IOWADOT

US 34 Super Two Planning Study
Clarke, Lucas, Monroe, and Union Counties

34

Existing Crash and Safety Performance Report

Location and Environment Bureau | September 2023

EXECUTIVE SUMMARY

As part of the US 34 Super Two Study, referred to hereafter as the Study, this existing crash and safety performance report summarizes analysis of U.S. Highway 34 (US 34) corridor's safety performance. The Study corridor includes approximately 65 miles of US 34 in Clarke, Lucas, Monroe, and Union counties in south central Iowa. Beginning approximately 3 miles east of US 169, the Study corridor continues east through Osceola, Chariton, and Albia and ends just east of 201st Street/South 13th Street. The analysis is based on the Iowa Department of Transportation's (DOT's) most recent 5-year crash data (2017 through 2021). Within the Study corridor, 478 crashes occurred between 2017 and 2021. The total number of crashes was relatively consistent year-over-year, with a high of 119 crashes in 2019 and a low of 70 crashes in 2020. The corridor experienced five fatal crashes. There was no overrepresentation of fatal crashes at any one segment or intersection. Two fatal crashes occurred at intersections (one at US 34 and 277th Avenue and one at US 34 and South 1st Street), and three were non-intersection related. Of the 478 total crashes, 54 involved serious or minor injuries.

The following observations were made based on a review of the 2017-2021 crash data information and attributes associated with crash events occurring in the Study corridor:

- There was no overrepresentation of fatal crashes at any one segment or intersection that could be attributed to roadway design.

- The most common crash types were single-vehicle crashes (accounted for 253 crashes or 53 percent of total, however, accounted for only 39 percent or 186 of injury crashes).

- The second most common crash types were animal-related crashes (196 or 41 percent of total), all of which were single-vehicle crashes except for 3 multi-vehicle crashes.

- Crashes along roadway segments were more frequent than at intersections. Severity of segment-related and intersection crashes was similar, with segment-related crashes accounting for approximately 17 percent of injury crashes and intersection crashes accounting for 28 percent of injury crashes.

- Rear-end and broadside crashes were most common among multi-vehicle crashes at intersections.

- Crashes predominately occurred under dry pavement surface conditions; 7 percent of the total crashes (accounting for 8 percent of injury crashes) occurred during rain and wet pavement conditions, while only 4 percent of the total crashes (accounting for 9 percent of injury crashes) occurred during snow and ice conditions.

- Crashes were split approximately 50/50 between occurring in the daytime and the nighttime.

- Crashes occurred throughout the day; with spikes in crashes occurring during the AM and PM peak traffic periods.

- 34 percent (162) of total crashes (accounting for 45 percent of injury crashes) occurred at intersections.

- Failure to yield right-of-way at intersections was the most common cause of intersection-related crashes and accounted for approximately 21 percent of the injury crashes.

- Frequency of crashes tended to increase in October, November, and December (36 percent of total, and 31 percent of injury crashes), which coincided with an increase in animal-related crashes (40 percent of all animal crashes) during the same months.

- Heavy trucks or agricultural equipment (which account for between 7 and 17 percent of the traffic on US 34) were involved in 20 percent (or 95) of the total crashes (and accounted for 21 percent of injury crashes) and were distributed throughout the year.

Iowa DOT provided potential for crash reduction (PCR) values, which were used to normalize the crash statistics against the volume of traffic within the Study corridor. The values are also available on the Iowa DOT website. Roadways were segmented by Iowa DOT, and PCR values were created by comparing the observed crashes at a location, predicted crashes using Safety Performance Functions, and a corrected number of crashes using the Empirical Bayes method. The difference between the predicted and expected number of crashes is the PCR or the potential safety improvement on the site. Other locations where injury crashes occurred were also investigated.

A total of 13 segments and 21 intersections within the Study corridor along US 34 were identified as having PCR values greater than those of comparable US highways in Iowa (Study Sites 1-4) or having a history of one or more injury crashes (Study Sites Segments 1-13 and Intersection 1-21) (Figure ES-1, ES-2, ES-3, an ES-4). Table ES-1 summarizes all locations with PCR values that were higher than statewide averages, and Table ES-2 summarizes all locations with a history of injury crashes. It should be noted that having a PCR higher than the statewide average PCR or a higher frequency of crashes compared to other roadway segments does not necessarily indicate that a safety problem exists at these locations. Rather, the locations have experienced more crashes than would be expected over a 5-year period compared to other similar roadways.

Figure ES-1. US 34 Roadway Sections with Noteworthy PCR Values or Crash History of Injury Crashes – Union County
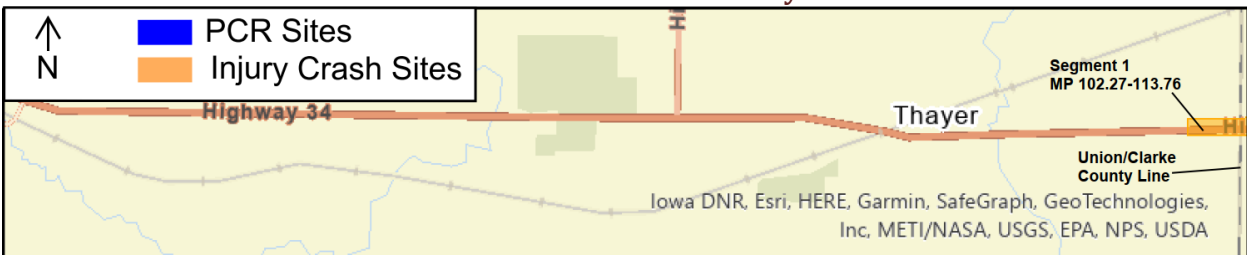
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure ES-2. US 34 Roadway Sections with Noteworthy PCR Values or Crash History of Injury Crashes – Clarke County
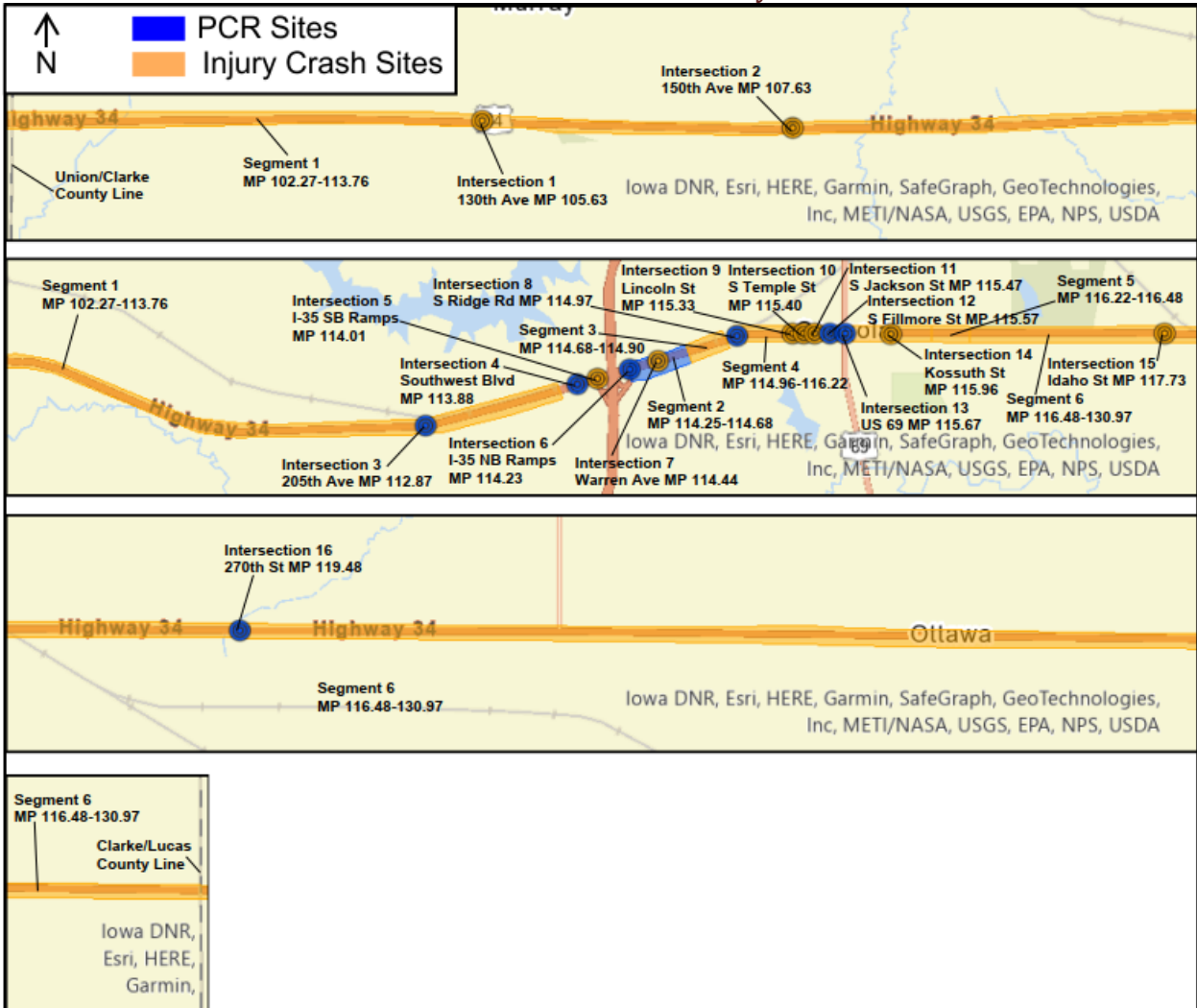
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure ES-3. US 34 Roadway Sections with Noteworthy PCR Values or Crash History of Injury Crashes – Lucas County
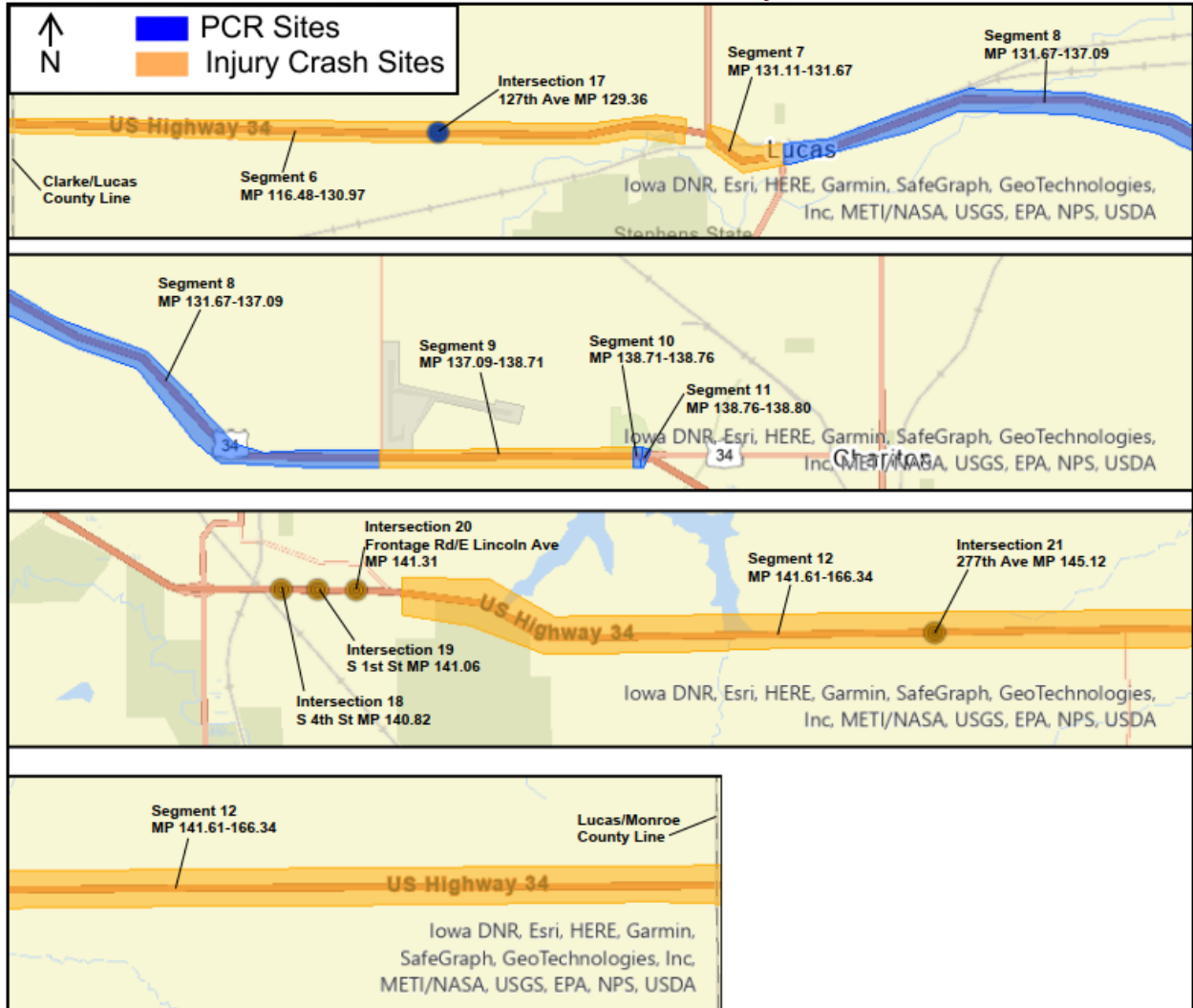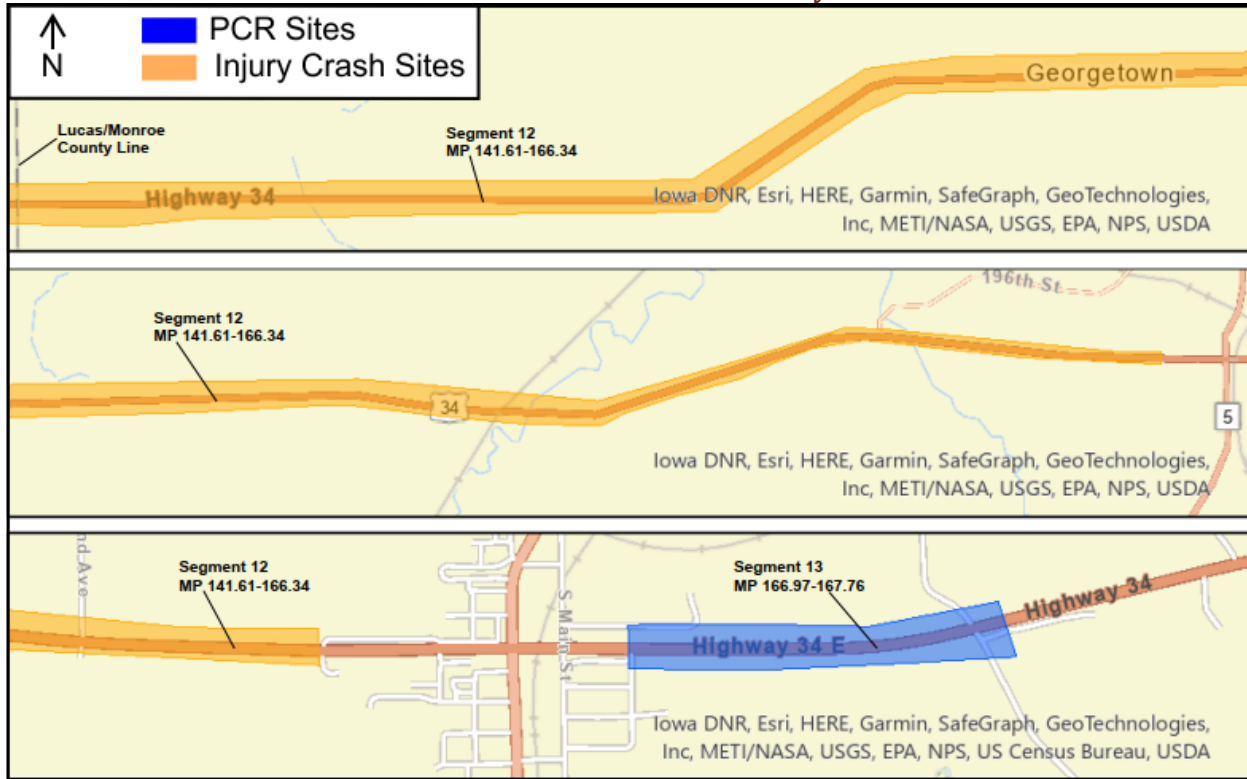

Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure ES-4. US 34 Roadway Sections with Noteworthy PCR Values or Crash History of Injury Crashes – Monroe County

Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Each of the 34 Study sites has both unique and common characteristics. The following are the commonalities:

- Crashes involving failure to yield right-of-way at stop signs by drivers turning onto US 34: in most cases, the driver making the turn from the minor approach onto US 34 was cited in the crash.

- Many crashes are animal crashes or clustered at or near roadway curves.

Table ES-1. US 34 Locations with Noteworthy PCR Values (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 3 (Clarke County)	US 34 and 205th Avenue MP 112.87	• 1 total crash that was a possible injury. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was a rear-end crash.	All Crashes: 0.30 (Medium) Severe Crashes: -0.03 (Negligible)
Intersection 4 (Clarke County)	US 34 and Southwest Boulevard MP 113.88	• 9 total crashes (2 minor injuries, 1 possible injury, and 6 PDO crashes). • 1 crash occurred during the nighttime. • 2 crashes occurred in wet conditions. • 3 crashes were caused by failure to yield right-of-way. • 5 crashes were angle/broadside crashes.	All Crashes: 1.25 (High) Severe Crashes: 0.24 (Medium)
Intersection 6 (Clarke County)	US 34 and Interstate 35 Northbound Ramps MP 114.23	• 17 total crashes (1 serious injury, 1 minor injury, 3 possible injuries, and 12 PDO crashes). • 2 crashes occurred during the nighttime. • 3 crashes occurred in wet conditions. • 7 crashes were caused by failure to yield right-of-way. • 5 crashes were caused by improper turning. • 11 crashes were angle/broadside crashes and 5 were rear-end crashes.	All Crashes: 0.33 (Medium) Severe Crashes: 0.11 (Medium)
Segment 2 (Clarke County)	US 34 MP 114.25 to MP 114.68 (Iowa DOT ID: 4919)	• 5 total crashes (1 minor injury, 1 possible injury, and 3 PDO crashes). • 1 crash occurred during the nighttime. • 1 crash occurred in wet conditions. • 3 crashes were rear-end crashes.	All Crashes: -0.09 (Negligible) Severe Crashes: 0.12 (Medium)
Intersection 8 (Clarke County)	US 34 and South Ridge Road MP 114.97	• 8 total crashes (1 serious injury and 7 PDO crashes). • 3 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 3 crashes were caused by failure to yield right-of-way. • 4 crashes were broadside crashes.	All Crashes: 0.93 (Medium) Severe Crashes: 0.01 (Negligible)
Intersection 12 (Clarke County)	US 34 and South Fillmore Street MP 115.57	• 5 total crashes (1 minor injury, 1 possible injury, and 3 PDO crashes). • No crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 2 crashes were cause by failure to yield right-of-way. • 3 crashes were angle/broadside crashes.	All Crashes: 0.68 (Medium) Severe Crashes: 0.08 (Medium)

Table ES-1. US 34 Locations with Noteworthy PCR Values (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 13 (Clarke County)	US 34 and US 69 MP 115.67	• 18 total crashes (1 minor injury, 1 possible injury, and 16 PDO crashes). • 5 crashes occurred during the nighttime. • 2 crashes occurred in wet conditions. • 8 crashes were caused by failure to yield right-of-way and 3 by ran traffic signal. • 7 crashes were angle/broadside, 2 were head-on, 3 were rear-end, and 5 were sideswipe crashes.	All Crashes: 1.62 (High) Severe Crashes: 0.04 (Negligible)
Intersection 16 (Clarke County)	US 34 and 270th Street MP 119.48	• 1 total crash that was a PDO crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by passing.	All Crashes: 0.47 (Medium) Severe Crashes: -0.02 (Negligible)
Intersection 17 (Lucas County)	US 34 and 127th Avenue MP 129.36	• 1 total crash that was a minor injury crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by following too close. • 1 crash was a rear-end crash.	All Crashes: 0.43 (Medium) Severe Crashes: -0.02 (Negligible)
Segment 8 (Lucas County)	US 34 MP 131.67 to MP 137.09 (Iowa DOT ID: 5095)	• 35 total crashes (1 serious injury, 5 minor injuries, 2 possible injuries, and 27 PDO crashes). • 21 crashes occurred during the nighttime. • 5 crashes occurred in wet conditions. • 21 crashes were animal-related crashes.	All Crashes: 0.36 (Medium) Severe Crashes: 0.02 (Negligible)
Segment 10 (Lucas County)	US 34 MP 138.71 to MP 138.76 (Iowa DOT ID: 6301)	• 2 total crashes, both PDO crashes. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was animal-related and 1 was caused by an improper turn. • 1 crash was a sideswipe crash.	All Crashes: 0.30 (Medium) Severe Crashes: 0.00 (Negligible)
Segment 11 (Lucas County)	US 34 MP 138.76 to MP 138.80 (Iowa DOT ID: 6712)	• 1 total crash that was a PDO crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was a ran off the road crash. • 1 crash was a fixed object crash.	All Crashes: 0.33 (Medium) Severe Crashes: 0.00 (Negligible)
Segment 13 (Monroe County)	US 34 MP 166.97 to MP 167.76 (Iowa DOT ID: 5064)	• 11 total crashes, all of which were PDO crashes. • 7 crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 9 crashes were animal-related crashes. • 1 crash was a head-on crash.	All Crashes: 0.49 (Medium) Severe Crashes: -0.05 (Negligible)

MP = mile post, NE = northeast, PDO = Property Damage Only, SE = southeast

Table ES-2. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Segment 1 (Union/ Clarke Counties)	US 34 MP 102.27 to MP 113.76 (Iowa DOT ID: 6013)	• 47 total crashes (2 fatal, 1 serious injury, 5 minor injury, 1 possible injury, and 38 PDO crashes). • 33 crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 33 crashes were animal-related. • 1 fatal crash was caused by a swerving/evasive action. • 1 fatal crash was caused by a head-on crash in which one vehicle crossed the centerline.	All Crashes: -0.41 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 1 (Union County)	US 34 and 130th Avenue MP 105.63	• 7 total crashes (1 minor injury, 1 possible injury, and 5 PDO crashes). • 3 crashes occurred during the nighttime. • 2 crashes occurred in wet conditions. • 2 crashes were caused by following too close, 2 were improper turning, and 1 was failure to yield right-of-way. • 4 crashes were broadside, 2 were head-on, and 1 was a sideswipe crash.	All Crashes: 0.02 (Negligible) Severe Crashes: 0.01 (Negligible)
Intersection 2 (Union County)	US 34 and 150th Avenue MP 107.63	• 3 total crashes (1 minor injury, 1 possible injury and 1 PDO crash). • 3 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 1 crash was animal-related and 1 was caused by crossing the centerline. • 1 crash was a rear-end, and 1 was a sideswipe crash.	All Crashes: -0.02 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 5 (Union County)	US 34 and Interstate 35 Southbound Ramps MP 114.01	• 15 total crashes (3 possible injuries and 12 PDO crashes). • 3 crashes occurred during the nighttime. • 3 crashes occurred in wet conditions. • 5 crashes were caused by failure to yield right-of-way and 4 by following too close. • 8 crashes were rear-end and 7 were broadside crashes.	All Crashes: N/A Severe Crashes: N/A
Intersection 7 (Union County)	US 34 and Warren Avenue MP 114.44	• 12 total crashes (2 minor injuries, 1 possible injury, and 9 PDO crashes). • 3 crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 7 crashes were failure to yield to right-of-way and 3 were ran traffic signal crashes. • 10 crashes were angle/broadside crashes.	All Crashes: 0.16 (Negligible) Severe Crashes: 0.03 (Negligible)

Table ES-2. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Segment 3 (Union County)	US 34 MP 114.68 to MP 114.90 (Iowa DOT ID: 6637)	• 1 total crash that was a minor injury crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was an animal-related crash.	All Crashes: -0.98 (Negligible) Severe Crashes: 0.05 (Negligible)
Segment 4 (Union County)	US 34 MP 114.96 to MP 116.22 (Iowa DOT ID: 4929)	• 23 total crashes (1 major injury, 1 minor injury, 1 possible injury, and 20 PDO crashes). • 4 crashes occurred during the nighttime. • 5 crashes occurred in wet conditions. • 5 crashes were failure to yield right-of-way and 4 were following too close. • 10 crashes were broadside and 7 were rear-end crashes.	All Crashes: -1.90 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 9 (Union County)	US 34 and Lincoln Street MP 115.33	• 2 total crashes (1 minor injury and 1 PDO crash). • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by an improper turn and 1 was by speeding. • 2 crashes were head-on crashes.	All Crashes: -0.16 (Negligible) Severe Crashes: -0.01 (Negligible)
Intersection 10 (Union County)	US 34 and South Temple Street MP 115.40	• 3 total crashes (1 serious injury and 2 PDO crashes). • No crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 1 crash was caused by failure to yield right-of-way and 1 was by passing. • 1 crash was a broadside and 1 was a sideswipe crash.	All Crashes: 0.15 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 11 (Union County)	US 34 and South Jackson Street MP 115.47	• 1 total crash that was a minor injury crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was a broadside crash.	All Crashes: -0.32 (Negligible) Severe Crashes: 0.04 (Negligible)

Table ES-2. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 14 (Union County)	US 34 and Kossuth Street MP 115.96	• 2 total crashes (1 serious injury and 1 PDO crash). • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 2 crashes were caused by failure to yield right-of-way. • 1 crash was a broadside and 1 was a pedestrian crash.	All Crashes: 0.00 (Negligible) Severe Crashes: 0.04 (Negligible)
Segment 5 (Union County)	US 34 MP 116.22 to MP 116.48 (Iowa ID: 6637)	• 1 total crash that was a minor injury crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by following too close. • 1 crash was a rear-end crash.	All Crashes: -1.22 (Negligible) Severe Crashes: 0.03 (Negligible)
Segment 6 (Union/ Lucas Counties)	US 34 MP 116.48 to MP 130.97 (Iowa ID: 4909)	• 64 total crashes (4 minor injuries, 3 possible injuries, and 57 PDO crash). • 49 crashes occurred during the nighttime. • 8 crashes occurred in wet conditions. • 47 crashes were animal-related and 3 were caused by speeding. • 6 crashes were sideswipe and 2 were rear-end crashes.	All Crashes: 0.13 (Negligible) Severe Crashes: -0.03 (Negligible)
Intersection 15 (Union County)	US 34 and Idaho Street MP 117.73	• 1 total crash that was a minor injury crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by loss of control. • 1 crash was a rear-end crash.	All Crashes: 0.00 (Negligible) Severe Crashes: 0.00 (Negligible)
Segment 7 (Lucas County)	US 34 MP 131.11 to MP 131.67 (Iowa ID: 5232)	• 4 total crashes (1 minor injury and 3 PDO crashes). • 3 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 2 crashes were caused by running off the road. • 1 crash was a sideswipe and 1 was a fixed object crash.	All Crashes: 0.17 (Negligible) Severe Crashes: 0.04 (Negligible)
Segment 9 (Lucas County)	US 34 MP 137.09 to MP 138.71 (Iowa ID: 5274)	• 4 total crashes (2 minor injuries, 1 possible injury, and 1 PDO crashes). • 2 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 2 crashes were animal-related crashes. • 1 crash was a sideswipe and 1 was a pedestrian crash.	All Crashes: -0.45 (Negligible) Severe Crashes: 0.00 (Negligible)

Table ES-2. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 18 (Lucas County)	US 34 and South 4th Street MP 140.82	• 2 total crashes (1 minor injury and 1 PDO crash). • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by failure to yield right-of-way. • 2 crashes were broadside crashes.	All Crashes: 0.04 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 19 (Lucas County)	US 34 and South 1st Street MP 141.06	• 2 total crashes (1 fatal and 1 PDO crash). • The fatal crash was caused by failure to yield right-of-way and was a broadside crash that occurred during dusk and under dry conditions. • The PDO crash was a rear-end crash that occurred during the daylight and under dry conditions.	All Crashes: -0.09 (Negligible) Severe Crashes: 0.03 (Negligible)
Intersection 20 (Lucas County)	US 34 and Frontage Road/East Lincoln Avenue MP 141.31	• 1 total crash that was a serious injury crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by lane departure. • 1 crash was a head-on crash.	All Crashes: N/A Severe Crashes: N/A
Segment 12 (Lucas/ Monroe Counties)	US 34 MP 141.61 to MP 166.34 (Iowa ID: 5047)	• 109 total crashes (1 fatal, 2 serious injuries, 4 minor injuries, 12 possible injuries, and 90 PDO crashes). • The fatal crash was caused by failure to yield right-of-way and was an overturn, non-collision crash that occurred during nighttime and under dry conditions. • 74 crashes occurred during the nighttime. • 13 crashes occurred in wet conditions. • 78 crashes were animal-related crashes, 12 were caused by ran off road, and 3 were by speeding. • 6 crashes were sideswipes and 4 were rear-end crashes.	All Crashes: 0.16 (Negligible) Severe Crashes: -0.01 (Negligible)
Intersection 21 (Lucas County)	US 34 and 277th Avenue MP 145.12	• 2 total crashes (1 fatal and 1 PDO crash). • The fatal crash was caused by crossing the centerline and was a head-on crash that occurred during daylight and under dry conditions. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by running off the road.	All Crashes: 0.00 (Negligible) Severe Crashes: 0.00 (Negligible)

MP = mile post, NE = northeast, PDO = Property Damage Only, SE = southeast

The findings of this analysis will be used as one of the data inputs into the development and evaluation of potential improvement alternatives for the US 34 corridor being prepared and considered as part of the overall US 34 Super Two Study. How the crash data are applied to the alternatives process and how the potential improvement projects can address and improve safety in the Study corridor will be documented as part of a separate Vision Document.

