identified.
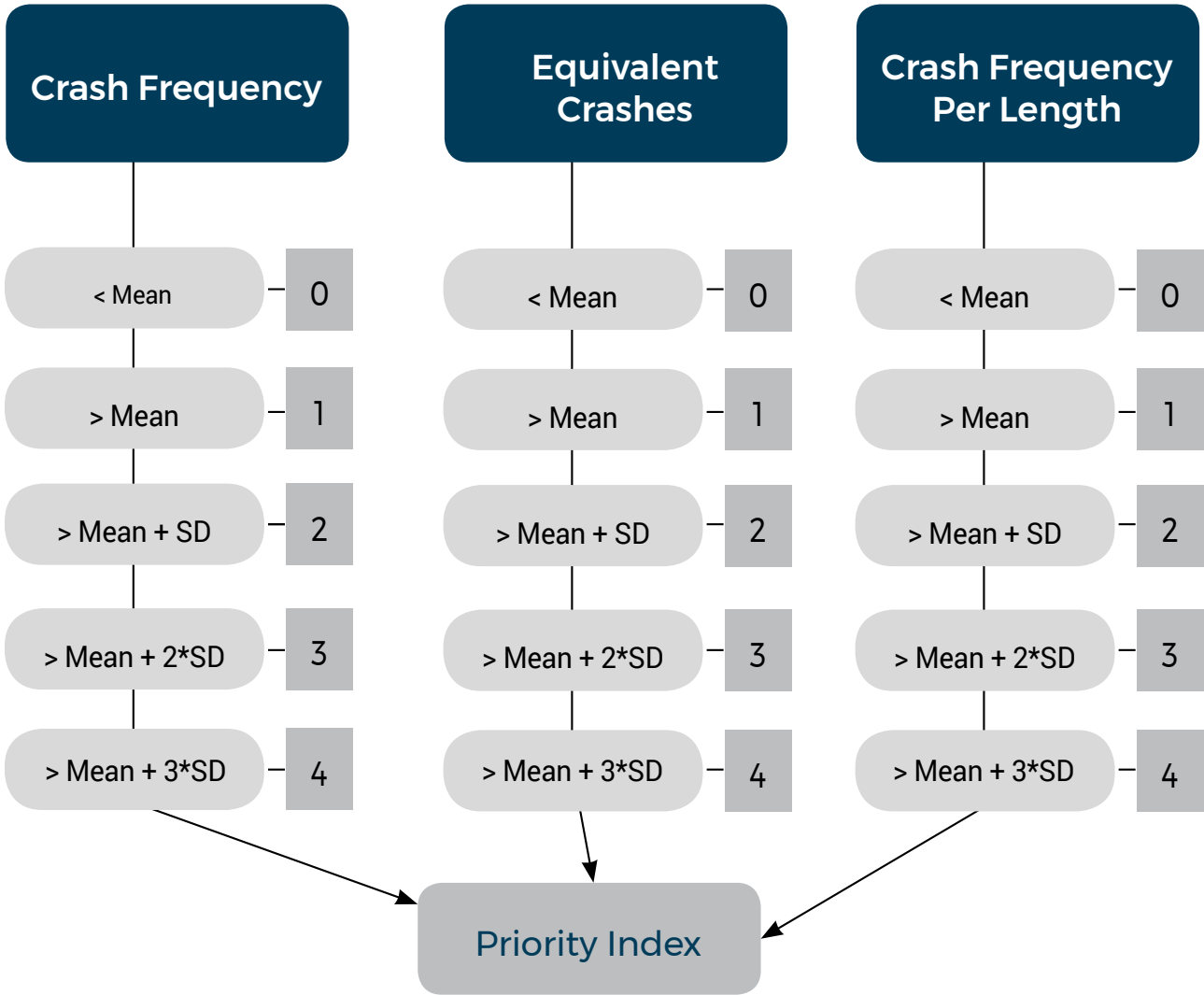
Figure 11 *Methodology to identify high-priority segments*

Map 7 presents the high-priority segments considering all the roadway types except for interstates in the rural Champaign County area. These segments were identified using the methodology explained in Figure 11. Map 7 also presents IDOT five percent critical segments, which were identified by using the IDOT crash data from 2011-2015.

From Map 7, the high-priority segments identified were found to be biased toward either state routes or US routes, which are maintained by IDOT. Due to the high vehicular volume on these type of roadways, which correlates to a high number of crashes, county highways were not identified. Thus, keeping in mind that there are different agencies responsible for different roadway types, a separate analysis was done to identify high-priority county highways, in which only the crashes occurring on county highways in Champaign County were considered. High-priority interstate segments were also identified. The list of high-priority county highways, US and state routes, and interstates are presented in *Appendix A*. The most recent safety improvement projects from different agencies are listed in *Appendix B*.

Legend

|||||| IDOT 5 Percent Critical Segments (2011-2015)

High-Priority Road Segments (2012-2016)

━━━ Priority Index of 9
━━━ Priority Index of 8
━━━ Priority Index of 7

Map 7 *High-priority road segments identified in the five-year study period (2012-2016) in the rural Champaign County area*

EMPHASIS AREAS

- Roadway Departures

- Intersections

- Impaired Driving

EMPHASIS AREA: ROADWAY DEPARTURES

In the study area, the collision type with the highest number of crashes was the fixed object type. Approximately 91 percent of these fixed object type of crashes were due to vehicles departing from the roadway.

In a Roadway Departure crash, the vehicle involved in the crash leaves its lane of travel and proceeds either into a different lane or direction of travel or off the road surface. The roadway departure crashes considered in this study include a vehicle hitting a fixed object, overturning, sideswiping an oncoming vehicle, or colliding head-on with an oncoming vehicle. Significant causes of roadway departure crashes were exceeding speed, impaired driving, improper lane usage, and failing to reduce speed.

OBJECTIVES

- Reduce the five-year rolling average of number of fatalities due to roadway departure crashes by 2 percent (from 2 to less than 2) by 2025 based on 2016 in the rural Champaign County area.

- Reduce the five-year rolling average of number of A-injuries due to roadway departure crashes by 2 percent (from 16 to less than 13) by 2025 based on 2016 in the rural Champaign County area.

Fatalities due to Roadway Departure Crashes in Rural Champaign County from 2005 to 2016
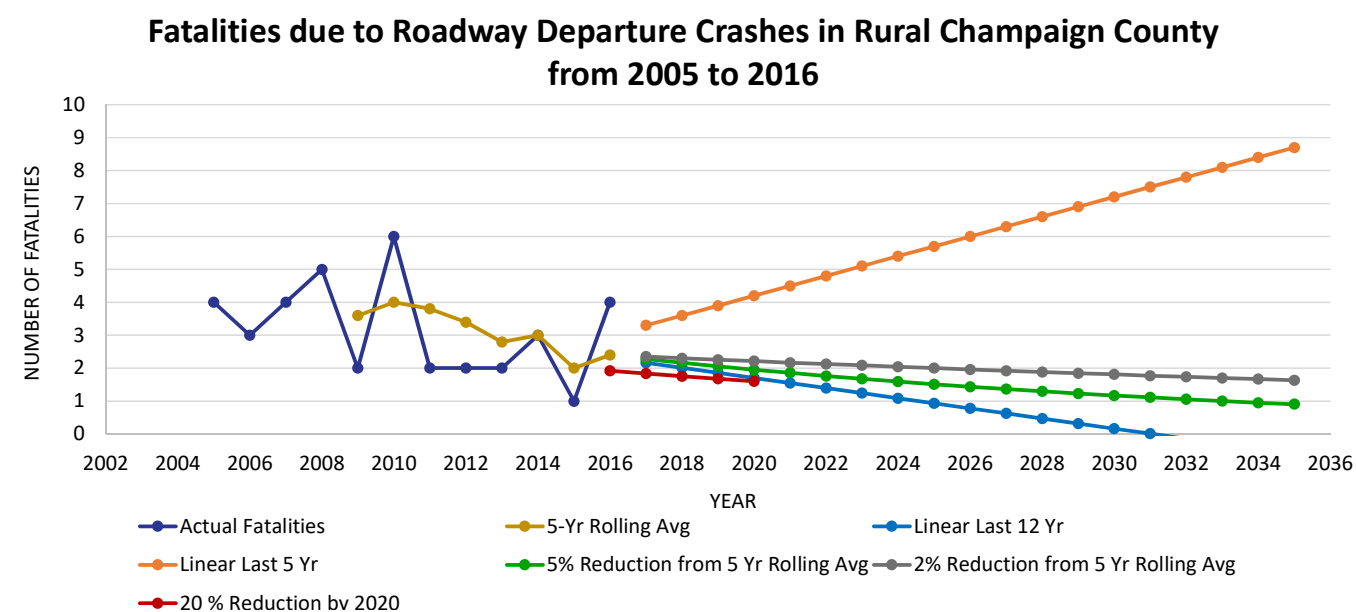
Figure 12   *Trend for the number of fatalities due to roadway departure crashes in the rural Champaign County area between 2005 and 2016, as well as possible trend projections for 2017 to 2035*

A-Injuries due to Roadway Departure Crashes in Rural Champaign County Area from 2005 to 2016
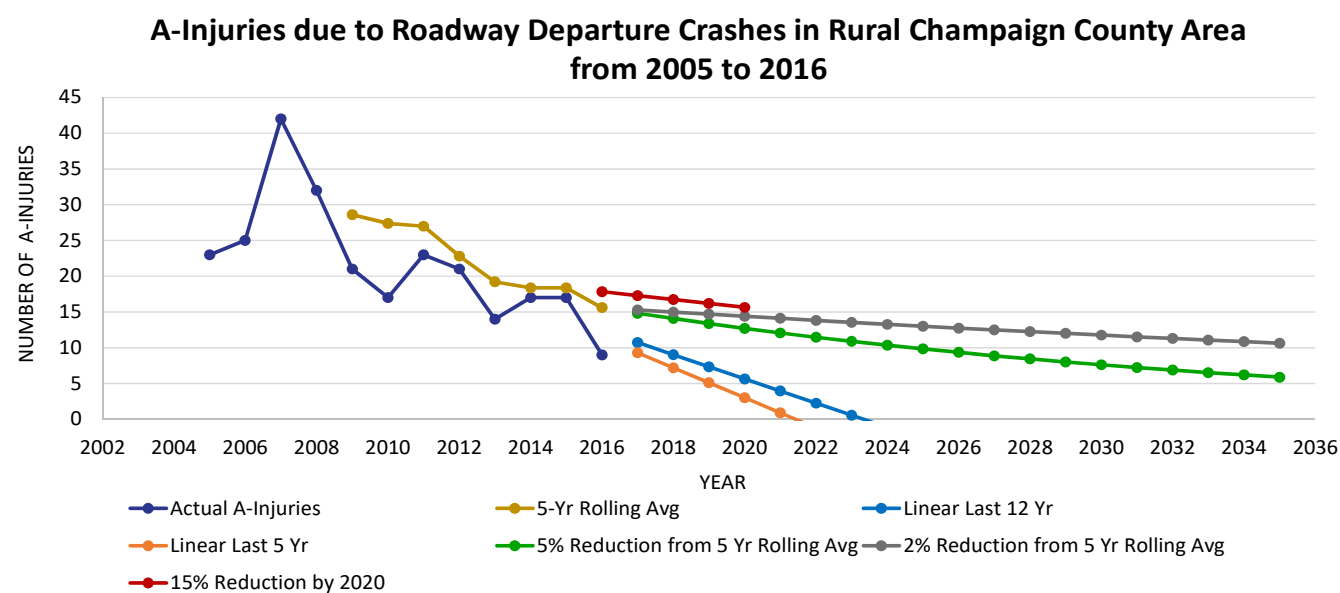
Figure 13   *Trend for the number of A-injuries (serious injuries) due to roadway departure crashes in rural Champaign County area between 2005 and 2016, as well as possible trend projections for 2017 to 2035*

Legend

Roadway Departure Crashes by Severity Type (2012-2016)

- ● Fatal
- ● A-Injury
- ● B-Injury
- ● C-Injury

Note: Only Intersection and Road Segment related Roadway Departure Crashes are presented

Map 8   *Location of roadway departure crashes by severity type in the five-year study period (2012-2016) in the rural Champaign County area*

The 2012-2016 crash data in the rural Champaign County study area was considered in this study.