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ACRONYMS AND ABBREVIATIONS

Iowa DOT	Iowa Department of Transportation
PCR	potential for crash reduction
PDO	Property Damage Only
US 34	United States Highway 34

1   INTRODUCTION

The Iowa Department of Transportation (DOT) is conducting a planning study, referred to hereafter as the Study, of a 65-mile-long section of US Route 34 (US 34) in Clarke, Lucas, Monroe, and Union counties in south central Iowa beginning approximately 3 miles east of US 169 and ending just east of 201st Street/South 13th Street in Albia (see Figure 1). This section of US 34 passes through or near seven communities and, depending on the location within the corridor, carries between 2,200 and 9,700 vehicles per day (of which 9 to 29 percent are trucks and other heavy vehicles). The Study will examine whether the existing facility is able to meet current and future travel and mobility needs and identify any potential improvement projects that may be necessary to meet future demands. Specifically, the goals of this Study are to:

- Provide Super Two highway recommendations for roadway improvements.

- Provide recommendations for prioritization of potential corridor improvements.

Figure 1. US 34 Planning Study Area

Source: Esri, 2022

This report summarizes an analysis of the safety performance of the existing US 34 corridor and identifies areas in the corridor where crashes are most common and the characteristics surrounding those crashes. The findings of this safety performance evaluation will feed into

other phases of the Study, including development and evaluation of improvements to address and meet the future transportation needs of the corridor.

2   STUDY AREA

Existing US 34 is a two-lane rural highway throughout the Study area. Approximately 65 miles in length, the corridor is primarily rural in nature and passes through or near four communities: Osceola, Lucas, Chariton, and Albia. There are numerous at-grade intersections along the corridor including intersections with both gravel and paved local roadways.

The *US 34 Super Two Study – Existing Conditions Memorandum* summarizes the existing roadway physical conditions, including the roadway alignment and intersection geometric characteristics.

3   METHODOLOGY

This safety performance evaluation and crash analysis used Iowa DOT's most recent and complete 5 years of crash data (2017–2021). Analyzing crash data statistics yearly generally results in crash numbers varying sporadically from year to year. To gain a more representative understanding of the safety performance of the corridor, it is common for Iowa DOT to evaluate at least 5 years of data to estimate yearly average statistics and crash trends.

This analysis included all crashes that occurred along US 34 Study corridor. Crashes within 500 feet of US 34 on the local roadway approaches in the Study corridor were also included in the analysis if they were coded as intersection-related in the crash data records. No review of crash reports was done to rectify any miscoded crashes.

For the 2017-2021 period, referred to hereafter as the safety Study period, crash data was evaluated for trends in the type, frequency, location, severity, and other contributing factors, such as roadway conditions at the time of the crashes. Evaluating these characteristics and factors provided insight on the crash history within the corridor and any prevailing trends in the data that could point to crash causation and/or areas of focus to improve travel safety.

Observed crashes are the number of crashes at a specific location during a defined time period. Observed crash frequencies consider historical crash data for location of interest but do not account for annual fluctuations in observed crashes or other geometric, weather, or driver-based changes. Predicted crashes are based on a Safety Performance Function. Predicted crash frequencies account for annual fluctuations in observed crashes and changes in traffic volume, roadway characteristics, and general time trends. They do not consider historical crash data for locations of interest. Expected crashes are the combination of observed and predicted crash frequencies. Specifically, the Empirical Bayes method is used to compute weighted averages of the observed and predicted crash frequencies. Expected crash frequencies account for annual fluctuations in observed crashes and consider changes in traffic volume, roadway characteristics, and general time trends. These frequencies also consider historical crash data for locations of interest; however, they do not account for major changes from the base condition to a condition with a countermeasure implemented.

The difference between the expected number of crashes and the predicted number of crashes gives the potential for safety improvement, also known as potential crash reduction (PCR). A PCR greater than 1.0 indicates that the intersection is experiencing higher crashes than would

be expected for peer intersections with similar geometric and operational characteristics. The higher the PCR, the greater the opportunity for improvement and crash reduction if safety improvements are implemented.

Intersection PCR values are expressed as PCR/year. Segment PCR values are typically expressed as PCR/mile/year. PCR values are calculated for both All Crashes (KABCO) and Severe Crashes (LAB) and can be split up between three different levels: High, Medium, and Negligible. High PCR level intersections or segments represent locations in which the potential safety improvement is above the statewide average. Projects at these intersections and segments will likely qualify for safety funds and will require a consultation with Traffic and Safety Bureau to determine potential safety improvements. Medium PCR level intersections or segments have room for improvement and may qualify for safety funds. Negligible PCR level intersections or segments are performing close to or better than expected. Table 1 shows the PCR value ranges for each differing level.

Table 1. PCR Level Definitions

All Crashes (KABCO) PCR/year		Severe Crashes (KAB) PCR/year		PCR Level
Paved Road Intersections	Primary Road Segments	Paved Road Intersections	Primary Road Segments	
PCR ≥ 1	PCR ≥ 1	PCR ≥ 0.25	PCR ≥ 1	High
PCR ≥ 0.02 and < 1	PCR ≥ 0.02 and < 1	PCR ≥ 0.05 and < 0.25	PCR ≥ 0.02 and < 1	Medium
PCR > 0 and < 0.02	PCR > 0 and < 0.02	PCR > 0 and < 0.05	PCR > 0 and < 0.02	Negligible
PCR ≤ 0	PCR ≤ 0	PCR ≤ 0	PCR ≤ 0	

Note: KABCO represents all crashes; K (fatal), A (severe injuries), B (minor injuries), C (possible injuries), and O (property damage only. KAB represent more severe crashes; K (fatal), A (severe injuries), and B (minor injuries).

Intersections and roadway segments identified as having a PCR level of high or medium for either All Crashes or Severe Crashes were identified for further investigation. Also included were intersections and roadway segments that had a PCR level of negligible but had a history of injury crashes. Having a higher PCR level does not necessarily imply a safety issue exists at these locations, rather it simply means the given section of roadway or intersection sees more crashes than would be expected compared to other similar roadway segments or intersections in Iowa and would benefit from evaluation to determine if safety improvements could improve this.

Locations where more crashes occurred than would be expected were investigated further to identify any prevailing trends that could suggest a safety concern is present, including a deeper dive into the safety study period crash data for events that occurred along the specific roadway segments or at a specific intersection in question.

4   RESULTS

Between 2017 and 2021, a total of 478 crashes occurred within the safety study corridor. Of those, 100 were crashes that resulted in at least one injury. The distribution of crashes along the safety study corridor is depicted in the series of graphics provided in Appendix A. Appendix B summarizes locations, crashes, severity, and PCR values. The following subsections summarize crash details.

4.1 CORRIDOR-WIDE CRASH DATA CHARACTERISTICS

CRASH FREQUENCY AND SEVERITY

From 2017 through 2021, the total annual crash frequency throughout the corridor was relatively constant, ranging from a low of 70 crashes in 2020 to a high of 119 crashes in 2019 (Figure 2). The frequency of injury crashes also remained level, ranging from a low of 12 crashes in 2020 to a high of 24 crashes in 2021.

There were 5 fatal crashes during the study period:

- Case Number: 20171006832 occurred in September 2017 at the intersection of US 34 and 277th Avenue and was a head-on collision.
- Case Number: 20181052592 occurred in June 2018 west of the intersection of US 34 and County Road R25/Lacelle Road/180th Avenue and was a head-on collision.
- Case Number: 20181038558 occurred in March 2018 on US 34 east of 160th Avenue and was caused by an evasive maneuver.
- Case Number: 2019112719 occurred in August 2019 on US 34 east of Albia Road and was caused by failure to yield at a driveway.
- Case Number: 20201203466 occurred in November 2020 at the intersection of US 34 and S 1st Street and was caused by failure to yield while making a left turn.

There was another fatal crash that occurred outside of the reporting period (in February 2015) at the intersection of US 34 and County Road H35/204th Trail and was a "run-off-road" (right) crash.

Figure 2. Fatal, Injury, and Total Crashes by Year, 2017 through 2021
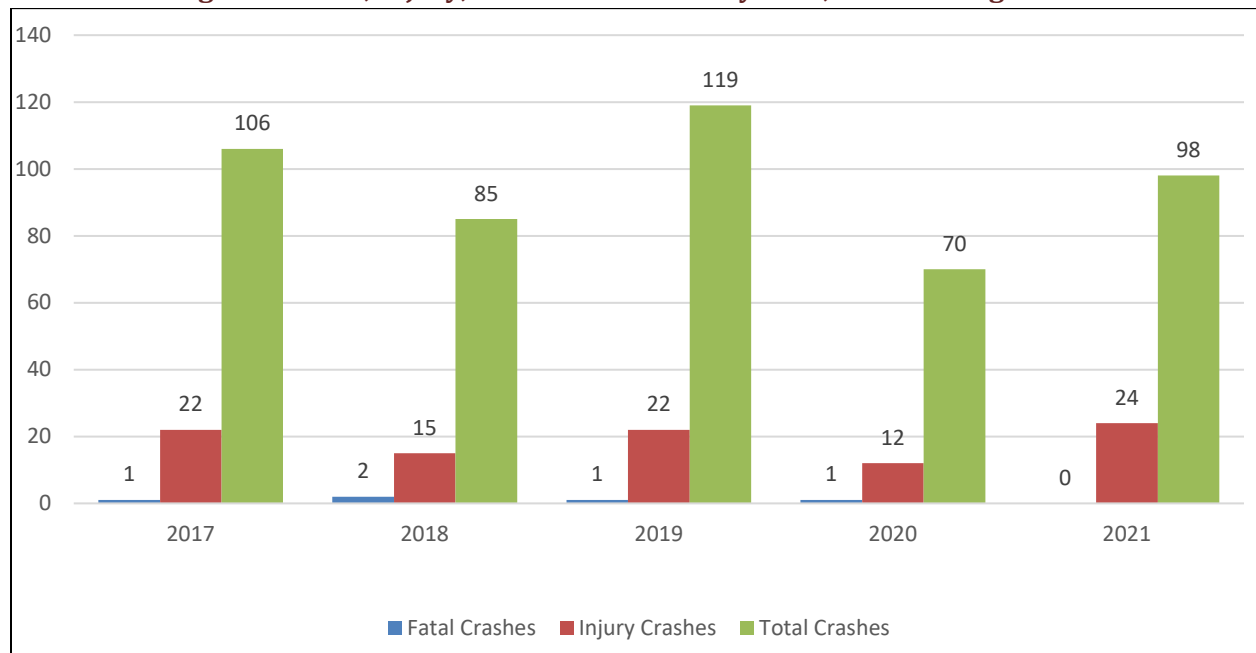
Source: Iowa DOT Crash Data (2017-2021)

In general, most crashes were of low or no severity within the corridor during the Study period. As shown in Figure 3, 79 percent of all crashes in the corridor were property-damage-only crashes, or crashes in which no involved person sustained any known or possible injury. Fifteen crashes (3 percent) resulted in a major, or incapacitating, injury five of which were fatal crashes (1 percent) occurred.

Figure 3. Crashes by Injury Severity, 2017 through 2021
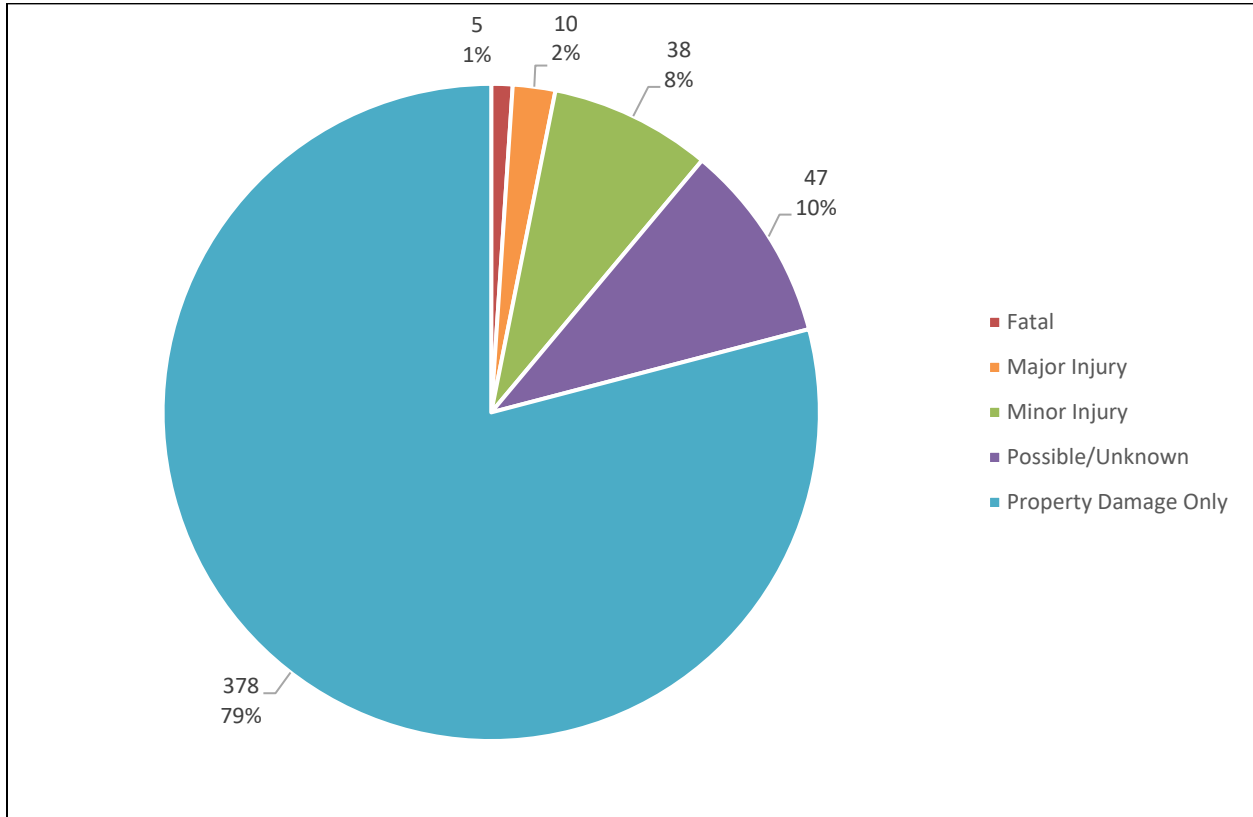
Source: Iowa DOT Crash Data (2017-2021)

PRE-CRASH ACTION

Figure 4 shows fatal, injury, and total crashes by pre-crash action (action or event that occurred immediately prior to the crash occurring). It is not uncommon for a single crash to have a variety of contributing factors related to environmental conditions, infrastructure elements, and driver behavior. Contributing crash factors help to understand common issues leading to a collision. The most common pre-crash action involved an animal(s) in the roadway (41 percent).

The second most common pre-crash action was "failure to yield right-of-way"[1] (typically, crashes at an intersection) (15 percent) and resulted in the second highest proportion of injury crashes (19 percent) as well as the two fatal crashes. Crashes that had an "other/unknown" cause were the third most common (11 percent). "Lane departure" crashes resulted in the fourth most comment pre-crash action (10 percent) and resulted in the highest proportion of injury crashes (22 percent) as well as the two fatal crashes within the safety study corridor between 2017 and 2021. "Improper driving action/ loss of control" resulted in the fifth highest number of total crashes (10 percent).

Figure 4. Fatal, Injury and Total Crashes by Pre-crash Action, 2017-2021
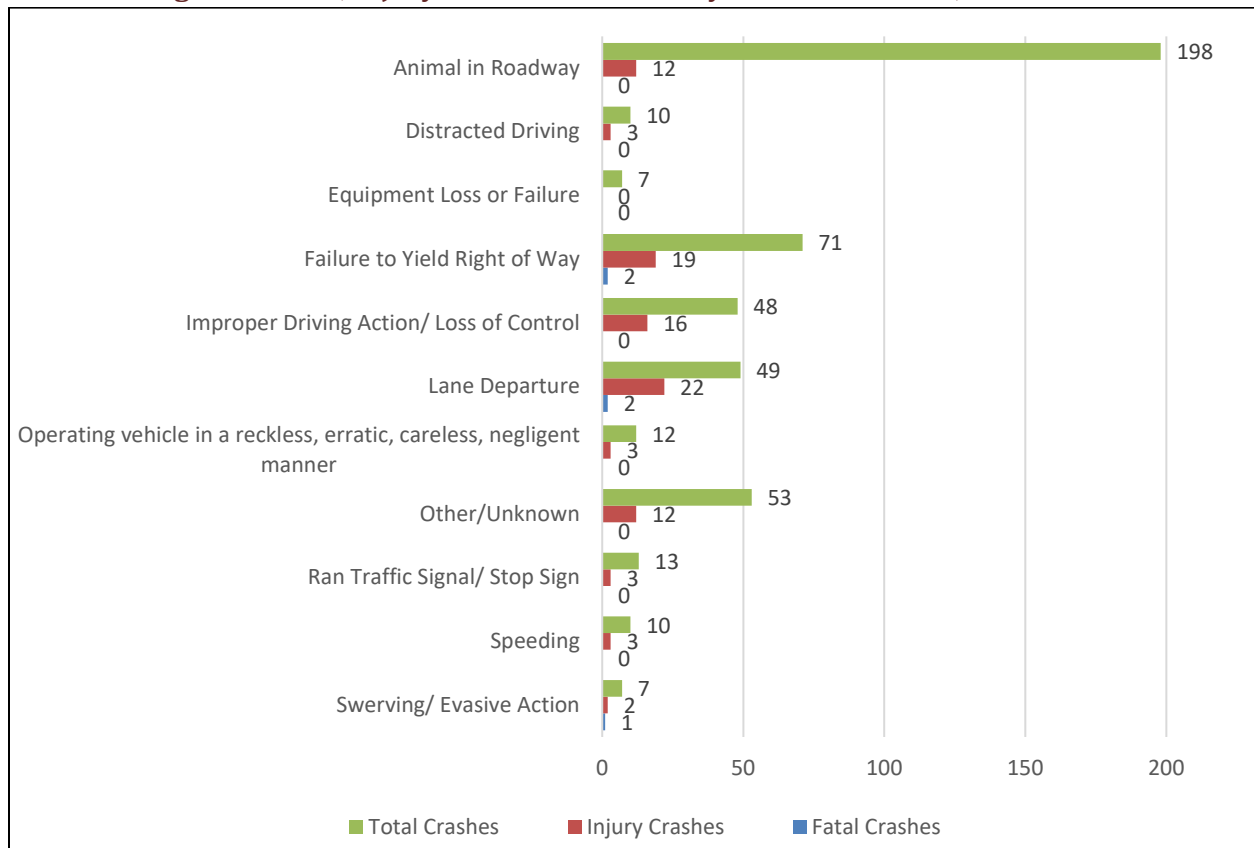
Source: Iowa DOT Crash Data (2017-2021)

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1 Failure to yield right-of-way" can refer to several situations involving two or more vehicles wherein one vehicle does not allow another vehicle to travel freely along the legally established traveled way. The various specific legal descriptions of failing to yield right-of-way in Iowa are defined in 2015 Iowa Code TITLE VIII – TRANSPORTATION SUBTITLE 2 – VEHICLES CHAPTER 321 - MOTOR VEHICLES AND LAW OF THE ROAD.

COLLISION TYPE

Figure 5 shows fatal, injury, and total crashes by type of collision and manner of collision. The data suggest that the frequency of multi-vehicle and single-vehicle crashes are nearly evenly split within the safety study corridor. The most common collision type reported was vehicles in traffic (meaning two or more vehicles were involved and the collision did not include a vehicle parked on/adjacent to the roadway) accounting for 209 of the total crashes (44 percent) and 54 (54 percent) of the injury crashes as well four fatal crashes. The next highest number of collision type reported in the crash data was collisions was with animals, which accounted for 197 (41 percent) of the total crashes. Animal crashes tend to involve just a single vehicle.

Figure 5. Fatal, Injury, and Total Crashes by Collision Type, 2017-2021
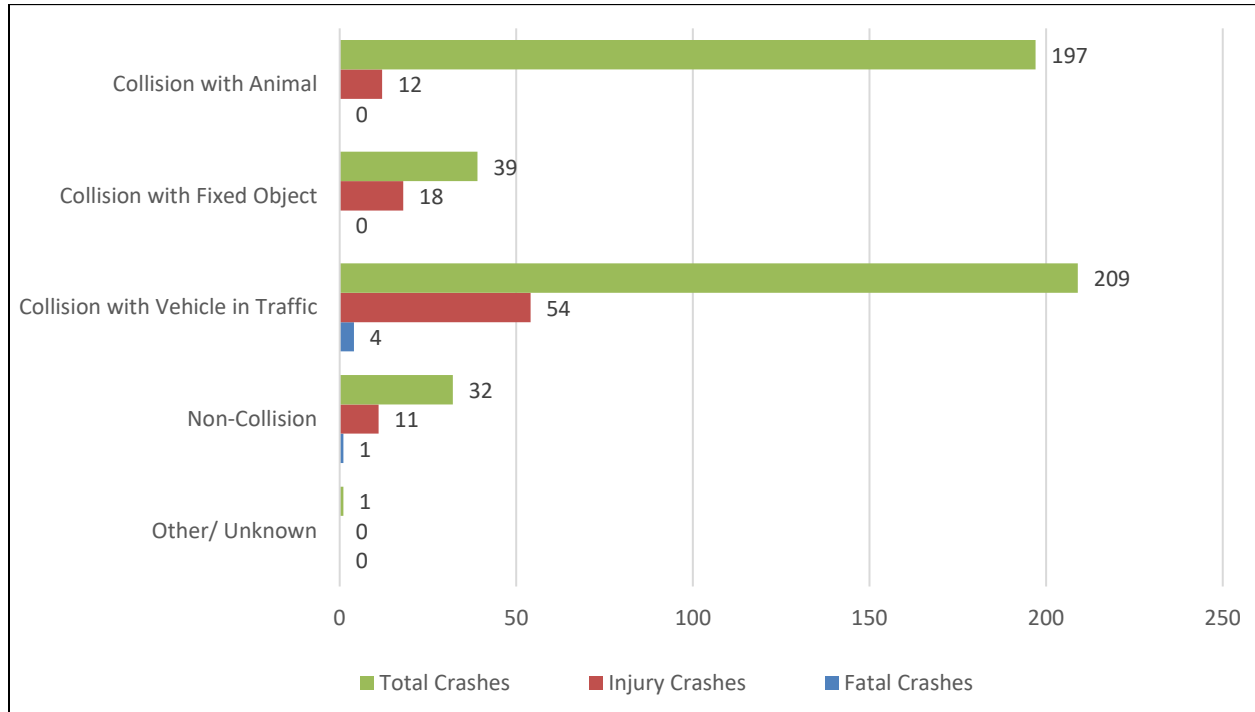
Source: Iowa DOT Crash Data (2017-2021)

Figure 6 presents a breakdown of crashes by manner of collision. Non-collision (single vehicle) crashes compose 145 (30 percent) of the total crashes and 39 (39 percent) of the total injury crashes. Not reported manner of collision crashes compose 112 (23 percent) of the total crashes. Broadside (78 crashes) and rear-end (52 crashes) crashes were also among the most common collision types and typically occurred at or near an intersection or driveway.

Figure 6. Fatal, Injury, and Total Crashes by Manner of Collision, 2017-2021
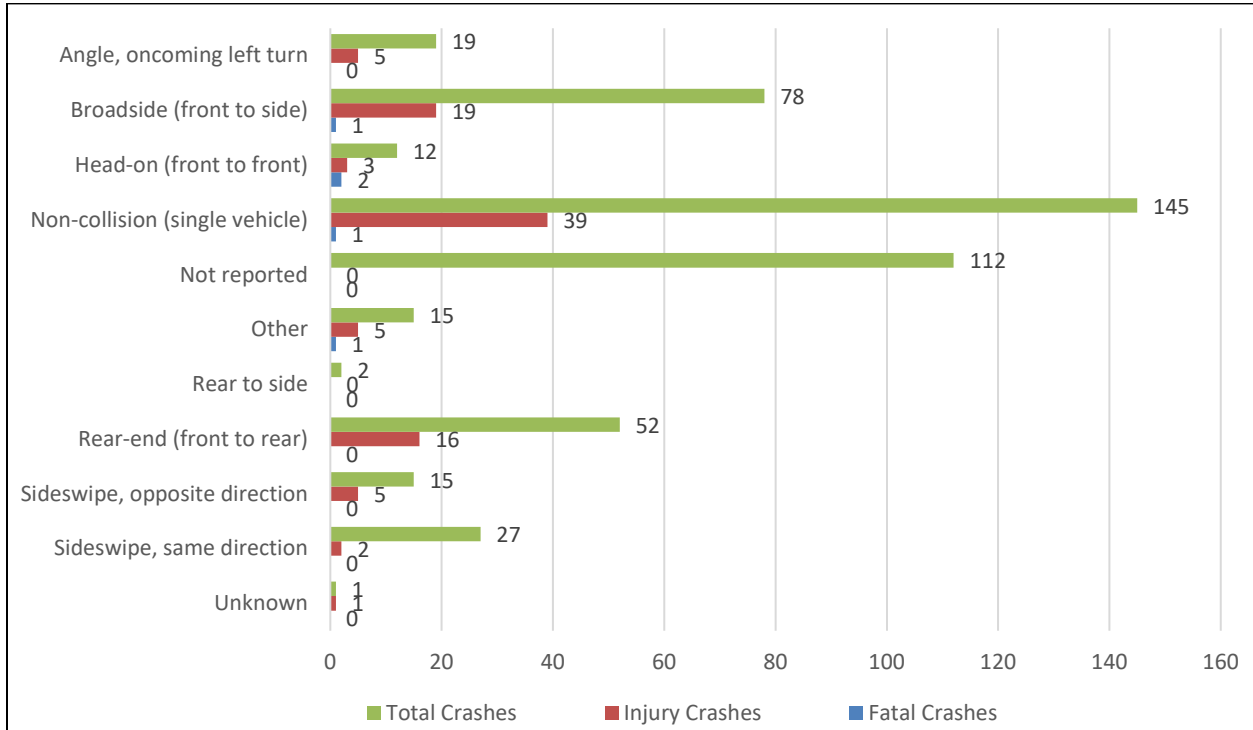
Source: Iowa DOT Crash Data (2017-2021)

WEATHER AND PAVEMENT CONDITIONS

Figure 7 provides a breakdown of crashes by weather and pavement conditions. Adverse weather conditions can affect drivers in multiple ways. For example, rain or snow can impair a driver's vision, obscure pavement markings, and reduce traction on roadway surfaces.

Various weather-related factors were reported along the corridor, though the most reported weather conditions were "clear" and "cloudy." It is notable that 155 (32 percent) of the total crashes had no weather condition attributes included in the crash data; all these crashes were property-damage-only crashes. 21 (4 percent) of the total crashes occurred during rain, six of which resulted in an injury.

Crashes occurring on snow, ice/frost, or slush covered roads resulted in 21 (4 percent) of the total crashes and 9 (9 percent) of the injury crashes. Like rain, the contribution of snow and ice conditions to the overall crashes in the corridor during the Study period is relatively minor.

Figure 7. Fatal, Injury, and Total Crashes by Reported Weather Conditions and by Roadway Conditions, 2017-2021
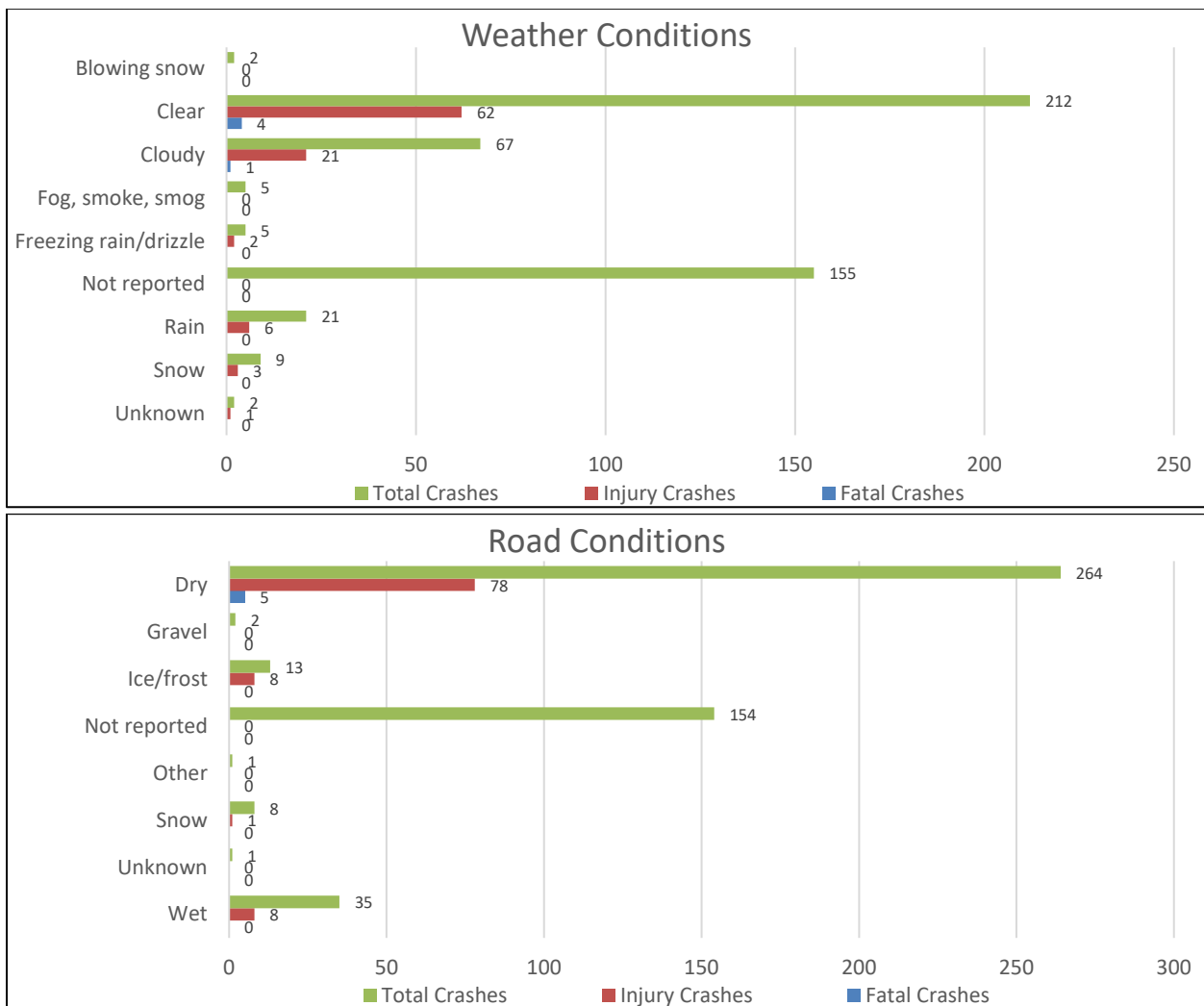
Source: Iowa DOT Crash Data (2017-2021)

TIME OF DAY

Figure 8 presents the distribution of crashes by time of day. Total crashes and injury crashes both tended to occur during the daylight hours, with 72 percent of total crashes and 70 percent of injury crashes happening between 6:00 AM and 8:00 PM. Crash frequency also increased during AM and PM peak traffic hours (times when commuter travel between home and work and the largest volumes of traffic are on the road). The number of injury crashes is highest from 4:00 PM to 5:59 PM, with 19 (19 percent) of the injury crashes occurring during this time.

In general, the crash data do not suggest that time of day is a contributing factor in the overall crash trends of the Study corridor.

Figure 8. Fatal, Injury, and Total Crashes by Time of Day, 2017-2021
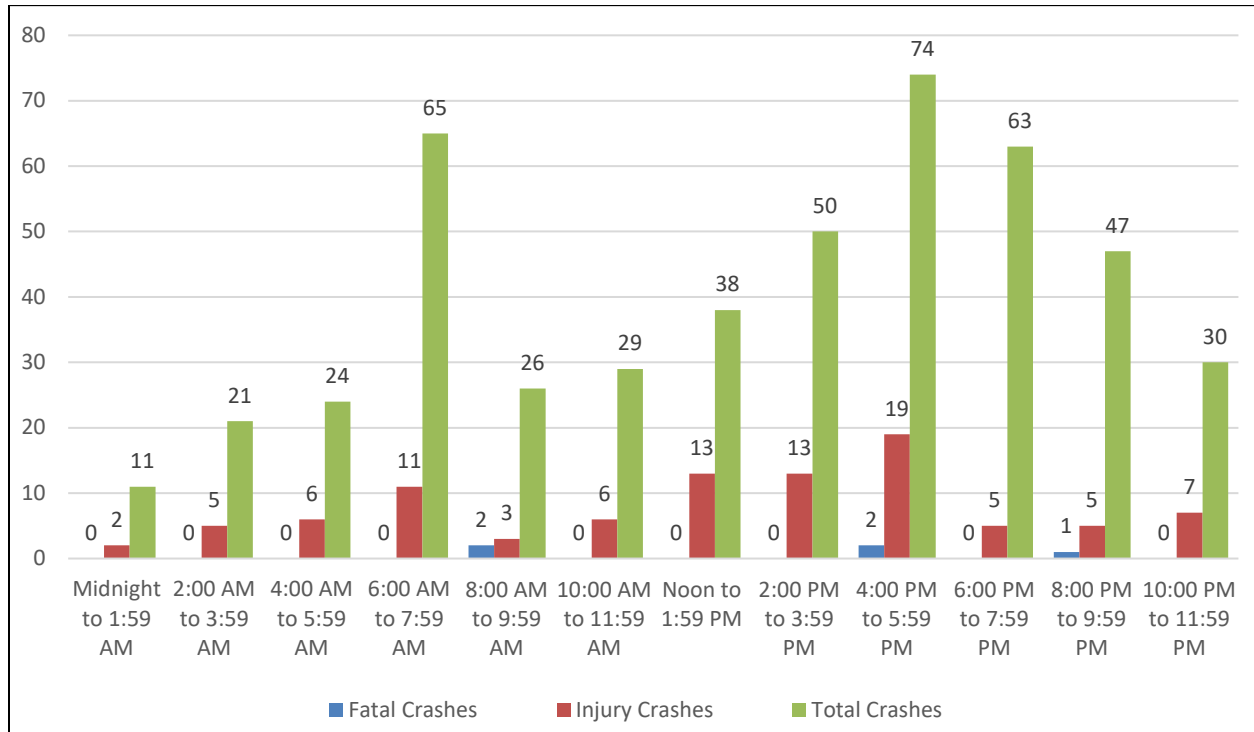
Source: Iowa DOT Crash Data (2017-2021)

Figure 9 shows the number of crashes by lighting condition. Lighting conditions for crashes in the corridor are consistent with time-of-day trends, with 204 (43 percent) of the total crashes occurring during daylight. However, it is notable that 119 (25 percent) of the total crashes and 44 (44 percent) of the injury crashes occurred during dark, dawn, or dusk and without the presence of roadway lighting. Further investigation of the 119 dark, not lighted, crashes noted that only 29 occurred at intersections.

Figure 9. Fatal, Injury, and Total Crashes by Lighting Condition, 2017-2021
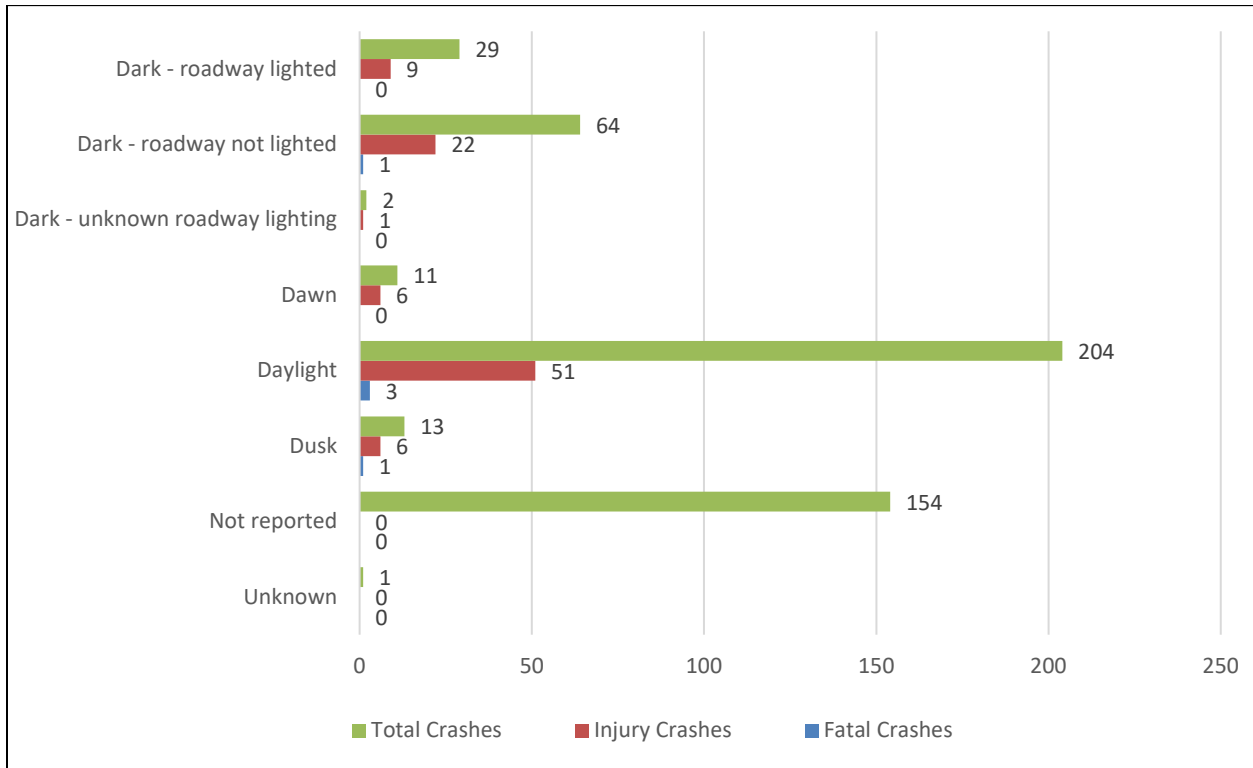
Source: Iowa DOT Crash Data (2017-2021)

INTERSECTION RELATED

Figure 10 shows a breakdown of all crashes by intersection relationship. While only 157 (33 percent) of the total crashes occurred at intersections, intersection-related crashes were responsible for about 42 (42 percent) of the total injury crashes in the safety study corridor between 2017 and 2021. Of the total crashes, 136 (28 percent) had no information in the crash data to identify the crash as intersection-related or non-intersection-related.

Figure 10. Fatal, Injury, and Total Crashes by Intersection Relationship, 2017-2021
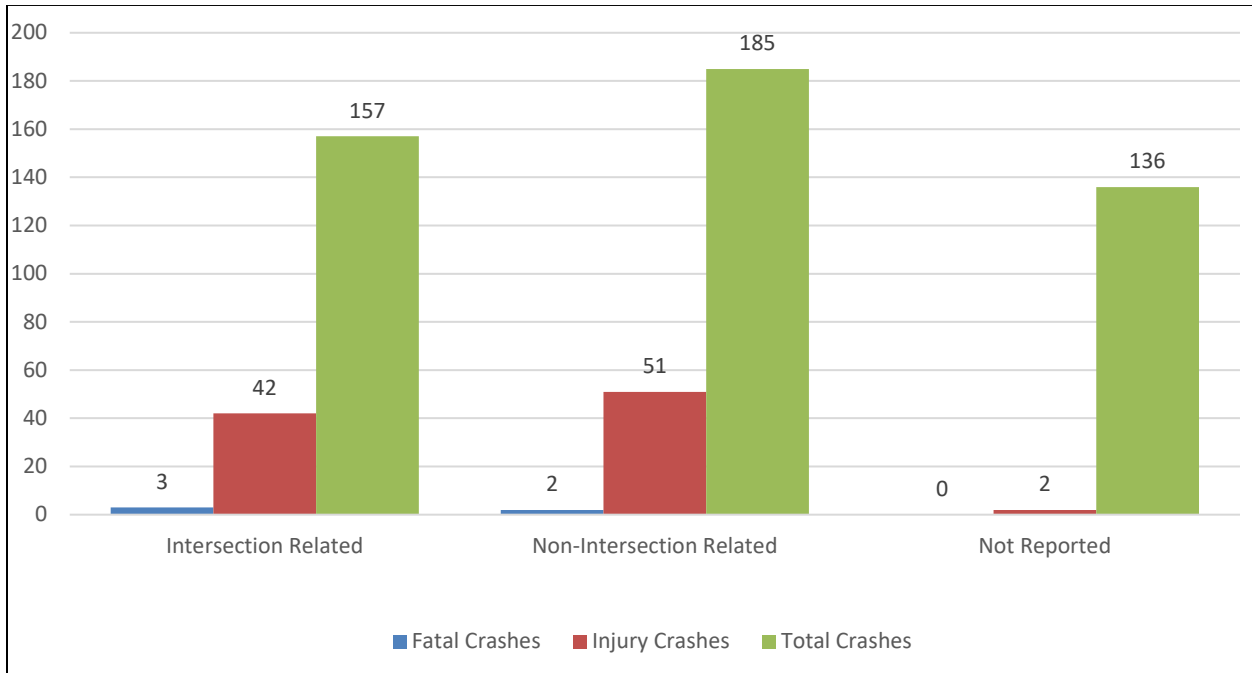
Source: Iowa DOT Crash Data (2017-2021)

TIME OF YEAR (MONTH)

Figure 11 presents crashes by month. Crashes increase during certain months of the year. The monthly crash frequencies could be related to weather conditions and monthly fluctuations in traffic patterns due to factors such as school sessions and activities, agricultural truck travel, or tourism during the summer months. The data show that crashes in the safety study corridor tend to increase during October, November, and December. As previously noted, snow and ice conditions do not show a statistically significant correlation to the frequency of crashes. However, animal-related crashes in the corridor also increase in this same period, indicating a possible correlation with the time of year and animal crashes; 40 percent of animal crashes occurred in between October and December.

Figure 11. Fatal, Injury and Total Crashes by Month and Total Animal-Involved Crashes by Month, 2017-2021
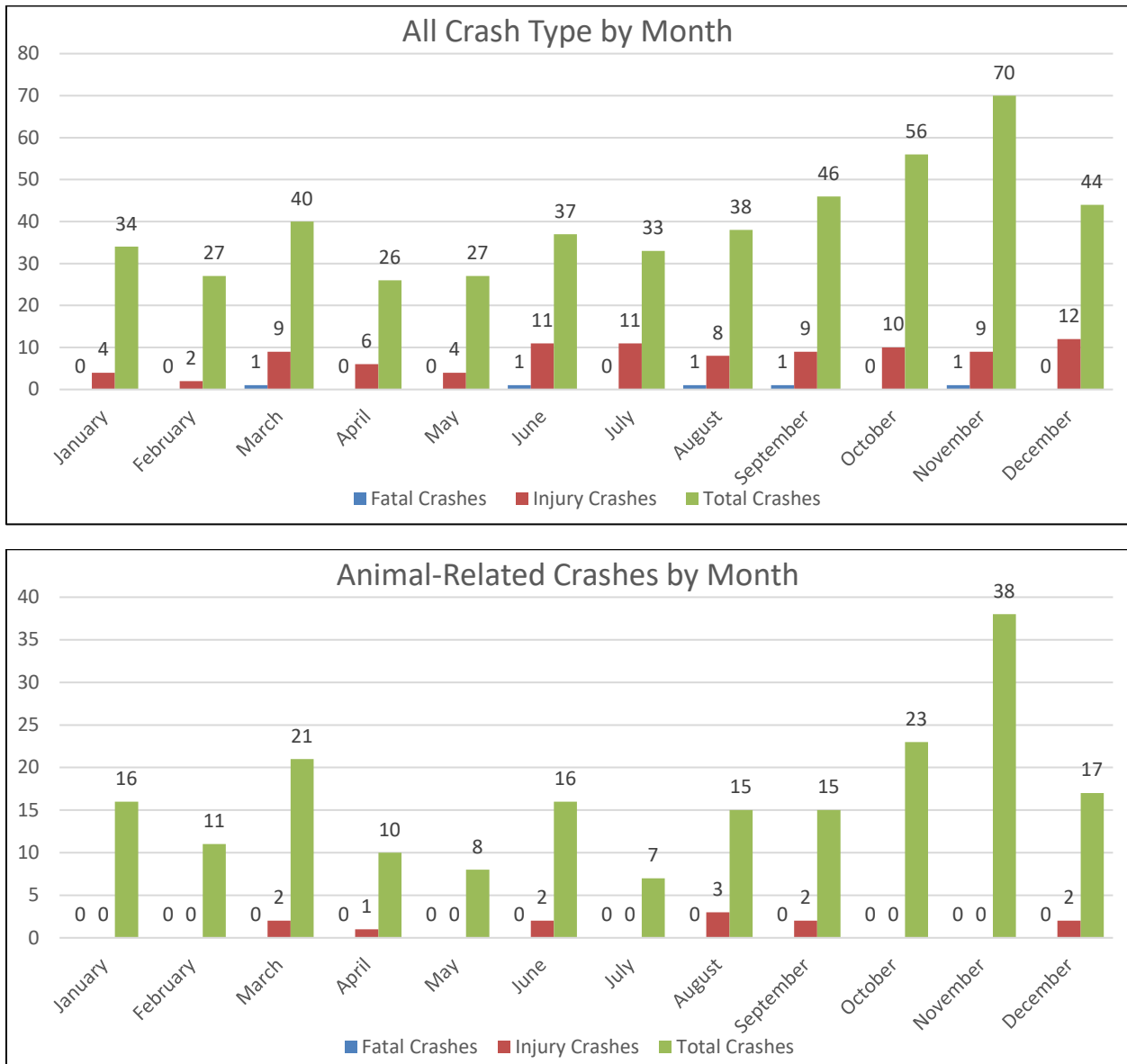
Source: Iowa DOT Crash Data (2017-2021)

TRUCKS AND OTHER HEAVY VEHICLES

Of the total crashes, 25 (7 percent) involved a large truck/commercial vehicle. Large trucks/commercial vehicles were involved in 6 (8 percent) of the injury crashes in the corridor. Crash trends by month did not suggest truck or agricultural equipment crashes were more likely during planting or harvest periods. Rather, they tended to occur randomly throughout the year.

URBAN VERSUS RURAL

Finally, crash frequency was compared to the roadway setting. Figure 12 presents the distribution of crashes occurring on rural sections versus sections within the municipal boundaries along the safety study corridor. Roughly 51 percent of total and 57 percent of fatal and injury crashes occurred in municipal areas, while the remaining percentages occurred in rural areas. By centerline miles, only approximately 8.6 miles (13 percent) of the corridor are in municipal areas versus 87 percent in rural areas. This indicates more total and injury crashes occurred on municipal sections of the safety study corridor than would be expected considering the proportion of municipal roadway miles in the Study corridor.

Figure 12. Fatal, Injury, and Total Crashes by Rural/Municipal Crash Location, 2017-2021
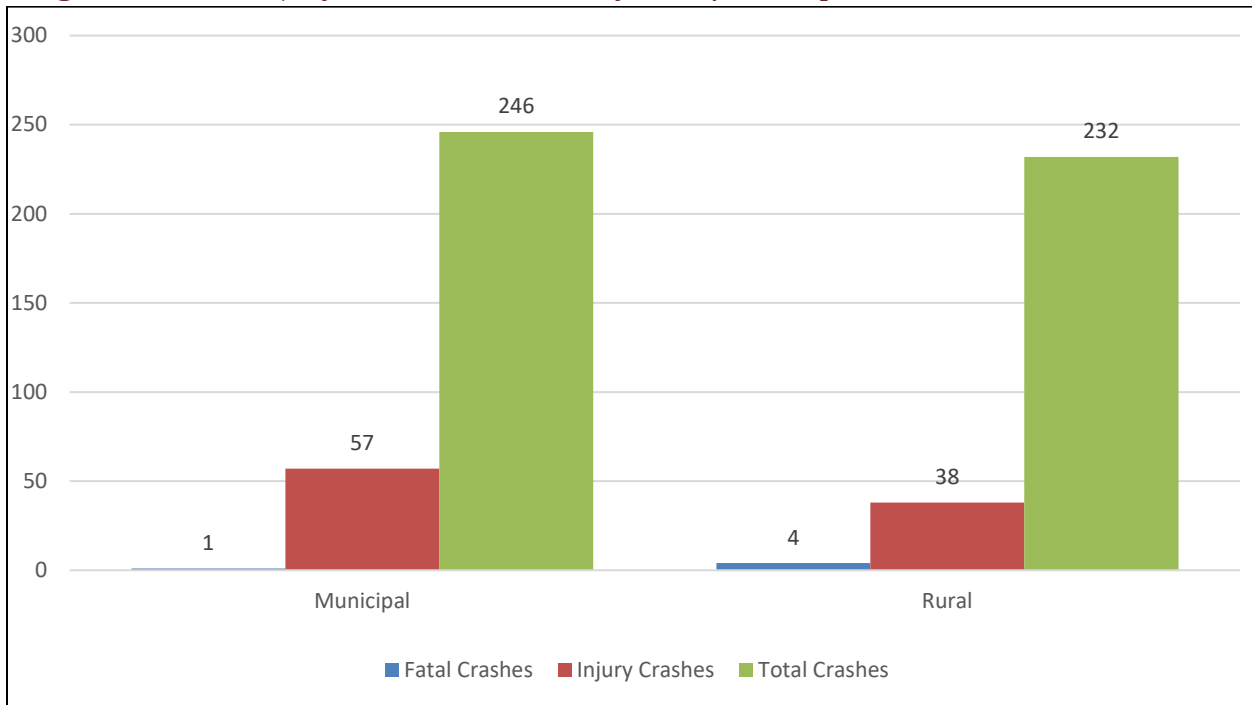
Source: Iowa DOT Crash Data (2017-2021)

4.2   POTENTIAL FOR CRASH REDUCTION ANALYSIS BY SEGMENT

Figures 13-16 presents the results of the PCR and injury crash location analyses. As shown in blue, roadway segments and intersections highlighted by the higher PCR values are sporadically spaced throughout the corridor. Segments and intersections identified as having lower PCR values but still having a history of injury crashes are shown in orange and are also sporadically spaced throughout the corridor. Section 5.2 provides additional details on the crash trends of these 13 roadway segments and 21 intersections.