In a roadway departure crash, the vehicle involved in the crash leaves its lane of travel and proceeds either into a different lane or direction of travel or off the road surface. The roadway departure crashes considered in this study include a vehicle hitting a fixed object, overturning, sideswiping an oncoming vehicle, or colliding head-on with an oncoming vehicle. Significant causes of roadway departure crashes were exceeding speed, impaired driving, improper lane usage and failing to reduce speed.
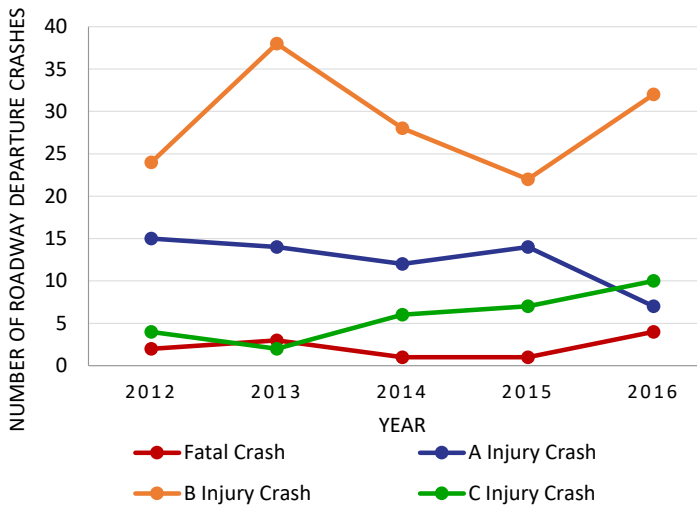
Two percent of roadway departure crashes were **fatal,** while **10 percent** and 24 percent were **A-injury** and B-injury, respectively.
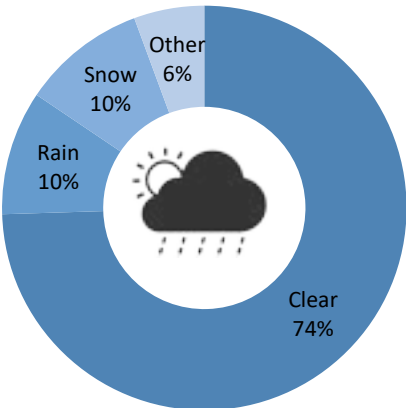
Weather Condition
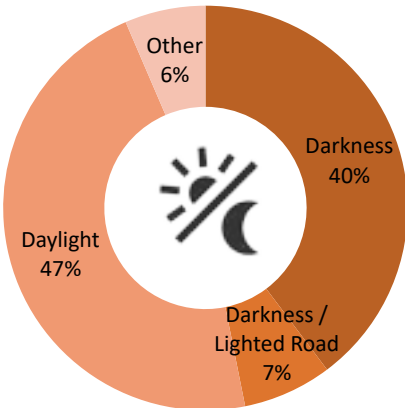
Lighting Condition
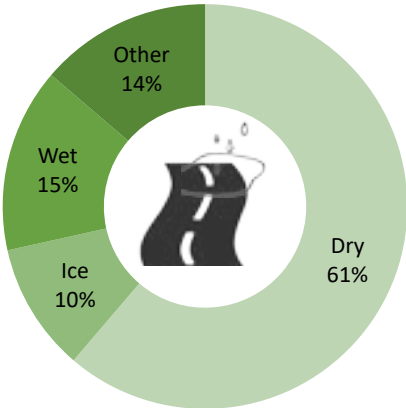
Road Surface Condition

Ten percent of roadway departure crashes took place in rainy weather conditions, and 10 percent took place in snowy weather conditions.

Forty percent of roadway departure crashes took place in dark conditions.

Fifteen percent of roadway departure crashes took place on a wet road surface, and 10 percent took place on an icy road surface.
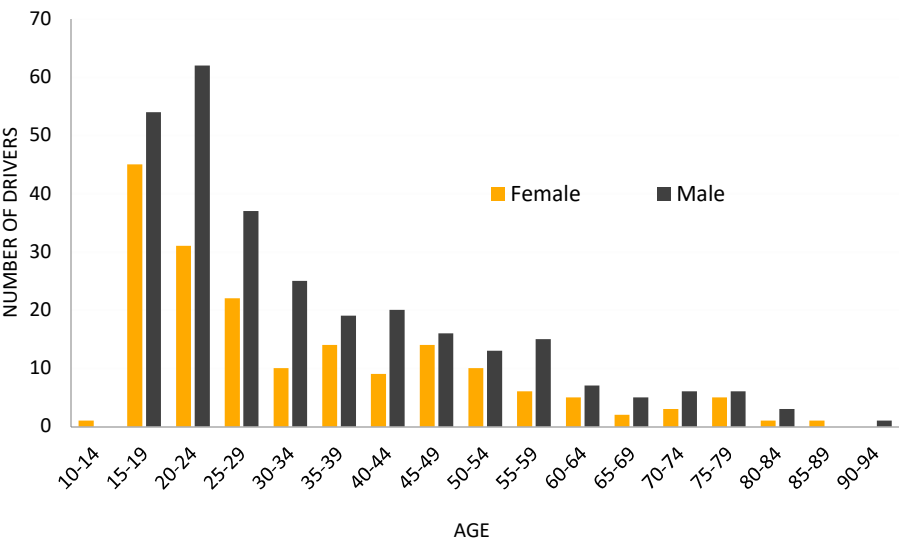
6 out of **10** drivers involved in roadway departure crashes were **Male**

The two age cohorts with the largest number of drivers involved in roadway departure crashes were ages 15 to 19 and ages 20 to 24, accounting for 99 (20 percent) and 93 (19 percent) of drivers, respectively.

Time of the Day

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan	3	3			4	1	4	7	8	3	3	1	2	2	3	5	2	1	6	2	3	5	2	4
Feb	2	2	1		2	1	3	5	3		1	6	1	5	2	4	6	5	2		4	3	2	1
Mar	3		1	2	1		4	4	3	2		1	1	1	1	3	6	3		3		2	1	1
Apr	3	2	1	2	3	3	2	5	1	2		3	1	1	2	2	4	3	3		1	2	3	2
May	1	1	1	4	2	2		1					2	3	3	1	2	2	2	2	2	6		4
Jun	2	1	3		1		3	2		1	1	1	2	1	3	4	2	2	1		5	2	5	2
Jul	2	4	2	1		3	5	1	2	2	1	1			4	1	3	4		2		4	2	2
Aug	2	1	1	2		3	2	1	2		1		4	3	1	1	1		3	2	3	2	3	3
Sep	4	2		1	1	1	1		3	1	1	1	1	1	2	3	1	2	2		2	3	2	4
Oct	1	3	3	3	3	2	3	2		1	2	2	1	2	2	1	4	1	1	3	1	3	2	1
Nov	2	5	3	2	1	2	3	2	3	1	5	2	1	2	3	2	1	4	2	3	2	3	2	1
Dec	4	3	3	2	3	2	1	2	4	1	2		4	3	2	3	2	3	4	1	3	5	3	4

Number of crashes

Highest ▬▬▬ Lowest

Forty roadway departure crashes occurred between 9 p.m. and 10 p.m., the largest number of crashes to occur in any one-hour period. Thirty-two crashes took place between 4 p.m. and 5 p.m., and 34 crashes took place between 7 a.m. and 8 a.m.

Seventy-four roadway departure crashes occurred in January, and 64 took place in December.

Table 5 *Strategies to reduce roadway departure crashes*

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
1. Keep vehicles in their respective lanes	**1.1** Install rumble strips that alert drowsy and distracted drivers beginning to depart from their lane.	(Engineering)	ILSHSP, On Ramp to Innovation, Systemic Safety Improvements	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.2 Provide enhanced shoulder or in-lane delineation and marking for sharp curves. Provide chevrons.	(Engineering)	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.3 Improve highway geometry for horizontal curves.	(Engineering)	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.4 Provide enhanced pavement markings and signage that delineate lane edges and alignment to help drivers navigate. Provide raised pavement markers and 6" edge lines.	(Engineering)	ILSHSP, On Ramp to Innovation, Systemic Safety Improvements	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.5 Provide median barrier devices/installations, midlane rumble strips (two lane roads) and 6" center lines.	(Engineering)	ILSHSP, On Ramp to Innovation, Systemic Safety Improvements	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.6 Provide signs on both sides/speed bars/chevrons/flashing signs encouraging drivers to reduce speeding.	(Engineering)	On Ramp to Innovation	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.7 Apply shoulder treatments, eliminating shoulder drop-offs, and widen/pave shoulders.	(Engineering)	ILSHSP, On Ramp to Innovation	IDOT, Champaign County, local cities, villages and townships (Public Works)

Implementation Areas: 📖 Education ⭐ Enforcement ⛑ Engineering ✚ Emergency Services

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
1. Keep vehicles in their respective lanes (continued)	**1.8** Install only new guardrail and guardrail end sections that pass crashworthy tests. Provide chevrons and guardrail reflectors.	⚙	ILSHSP, On Ramp to Innovation	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.9 Develop a procedure for law enforcement officers to request engineering assessments of crash sites.	⚙ ★	ILSHSP	IDOT, ISP, Champaign County, local cities, villages and townships (Public Works and Police Departments)
	1.10 Evaluate pavement and skid resistance to reduce roadway departure crashes.	⚙	ILSHSP	IDOT, Champaign County, local cities, villages and townships. (Public Works)
	1.11 Implement strategic enforcement based on data-driven approaches and enhance communication and coordination between agencies.	⚙ ★	ILSHSP	IDOT, ISP, Champaign County, local cities, villages and townships (Public Works and Police Departments)
	1.12 Provide SafetyEdge^{SM}.	⚙	On Ramp to Innovation	IDOT, Champaign County, local cities, villages and townships (Public Works)
2. Minimize the likelihood of crashing into an object or overturning if the vehicle travels beyond the edge of the shoulder	**2.1** Evaluate and address existing slopes and ditches where appropriate to prevent rollovers. Provide traversable roadside slopes.	⚙	ILSHSP, On Ramp to Innovation	IDOT, Champaign County, local cities, villages and townships (Public Works)
	2.2 Provide clear zones to provide opportunity for a safe recovery when drivers leave the roadway.	⚙	On Ramp to Innovation	IDOT, Champaign County, local cities, villages and townships (Public Works)
	2.3 Remove or relocate objects in hazardous locations including evaluating the need for guardrails.	⚙	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	2.4 Delineate roadside objects such as trees, utility poles, or drainage structures with the appropriate treatment.	⚙	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)

Implementation Areas: 📚 Education   ★ Enforcement   ⚙ Engineering   ✚ Emergency Services

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
3. Reduce crash severity	**3.1** Utilize improved designs for roadside hardware, where appropriate.	⛑	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	3.2 Use barriers and attenuation systems at needed locations.	⛑	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	3.3 Evaluate existing signage and implement additional innovative engineering and ITS (intelligent transportation systems) signage and countermeasures to communicate and enforce lower speeds where appropriate.	⛑ ★	ILSHSP	CUUATS staff, IDOT, ISP, Champaign County, local cities, villages and townships (Public Works and Police Departments)
	3.4 Evaluate the use of ITS to alert traffic of errant vehicles.	⛑	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities (Police Departments)
4. Improve public awareness and communication	**4.1** Add extra information on roadway departure to the "Rules of The Road" booklet to educate drivers.	⛑ 📖	ILSHSP	Illinois Secretary of State
	4.2 Expand the use of ITS to provide real time information of potential crashes to Emergency Medical Services (EMS).	⛑ ➕	ILSHSP	IDOT, ISP, Champaign County, local cities, villages and townships (Police Departments) and local EMS

Sources:

ILSHSP (Link: *http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/SHSP/SHSP_2017.pdf*)

On ramp to innovations: Reducing Rural Roadway Departures (Link: *https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/rural-roadway-factsheet1.pdf*)

Systemic Safety Improvements: Analysis, Guidelines and Procedures (Link: *http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Manuals-Guides-&-Handbooks/Safety/Systemic%20Safety%20Improvements%20Analysis,%20Guidelines%20and%20Procedures.pdf*)

Implementation Areas: 📖 Education   ★ Enforcement   ⛑ Engineering   ➕ Emergency Services

EMPHASIS AREA: INTERSECTIONS

In the rural Champaign County area, more than 85 percent of angle and turning crashes and 43 percent of rear end crashes occurred at intersections. In this study, intersection crashes are defined as crashes that took place within a 150-foot radius of an intersection that lies outside the Champaign-Urbana urban area boundary, and within a 100-foot of an intersection that lies within the Champaign-Urbana urban boundary.

OBJECTIVE

- Reduce the five-year rolling average of number of fatalities due to intersection crashes by 2 percent (from 3 to less than 3) by 2025 based on 2016 in the rural Champaign County area.

- Reduce the five-year rolling average of number of A-injuries due to intersection crashes by 2 percent (from 22 to less than 19) by 2025 based on 2016 in the rural Champaign County area.
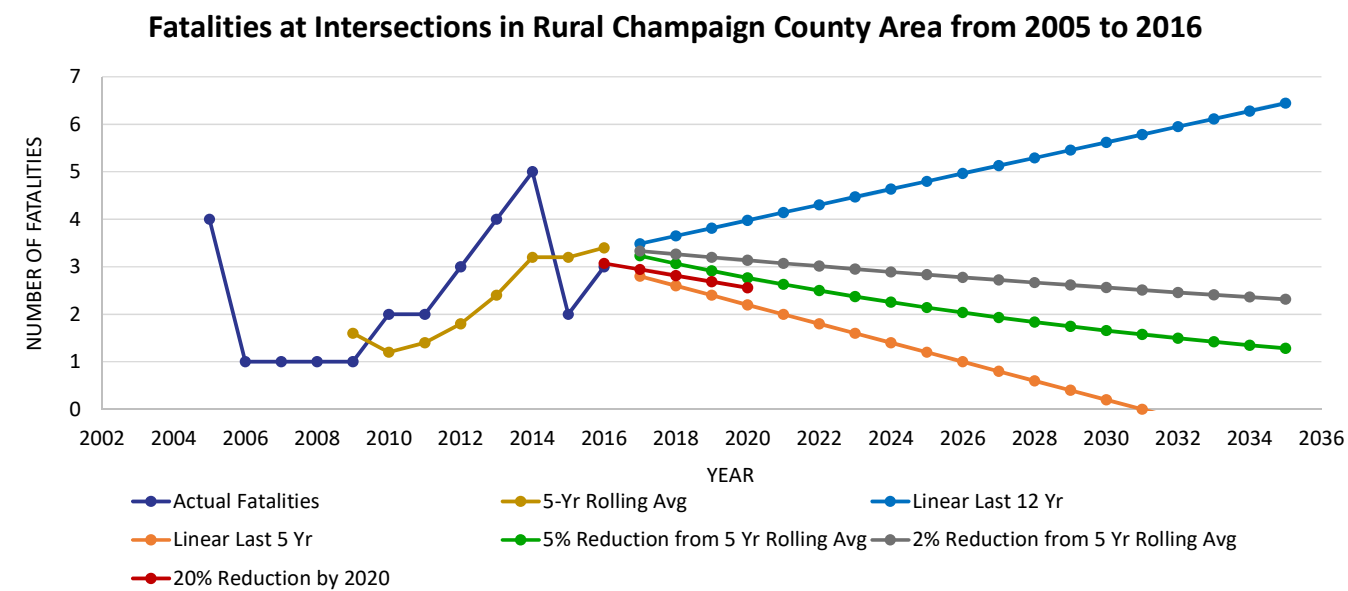
Fatalities at Intersections in Rural Champaign County Area from 2005 to 2016

Figure 14 *Trend for the number of fatalities due to intersection crashes in the rural Champaign County area between 2005 and 2016, as well as possible trend projections for 2017 to 2035*
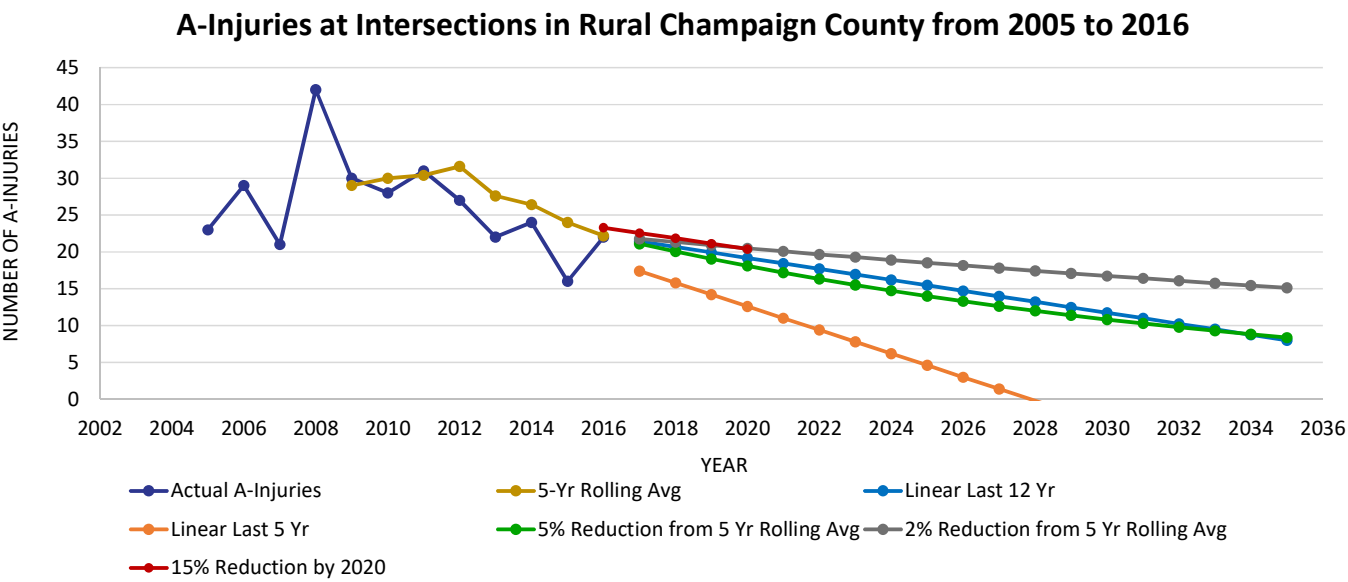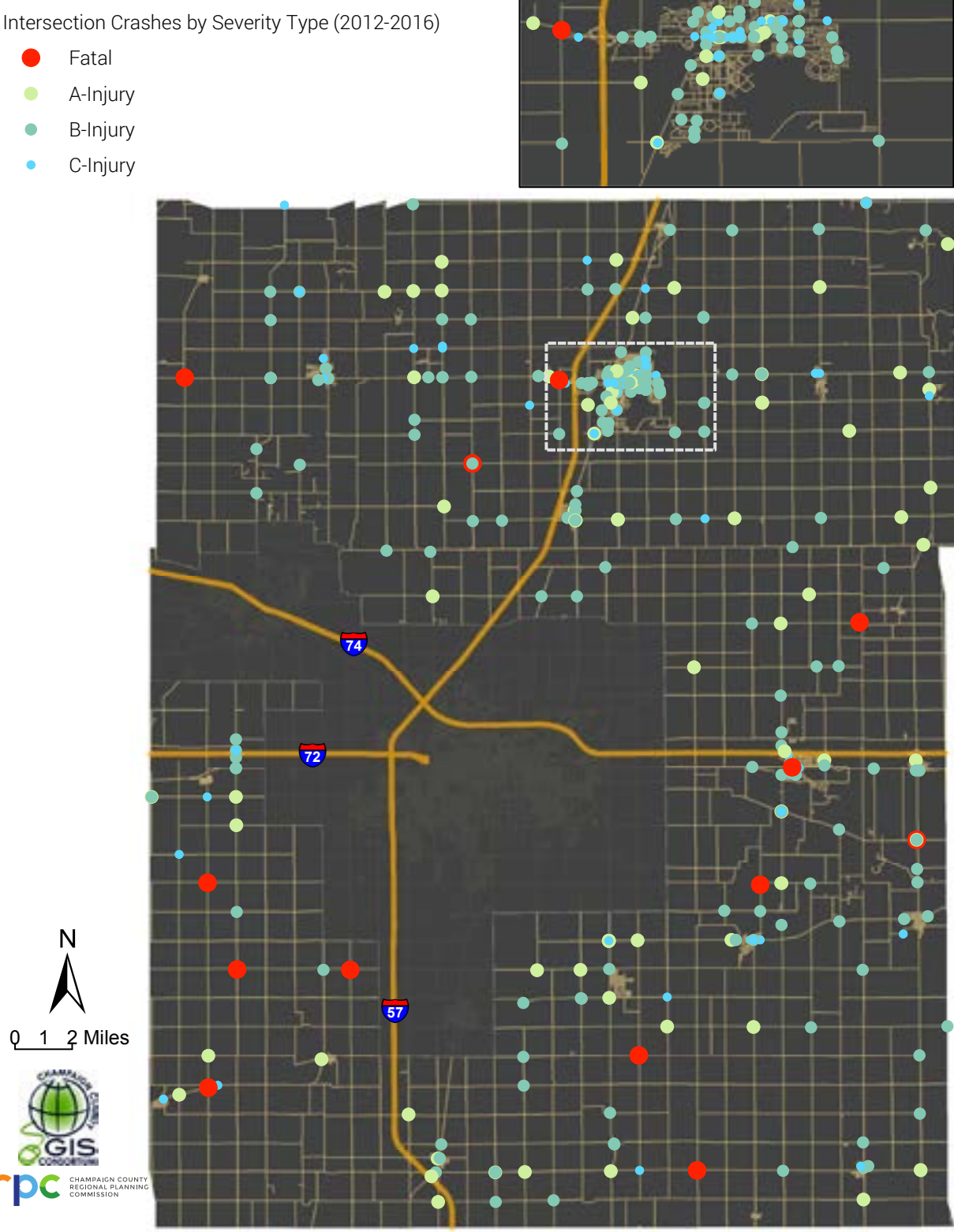

A-Injuries at Intersections in Rural Champaign County from 2005 to 2016
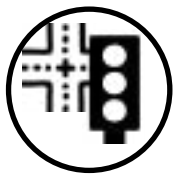
Figure 15 *Trend for the number of A-injuries (serious injuries) due to intersection crashes in the rural Champaign County area between 2005 and 2016, as well as possible trend projections for 2017 to 2035*
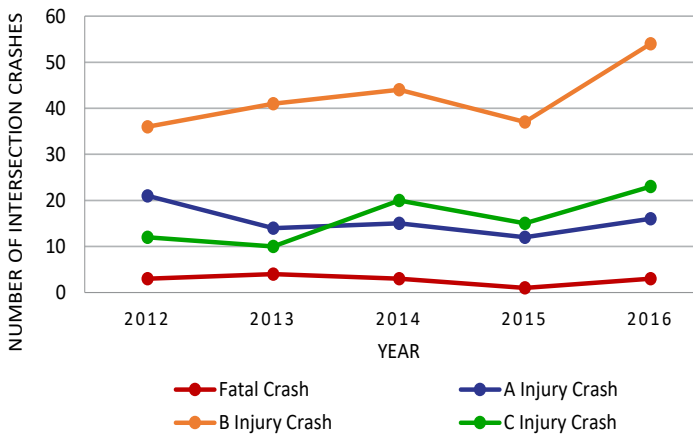

Intersection Crashes by Severity Type (2012-2016)

- Fatal
- A-Injury
- B-Injury
- C-Injury

Map 9 *Location of intersection crashes by severity in the five-year study period (2012-2016) in the rural Champaign County area*
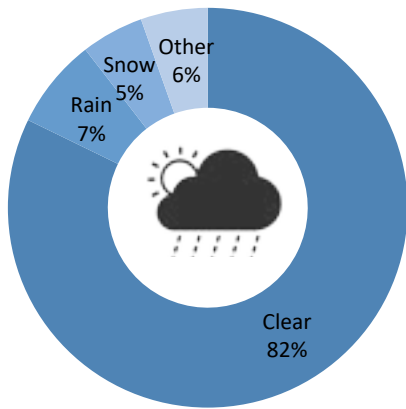
The 2012-2016 crash data in the rural Champaign County study area was considered in this study.
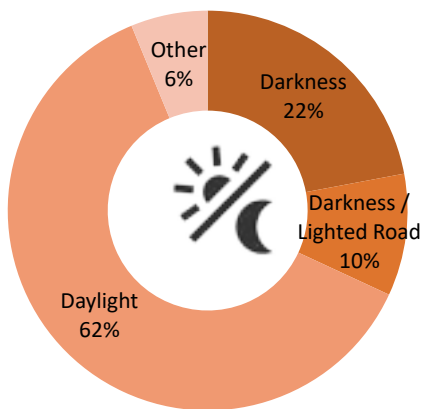
In this study, intersection crashes are defined as crashes that took place within a 150-foot radius of an intersection that lies outside the Champaign-Urbana urban area boundary, and within a 100-foot of an intersection that lies within the Champaign-Urbana urban boundary.
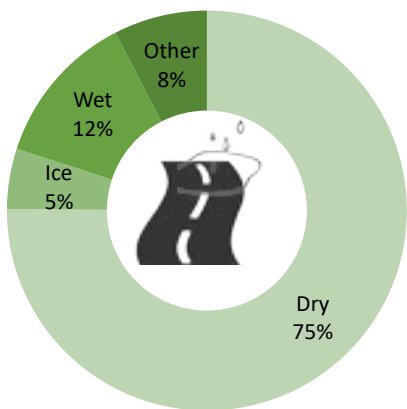
Weather Condition

Other 6%
Snow 5%
Rain 7%
Clear 82%

Lighting Condition

Other 6%
Darkness 22%
Darkness / Lighted Road 10%
Daylight 62%

Road Surface Condition

Other 8%
Wet 12%
Ice 5%
Dry 75%

Seven percent of intersection crashes took place in rainy conditions, and five percent took place in snowy conditions.