Figure 13. Comparison of Corridor Segments to Statewide Averages – Union County
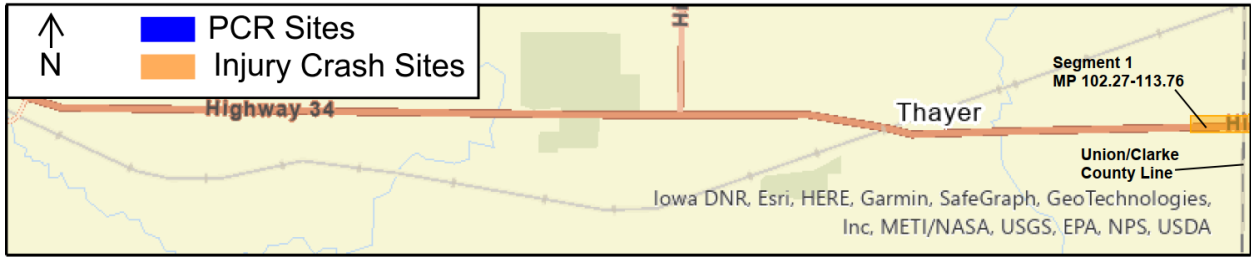
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 14. Comparison of Corridor Segments to Statewide Averages – Clarke County
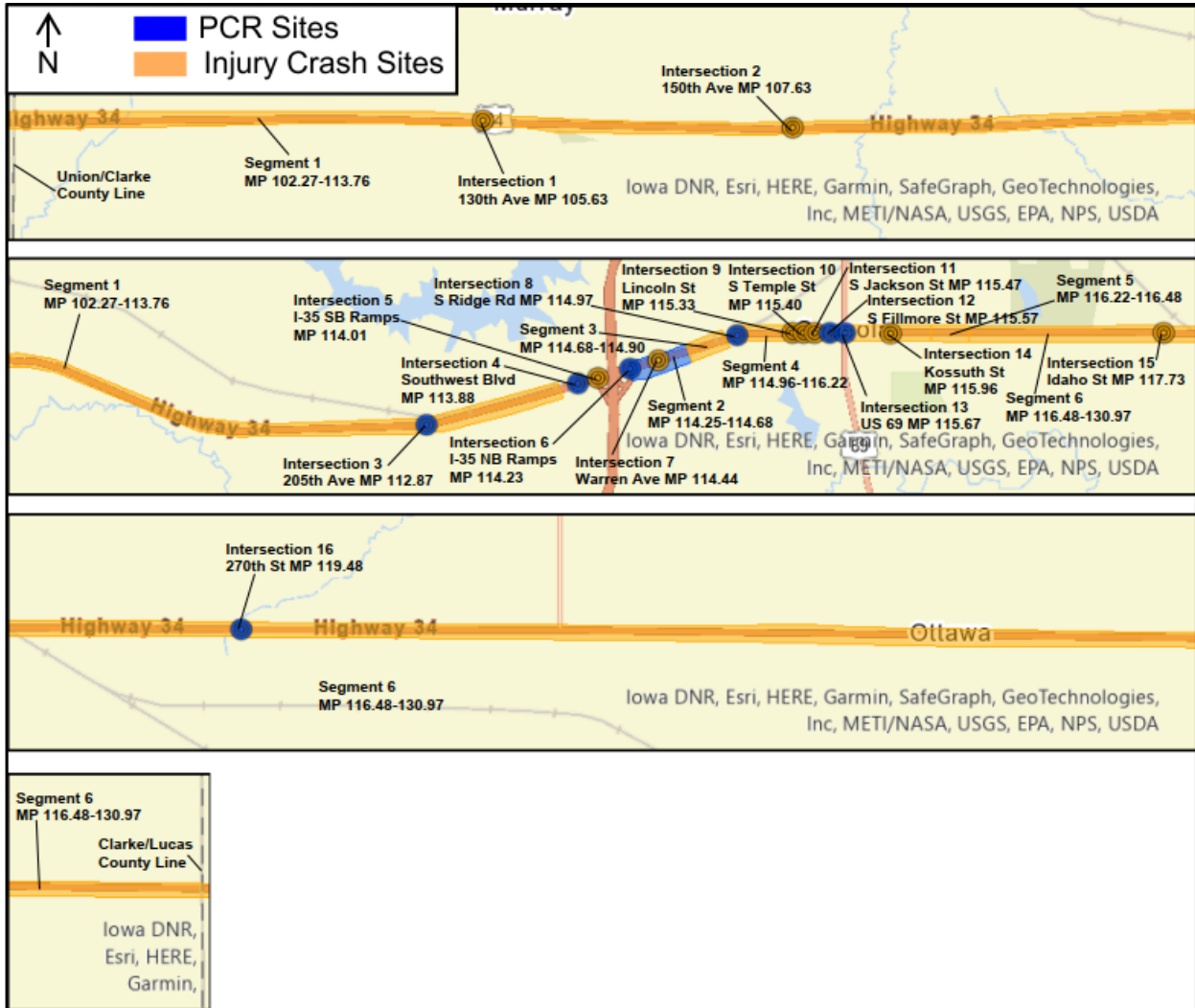
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 15. Comparison of Corridor Segments to Statewide Averages – Lucas County
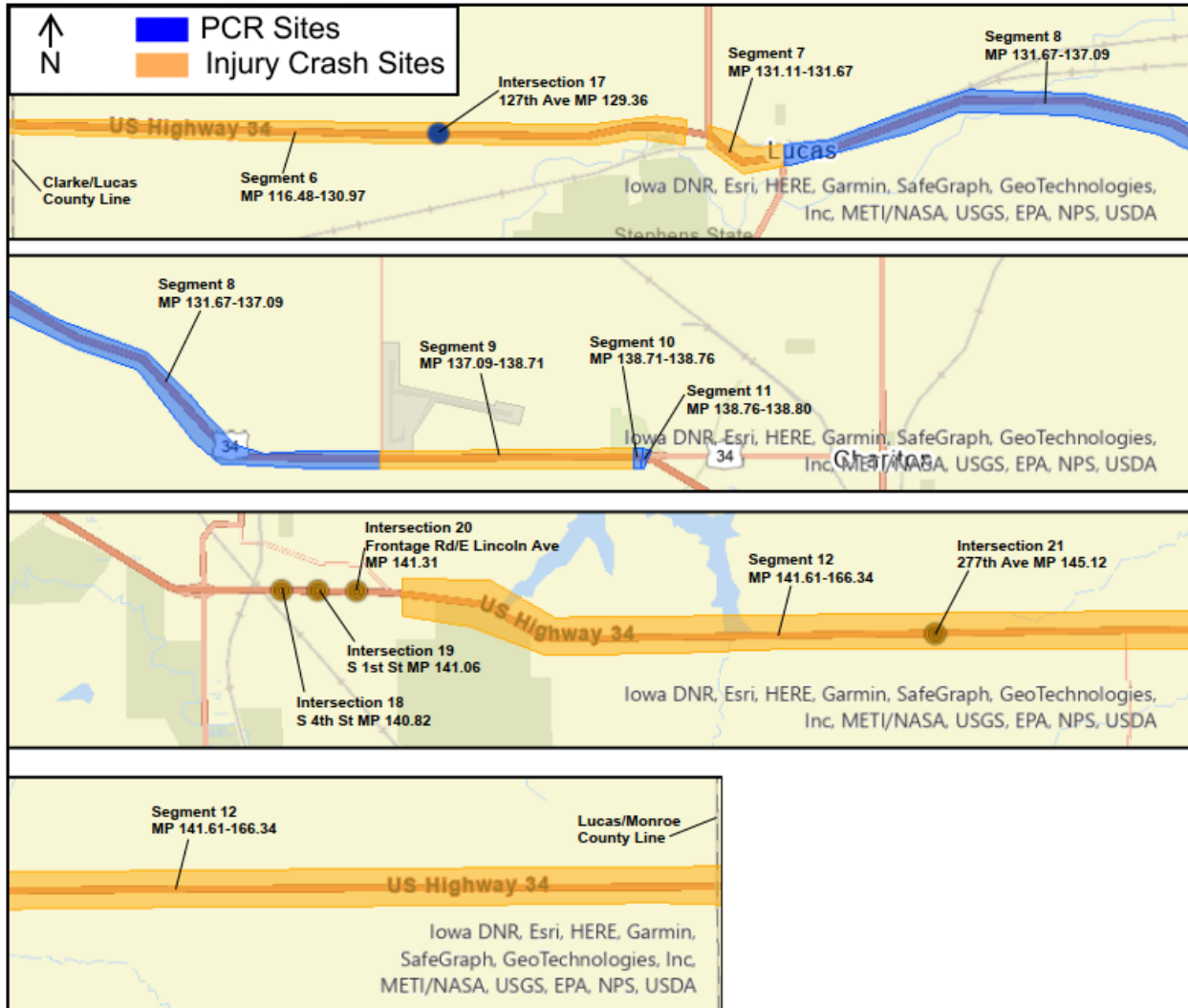
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 16. Comparison of Corridor Segments to Statewide Averages – Monroe County
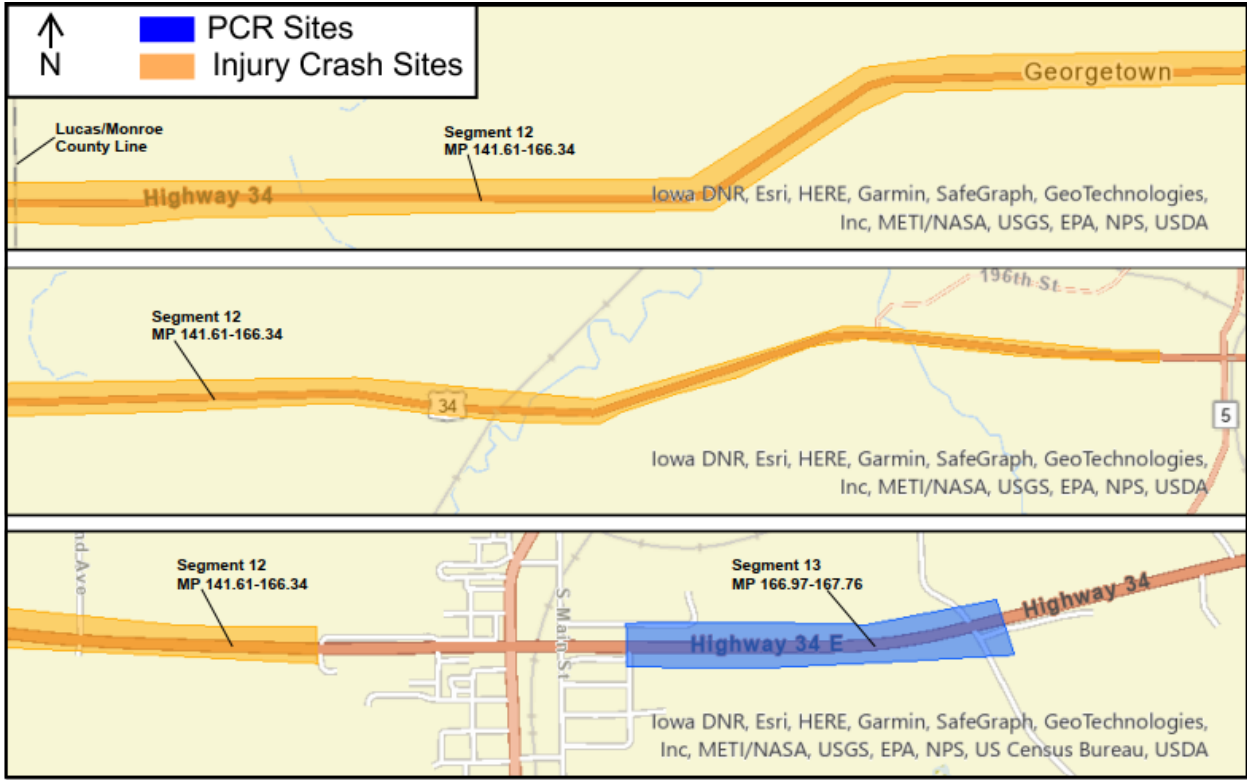
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 17. Comparison of Corridor Segments to Statewide Averages – Osceola Inset
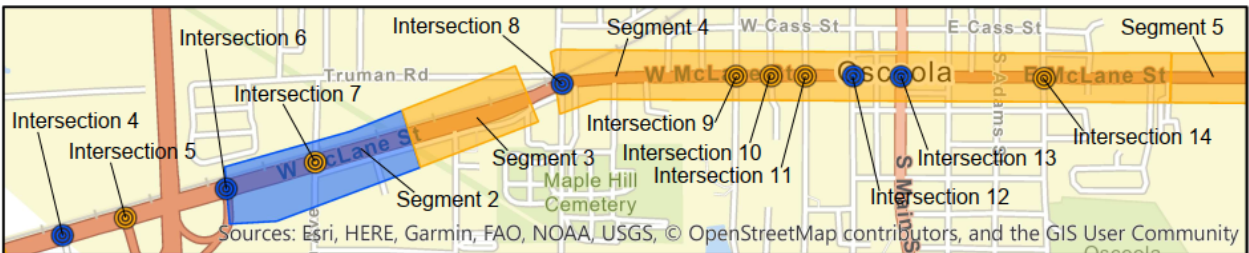
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 18. Comparison of Corridor Segments to Statewide Averages – Chariton Inset
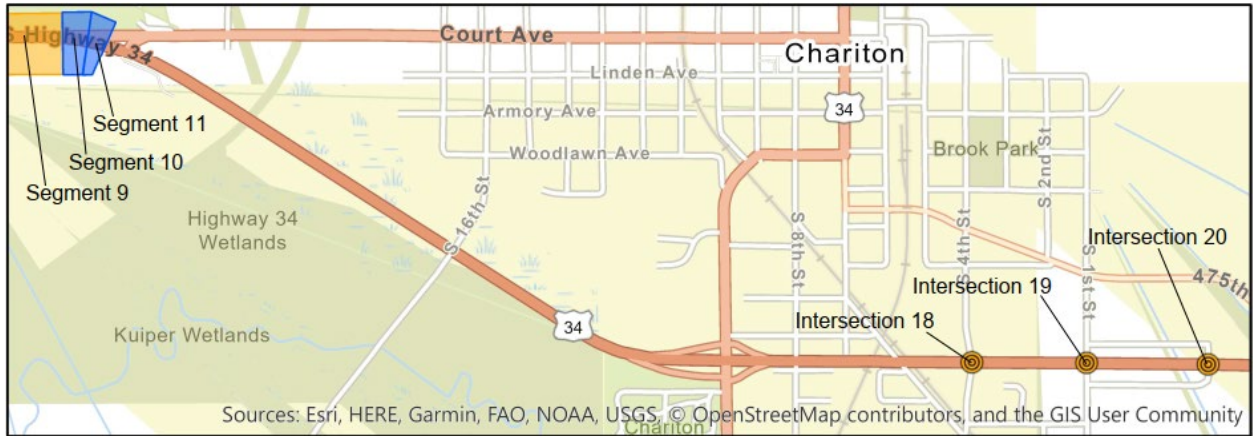
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 19. Comparison of Corridor Segments to Statewide Averages – Albia Inset
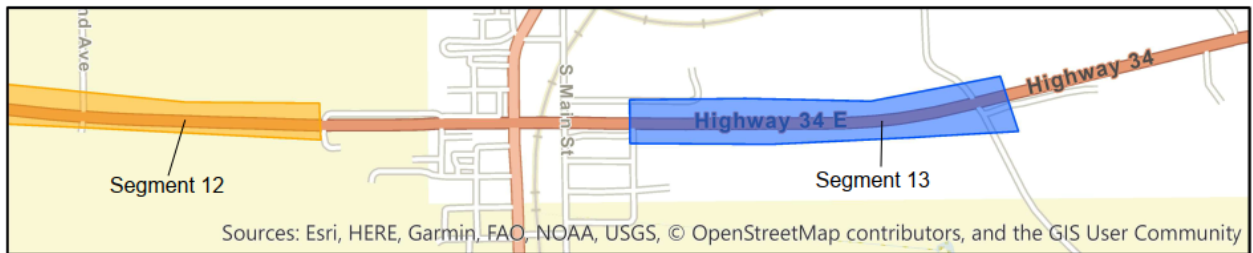
Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

5 SAFETY PERFORMANCE HIGHLIGHTED LOCATIONS

The following subsections provide further details on the locations that experienced the highest PCR values and/or have a history or injury crashes within the safety study corridor between 2017 and 2021.

5.1 POTENTIAL FOR CRASH REDUCTION

The roadway segments and intersections listed in Table 2 were identified in the crash data as having higher PCR values in the Study corridor. Table 3 lists all of the roadway segments and intersections that have lower PCR values but still have a history of injury crashes. Tables 2 and 3 also summarize the crash data observations at each of the locations. The maps that follow show how the crashes are distributed over the individual roadway sections. Summarized on these maps are the totals for animal, alcohol/drug, and speed-related crashes, as these crash types tend to be commonly requested information. For more in-depth details for each location, refer to the "Crash Characteristics" column in Table 2 and Table 3.

Table 2. US 34 Locations with Noteworthy PCR Values (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 3 (Clarke County)	US 34 and 205th Avenue MP 112.87	• 1 total crash that was a possible injury. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was a rear-end crash.	All Crashes: 0.30 (Medium) Severe Crashes: -0.03 (Negligible)
Intersection 4 (Clarke County)	US 34 and Southwest Boulevard MP 113.88	• 9 total crashes (2 minor injuries, 1 possible injury, and 6 PDO crashes). • 1 crash occurred during the nighttime. • 2 crashes occurred in wet conditions. • 3 crashes were caused by failure to yield right-of-way. • 5 crashes were angle/broadside crashes.	All Crashes: 1.25 (High) Severe Crashes: 0.24 (Medium)
Intersection 6 (Clarke County)	US 34 and Interstate 35 Northbound Ramps MP 114.23	• 17 total crashes (1 serious injury, 1 minor injury, 3 possible injuries, and 12 PDO crashes). • 2 crashes occurred during the nighttime. • 3 crashes occurred in wet conditions. • 7 crashes were caused by failure to yield right-of-way. • 5 crashes were caused by improper turning. • 11 crashes were angle/broadside crashes and 5 were rear-end crashes.	All Crashes: 0.33 (Medium) Severe Crashes: 0.11 (Medium)
Segment 2 (Clarke County)	US 34 MP 114.25 to MP 114.68 (Iowa DOT ID: 4919)	• 5 total crashes (1 minor injury, 1 possible injury, and 3 PDO crashes). • 1 crash occurred during the nighttime. • 1 crash occurred in wet conditions. • 3 crashes were rear-end crashes.	All Crashes: -0.09 (Negligible) Severe Crashes: 0.12 (Medium)
Intersection 8 (Clarke County)	US 34 and South Ridge Road MP 114.97	• 8 total crashes (1 serious injury and 7 PDO crashes). • 3 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 3 crashes were caused by failure to yield right-of-way. • 4 crashes were broadside crashes.	All Crashes: 0.93 (Medium) Severe Crashes: 0.01 (Negligible)

Table 2. US 34 Locations with Noteworthy PCR Values (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 12 (Clarke County)	US 34 and South Fillmore Street MP 115.57	• 5 total crashes (1 minor injury, 1 possible injury, and 3 PDO crashes). • No crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 2 crashes were cause by failure to yield right-of-way. • 3 crashes were angle/broadside crashes.	All Crashes: 0.68 (Medium) Severe Crashes: 0.08 (Medium)
Intersection 13 (Clarke County)	US 34 and US 69 MP 115.67	• 18 total crashes (1 minor injury, 1 possible injury, and 16 PDO crashes). • 5 crashes occurred during the nighttime. • 2 crashes occurred in wet conditions. • 8 crashes were caused by failure to yield right-of-way and 3 by ran traffic signal. • 7 crashes were angle/broadside, 2 were head-on, 3 were rear-end, and 5 were sideswipe crashes.	All Crashes: 1.62 (High) Severe Crashes: 0.04 (Negligible)
Intersection 16 (Clarke County)	US 34 and 270th Street MP 119.48	• 1 total crash that was a PDO crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by passing.	All Crashes: 0.47 (Medium) Severe Crashes: -0.02 (Negligible)
Intersection 17 (Lucas County)	US 34 and 127th Avenue MP 129.36	• 1 total crash that was a minor injury crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by following too close. • 1 crash was a rear-end crash.	All Crashes: 0.43 (Medium) Severe Crashes: -0.02 (Negligible)
Segment 8 (Lucas County)	US 34 MP 131.67 to MP 137.09 (Iowa DOT ID: 5095)	• 35 total crashes (1 serious injury, 5 minor injuries, 2 possible injuries, and 27 PDO crashes). • 21 crashes occurred during the nighttime. • 5 crashes occurred in wet conditions. • 21 crashes were animal-related crashes.	All Crashes: 0.36 (Medium) Severe Crashes: 0.02 (Negligible)

Table 2. US 34 Locations with Noteworthy PCR Values (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Segment 10 (Lucas County)	US 34 MP 138.71 to MP 138.76 (Iowa DOT ID: 6301)	• 2 total crashes, both PDO crashes. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was animal-related and 1 was caused by an improper turn. • 1 crash was a sideswipe crash.	All Crashes: 0.30 (Medium) Severe Crashes: 0.00 (Negligible)
Segment 11 (Lucas County)	US 34 MP 138.76 to MP 138.80 (Iowa DOT ID: 6712)	• 1 total crash that was a PDO crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was a ran off the road crash. • 1 crash was a fixed object crash.	All Crashes: 0.33 (Medium) Severe Crashes: 0.00 (Negligible)
Segment 13 (Monroe County)	US 34 MP 166.97 to MP 167.76 (Iowa DOT ID: 5064)	• 11 total crashes, all of which were PDO crashes. • 7 crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 9 crashes were animal-related crashes. • 1 crash was a head-on crash.	All Crashes: 0.49 (Medium) Severe Crashes: -0.05 (Negligible)

Study Site: Intersection 3

US 34 & 205th Avenue

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.30 (Medium)
Injurious Crashes: -0.03 (Negligible)

0 0.01 0.01   0.02 Miles

N

Legend
Crashes by Severity
- Property Dame Only: 0 Crash(es)
- Possible/Unknown: 1 Crash(es)
- Minor Injury: 0 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

- Study Site Extents

County: Clarke

Study Site: Intersection 4

US 34 & Southwest Boulevard

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 1

Crash Notes:
-1 crash occurred in dark unlight conditions
-2 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 1.25 (High)
Injurious Crashes: 0.24 (Medium)

0   0.01 0.01   0.02 Miles

N

Legend
Crashes by Severity
- Property Dame Only: 6 Crash(es)
- Possible/Unknown: 1 Crash(es)
- Minor Injury: 2 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Clarke

Study Site: Intersection 6

US 34 I-35 Northbound Ramps

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-2 crashes occurred in dark unlight conditions
-3 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.33 (Medium)
Injurious Crashes: 0.11 (Medium)

Legend

Crashes by Severity

●	Property Dame Only:	12 Crash(es)
●	Possible/Unknown:	3 Crash(es)
●	Minor Injury:	1 Crash(es)
●	Major Injury:	1 Crash(es)
●	Fatality:	0 Crash(es)

Study Site Extents

County: Clarke

Study Site: Segment 2

US 34 MP 114.25 to MP 114.68
(Iowa DOT ID: 4919)
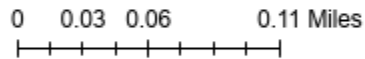
Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-1 crash occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.09 (Negligible)
Injurious Crashes: 0.12 (Medium)

N

0   0.03   0.06   0.11 Miles

Legend
Crashes by Severity

● Property Dame Only:	3 Crash(es)
● Possible/Unknown:	1 Crash(es)
● Minor Injury:	1 Crash(es)
● Major Injury:	0 Crash(es)
● Fatality:	0 Crash(es)

⬚ Study Site Extents

County: Clarke

Study Site: Intersection 8

US 34 & South Ridge Road

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 1

Crash Notes:
-3 crashes occurred in dark unlight conditions
-1 crash occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.93 (Medium)
Injurious Crashes: 0.01 (Negligible)

0   0.01 0.01   0.02 Miles

N

Legend
Crashes by Severity

●	Property Dame Only:	7 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	0 Crash(es)
●	Major Injury:	1 Crash(es)
●	Fatality:	0 Crash(es)

⬚ Study Site Extents

County: Clarke

Study Site: Intersection 12

US 34 & South Fillmore Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-1 crash occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.68 (Medium)
Injurious Crashes: 0.08 (Medium)

County: Clarke

0   0.01 0.01   0.02 Miles

N

Legend

Crashes by Severity
- Property Dame Only: 3 Crash(es)
- Possible/Unknown: 1 Crash(es)
- Minor Injury: 1 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

Study Site: Intersection 13

US 34 & US 69

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-5 crashes occurred in dark unlight conditions
-2 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 1.62 (High)
Injurious Crashes: 0.04 (Negligible)

0   0.01 0.01   0.02 Miles

Legend
Crashes by Severity
- Property Dame Only: 16 Crash(es)
- Possible/Unknown: 1 Crash(es)
- Minor Injury: 1 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Clarke

Study Site: Intersection 16

US 34 & 270th Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.47 (Medium)
Injurious Crashes: -0.02 (Negligible)

0   0.01 0.01   0.02 Miles

Legend
Crashes by Severity

●	Property Dame Only:	1 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	0 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	0 Crash(es)

⬚ Study Site Extents

County: Clarke

Study Site: Intersection 17

US 34 & 127th Avenue

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.43 (Medium)
Injurious Crashes: -0.02 (Negligible)

Legend
Crashes by Severity

●	Property Dame Only:	0 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	1 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	0 Crash(es)

⬜ Study Site Extents

County: Lucas

Study Site: Segment 8

US 34 MP 131.67 to MP 137.09
(Iowa DOT ID: 5095)
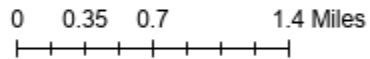
Animal-Related Crashes: 21
Alcohol/Drugs-Related Crashes: 1
Speeding-Related Crashes: 0

Crash Notes:
-21 crashes occurred in dark unlight conditions
-5 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.36 (Medium)
Injurious Crashes: 0.02 (Negligible)

Legend
Crashes by Severity
- Property Dame Only: 27 Crash(es)
- Possible/Unknown: 2 Crash(es)
- Minor Injury: 5 Crash(es)
- Major Injury: 1 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Lucas

Study Site: Segment 10

US 34 MP 138.71 to MP 138.76
(Iowa DOT ID: 6301)

Animal-Related Crashes: 1
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.30 (Medium)
Injurious Crashes: 0.00 (Negligible)

0   0.01   0.03   0.06 Miles

Legend

Crashes by Severity
- Property Dame Only: 2 Crash(es)
- Possible/Unknown: 0 Crash(es)
- Minor Injury: 0 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Lucas

Study Site: Segment 11

US 34 MP 138.76 to MP 138.80
(Iowa DOT ID: 6712)

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.33 (Medium)
Injurious Crashes: 0.00 (Negligible)

Legend

Crashes by Severity

● Property Dame Only:	1 Crash(es)	
● Possible/Unknown:	0 Crash(es)	
● Minor Injury:	0 Crash(es)	
● Major Injury:	0 Crash(es)	
● Fatality:	0 Crash(es)	

Study Site Extents

County: Lucas

Study Site: Segment 13

US 34 MP 166.97 to MP 167.76
(Iowa DOT ID: 5064)

Animal-Related Crashes: 9
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-7 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.49 (Medium)
Injurious Crashes: -0.05 (Negligible)

Legend

Crashes by Severity

●	Property Dame Only:	11 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	0 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	0 Crash(es)

Study Site Extents

County: Monroe

5.2 FREQUENCY AND SEVERITY

Table 3. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Segment 1 (Union/ Clarke Counties)	US 34 MP 102.27 to MP 113.76 (Iowa DOT ID: 6013)	• 47 total crashes (2 fatal, 1 serious injury, 5 minor injury, 1 possible injury, and 38 PDO crashes). • 33 crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 33 crashes were animal-related. • 1 fatal crash was caused by a swerving/evasive action. • 1 fatal crash was caused by a head-on crash in which one vehicle crossed the centerline.	All Crashes: -0.41 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 1 (Union County)	US 34 and 130th Avenue MP 105.63	• 7 total crashes (1 minor injury, 1 possible injury, and 5 PDO crashes). • 3 crashes occurred during the nighttime. • 2 crashes occurred in wet conditions. • 2 crashes were caused by following too close, 2 were improper turning, and 1 was failure to yield right-of-way. • 4 crashes were broadside, 2 were head-on, and 1 was a sideswipe crash.	All Crashes: 0.02 (Negligible) Severe Crashes: 0.01 (Negligible)
Intersection 2 (Union County)	US 34 and 150th Avenue MP 107.63	• 3 total crashes (1 minor injury, 1 possible injury and 1 PDO crash). • 3 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 1 crash was animal-related and 1 was caused by crossing the centerline. • 1 crash was a rear-end, and 1 was a sideswipe crash.	All Crashes: -0.02 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 5 (Union County)	US 34 and Interstate 35 Southbound Ramps MP 114.01	• 15 total crashes (3 possible injuries and 12 PDO crashes). • 3 crashes occurred during the nighttime. • 3 crashes occurred in wet conditions. • 5 crashes were caused by failure to yield right-of-way and 4 by following too close. • 8 crashes were rear-end and 7 were broadside crashes.	All Crashes: N/A Severe Crashes: N/A

Table 3. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 7 (Union County)	US 34 and Warren Avenue MP 114.44	• 12 total crashes (2 minor injuries, 1 possible injury, and 9 PDO crashes). • 3 crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 7 crashes were failure to yield to right-of-way and 3 were ran traffic signal crashes. • 10 crashes were angle/broadside crashes.	All Crashes: 0.16 (Negligible) Severe Crashes: 0.03 (Negligible)
Segment 3 (Union County)	US 34 MP 114.68 to MP 114.90 (Iowa DOT ID: 6637)	• 1 total crash that was a minor injury crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was an animal-related crash.	All Crashes: -0.98 (Negligible) Severe Crashes: 0.05 (Negligible)
Segment 4 (Union County)	US 34 MP 114.96 to MP 116.22 (Iowa DOT ID: 4929)	• 23 total crashes (1 major injury, 1 minor injury, 1 possible injury, and 20 PDO crashes). • 4 crashes occurred during the nighttime. • 5 crashes occurred in wet conditions. • 5 crashes were failure to yield right-of-way and 4 were following too close. • 10 crashes were broadside and 7 were rear-end crashes.	All Crashes: -1.90 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 9 (Union County)	US 34 and Lincoln Street MP 115.33	• 2 total crashes (1 minor injury and 1 PDO crash). • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by an improper turn and 1 was by speeding. • 2 crashes were head-on crashes.	All Crashes: -0.16 (Negligible) Severe Crashes: -0.01 (Negligible)
Intersection 10 (Union County)	US 34 and South Temple Street MP 115.40	• 3 total crashes (1 serious injury and 2 PDO crashes). • No crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 1 crash was caused by failure to yield right-of-way and 1 was by passing. • 1 crash was a broadside and 1 was a sideswipe crash.	All Crashes: 0.15 (Negligible) Severe Crashes: 0.00 (Negligible)

Table 3. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Intersection 11 (Union County)	US 34 and South Jackson Street MP 115.47	• 1 total crash that was a minor injury crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was a broadside crash.	All Crashes: -0.32 (Negligible) Severe Crashes: 0.04 (Negligible)
Intersection 14 (Union County)	US 34 and Kossuth Street MP 115.96	• 2 total crashes (1 serious injury and 1 PDO crash). • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 2 crashes were caused by failure to yield right-of-way. • 1 crash was a broadside and 1 was a pedestrian crash.	All Crashes: 0.00 (Negligible) Severe Crashes: 0.04 (Negligible)
Segment 5 (Union County)	US 34 MP 116.22 to MP 116.48 (Iowa ID: 6637)	• 1 total crash that was a minor injury crash. • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by following too close. • 1 crash was a rear-end crash.	All Crashes: -1.22 (Negligible) Severe Crashes: 0.03 (Negligible)
Segment 6 (Union/ Lucas Counties)	US 34 MP 116.48 to MP 130.97 (Iowa ID: 4909)	• 64 total crashes (4 minor injuries, 3 possible injuries, and 57 PDO crash). • 49 crashes occurred during the nighttime. • 8 crashes occurred in wet conditions. • 47 crashes were animal-related and 3 were caused by speeding. • 6 crashes were sideswipe and 2 were rear-end crashes.	All Crashes: 0.13 (Negligible) Severe Crashes: -0.03 (Negligible)
Intersection 15 (Union County)	US 34 and Idaho Street MP 117.73	• 1 total crash that was a minor injury crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by loss of control. • 1 crash was a rear-end crash.	All Crashes: 0.00 (Negligible) Severe Crashes: 0.00 (Negligible)