Twenty-two percent of intersection crashes took place in dark conditions, and 10 percent of intersection crashes took place in dark conditions with roadway lighting.
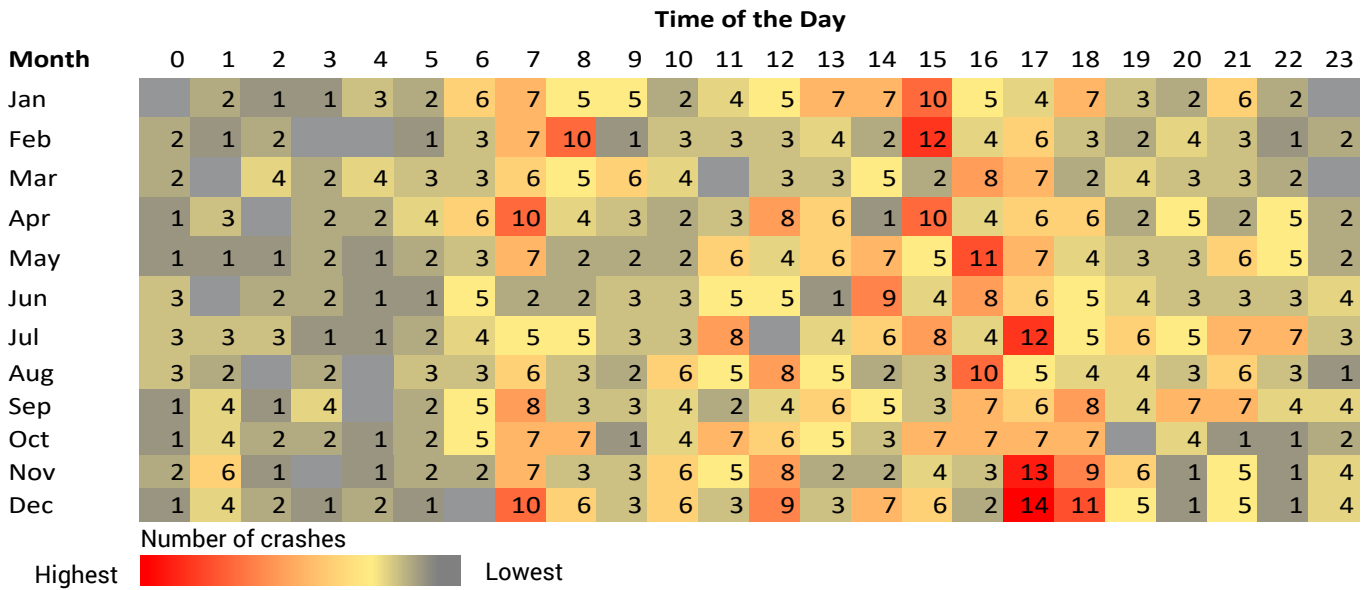
Twelve percent of intersection crashes took place on a wet road surface, and five percent took place on an icy road surface.
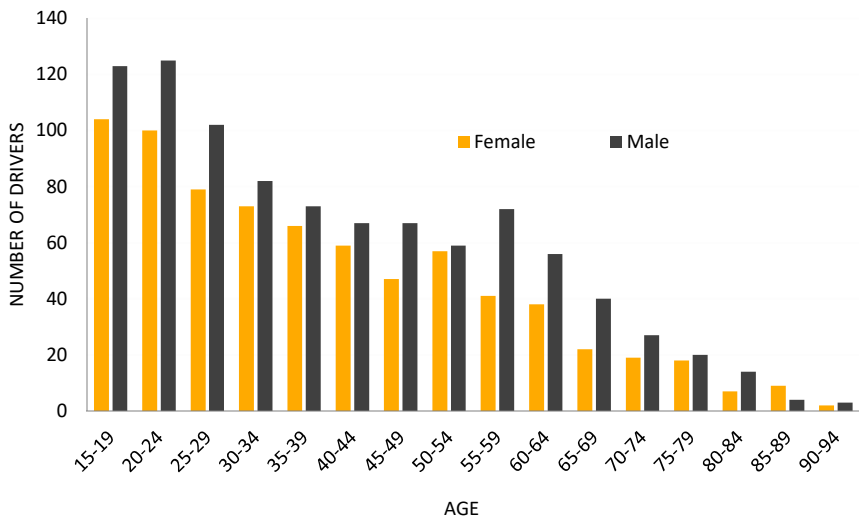
5 out of 10 drivers involved in intersection crashes were Male

The two age cohorts with the largest number of drivers involved in intersection crashes were ages 15 to 19 and ages 20 to 24, accounting for 238 (14 percent) and 234 (13 percent) drivers, respectively.

One percent of the intersection crashes were **fatal,** while **7 percent** and 19 percent were **A-injury** and B-injury respectively.

Female ■ Male

| Fatal Crash | A Injury Crash |
| B Injury Crash | C Injury Crash |

Time of the Day

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan		2	1	1	3	2	6	7	5	5	2	4	5	7	7	10	5	4	7	3	2	6	2	
Feb	2	1	2			1	3	7	10	1	3	3	3	4	2	12	4	6	3	2	4	3	1	2
Mar	2		4	2	4	3	3	6	5	6	4		3	3	5	2	8	7	2	4	3	3	2	
Apr	1	3		2	2	4	6	10	4	3	2	3	8	6	1	10	4	6	6	2	5	2	5	2
May	1	1	1	2	1	2	3	7	2	2	2	6	4	6	7	5	11	7	4	3	3	6	5	2
Jun	3		2	2	1	1	5	2	2	3	3	5	5	1	9	4	8	6	5	4	3	3	3	4
Jul	3	3	3	1	1	2	4	5	5	3	3	8		4	6	8	4	12	5	6	5	7	7	3
Aug	3	2		2		3	3	6	3	2	6	5	8	5	2	3	10	5	4	4	3	6	3	1
Sep	1	4	1	4		2	5	8	3	3	4	2	4	6	5	3	7	6	8	4	7	7	4	4
Oct	1	4	2	2	1	2	5	7	7	1	4	7	6	5	3	7	7	7	7		4	1	1	2
Nov	2	6	1		1	2	2	7	3	3	6	5	8	2	2	4	3	13	9	6	1	5	1	4
Dec	1	4	2	1	2	1		10	6	3	6	3	9	3	7	6	2	14	11	5	1	5	1	4

Number of crashes

Highest — Lowest

During the study period, there were 93 intersection crashes in the Rural Champaign County Area between 5 p.m. and 6 p.m., and 82 between 7 a.m. and 8 a.m. These peak crash periods correspond to morning and evening commute periods.

One hundred eight intersection crashes occurred in July and one hundred seven took place in December.

High-Priority Intersections

High-priority intersections were identified based on equivalent crashes and crash frequency. Equivalent crashes were calculated based on crash severity: more severe crashes (e.g., fatal crashes) were weighted more heavily than less severe crashes (e.g., C-injury crashes). Crash frequency is the average number of crashes over five year study period. These measures were combined to produce a Priority Index, which is used to identify high-priority intersections in the rural Champaign County area.

Equivalent Crashes = $\dfrac{(25*Fatal\ Crashes + 10*A\text{-}injury\ Crashes + B\text{-}injury\ Crashes + C\text{-}injury\ Crashes)}{5}$

Crash Frequency = $\dfrac{Total\ Number\ of\ Crashes}{5}$

Methodology to Identify High Priority Intersections:
High-priority intersections were identified based on two factors: Equivalent Crashes and Crash Frequency.

- Equivalent Crashes and Crash Frequency were calculated for each intersection based on the equations presented.
- Considering all the intersections, a mean and standard deviation for the two factors were calculated.
- For each intersection, based on the equivalent crashes and crash frequency values from its mean, an index was assigned.
- The two index values were combined to give a priority index value.
- The higher the priority index value, the higher the priority given to the segment was.
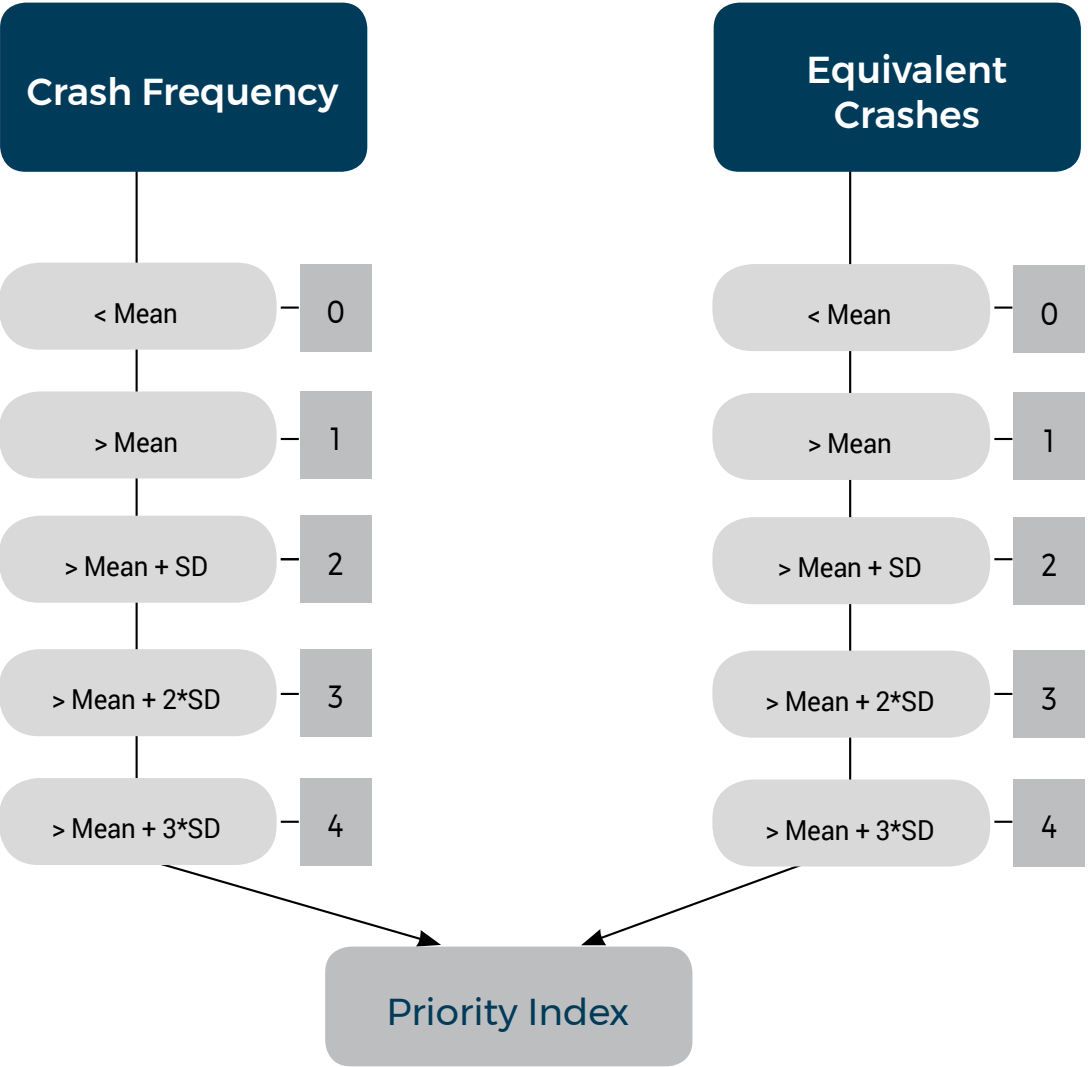- A list of high-priority intersections were identified.

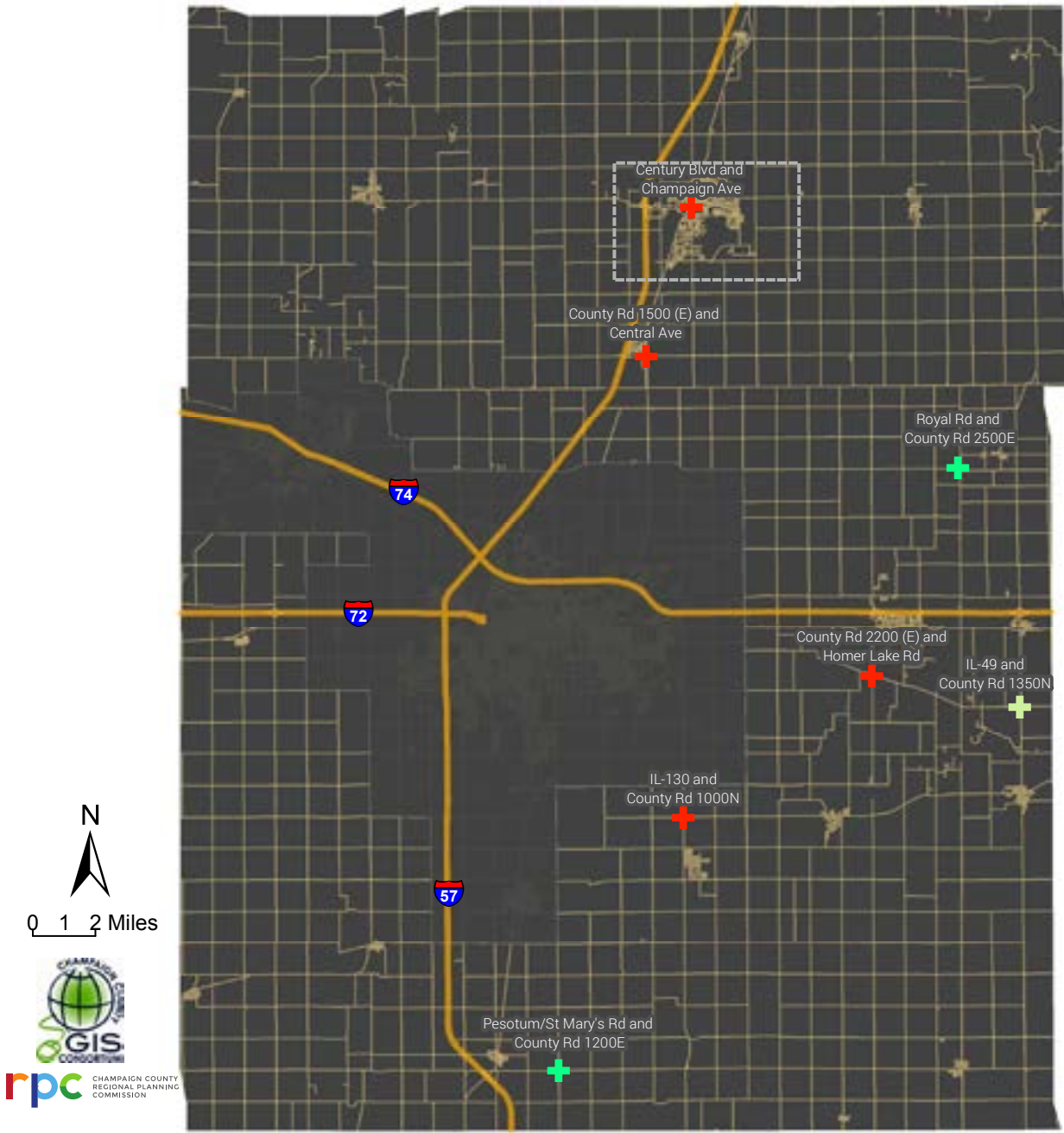**Figure 16**   *Methodology to identify high-priority intersections*

Table 6   *High-priority intersections in the rural Champaign County area*

					High-Priority Intersection in the rural Champaign County area				
No.	N-S Roadway	E-W Roadway	Control Type	Fatal Crashes	A-injury Crashes	Total Crashes	Crash Frequency Index	Equivalent Crash Index	Priority Index
1	County Rd. 1500 (E)	Central Ave.	2WSC (E-W)	0	5	20	4	4	8
2	CIL 130	County Rd. 1000 (N)	2WSC (E-W)	0	4	18	4	4	8
3	Century Blvd.	Champaign Ave.	Signal	0	2	2	4	4	8
4	County Rd. 2200 (E)	Homer Lake Rd.	2WSC (E-W)	0	2	12	4	4	8
5	IL 49	County Rd. 1350 (N)	2WSC (E-W)	2	1	7	3	4	7

The most recent safety improvement projects from different agencies are listed in *Appendix B*.

Legend

➕ IDOT 5 Percent Critical Intersections (2011-2015)

High Priority Intersections (2012-2016)

➕ Priority Index of 7

➕ Priority Index of 8

Map 10   *High-priority intersections identified in the five-year study period (2012-2016) in the rural Champaign County area*

Table 7 *Strategies to reduce intersection crashes*

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
1. Enhance intersection safety performance	**1.1** Apply network screening data to identify the crash types (angle and turning) contributing most to fatalities and injuries, and apply systematic low-cost improvements such as protected turns and signal progression to decrease the number of these crashes.	⛑	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.2 Evaluate intersection user lines of sight to traffic control devices and approaching motorists, pedestrians, and bicyclists.	⛑	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.3 Revise design of intersection geometry and road skew.	⛑	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.4 Provide/improve left- and right-turn channelization and storage.	⛑	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.5 Evaluate pavement design for intersection friction value and consider high-friction surface treatment where appropriate.	⛑	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.6 Evaluate existing intersection locations with high crash trends.	⛑	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.7 Incorporate access management techniques, including median construction, driveway closures or consolidations, and/or imposing left-turning restrictions.	⛑	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.8 Evaluate and implement pedestrian and bicyclist accommodations.	⛑	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities, villages and townships (Public Works)

Implementation Areas: 📚 Education ⭐ Enforcement ⛑ Engineering ➕ Emergency Services

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
1. Enhance intersection safety performance (continued)	**1.9** Consider nontraditional intersection types where appropriate, such as roundabouts, J-turns, median U-turn intersections, jughandles, displaced left turn intersections, offset T-intersections, and continuous flow intersections.	🦺	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.10 Improve conspicuity of the intersection and its users through a variety of approaches, such as lighting, advance warning devices, and upgrading of intersection signal head placement.	🦺	ILSHSP	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.11 Improve availability of gaps in traffic and assist drivers in judging gap sizes at unsignalized intersections.	🦺	Systemic Safety Improvements	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.12 Provide traffic calming on intersection approaches through a combination of geometrics and traffic control devices.	🦺	Systemic Safety Improvements	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.13 Improve driver awareness of intersection as viewed from the intersection: for example, providing supplementary messages, such as STOP AHEAD, installing flashing beacons at stop-controlled intersections, etc.	🦺	Systemic Safety Improvements	IDOT, Champaign County, local cities, villages and townships (Public Works)
	1.14 Consider intersection signing improvements to improve safety.	🦺	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities, villages and townships (Public Works)

Implementation Areas: 📖 Education ⭐ Enforcement ⛑ Engineering ➕ Emergency Services

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
2. Increase traffic law compliance near intersections	**2.1** Increase law enforcement presence and enforcement at known high-crash intersections.	⬟	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)
	2.2 Develop a procedure for law enforcement officers to request engineering assessments of crash sites.	⚙ ⬟	ILSHSP	IDOT, ISP, Champaign County, local cities, villages and townships (Public Works and Police Departments)
3. Increase awareness and education	**3.1** Establish education campaign for intersection safety.	📚	ILSHSP	IDOT, schools, Secretary of State (DMV)
	3.2 Increase intersection information in the Rules of the Road.	📚	ILSHSP	Secretary of State (DMV)
	3.3 Improve content and testing of driver education regarding intersection safety.	📚	ILSHSP	Secretary of State (DMV)
	3.4 Implement training and education for innovative intersection configurations.	📚	ILSHSP	Secretary of State (DMV), schools

Sources:

ILSHSP (Link: *http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/SHSP/SHSP_2017.pdf*)

Systemic Safety Improvements: Analysis, Guidelines and Procedures (Link: *http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Manuals-Guides-&-Handbooks/Safety/Systemic%20Safety%20Improvements%20Analysis,%20Guidelines%20and%20Procedures.pdf*)

Implementation Areas: 📚 Education   ⬟ Enforcement   ⚙ Engineering   ✚ Emergency Services

EMPHASIS AREA: IMPAIRED DRIVING

Impaired driving crashes are crashes where one or more of the involved drivers is considered impaired by drug use or alcohol consumption. Impaired drivers make up a relatively small percentage of drivers involved in all crashes (4 percent); however, the crashes that they are involved in tend to be more severe.

OBJECTIVES

- Reduce the five-year rolling average of number of fatalities due to impaired driving crashes by 2 percent (from 3 to less than 3) by 2025 based on 2016 in the rural Champaign County area.

- Reduce the five-year rolling average number of A-injuries due to impaired driving crashes by 2 percent (from 7 to less than 6) by 2025 based on 2016 in the rural Champaign County area.
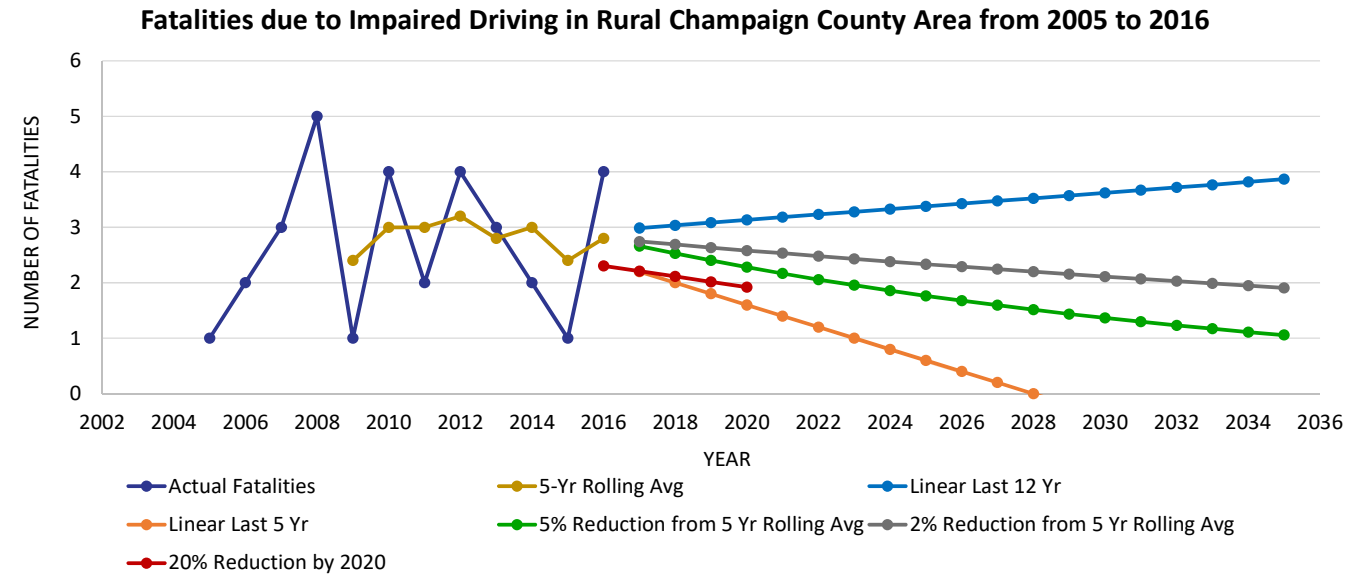
Figure 17 *Trend for the number of fatalities due to impaired driving in the rural Champaign County area between 2005 and 2016, as well as possible trend projections for 2017 to 2035.*
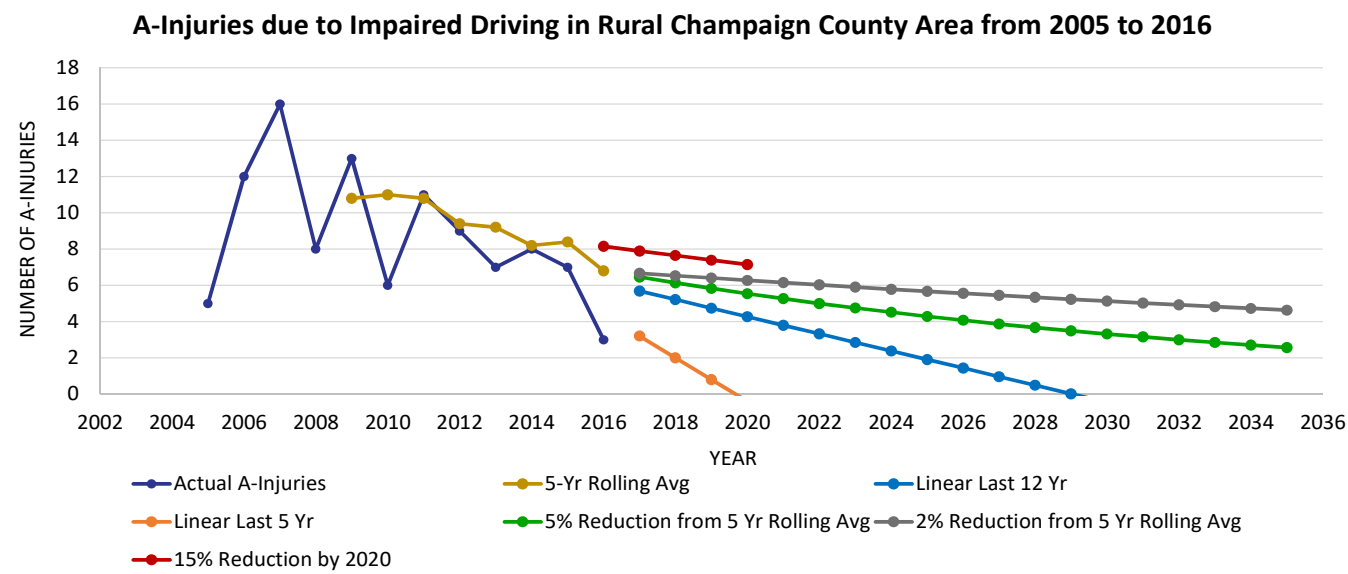
Figure 18 *Trend for the number of A-injuries (serious injuries) due to impaired driving in the rural Champaign County area between 2005 and 2016, as well as possible trend projections for 2017 to 2035.*

Legend

Crashes involving Impaired Drivers (2012-2016)