Table 3. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Segment 7 (Lucas County)	US 34 MP 131.11 to MP 131.67 (Iowa ID: 5232)	• 4 total crashes (1 minor injury and 3 PDO crashes). • 3 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 2 crashes were caused by running off the road. • 1 crash was a sideswipe and 1 was a fixed object crash.	All Crashes: 0.17 (Negligible) Severe Crashes: 0.04 (Negligible)
Segment 9 (Lucas County)	US 34 MP 137.09 to MP 138.71 (Iowa ID: 5274)	• 4 total crashes (2 minor injuries, 1 possible injury, and 1 PDO crashes). • 2 crashes occurred during the nighttime. • 1 crash occurred in wet conditions. • 2 crashes were animal-related crashes. • 1 crash was a sideswipe and 1 was a pedestrian crash.	All Crashes: -0.45 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 18 (Lucas County)	US 34 and South 4th Street MP 140.82	• 2 total crashes (1 minor injury and 1 PDO crash). • No crashes occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by failure to yield right-of-way. • 2 crashes were broadside crashes.	All Crashes: 0.04 (Negligible) Severe Crashes: 0.00 (Negligible)
Intersection 19 (Lucas County)	US 34 and South 1st Street MP 141.06	• 2 total crashes (1 fatal and 1 PDO crash). • The fatal crash was caused by failure to yield right-of-way and was a broadside crash that occurred during dusk and under dry conditions. • The PDO crash was a rear-end crash that occurred during the daylight and under dry conditions.	All Crashes: -0.09 (Negligible) Severe Crashes: 0.03 (Negligible)
Intersection 20 (Lucas County)	US 34 and Frontage Road/East Lincoln Avenue MP 141.31	• 1 total crash that was a serious injury crash. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by lane departure. • 1 crash was a head-on crash.	All Crashes: N/A Severe Crashes: N/A

Table 3. US 34 Locations with History of Injury Crashes (2017-2021)

Study Site (County)	Roadway Segment/ Intersection	Crash Characteristics	PCR Values
Segment 12 (Lucas/ Monroe Counties)	US 34 MP 141.61 to MP 166.34 (Iowa ID: 5047)	• 109 total crashes (1 fatal, 2 serious injuries, 4 minor injuries, 12 possible injuries, and 90 PDO crashes). • The fatal crash was caused by failure to yield right-of-way and was an overturn, non-collision crash that occurred during nighttime and under dry conditions. • 74 crashes occurred during the nighttime. • 13 crashes occurred in wet conditions. • 78 crashes were animal-related crashes, 12 were caused by ran off road, and 3 were by speeding. • 6 crashes were sideswipes and 4 were rear-end crashes.	All Crashes: 0.16 (Negligible) Severe Crashes: -0.01 (Negligible)
Intersection 21 (Lucas County)	US 34 and 277th Avenue MP 145.12	• 2 total crashes (1 fatal and 1 PDO crash). • The fatal crash was caused by crossing the centerline and was a head-on crash that occurred during daylight and under dry conditions. • 1 crash occurred during the nighttime. • No crashes occurred in wet conditions. • 1 crash was caused by running off the road.	All Crashes: 0.00 (Negligible) Severe Crashes: 0.00 (Negligible)

Study Site: Segment 1

US 34 MP 102.27 to MP 113.76
(Iowa DOT ID: 6013)
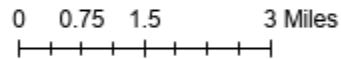
Animal-Related Crashes: 33
Alcohol/Drugs-Related Crashes: 2
Speeding-Related Crashes: 0

Crash Notes:
-One fatal crash was a swerving/evasive action crash that occurred in dry, clear, lit conditions
-One fatal crash was a crossed centerline, head-on crash that occurred in dry, cloudy conditions and was alcohol-related
-33 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.41 (Negligible)
Injurious Crashes: 0.00 (Negligible)

County: Union and Clarke

0   0.75   1.5   3 Miles

Legend

Crashes by Severity

●	Property Dame Only:	38 Crash(es)
●	Possible/Unknown:	1 Crash(es)
●	Minor Injury:	5 Crash(es)
●	Major Injury:	1 Crash(es)
●	Fatality:	2 Crash(es)

⬛ Study Site Extents

Study Site: Intersection 1

US 34 & 130th Avenue

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-3 crashes occurred in dark unlight conditions
-2 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.02 (Negligible)
Injurious Crashes: 0.01 (Negligible)

Legend

Crashes by Severity

●	Property Dame Only:	5 Crash(es)
●	Possible/Unknown:	1 Crash(es)
●	Minor Injury:	1 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	0 Crash(es)
⬚	Study Site Extents	

County: Clarke

Study Site: Intersection 2

US 34 & 150th Avenue

Animal-Related Crashes: 1
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-1 crash occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.02 (Negligible)
Injurious Crashes: 0.00 (Negligible)

Legend
Crashes by Severity
- Property Dame Only: 1 Crash(es)
- Possible/Unknown: 1 Crash(es)
- Minor Injury: 1 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Clarke

Study Site: Intersection 5

US 34 I-35 Southbound Ramps

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-3 crashes occurred in dark unlight conditions
-3 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: Not Available
Injurious Crashes: Not Available

Legend
Crashes by Severity

● Property Dame Only:	12 Crash(es)
● Possible/Unknown:	3 Crash(es)
● Minor Injury:	0 Crash(es)
● Major Injury:	0 Crash(es)
● Fatality:	0 Crash(es)

▢ Study Site Extents

County: Clarke

Study Site: Intersection 7

US 34 & Warren Avenue

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-3 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.16 (Negligible)
Injurious Crashes: 0.03 (Negligible)

Legend
Crashes by Severity

● Property Dame Only:	9 Crash(es)
● Possible/Unknown:	1 Crash(es)
● Minor Injury:	2 Crash(es)
● Major Injury:	0 Crash(es)
● Fatality:	0 Crash(es)

⬛ Study Site Extents

County: Clarke

Study Site: Segment 3

US 34 MP 114.68 to MP 114.90
(Iowa DOT ID: 5620)

Animal-Related Crashes: 1
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.98 (Negligible)
Injurious Crashes: 0.05 (Negligible)

Legend
Crashes by Severity

●	Property Dame Only:	0 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	1 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	0 Crash(es)

⬚	Study Site Extents

County: Clarke

Study Site: Segment 4

US 34 MP 114.96 to MP 116.22
(Iowa DOT ID: 4929)

Animal-Related Crashes: 1
Alcohol/Drugs-Related Crashes: 1
Speeding-Related Crashes: 0

Crash Notes:
-4 crashes occurred in dark unlight conditions
-5 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: -1.90 (Negligible)
Injurious Crashes: 0.00 (Negligible)

Legend
Crashes by Severity
- Property Dame Only: 20 Crash(es)
- Possible/Unknown: 1 Crash(es)
- Minor Injury: 1 Crash(es)
- Major Injury: 1 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Clarke

Study Site: Intersection 9

US 34 & South Lincoln Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 1

Crash Notes:
-0 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.16 (Negligible)
Injurious Crashes: -0.01 (Negligible)

0   0.01 0.01   0.02 Miles

Legend
Crashes by Severity

●	Property Dame Only:	1 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	1 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	0 Crash(es)

Study Site Extents

County: Clarke

Study Site: Intersection 10

Us 34 & South Temple Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-1 crash occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.15 (Negligible)
Injurious Crashes: 0.00 (Negligible)

0   0.01 0.01   0.02 Miles

N

Legend

Crashes by Severity

● Property Dame Only:	2 Crash(es)
● Possible/Unknown:	0 Crash(es)
● Minor Injury:	0 Crash(es)
● Major Injury:	1 Crash(es)
● Fatality:	0 Crash(es)

⬚ Study Site Extents

County: Clarke

Study Site: Intersection 11

US 34 & South Jackson Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.32 (Negligible)
Injurious Crashes: 0.04 (Negligible)

Legend
Crashes by Severity
- Property Dame Only: 0 Crash(es)
- Possible/Unknown: 0 Crash(es)
- Minor Injury: 1 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Clarke

Study Site: Intersection 14

US 34 & South Kossuth Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.00 (Negligible)
Injurious Crashes: 0.04 (Negligible)

Legend

Crashes by Severity
- ● Property Dame Only: 1 Crash(es)
- ● Possible/Unknown: 0 Crash(es)
- ● Minor Injury: 0 Crash(es)
- ● Major Injury: 1 Crash(es)
- ● Fatality: 0 Crash(es)

⬚ Study Site Extents

0   0.01 0.01   0.02 Miles

County: Clarke

Study Site: Segment 5

US 34 MP 116.22 to MP 116.48
(Iowa DOT ID: 6637)

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: -1.22 (Negligible)
Injurious Crashes: 0.03 (Negligible)

0   0.02   0.04   0.07 Miles

Legend
Crashes by Severity
- ● Property Dame Only: 0 Crash(es)
- ● Possible/Unknown: 0 Crash(es)
- ● Minor Injury: 1 Crash(es)
- ● Major Injury: 0 Crash(es)
- ● Fatality: 0 Crash(es)

⬚ Study Site Extents

County: Clarke

Study Site: Segment 6

US 34 MP 116.48 to MP 130.97
(Iowa DOT ID: 4909)

Animal-Related Crashes: 47
Alcohol/Drugs-Related Crashes: 3
Speeding-Related Crashes: 3

Crash Notes:
-49 crashes occurred in dark unlight conditions
-8 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.13 (Negligible)
Injurious Crashes: -0.03 (Negligible)

Legend

Crashes by Severity

● Property Dame Only:	57 Crash(es)
● Possible/Unknown:	3 Crash(es)
● Minor Injury:	4 Crash(es)
● Major Injury:	0 Crash(es)
● Fatality:	0 Crash(es)

⬚ Study Site Extents

County: Clarke and Lucas

Study Site: Intersection 15

US 34 & Idaho Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
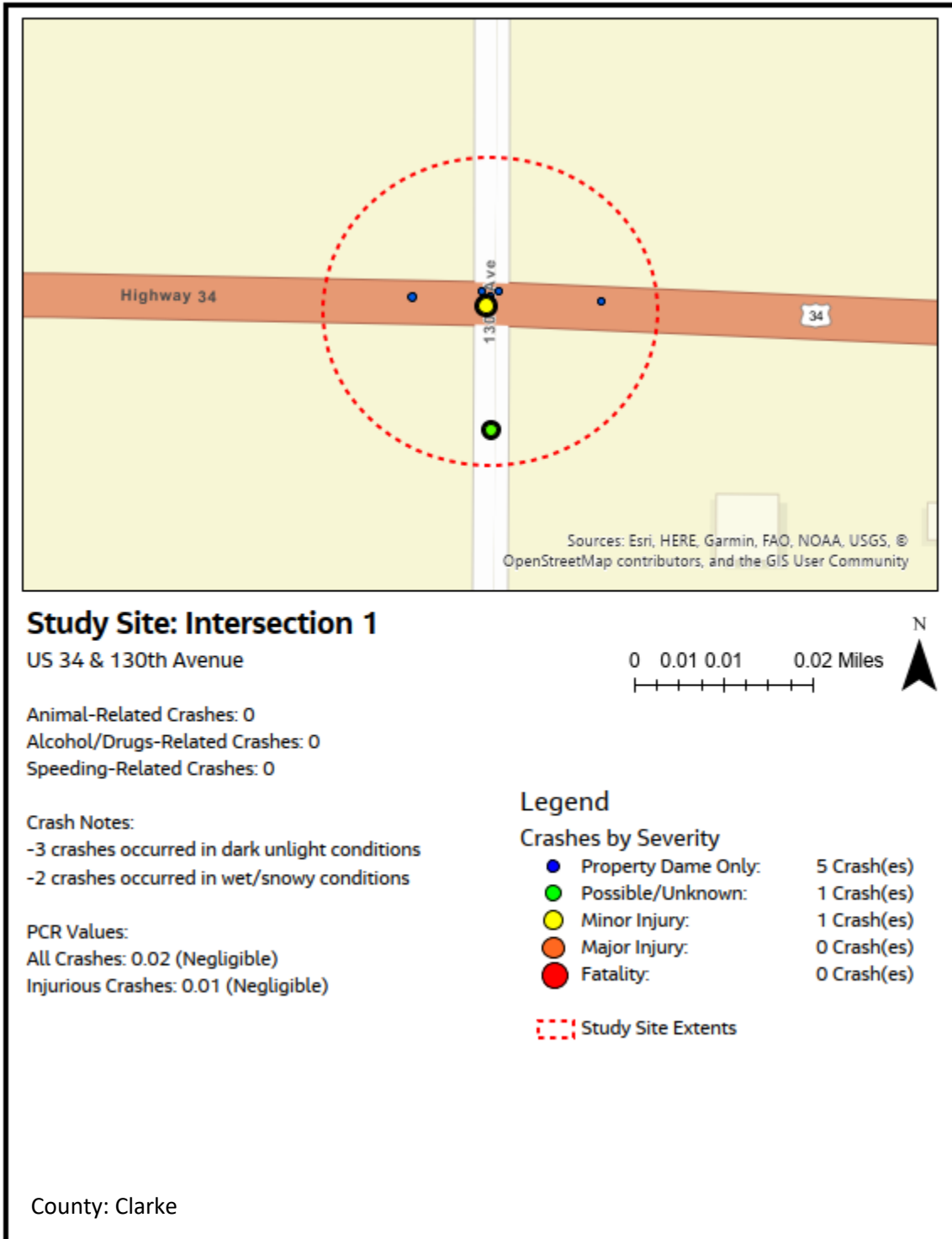All Crashes: 0.00 (Negligible)
Injurious Crashes: 0.00 (Negligible)

Legend

Crashes by Severity
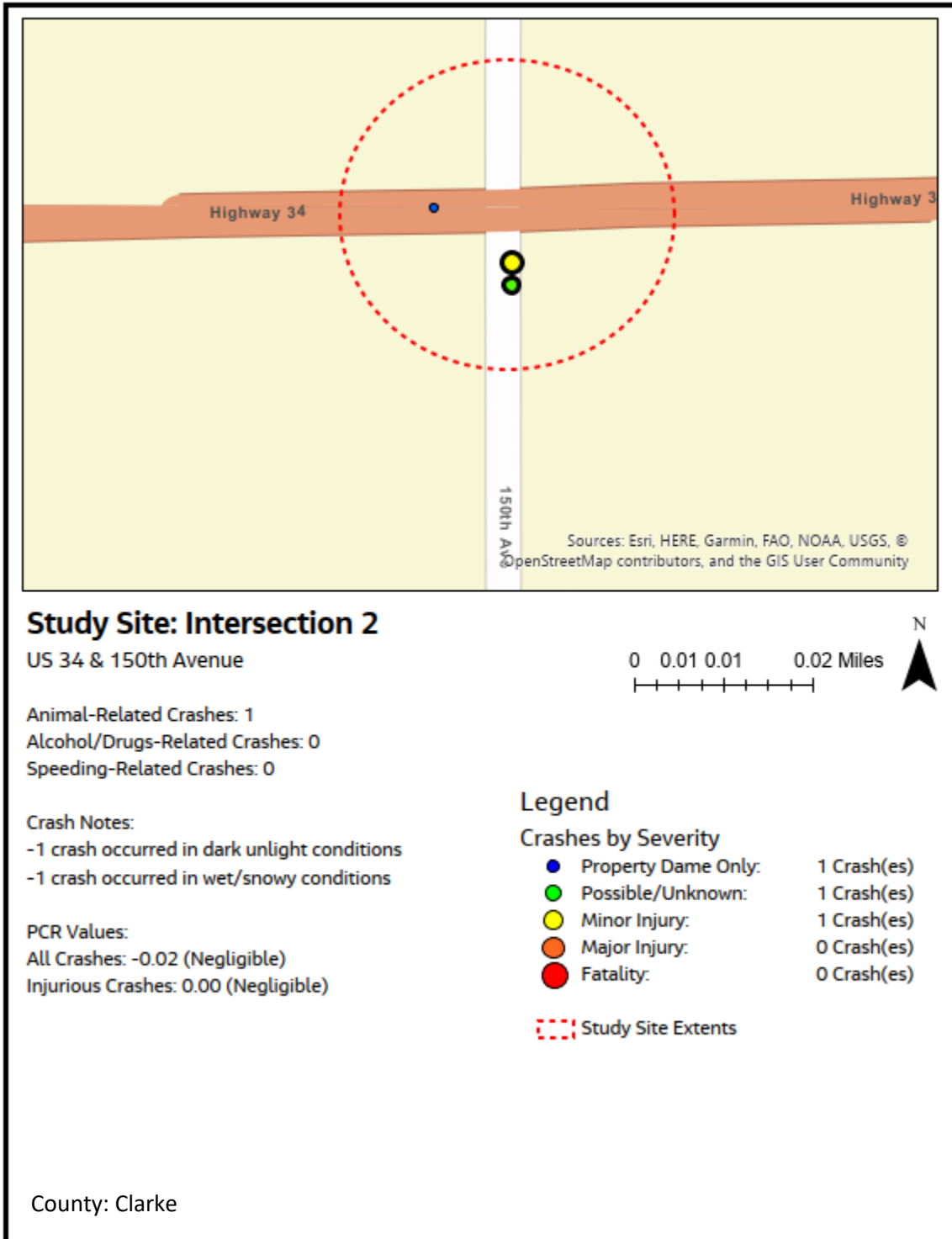
●	Property Dame Only:	0 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	1 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	0 Crash(es)

⬚ Study Site Extents

County: Clarke

Study Site: Segment 7

US 34 MP 131.11 to MP 131.67
(Iowa DOT ID: 5232)

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-3 crashes occurred in dark unlight conditions
-1 crash occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.17 (Negligible)
Injurious Crashes: 0.04 (Negligible)

0   0.04   0.07   0.15 Miles
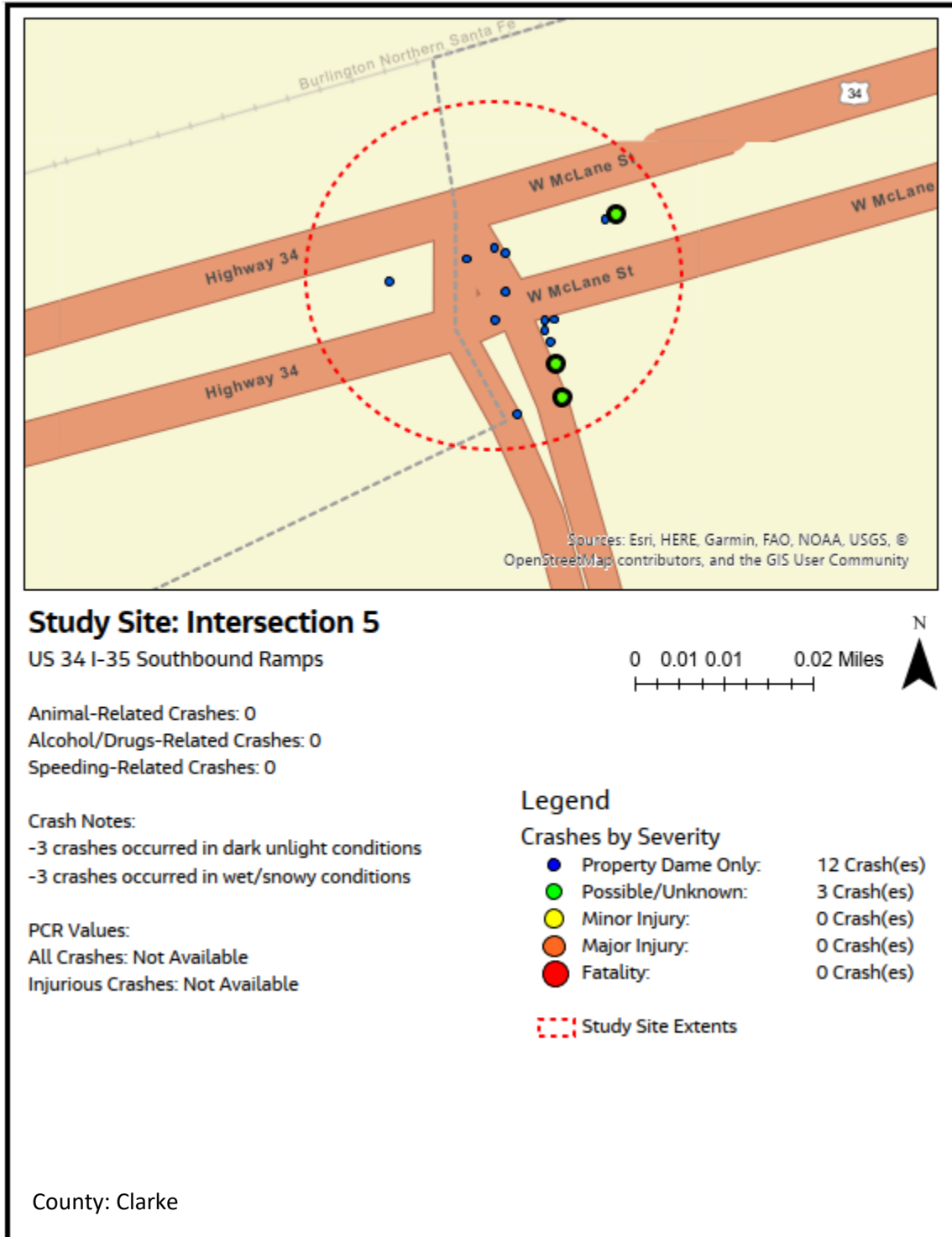
N

Legend
Crashes by Severity
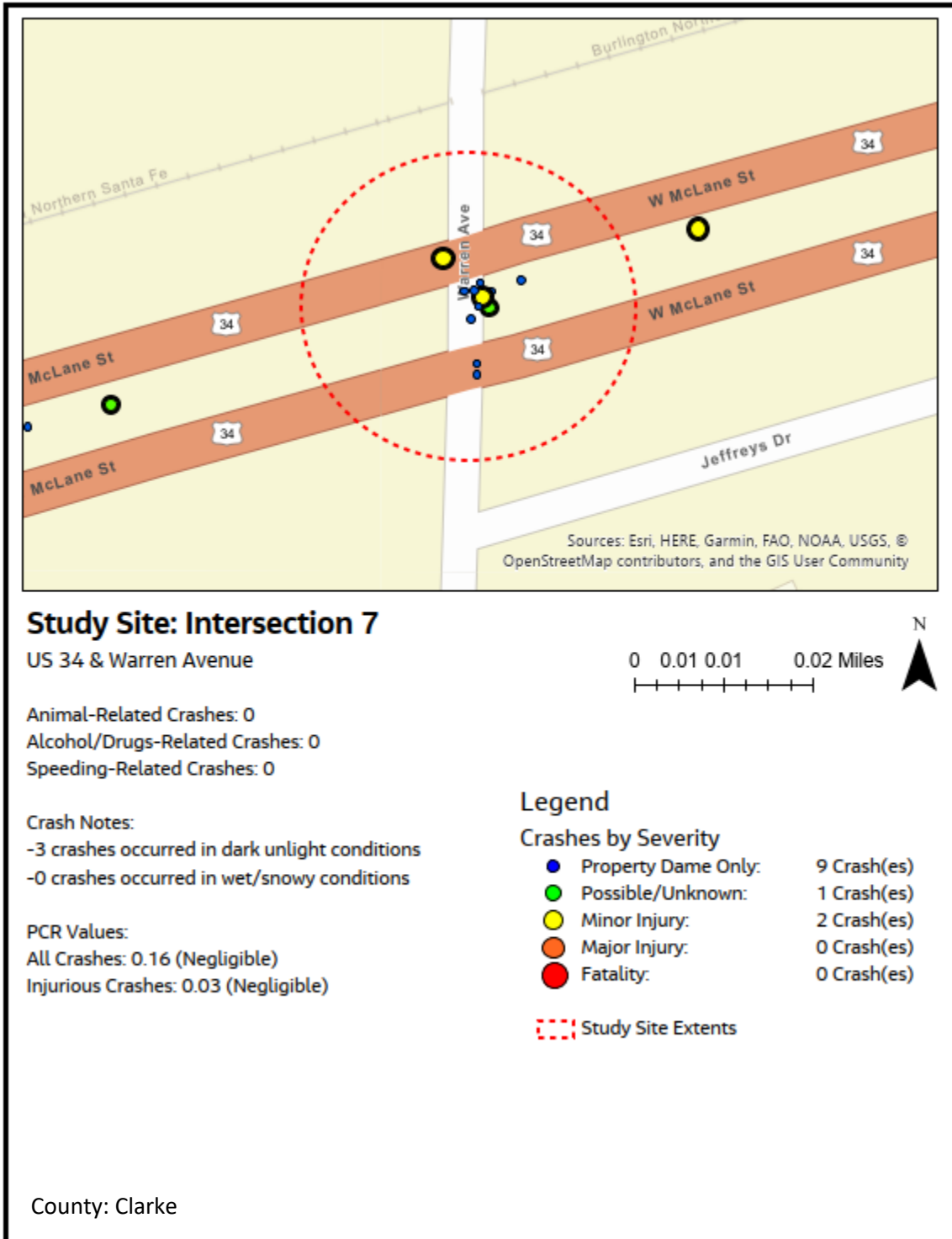- Property Dame Only: 3 Crash(es)
- Possible/Unknown: 0 Crash(es)
- Minor Injury: 1 Crash(es)
- Major Injury: 0 Crash(es)
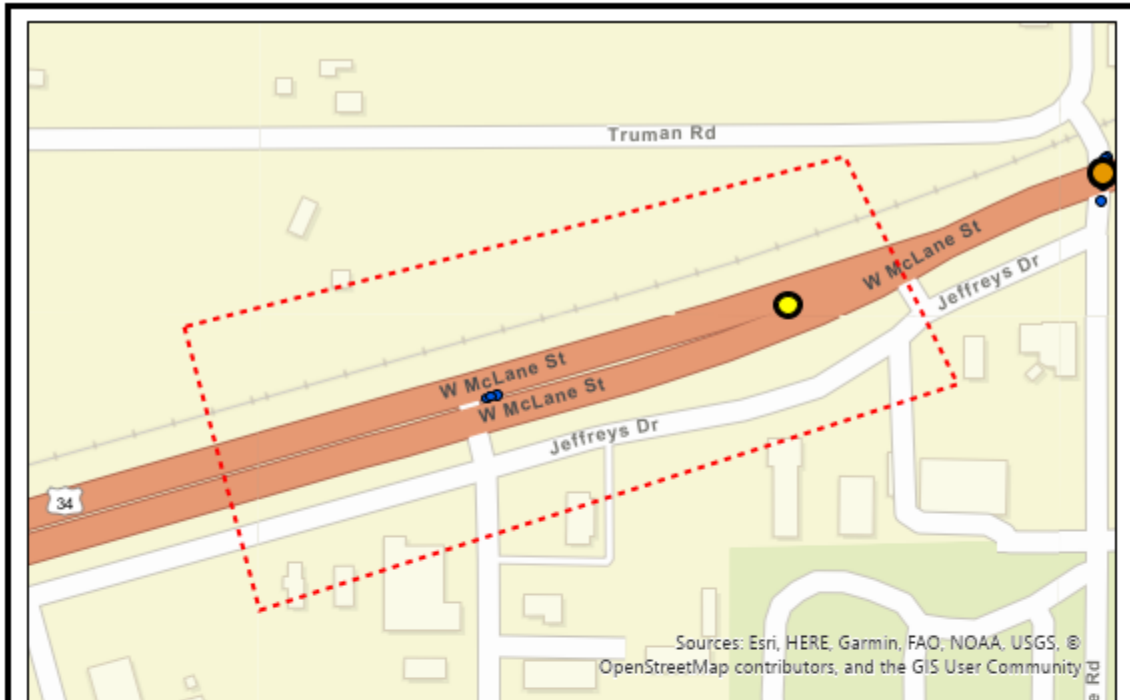- Fatality: 0 Crash(es)

- Study Site Extents

County: Lucas

Study Site: Segment 9

US 34 MP 137.09 to MP 138.71
(Iowa DOT ID: 5274)

Animal-Related Crashes: 2
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-2 crashes occurred in dark unlight conditions
-1 crash occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.45 (Negligible)
Injurious Crashes: 0.00 (Negligible)

Legend
Crashes by Severity
- Property Dame Only: 1 Crash(es)
- Possible/Unknown: 1 Crash(es)
- Minor Injury: 2 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Lucas

Study Site: Intersection 18

US 34 & South 4th Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-0 crashes occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
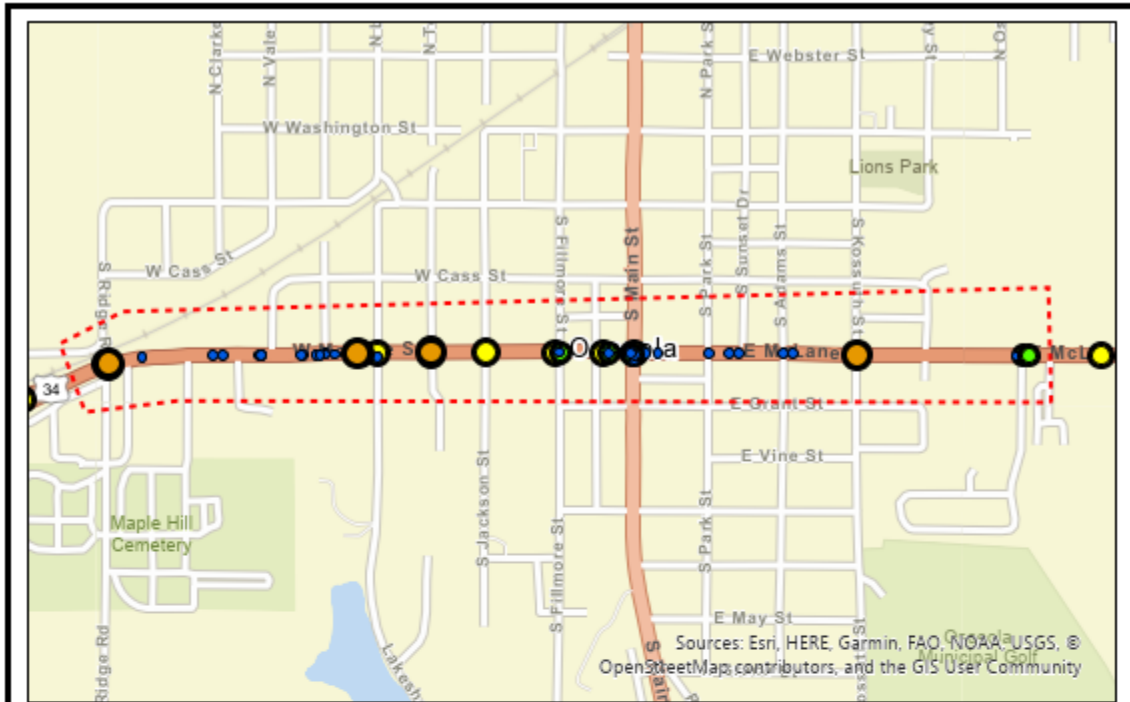All Crashes: 0.04 (Negligible)
Injurious Crashes: 0.00 (Negligible)

0   0.01 0.01   0.02 Miles

N

Legend
Crashes by Severity
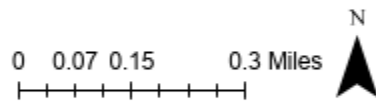- Property Dame Only: 1 Crash(es)
- Possible/Unknown: 0 Crash(es)
- Minor Injury: 1 Crash(es)
- Major Injury: 0 Crash(es)
- Fatality: 0 Crash(es)

Study Site Extents

County: Lucas

Study Site: Intersection 19

US 34 & South 1st Street

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 1
Speeding-Related Crashes: 0

Crash Notes:
-Fatal crash was failure to yield right of way, making a left-turn, broadside crash that occurred during dusk, in clear conditions and was alcohol-related
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: -0.09 (Negligible)
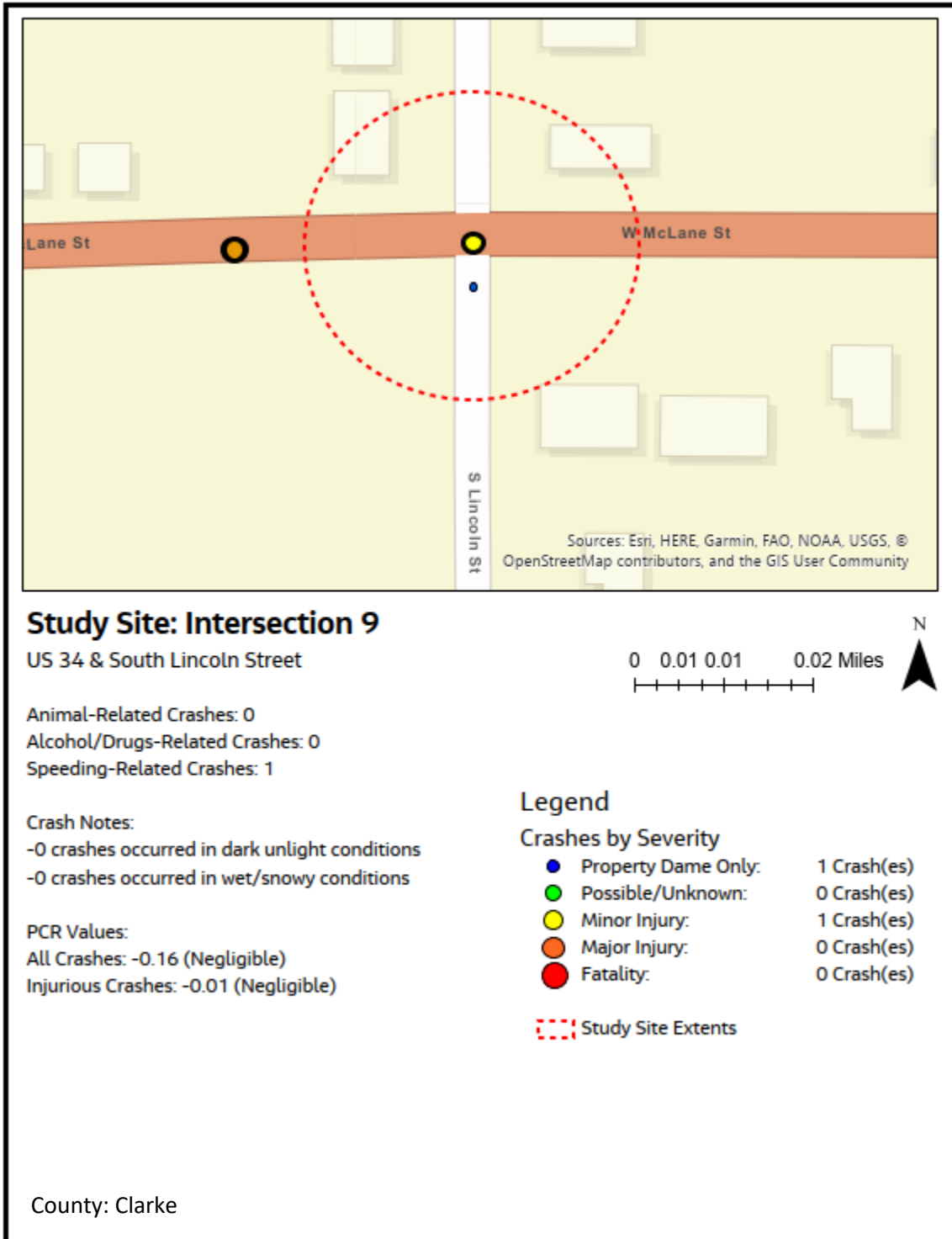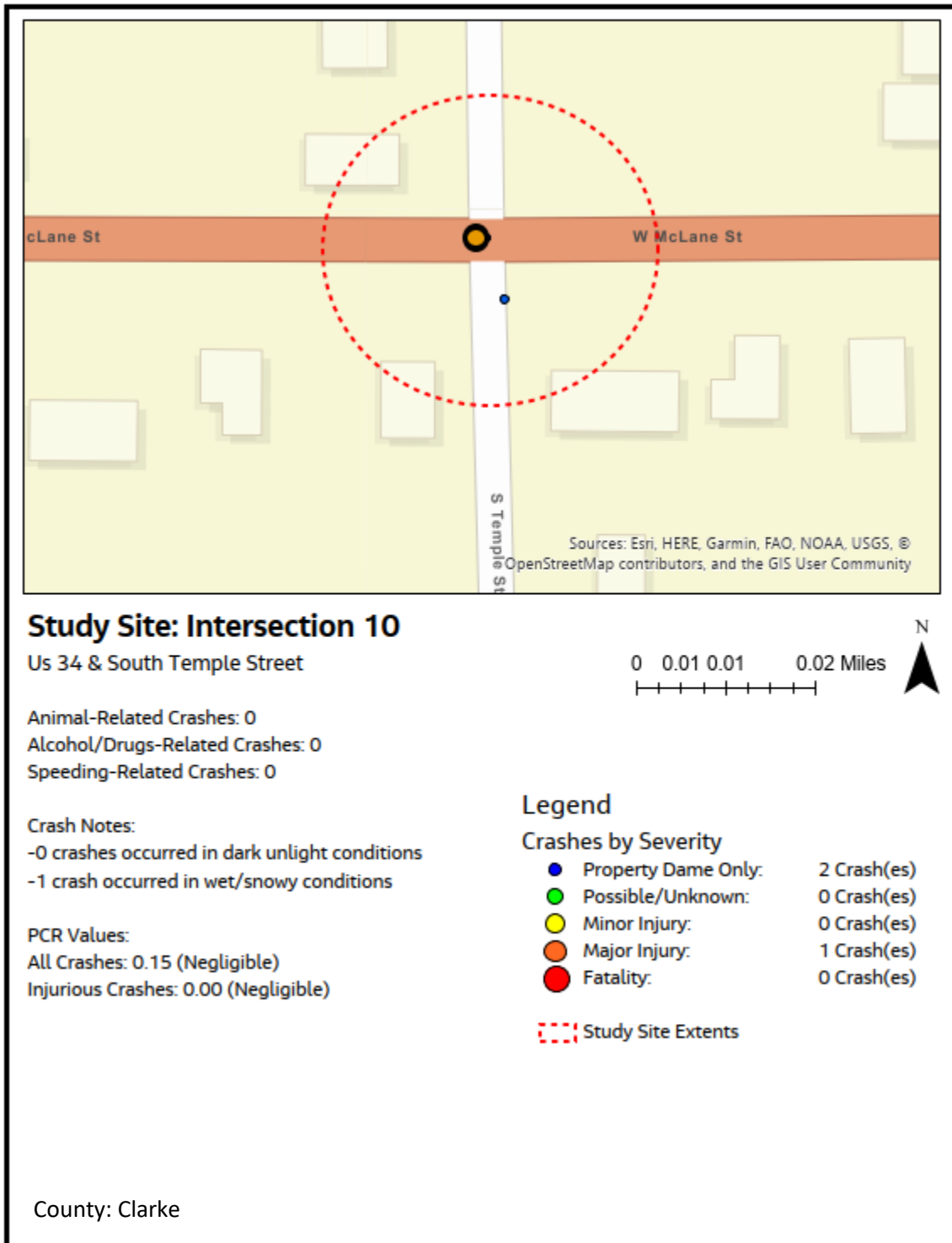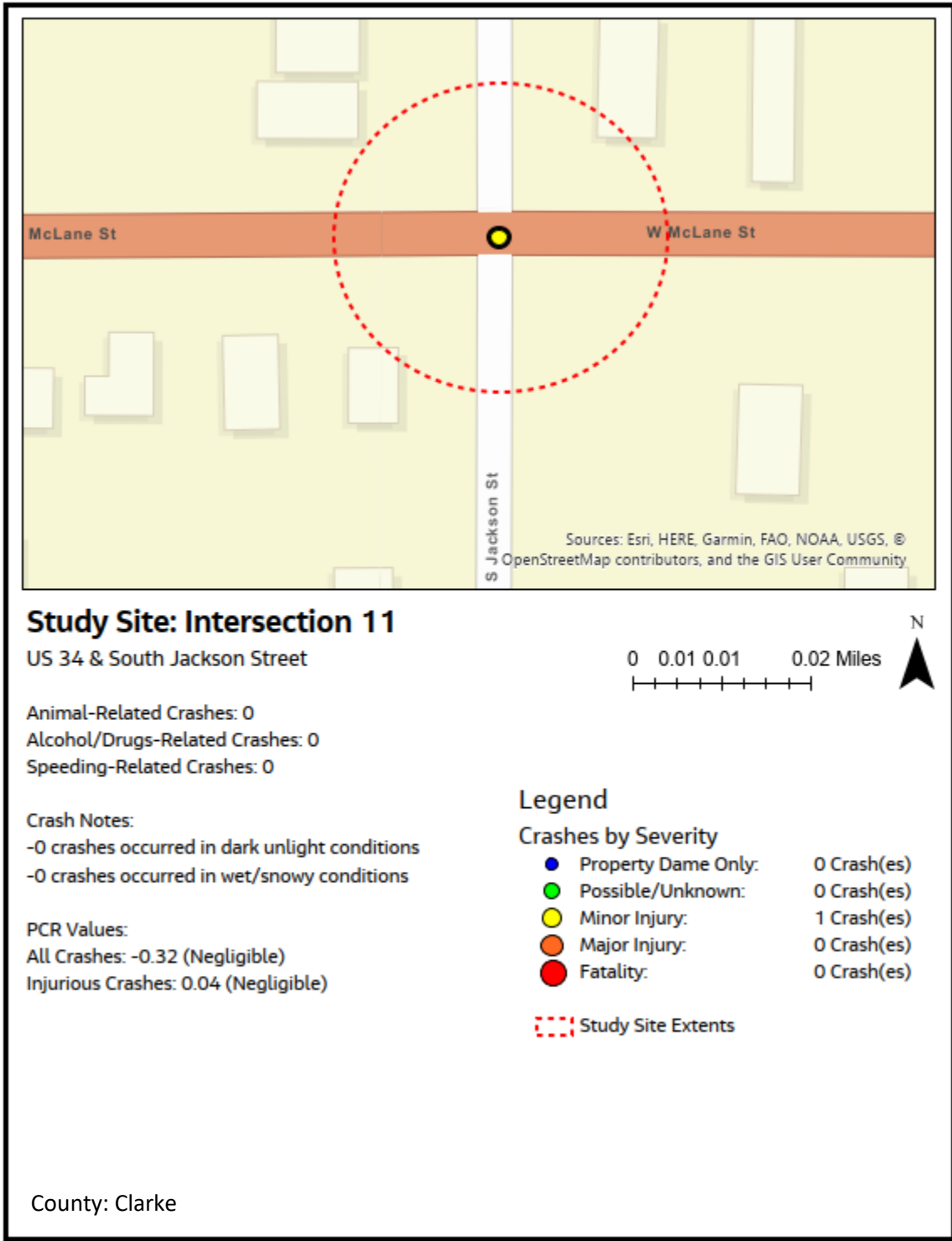Injurious Crashes: 0.03 (Negligible)

County: Lucas

Legend

Crashes by Severity

● Property Dame Only:	1 Crash(es)
● Possible/Unknown:	0 Crash(es)
● Minor Injury:	0 Crash(es)
● Major Injury:	0 Crash(es)
● Fatality:	1 Crash(es)

▮ ▮ Study Site Extents

Study Site: Intersection 20

US 34 & Frontage Road/East Lincoln Avenue

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 0
Speeding-Related Crashes: 0

Crash Notes:
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: Not Available
Injurious Crashes: Not Available

N

0   0.01 0.01   0.02 Miles

Legend
Crashes by Severity
- ● Property Dame Only: 0 Crash(es)
- ● Possible/Unknown: 0 Crash(es)
- ● Minor Injury: 0 Crash(es)
- ● Major Injury: 1 Crash(es)
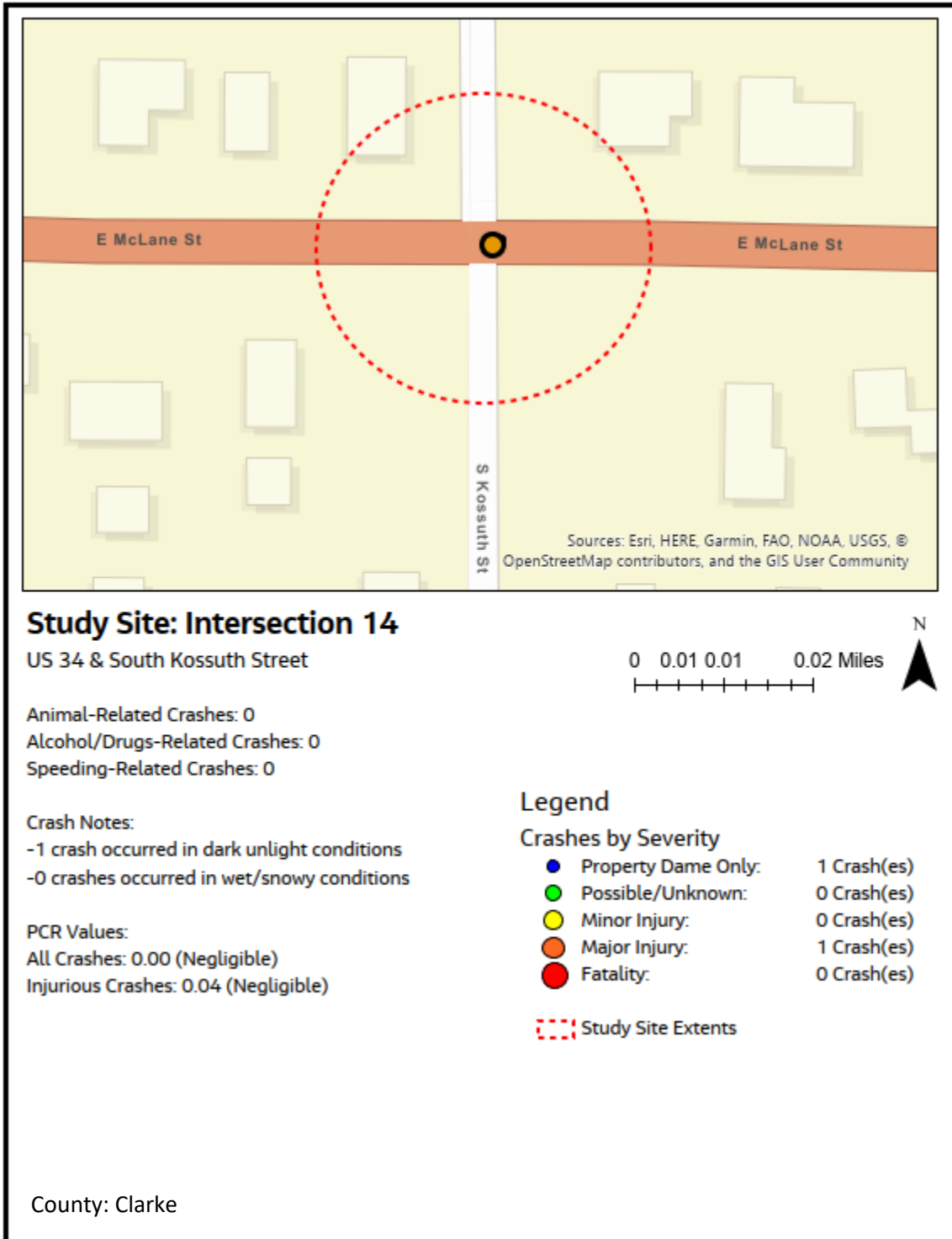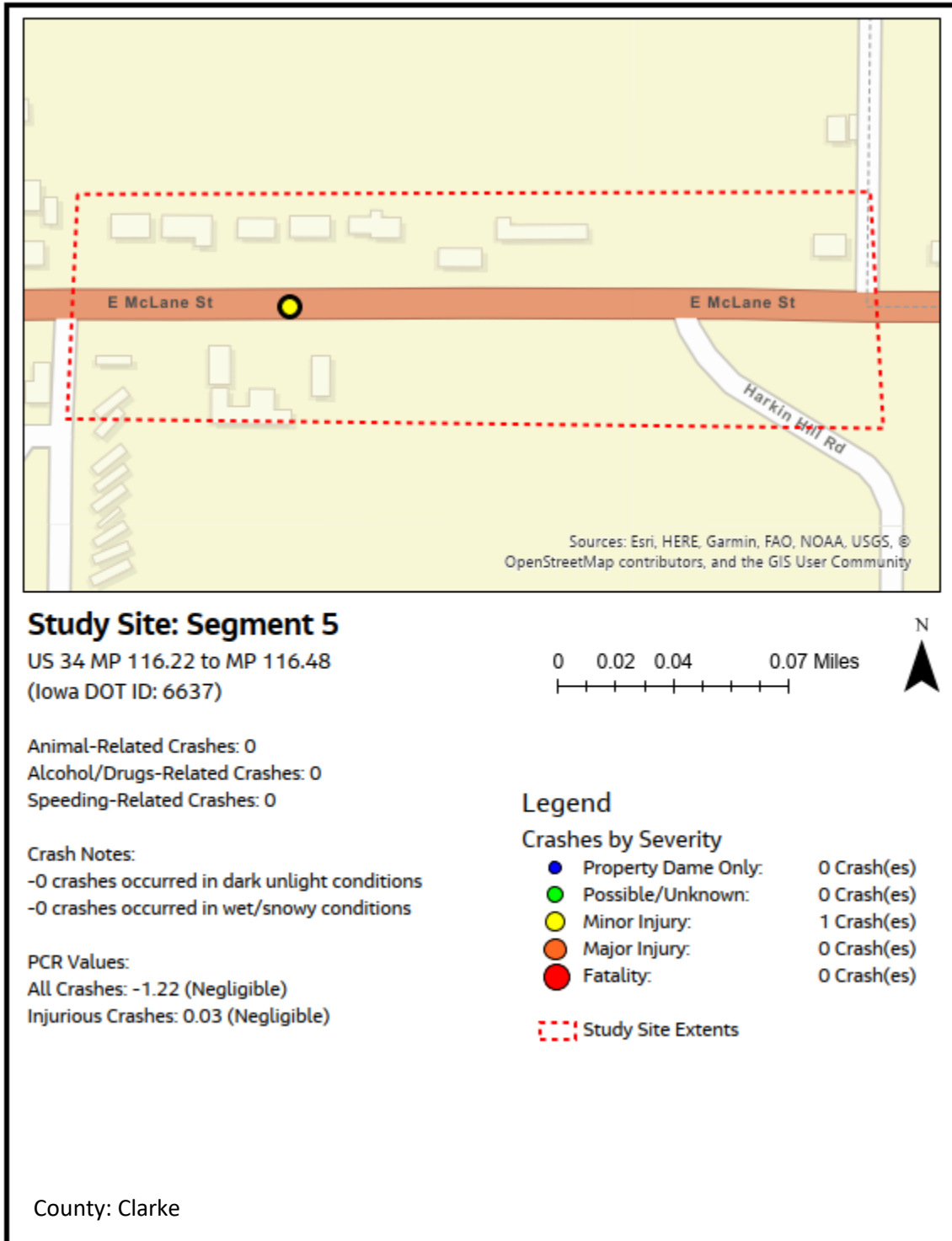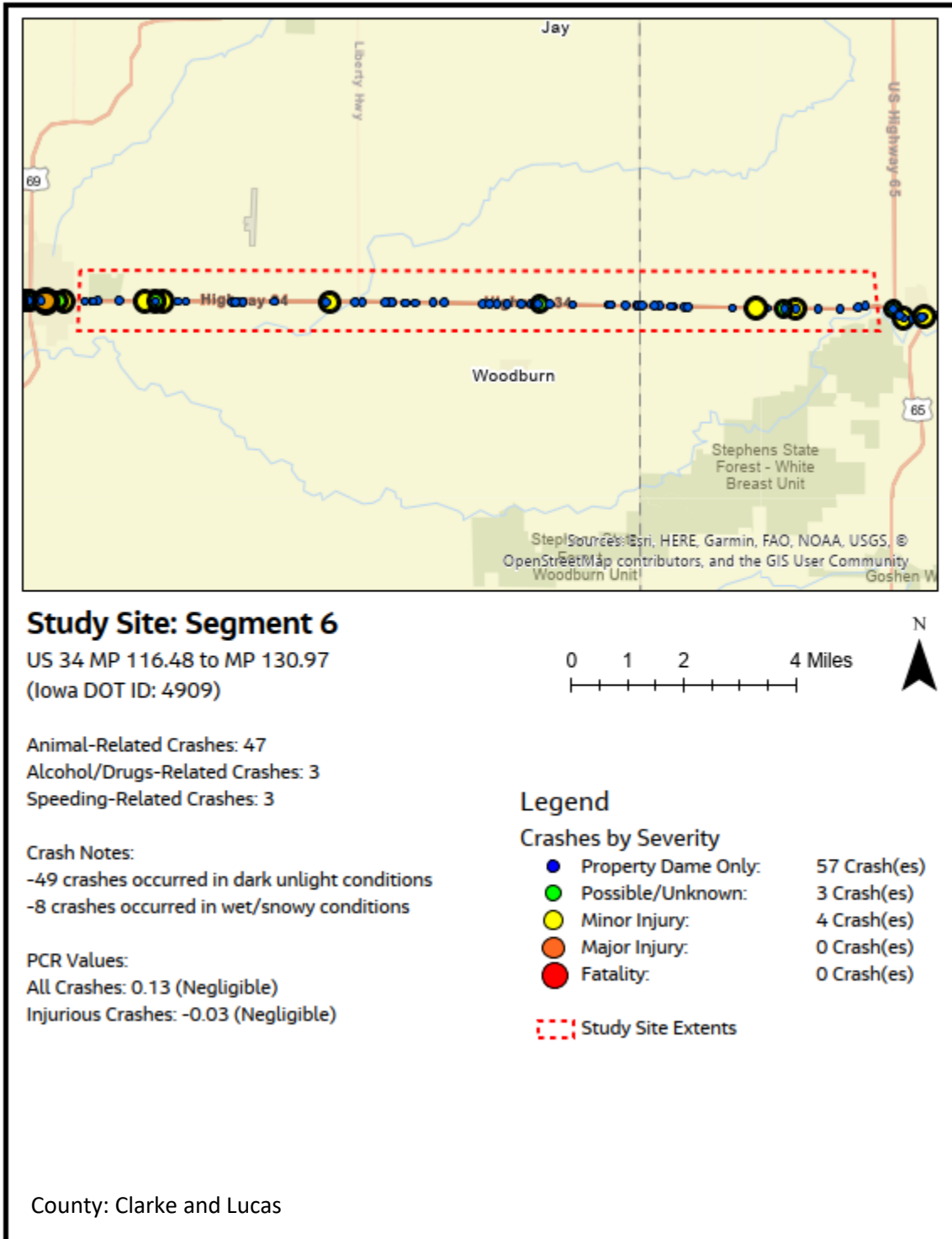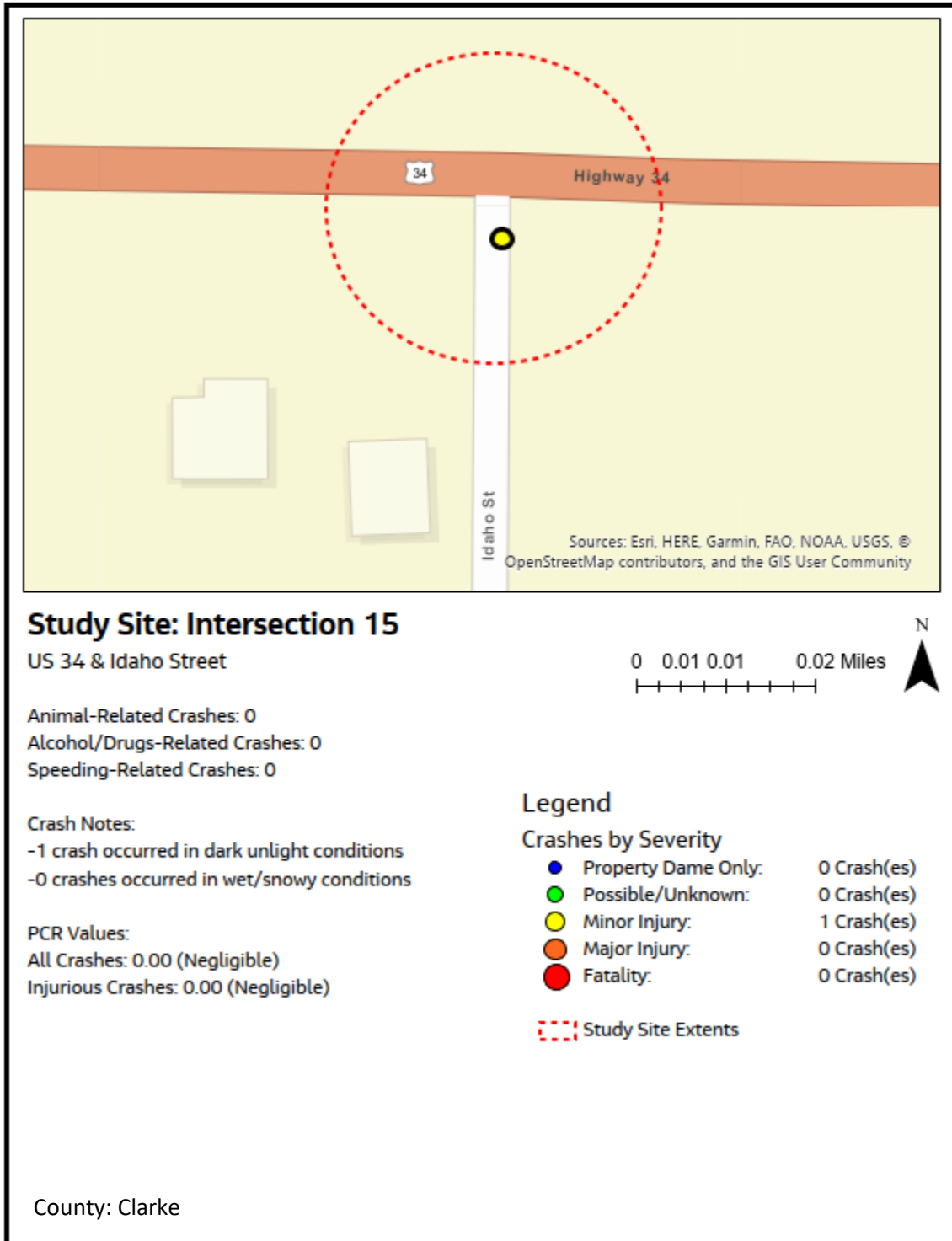- ● Fatality: 0 Crash(es)
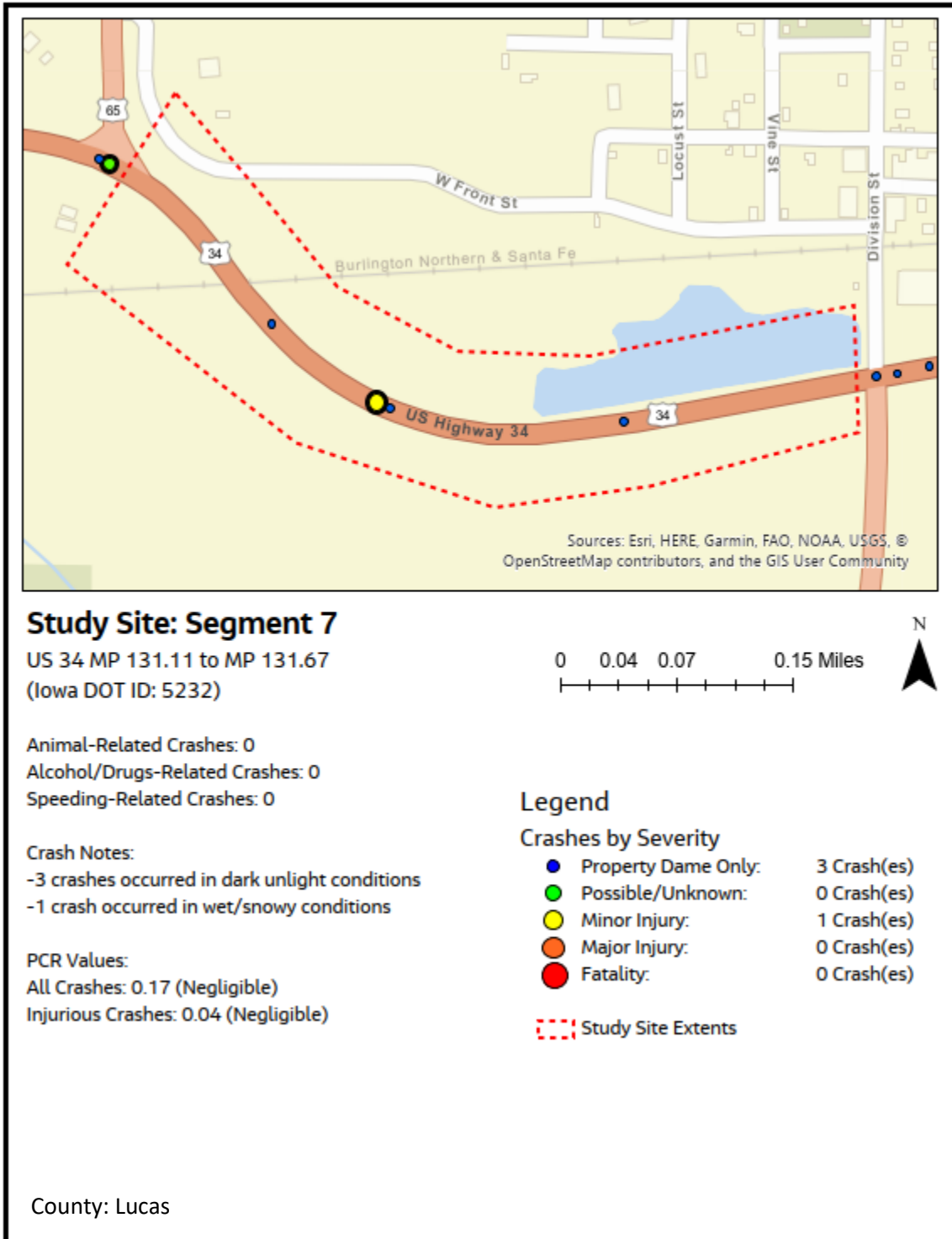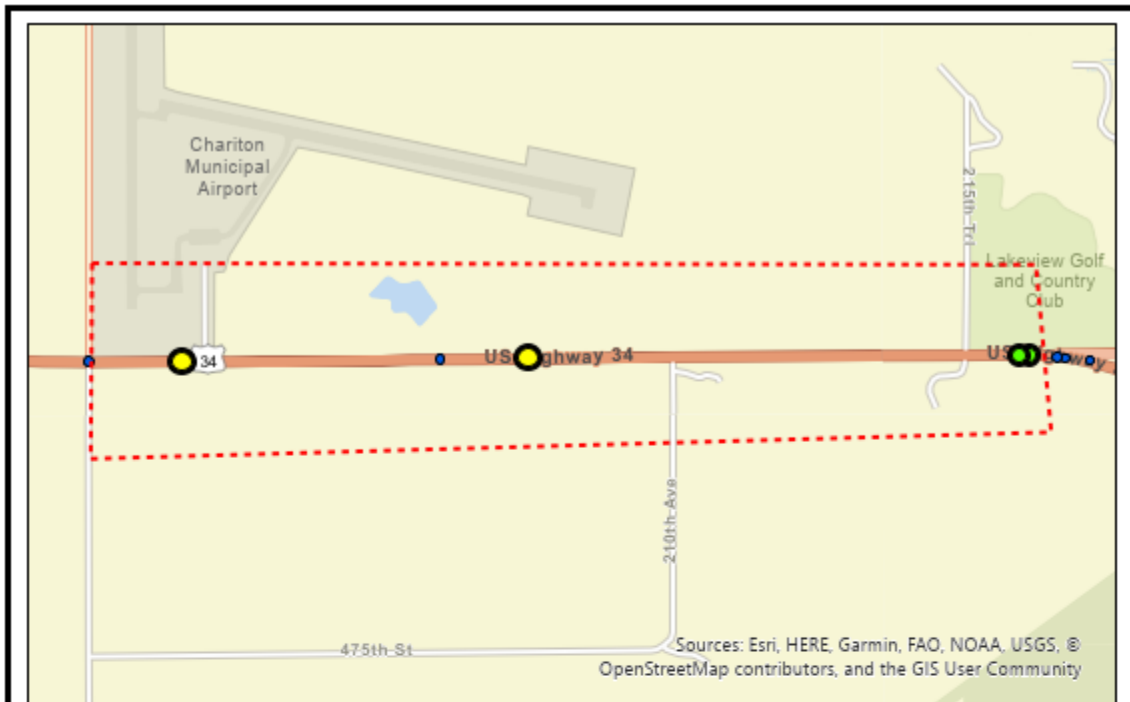
⬚ Study Site Extents