Crashes by Severity Type

- ● Fatal
- ● A-Injury
- ● B-Injury
- ● C-Injury
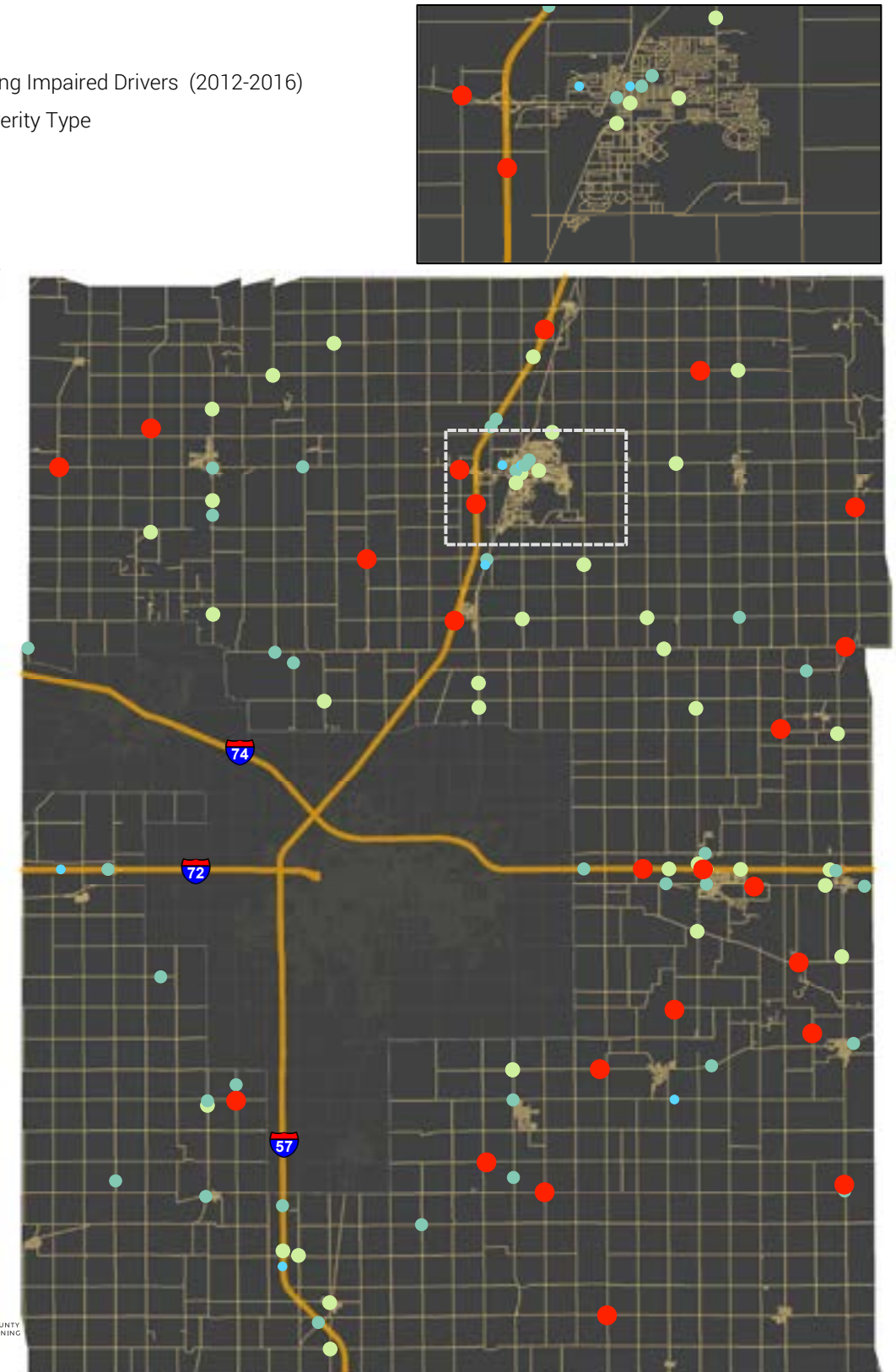
Map 11 *Location of crashes involving impaired drivers by severity type in the five-year study period (2012-2016) in the rural Champaign County area*

Table 8 *Number of crashes due to impaired driving by severity type in the rural Champaign County area*

Crash Severity	2012	2013	2014	2015	2016	Total	Percent
Fatal	4	5	5	4	5	23	13
A-injury	10	7	9	6	5	37	21
B-Injury	6	12	7	3	7	35	20
C-Injury	0	1	0	4	1	6	3
No Injury	18	13	18	14	11	74	42
Total	34	33	34	27	24	175	100

Table 9 *Number of crashes by type of impaired drivers by year in the rural Champaign County area*

Number of Crashes by Type of Impaired Drivers by Year in the rural Champaign County area

Year	Alcohol	Drugs
2012	31	7
2013	35	3
2014	33	6
2015	23	8
2016	21	8
Total	143	32

Table 10 *Number of people involved in crashes by type of impaired driving by severity type in the rural Champaign County area*

Number of People involved in Crashes by Type of Impaired Drivers by severity type in the rural Champaign County area

Severity Type	Alcohol	Drugs	Total
Fatalities	13	10	23
A-injuries	50	16	66
B-injuries	48	16	64
C-injuries	5	4	9
Total	116	46	162

- Between 2012 and 2016, there were 143 crashes in the rural Champaign County area in which one or more drivers were impaired due to alcohol consumption. There were 32 crashes in which one or more drivers were impaired due to drug consumption.

- Thirteen percent of impaired driver related crashes between 2012 and 2016 in the rural Champaign County area were fatal, while 21 percent and 20 percent were of A-injury and B-injury crashes, respectively.

Legend

Crashes involving Impaired Drivers (2012-2016)
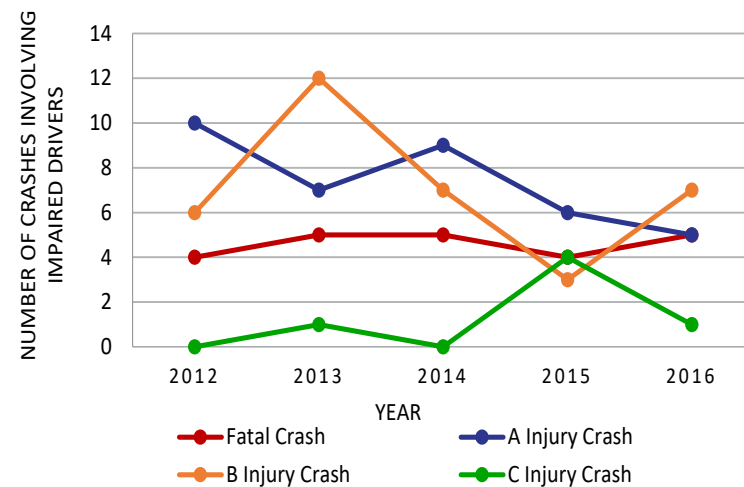
- ● Alcohol
- ■ Drugs

Map 12 *Location of crashes involving impaired drivers by type in the five-year study period (2012-2016) in the rural Champaign County area*
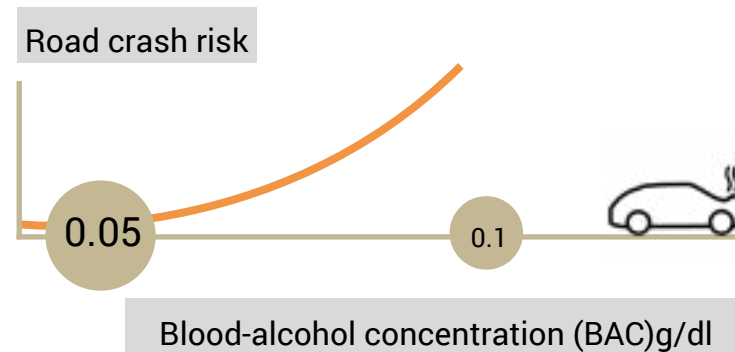
The 2012-2016 crash data in rural Champaign County study area was considered in this study.

Impaired driving crashes are crashes where one or more of the involved drivers is considered impaired by drug use or alcohol consumption.
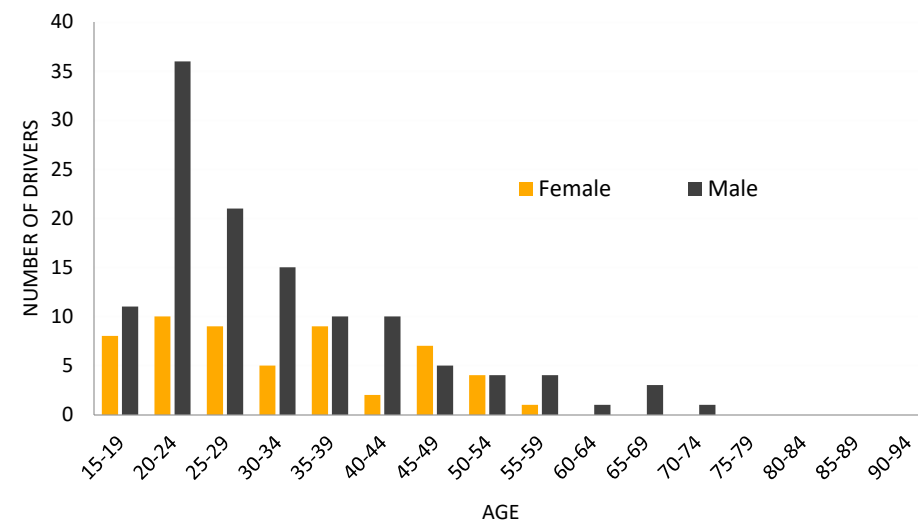
Drinking Alcohol and driving increases the risk of a road traffic crash. Above a blood-alcohol concentration (BAC) of 0.05g/dl, the risk of road traffic crashes increases dramatically (WHO)[9].
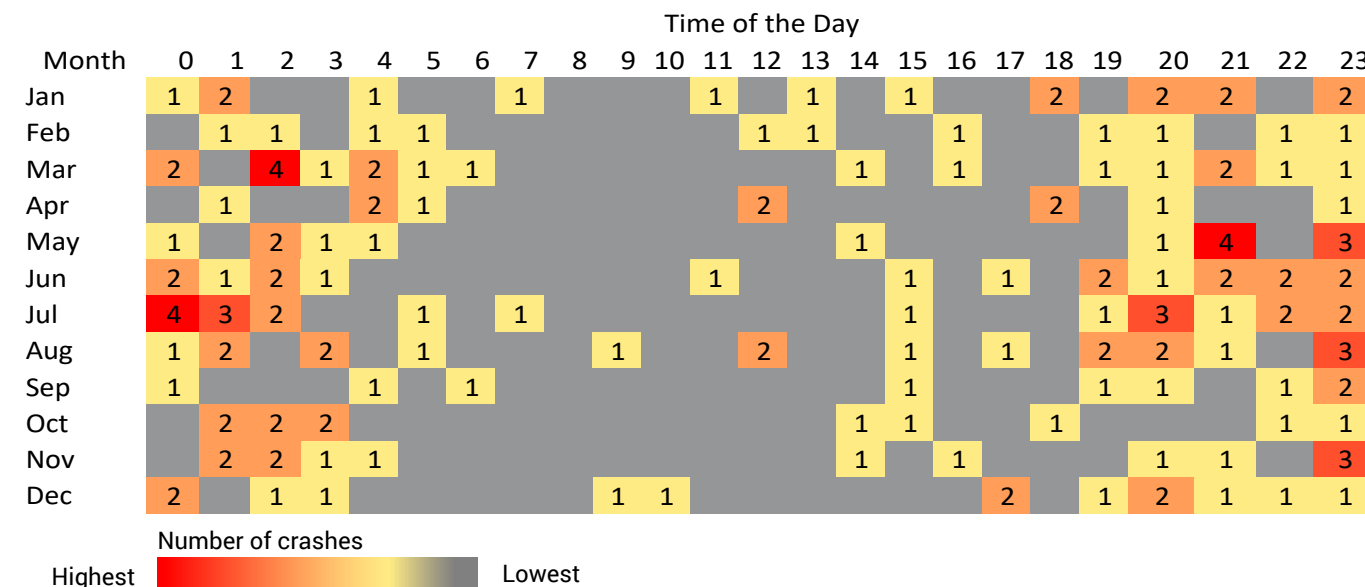
In Illinois, drivers are legally considered to be under the influence if they have a blood-alcohol content (BAC) of .08 or more, have a tetrahydrocannabinol (cannabis) concentration (THC) of either 5 nomograms or more per milliliter of whole blood or 10 nomograms or more per milliliter of other bodily substance, have used any other controlled substance, or are impaired by medication[8].

Road crash risk

0.05   0.1

Blood-alcohol concentration (BAC)g/dl

Source: WHO, Global status report on road safety 2013

7 out of **10** drivers involved in impaired driving crashes were **Male**

The age cohort with the greatest number of drivers involved in impaired driving crashes was ages 20-24, with 46 drivers, followed by ages 25-29, with 30 drivers.

NUMBER OF DRIVERS (Female / Male) by **AGE**

Thirteen percent of the crashes involving impaired drivers were **fatal,** while **21 percent** and 20 percent were **A-injury** and B-injury, respectively.