County: Lucas

Study Site: Segment 12

US 34 MP 141.61 to MP 166.34
(Iowa DOT ID: 5047)

Animal-Related Crashes: 78
Alcohol/Drugs-Related Crashes: 2
Speeding-Related Crashes: 3

Crash Notes:
-Fatal crash was a failure to yield right-of-way
crash that occurred in dark, clear, dry
conditions
-74 crashes occurred in dark unlight conditions
-13 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.16 (Negligible)
Injurious Crashes: -0.01 (Negligible)

County: Lucas and Monroe

Legend
Crashes by Severity

Property Dame Only:	90 Crash(es)
Possible/Unknown:	12 Crash(es)
Minor Injury:	4 Crash(es)
Major Injury:	2 Crash(es)
Fatality:	1 Crash(es)

Study Site Extents

Study Site: Intersection 21

US 34 & 277th Avenue

Animal-Related Crashes: 0
Alcohol/Drugs-Related Crashes: 1
Speeding-Related Crashes: 0

Crash Notes:
-Fatal crash was a crossed centerline, head-on crash that occurred during daylight, in clear, dry conditions and was alcohol-related
-1 crash occurred in dark unlight conditions
-0 crashes occurred in wet/snowy conditions

PCR Values:
All Crashes: 0.00 (Negligible)
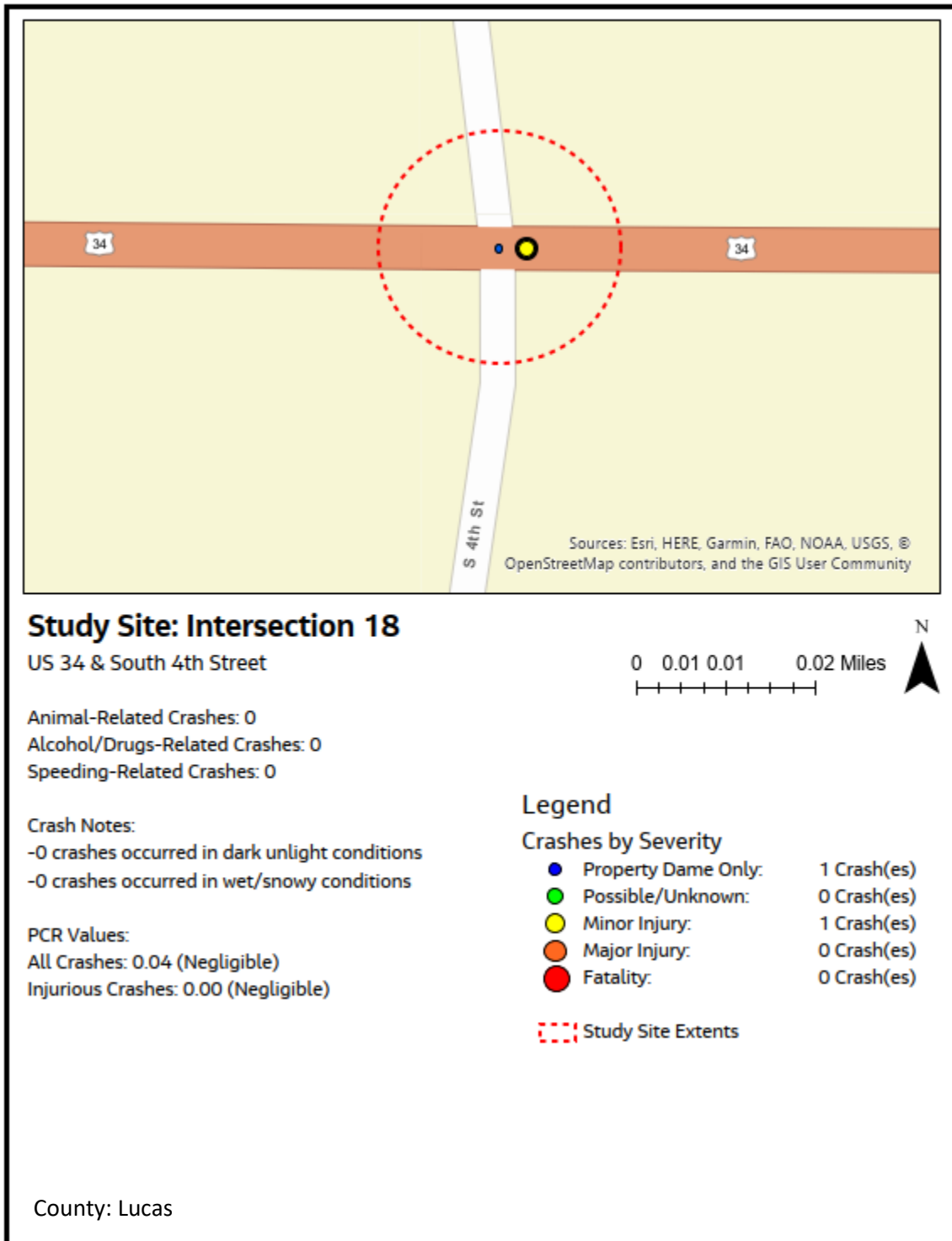Injurious Crashes: 0.00 (Negligible)

Legend

Crashes by Severity

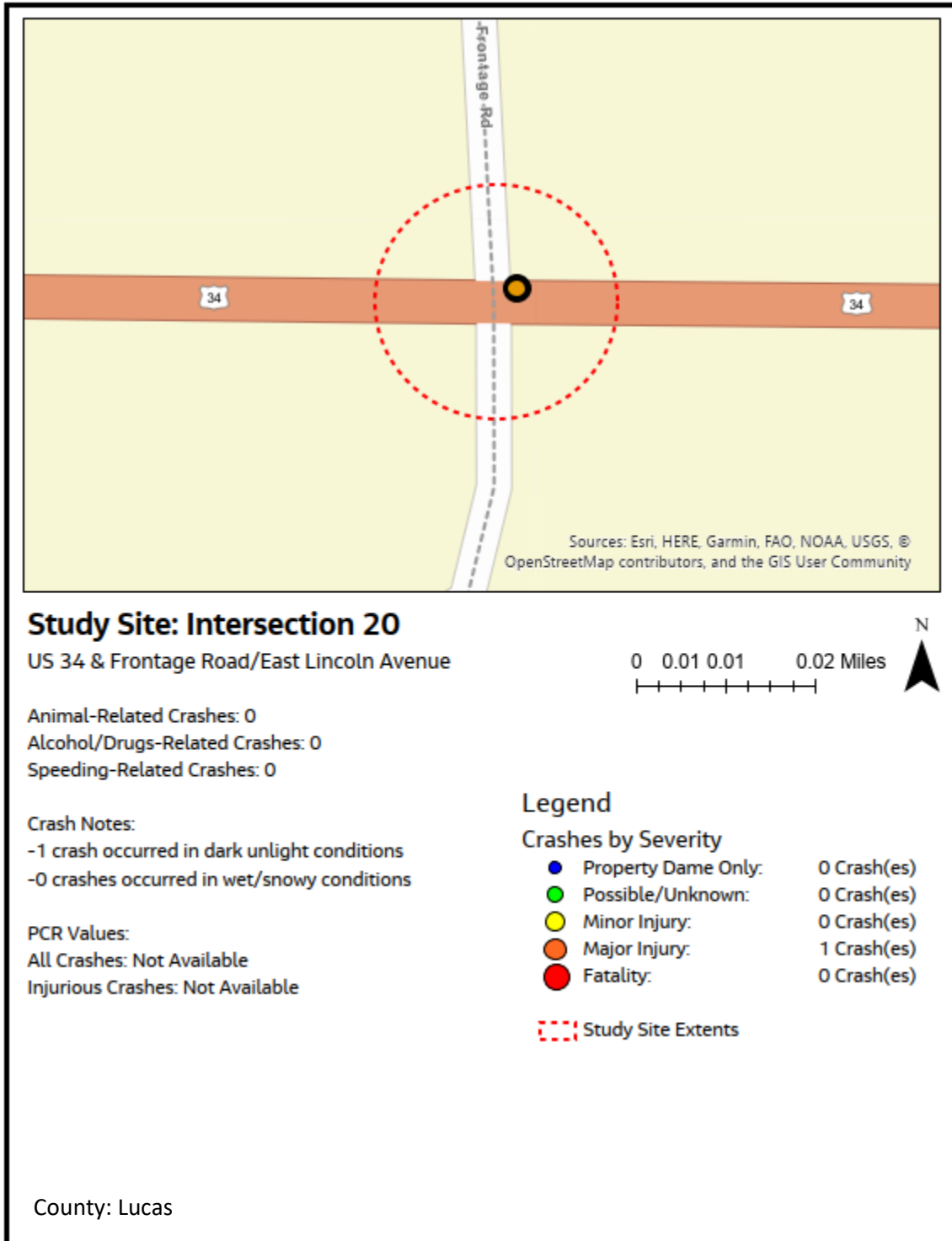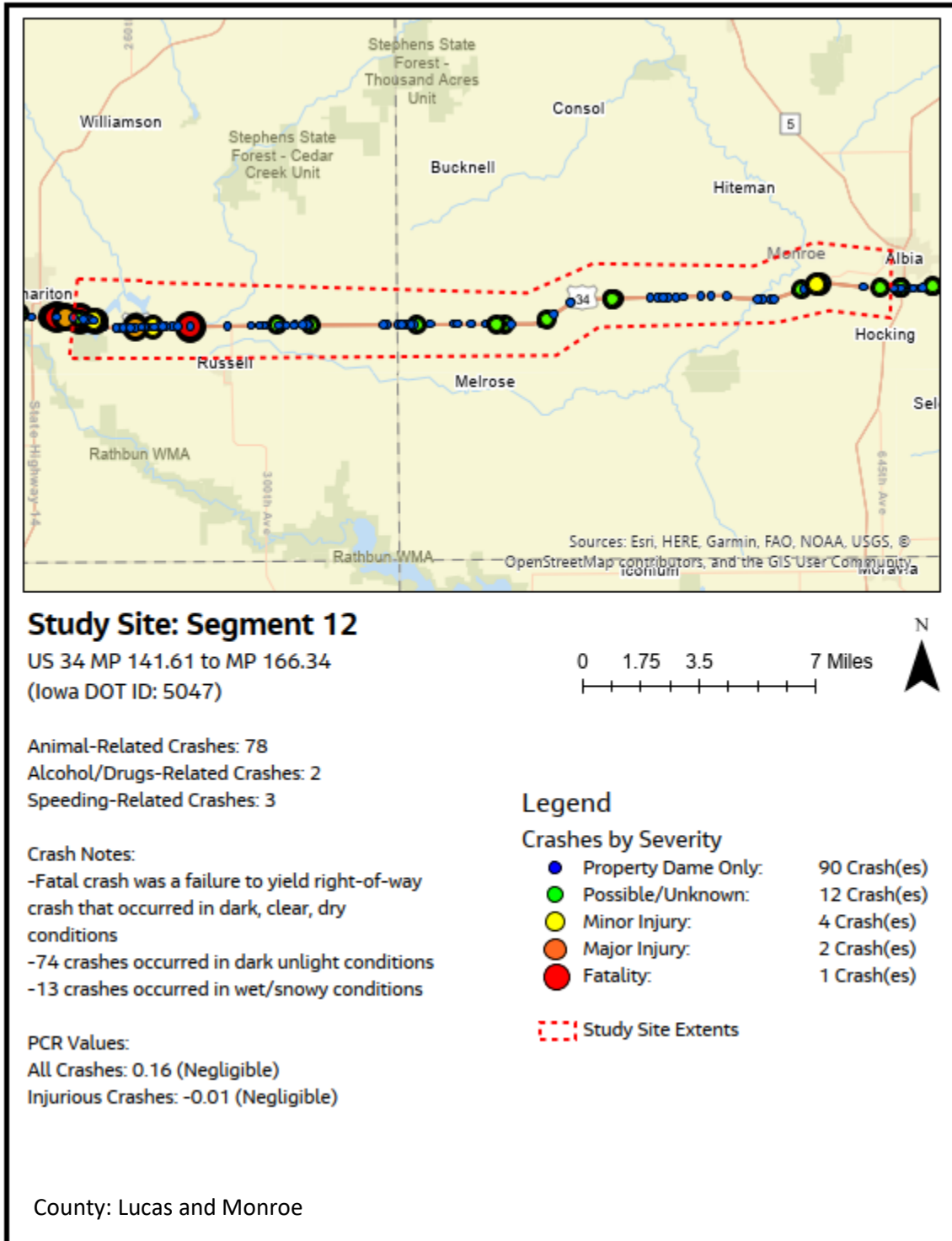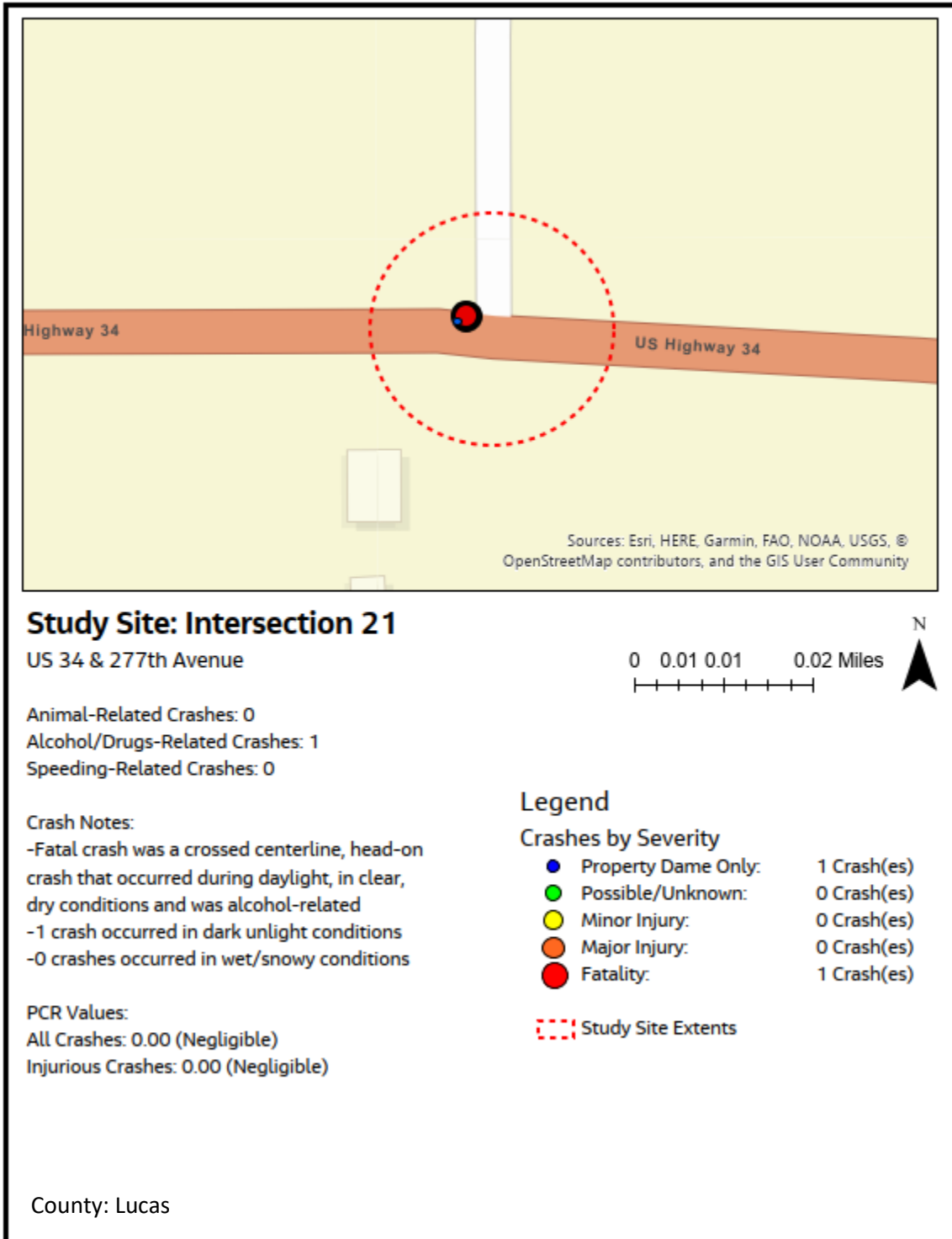|		
●	Property Dame Only:	1 Crash(es)
●	Possible/Unknown:	0 Crash(es)
●	Minor Injury:	0 Crash(es)
●	Major Injury:	0 Crash(es)
●	Fatality:	1 Crash(es)
⬚	Study Site Extents	

County: Lucas

6 CONCLUSIONS AND NEXT STEPS

Between 2017 and 2021, a total of 478 crashes occurred within the US 34 Study area (from approximately 3 miles east of US 169 to just east of 201st Street/S 13th Street in Albia). Of these, 100 involved injuries, including 5 fatal crashes and 10 crashes with major or incapacitating injuries. Review of the various crash attributes, pre-crash actions, and contributing factors identified the following general crash trends in the US 34 Study corridor:

- The most common crash types were single-vehicle crashes (53 percent of total, however, only 39 percent of injury crashes).

- The second most coming crash types were animal-related crashes (41 percent of total), all of which were single-vehicle crashes except for 3 multi-vehicle crashes.

- Crashes along roadway segment were more frequent than at intersections. Severity between segment-related and intersection crashes was similar, with segment-related crashes having approximately 17 and intersection 28 percent injury crashes.

- Rear-end and broadside crashes were most common among multi-vehicle crashes at intersections.

- Crashes predominately occurred under dry pavement surface conditions; 7 percent of the total crashes (8 percent of the injury crashes) occurred during rain and wet pavement conditions, while only 4 percent of the total crashes (9 percent of the injury crashes) occurred with snow and ice conditions.

- Crashes were split approximately 50/50 between occurring in the daylight and the nighttime.

- Crashes occurred throughout the day; with expected spikes in crashes during the AM and PM peak traffic periods.

- 34 percent of total crashes (45 percent of injury crashes) occurred at intersections.

- Failure to yield right-of-way at intersections was the most common cause of intersection-related crashes and accounted for approximately 21 percent of the injury crashes.

- Frequency of crashes tends to increase in October, November, and December (36 percent of total and 31 percent of injury crashes), which coincides with an increase in animal-related crashes (40 percent of all animal crashes) during the same months.

- Between 7 and 17 percent of the traffic on US 34 is heavy truck traffic; heavy trucks or agricultural equipment were involved in 20 percent of the total crashes (21 percent of injury crashes) and were distributed throughout the calendar year.

Eight intersections and five roadway segments were found to have PCR levels (KAB, and/or KABCO) of medium or high. This does not necessarily indicate a safety problem exists at any of these locations; rather, it simply indicates that more crashes occurred on these sections of roadway than would be typically expected in a 5-year period when compared to crash trends on other similar roadways in Iowa. Thirteen intersections and eight roadway segments were found to have an injury crash history.