NUMBER OF CRASHES INVOLVING IMPAIRED DRIVERS by YEAR
Fatal Crash / B Injury Crash / A Injury Crash / C Injury Crash

Time of the Day

Month	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Jan	1	2			1		1					1		1		1			2		2	2		2
Feb		1	1		1	1						1	1			1			1	1			1	1
Mar	2		4	1	2	1	1						1		1				1	1	2	1	1
Apr		1			2	1						2		1			2		1				1
May	1		2	1	1								1					1		4		3
Jun	2	1	2	1				1				1		1		2	1	2	2	2
Jul	4	3	2			1		1				1				1	3	1	2	2
Aug	1	2		2		1		1		2		1		1		2	2	1		3
Sep	1			1		1						1				1	1		1	2
Oct		2	2	2								1	1		1				1	1
Nov		2	2	1	1							1		1			1	1	3
Dec	2		1	1				1	1				2		1	2	1	1	1

Number of crashes
Highest — Lowest

Twenty-two impaired driver crashes occurred between 11 p.m. and 12 a.m., the most impaired driver crashes to occur in any one-hour period.

A high number of impaired driving crashes occurred between 8 p.m. and 2 a.m.

Sixty-six percent of impaired driver crashes occurred over the weekend, which is from Friday to Sunday.

Table 11   *Strategies to reduce impaired driving crashes*

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
1. Prevent excessive and underage drinking and driving	**1.1** Enforce responsible beverage service policies and check compliance for alcohol servers and retailers.	🛡️	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)
	1.2 Conduct public outreach on the mandatory use of ignition interlock for all DUI offenders to deter drinking and driving.	📖	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments) and schools
	1.3 Employ screening and brief interventions in health care settings.	📖 ➕	ILSHSP	Local EMS and hospitals
	1.4 Control hours, locations, and promotion of alcohol sales.	🛡️	ILSHSP	Local police departments
	1.5 Provide a variety of initiatives to reduce excessive alcohol use and impaired driving within high school and collegiate settings.	📖 🛡️	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments) and schools
	1.6 Expand (or improve) education of the consequences of underage drinking.	📖	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments) and schools
	1.7 Consider emerging technologies that will continue to reduce impaired driving.	📖 🛡️	ILSHSP	CUUATS staff, IDOT, Champaign County, local cities, villages and townships (Public Works)

Implementation Areas: 📖 Education   🛡️ Enforcement   ⚙️ Engineering   ➕ Emergency Services

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
2. Enforce DUI laws	**2.1** Expand high-visibility DUI enforcement saturations including roadside safety checks.	(Enforcement)	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)
	2.2 Strengthen and expand law enforcement training to promote effective alcohol and/or drug impairment driving detection and arrest.	(Enforcement)	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)
	2.3 Expand training and technical assistance for law enforcement and prosecutors to implement DUI No-Refusal search warrant programs and processes in their communities.	(Enforcement)	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments) and Judiciary system
	2.4 Expand nighttime seat belt enforcement to detect unbelted drinking drivers.	(Enforcement)	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)
	2.5 Publicize and enforce zero tolerance laws for drivers under age 21.	(Education) (Enforcement)	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)
3. Prosecute, impose sanctions on, and treat DUI offenders	**3.1** Continue to suspend driver's license administratively upon arrest or refusal of blood-alcohol concentration (BAC) test.	(Enforcement)	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)
	3.2 Expand judicial education and outreach to promote the use of alcohol ignition interlock as well as highly supervised DUI and Drug Courts to monitor offenders.	(Enforcement)	ILSHSP	Judiciary system
	3.3 Provide training, technical assistance, and support to those who prosecute DUI offenses.	(Enforcement)	ILSHSP	Judiciary system
	3.4 Explore ways to reduce the total number of Statutory Summary Suspension rescissions.	(Enforcement)	ILSHSP	Judiciary system
	3.5 Eliminate diversion programs and plea bargains to nonalcoholic offenses.	(Enforcement)	ILSHSP	Judiciary system
	3.6 Continue to screen all convicted DUI offenders for alcohol problems and require treatment when appropriate.	(Enforcement)	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments) and Judiciary System

Implementation Areas: 📖 Education   🛡 Enforcement   ⚙ Engineering   ➕ Emergency Services

Objectives	Strategies	Implementation Area(s)	Sources	Responsible Agencies
4. Control high-BAC (0.16 or greater) and repeat offenders	**4.1** Seize vehicles or vehicle license plates administratively upon arrest.	⭐	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments) and Judiciary System
5. Increase educational efforts and policies and expand/ continue paid media exposure for public outreach regarding the consequences of and alternatives to impaired driving	**5.1** Partner with other agencies and employers to suggest policies and procedures aimed at reducing impaired driving by their employees.	📖	ILSHSP	IDOT, CUUATS staff, ISP
	5.2 Improve public awareness of and access to alternate forms of transportation.	📖	ILSHSP	IDOT, Schools, ISP, Champaign County Sheriff and local cities (Police Departments)
	5.3 Continue and expand comprehensive paid and earned media efforts in support of law enforcement.	⭐	ILSHSP	ISP, Champaign County Sheriff and local cities (Police Departments)

Source: ILSHSP   (Link: *http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/SHSP/SHSP_2017.pdf*)

Implementation Areas: 📖 Education ⭐ Enforcement ⚙ Engineering ➕ Emergency Services

REFERENCES

1   Illinois Strategic Highway Safety Plan 2017 (ILSHSP)

    (Link: http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/Safety/SHSP/SHSP_2017.pdf)

2   Systemic Safety Project Selection Tool

    (Link: https://safety.fhwa.dot.gov/systemic/fhwasa13019/sspst.pdf)

3   Center for Disease Control and Prevention (CDC). National Vital and Statistics Reports – Deaths: Leading Causes for 2016

    (Link: https://www.cdc.gov/nchs/data/nvsr/nvsr67/nvsr67_06.pdf)

4   National Highway Traffic Safety Administration. Traffic safety facts 2016 data. Rural/Urban Comparison of Traffic Fatalities

    (Link: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812521)

5   National Safety Council. Road to Zero Presents Plan to Eliminate Roadway Deaths.

    (Link: https://www.nsc.org/road-safety/get-involved/road-to-zero)

6   KABCO Injury Classification Scale and Definitions

    (Link: https://safety.fhwa.dot.gov/hsip/spm/conversion_tbl/pdfs/kabco_ctable_by_state.pdf)

7   Illinois Traffic Crash Report SR 1050 for 2019

    (Link:http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Manuals-Guides-&-Handbooks/Safety/Illinois%20Traffic%20Crash%20Report%20SR%201050%20Instruction%20Manual%202019.pdf)

8   Illinois DUI Fact Book

    (Link: https://www.cyberdriveillinois.com/publications/pdf_publications/dsd_a118.pdf)

9   World Health Organization

    (Link: https://www.who.int/violence_injury_prevention/road_safety_status/2013/facts/drinkdriving_web.jpg?ua=1)

APPENDIX A

A.1 County Highways

Map 13 presents the high-priority county highway segments identified using the methodology outlined in section *10.1 High-Priority Segments*. These segments are identified by comparing only the crashes that occurred on county highways. In this analysis, only segment-related crashes were considered; intersection-related crashes were not considered. Table 12 presents the list of high-priority county highway segments.

Table 12 *List of high-priority county highway segments in the rural Champaign County area*

Segment Name	Number of Crashes						Index Values			Priority Index
	Total	Fatal	A-injury	B-injury	C-injury	No injury	Crash Index	EPDO Index	Crash per Mile Index	
S Prairieview Rd	9	0	2	3	0	4	4	4	4	12
Homer Lake Rd	2	1	0	0	0	1	1	4	2	7
900E	5	0	1	2	0	2	3	2	1	6
S Prarieview Rd	4	0	0	1	1	2	2	0	4	6
900E	2	1	0	0	0	1	1	4	0	5
600E	3	0	1	0	0	2	2	2	1	5
200E	3	0	1	2	0	0	2	2	1	5
900N	3	0	1	1	1	0	2	2	1	5
1000N	2	1	0	1	0	0	1	4	0	5
1050N	4	0	1	2	0	1	2	2	1	5
2700E	2	1	0	0	0	1	1	4	0	5
2500N	3	0	1	0	0	2	2	2	1	5
2200E	3	0	1	1	0	1	2	2	1	5
N Mattis Ave	4	0	1	0	0	3	2	2	1	5

Legend

— County Highways

High-Priority County Highways (2012-2016)

Priority Index Value

— 12
— 7
— 6
— 5

Note: Only segment-related crashes were considered. Intersection-related crashes were not considered.
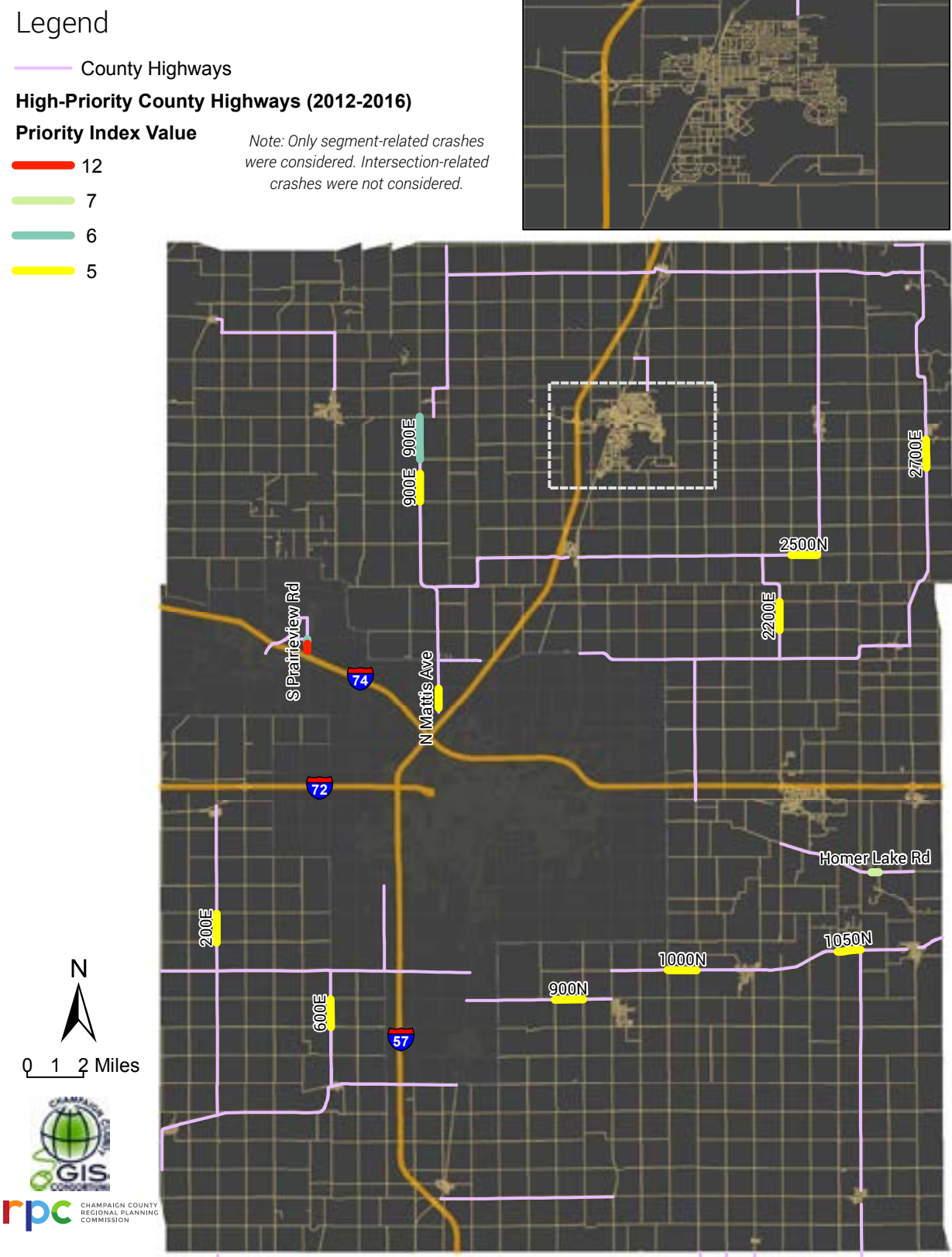
Map 13 *Location of the high-priority county highways in the five-year study period (2012-2016) in the rural Champaign County area*

A.2 U.S. and State Routes

Map 14 presents the high-priority U.S. and state route segments using the methodology outlined in section *10.1 High-Priority Segments*. These segments are identified by comparing only the crashes that occurred on U.S. and state routes. In this analysis, only segment-related crashes were considered; intersection-related crashes were not considered. Table 13 presents the list of high-priority U.S. and state route segments.

Table 13 *List of high-priority U.S. and state route segments in the rural Champaign County area*

Segment Name	Number of Crashes						Index Values			Priority Index
	Total	Fatal	A-injury	B-injury	C-injury	No injury	Crash Index	EPDO Index	Crash per Mile Index	
Bloomington Rd	19	0	1	1	1	16	4	2	4	10
Cunningham Ave	10	0	1	0	1	8	3	2	4	9
W University Ave	7	0	2	0	0	5	2	3	3	8
W Springfield Ave	11	0	2	1	0	8	3	3	2	8
S Dunlap Ave	24	0	1	2	4	17	4	3	1	8
S Neil St	17	0	0	0	2	15	4	0	4	8
SR 47	8	0	3	2	0	3	2	4	0	6
W University Ave	10	0	0	0	0	10	3	0	4	7
Cunningham Ave	10	0	2	1	1	6	3	3	0	6
W Springfield Ave	5	0	1	1	0	3	1	2	3	6
Cunningham Ave	11	0	0	1	1	9	3	0	3	6

Legend

US and State Routes

High-Priority US and State Routes

Priority Index Value

- 10
- 9
- 8
- 7
- 6
- 5
- 4

Note: Only segment-related crashes were considered. Intersection-related crashes were not considered.
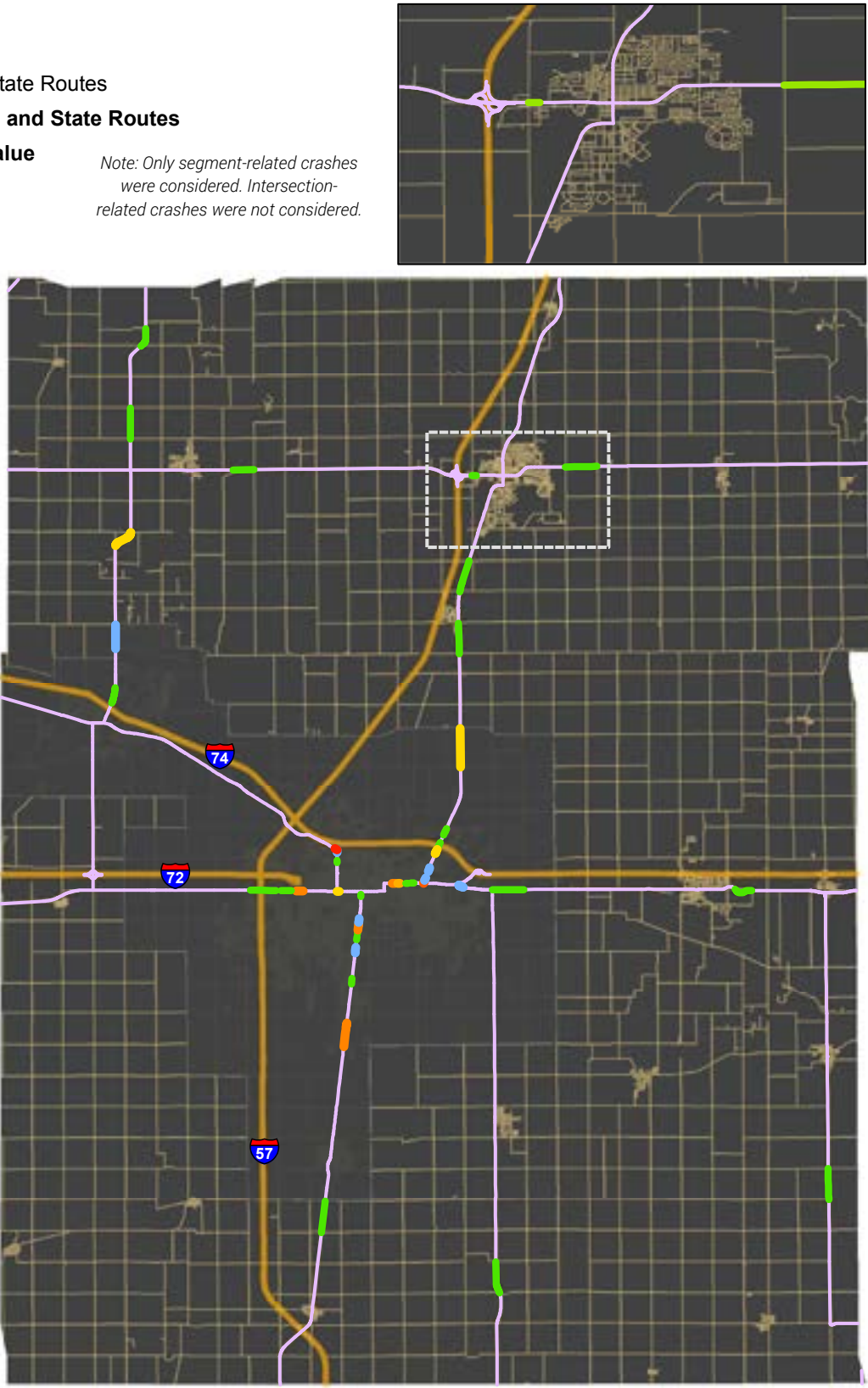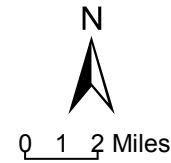
Map 14 *Location of the high-priority U.S. and state routes in the five-year study period (2012-2016) in the rural Champaign County area*
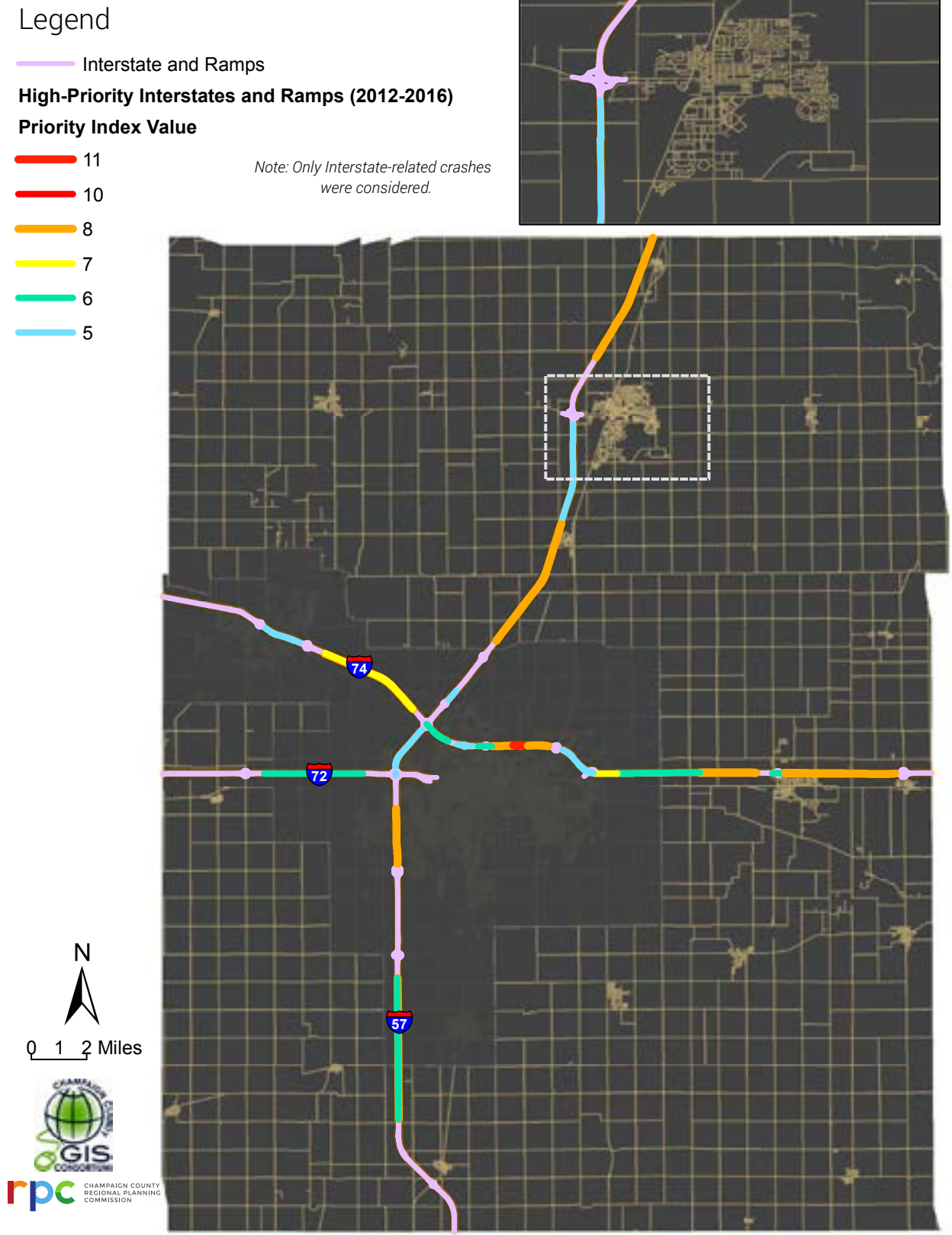
A.3 Interstates

Map 15 presents the high-priority Interstate segments identified using the methodology outlined in section *10.1 High-Priority Segments*. These segments are identified by comparing only the crashes that occurred on interstates. In this analysis, only interstate-related crashes were considered. Table 14 presents the list of high-priority interstate segments.

Table 14 *List of high-priority interstate segments in the rural Champaign County area*

Segment Name	Number of Crashes						Index Values			Priority Index
	Total	Fatal	A-injury	B-injury	C-injury	No injury	Crash Index	EPDO Index	Crash per Mile Index	
I-74 W	42	0	4	4	1	33	4	4	3	11
I-74 E	40	0	2	6	4	28	4	3	3	10
I-57 N	48	1	3	9	2	33	4	4	0	8
I-74 E	31	1	2	7	0	21	3	4	1	8
I-74 W	51	0	3	1	5	42	4	3	1	8
I-74 E	49	1	1	4	2	41	4	3	1	8
I-74 W	48	0	3	4	2	39	4	3	1	8
I-74 E	36	1	2	1	0	32	3	4	1	8
I-57 S	47	2	5	6	2	32	4	4	0	8
I-57 N	42	1	1	6	1	33	4	4	0	8
I-74 E	48	1	5	6	2	34	4	4	0	8
I-57 N	42	0	3	1	2	36	4	3	1	8
I-74 E	30	0	3	3	6	18	3	3	2	8
I-74 E	36	0	3	6	2	25	3	3	2	8

Legend

Interstate and Ramps

High-Priority Interstates and Ramps (2012-2016)
Priority Index Value
- 11
- 10
- 8
- 7
- 6
- 5

Note: Only Interstate-related crashes were considered.

N

0 1 2 Miles

Map 15 *Location of the high-priority interstates in the five-year study period (2012-2016) in the rural Champaign County area*

APPENDIX B

Agency Project Updates

Champaign County Highway Department

— Stop signs were installed at all the uncontrolled intersections in Champaign County in 2018. A four-way stop sign was placed at the intersection of Homer Lake Road and the St. Joseph/Sidney Road.

— At the intersection of US-136 and County Highway 1, recent upgrades include paved shoulders, centerline rumble strips, shoulder rumble strips, and lane narrowing. At this intersection, stop sign with a red beacon on top was installed.

— At the intersection of County Highway 20 and the St. Joseph Road (2200E), recent improvements include installation of oversized stop signs with flashing red beacons and rumble strips on the stopped roadway (2200E) and crossroad signs with a yellow flashing beacon on the through road (County Highway 20) to alert the travelers of the existence of an intersection.

— At 900N and 1200E intersection, recent improvements include installation of stop signs with the LED blinkers around the perimeter, rumble strips on 1200E and "Watch for vehicles" signs with yellow beacons on 900N.

— A countywide guardrail upgrade project is planned to install new guardrails and end treatments on all deficient guardrails on the county highway system in 2019.

— Curve signs with recommended speeds were installed at all curves that warranted the posting as per the Manual on Uniform Traffic Control Devices (MUTCD).

— Chevrons were installed on all curves on the county highway system that warranted them as per the MUTCD.

— On Country Highway 23, existing shoulders were widened and provided with safety slopes of 1:3 along the corridor.

IDOT
Table 15 presents recent improvements done by IDOT in four years.

Table 15 *List of IDOT improvements in the rural Champaign County area from 2015 to 2019*

Year	Route	Location	Improvement Type
2019	I-74	2 mile East of St Joseph interchange to IL 49 (N)	Resurfacing, Guardrail Ramp Repair
2019	IL 49	Homer south city limits to Edgar Co Line	Standard Overlay, New Shoulders, Milled Rumble Strip, Bridge Deck Overlay
2018	I-57	Douglas County line to Rantoul	Pavement Marking
2018	Broadlands Road (FA 525)	Longview Road to IL 49	Milled Rumble Strip, New Shoulders
2017	US 45 & US 136 / IL 47 & US 150	Various Locations in Rantoul and Mahomet	Surveillance
2016	US 136	Fisher to Dewy	New Shoulders, Milled Rumble Strip
2016	US 45	Ford County line to US 136 in Rantoul	Standard Overlay, Guardrail ADA Improvements , Milled Rumble Strip, New Shoulders
2016	IL 49	Homer to Ogden	New Shoulders, Milled Rumble Strip
2016	US 45	North city limits of Tolono to I-57 at Pesotum	Resurfacing (Smart), Guardrail, ADA Improvements
2015	IL 47	US 136 to I-74 in Mahomet	Designed Overlay, New Shoulders, Culvert Replacement, Intersection Improvement, Safety Improvements
2015	IL 47	Mahomet to IL 10	Milled Rumble Strips
2015	US 136	East of Rantoul to Gifford	Milled Rumble Strips