The findings of this safety study will be used as one of the data inputs into the development and evaluation of potential improvement alternatives for the US 34 corridor being prepared and considered as part of the overall US 34 Super Two Study. How the crash data are applied to the alternatives process and how the potential improvement projects can address and improve safety in the US 34 Super Two Study corridor will be documented as part of a separate report.

APPENDIX A—DISTRIBUTION OF 2017-2021 CRASHES BY LOCATION

Legend

Crashes by Severity
- Property Damage Only
- Possible/Unknown
- Minor Injury
- Major Injury
- Fatality

N

0 0.1 0.2 0.4 Miles

Page 1

Notes:
Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community

Highway 34

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Legend

Crashes by Severity
- Property Damage Only
- Possible/Unknown
- Minor Injury
- Major Injury
- Fatality

N

0 0.1 0.2 0.4 Miles

Page 2

Notes:
Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community

Legend

Crashes by Severity

- • Property Damage Only
- • Possible/Unknown
- • Minor Injury
- • Major Injury
- • Fatality

N

0 0.1 0.2   0.4 Miles

Page 3

Notes:

Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Map 1 (top)

297th-Ave

34   Highway 34   34   Highway 34   Highway 34

Map 2 (bottom)

5th-Ave   330th-Ave

4   Highway 34   Ottawa   Highw

Iowa St

Legend

Crashes by Severity

- • Property Damage Only
- • Possible/Unknown
- • Minor Injury
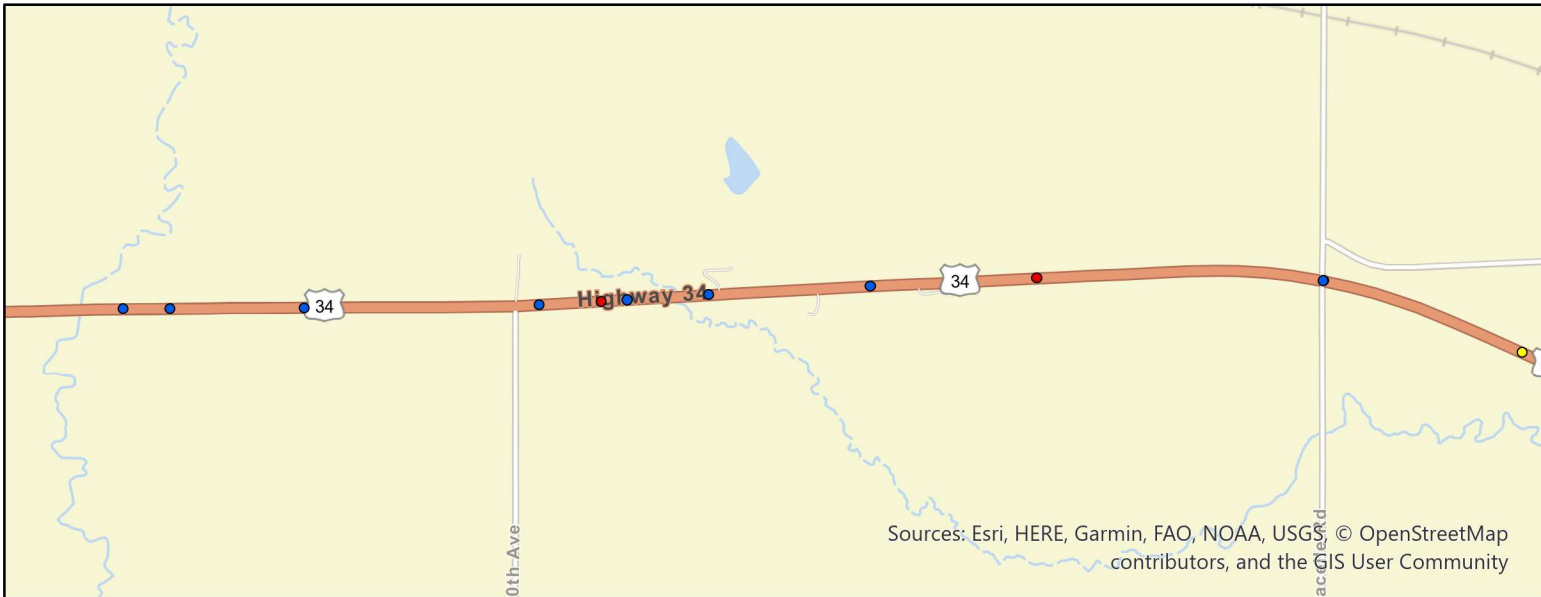- • Major Injury
- • Fatality

N

0 0.10.2 0.4 Miles

Page 4

Notes:

Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community

297th-Ave

34   Highway 34   34   Highway 34

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

th-Ave

5th-Ave

5th-Ave

330th-Ave

4   Highway 34   Ottawa   Highw

Iowa St

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Legend

Crashes by Severity
- Property Damage Only
- Possible/Unknown
- Minor Injury
- Major Injury
- Fatality

N

0 0.1 0.2 0.4 Miles

Page 5

Notes:
Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community
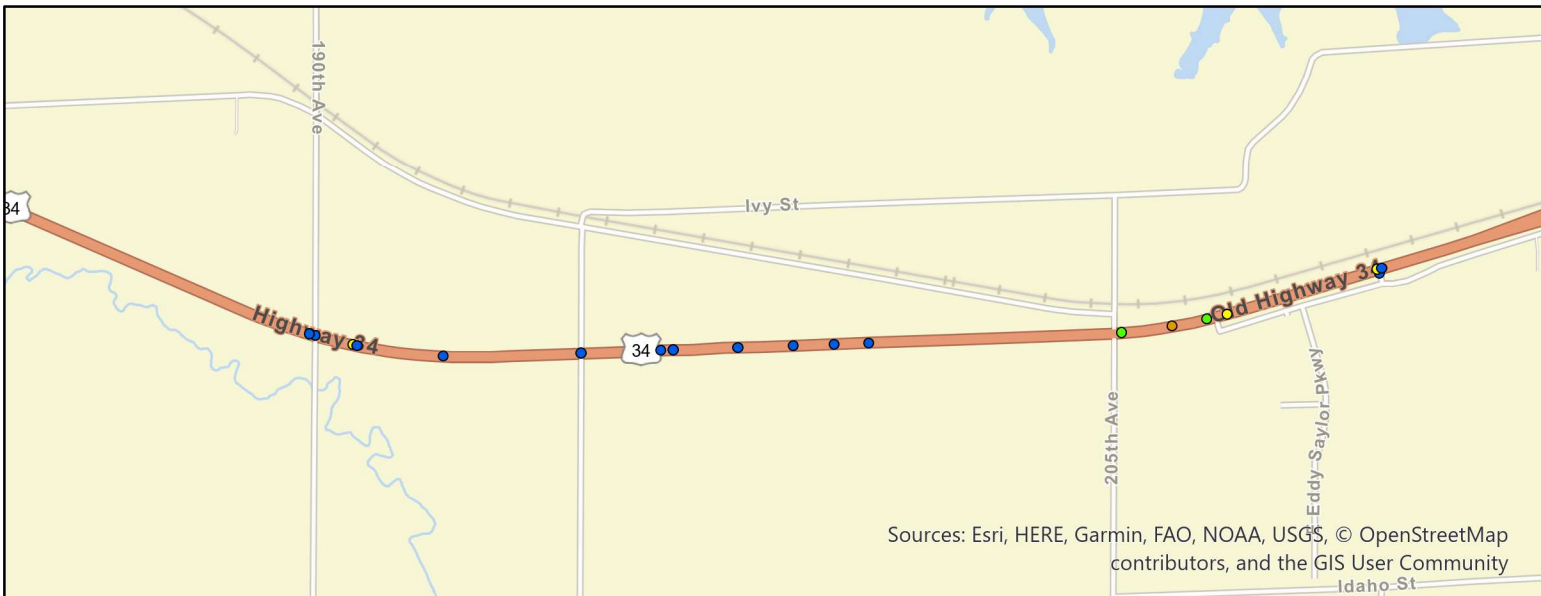
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

US Highway 34

US Highway 34

Legend

Crashes by Severity
- ● Property Damage Only
- ● Possible/Unknown
- ● Minor Injury
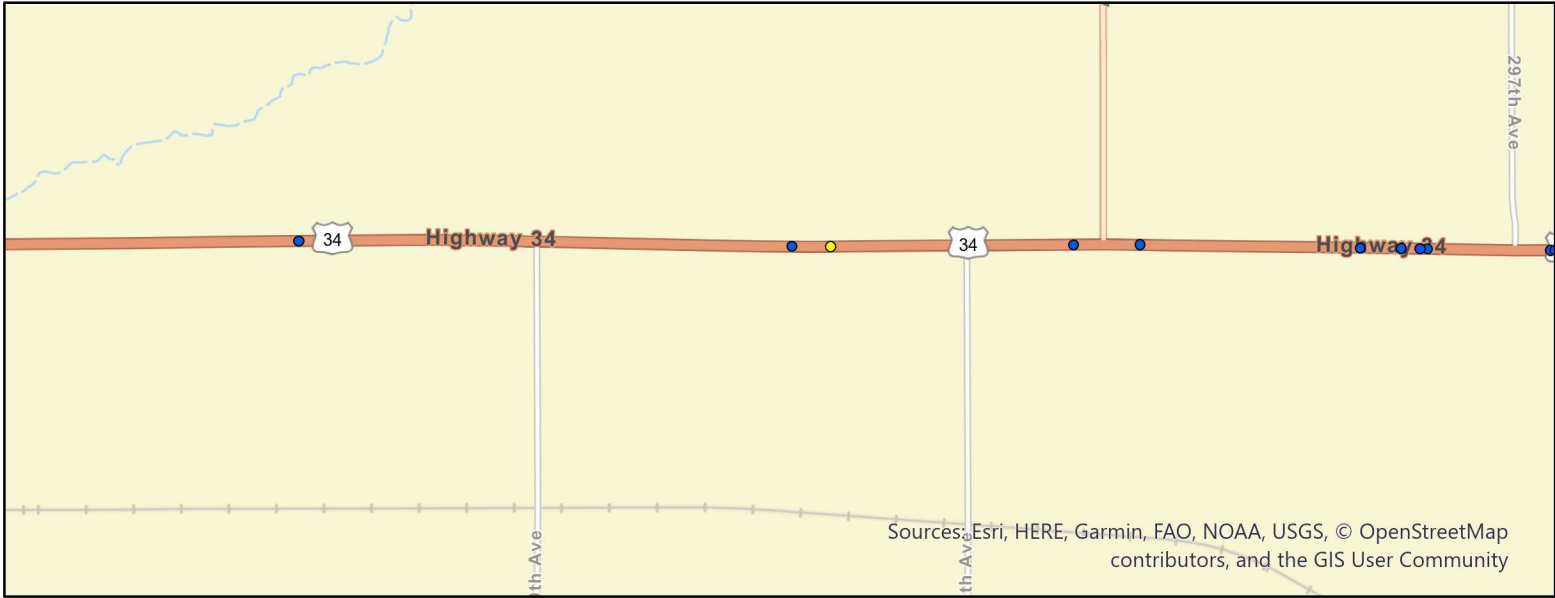- ● Major Injury
- ● Fatality

N

0 0.1 0.2 0.4 Miles

Page 6

Notes:
Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Legend

Crashes by Severity

- Property Damage Only
- Possible/Unknown
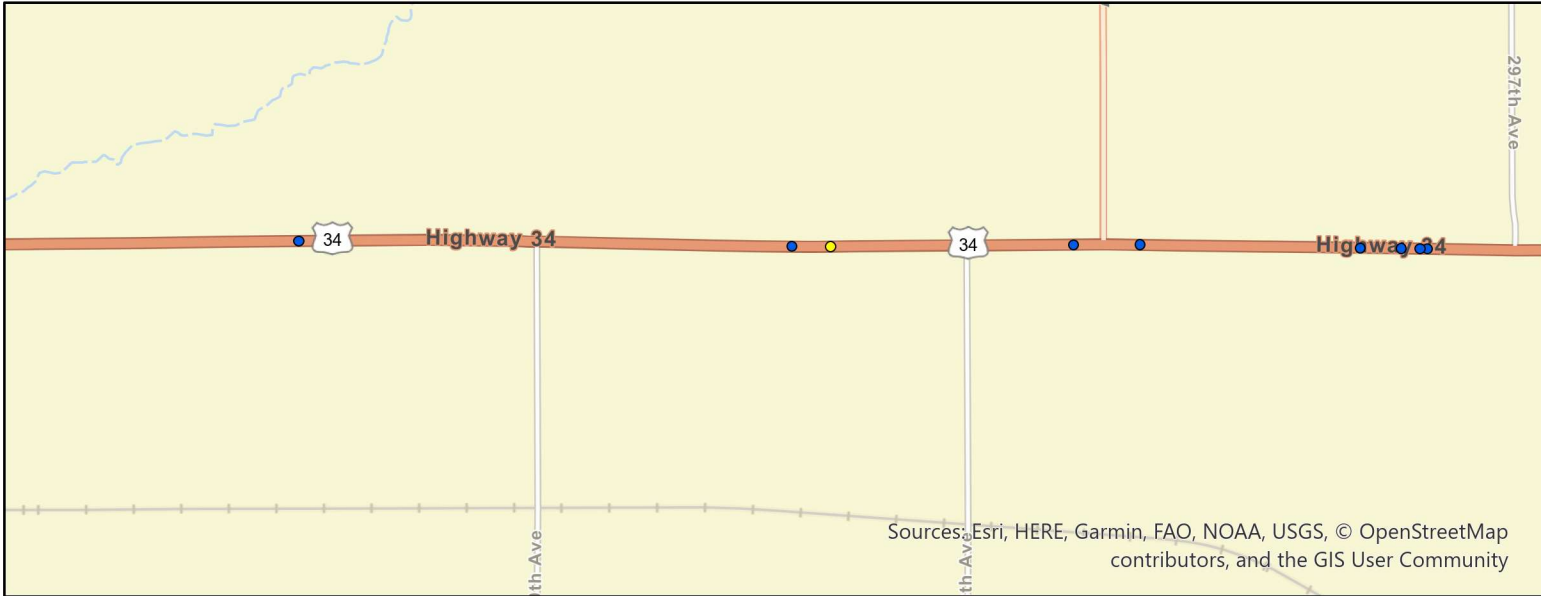- Minor Injury
- Major Injury
- Fatality

N

0 0.1 0.2 0.4 Miles

Page 7

Notes:

Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community

Legend

Crashes by Severity
- ● Property Damage Only
- ● Possible/Unknown
- ● Minor Injury
- ● Major Injury
- ● Fatality

N

0 0.1 0.2   0.4 Miles

Page 8

Notes:
Crash data are
courtesy of Iowa
Department of
Transportation
and encompass 2017
through 2021

Crashes by Severity
- Property Damage Only
- Possible/Unknown
- Minor Injury
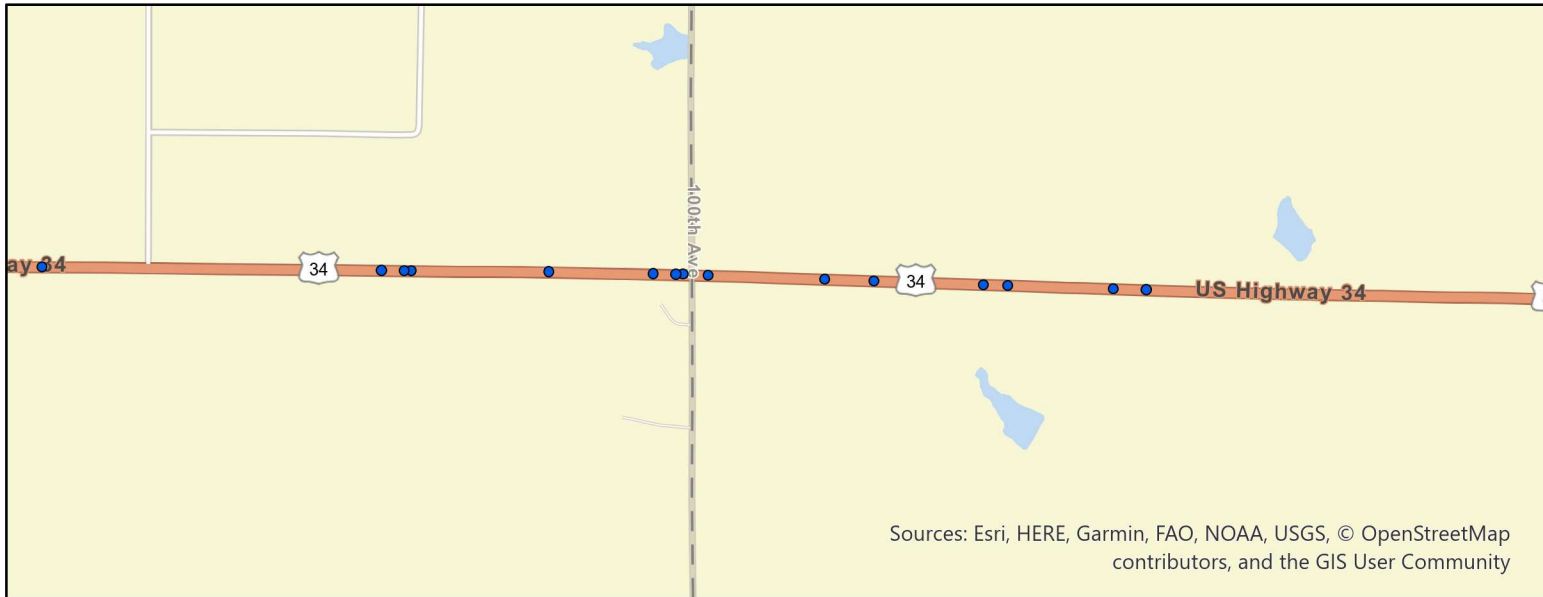- Major Injury
- Fatality

N

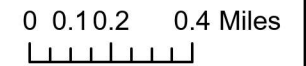0 0.1 0.2   0.4 Miles

Page 9

Notes:
Crash data are
courtesy of Iowa
Department of
Transportation
and encompass 2017
through 2021

Sources: Esra, HERE,
Garmin, USGS, Intermap,
INCREMENTP, NRCan, Esri
Japan, METI, Esri China
(HongKong) Esri Korea, Esri
(Thailand), NGCC, Open
StreetMap contributors, and
the GIS User Community

Legend

Crashes by Severity

- • Property Damage Only
- • Possible/Unknown
- • Minor Injury
- • Major Injury
- • Fatality

N

0 0.1 0.2 0.4 Miles

Page 10

Notes:

Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community
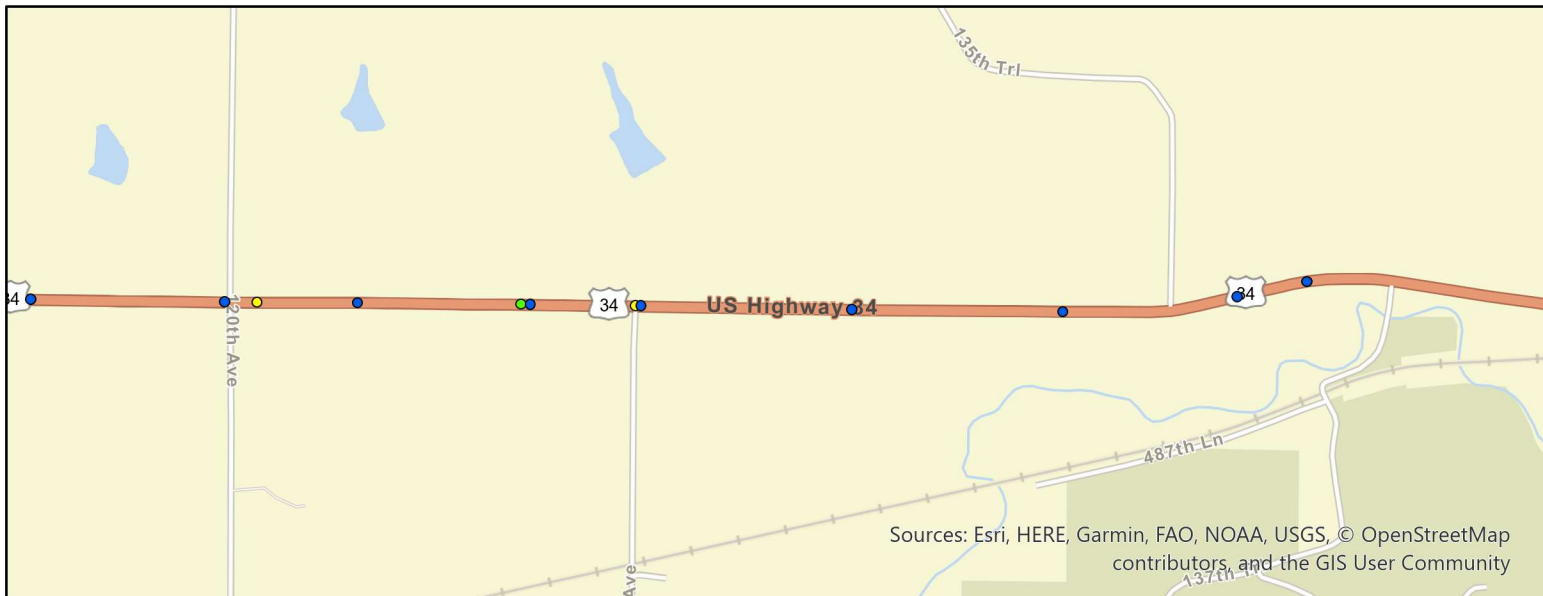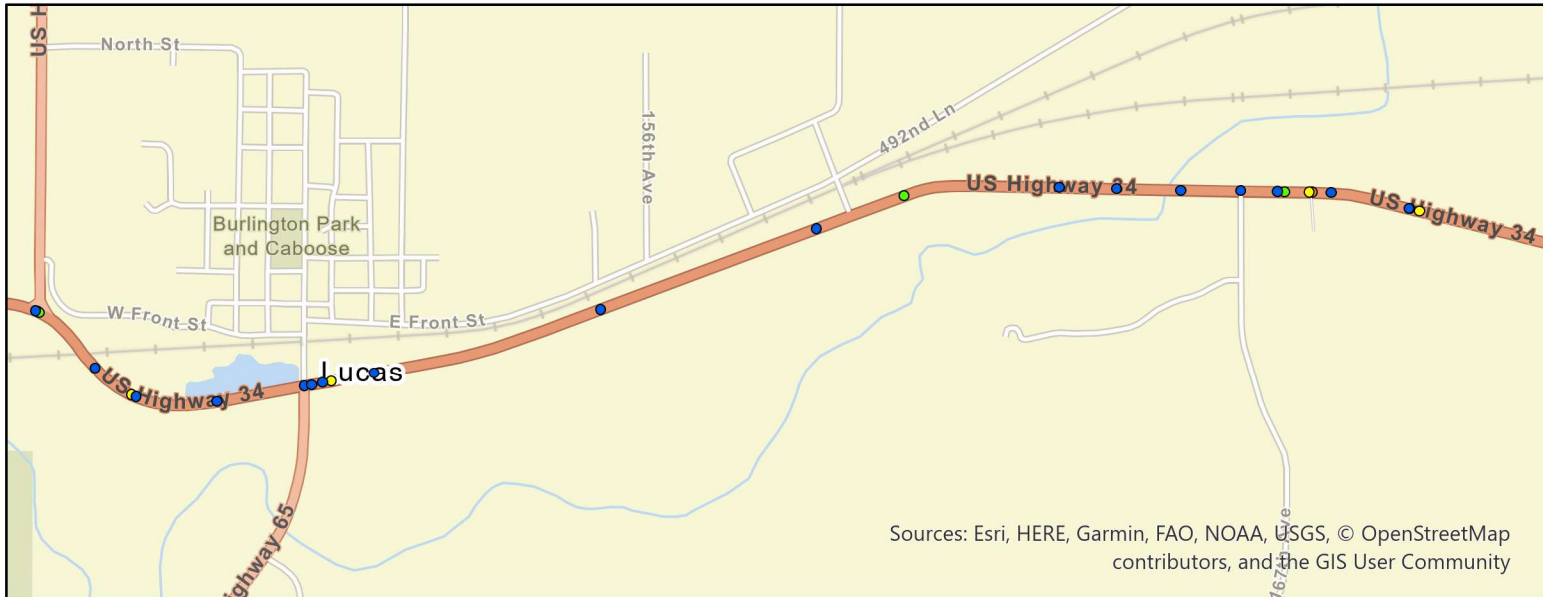
527th Ave

34

34

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

34

Georgetown

34

34

205th Ln

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Legend

Crashes by Severity

- ● Property Damage Only
- ● Possible/Unknown
- ● Minor Injury
- ● Major Injury
- ● Fatality

N

0 0.1 0.2 0.4 Miles

Page 11

Notes:
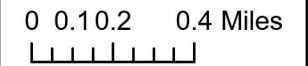Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

Sources: Esra, HERE, Garmin, USGS, Intermap, INCREMENTP, NRCan, Esri Japan, METI, Esri China (HongKong) Esri Korea, Esri (Thailand), NGCC, Open StreetMap contributors, and the GIS User Community
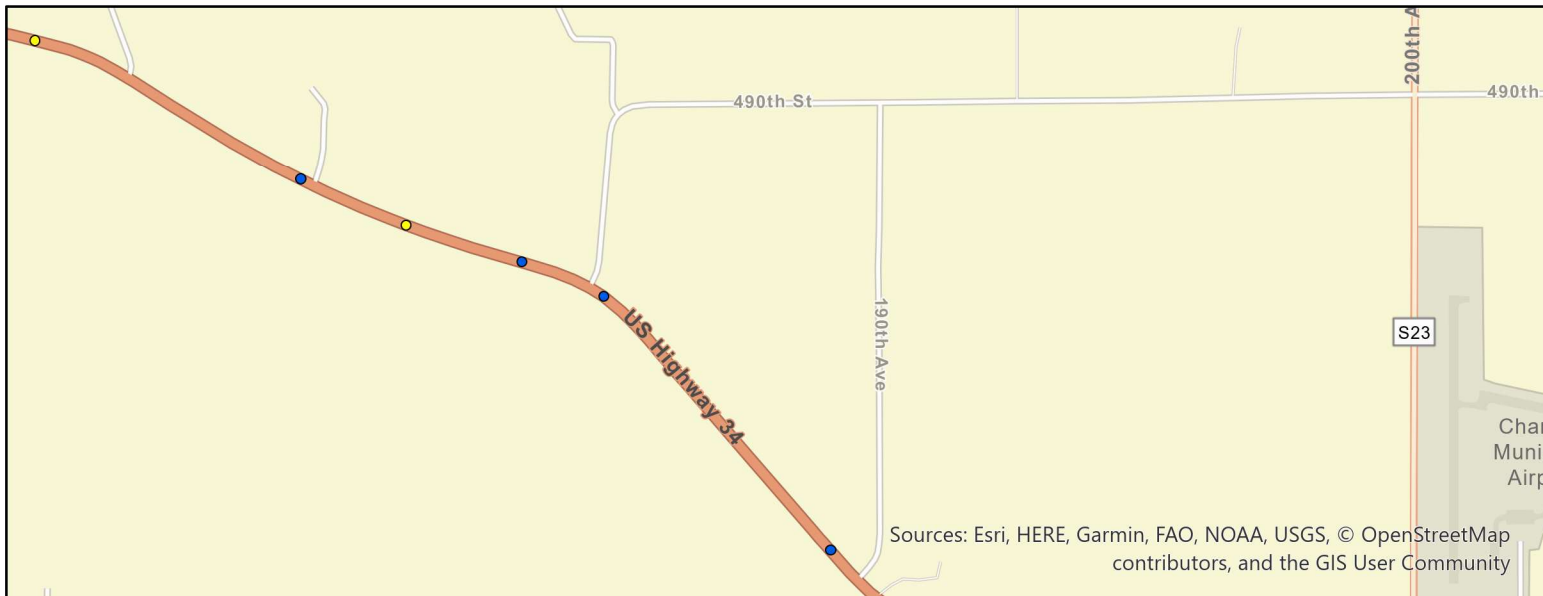
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Legend

Crashes by Severity
- Property Damage Only
- Possible/Unknown
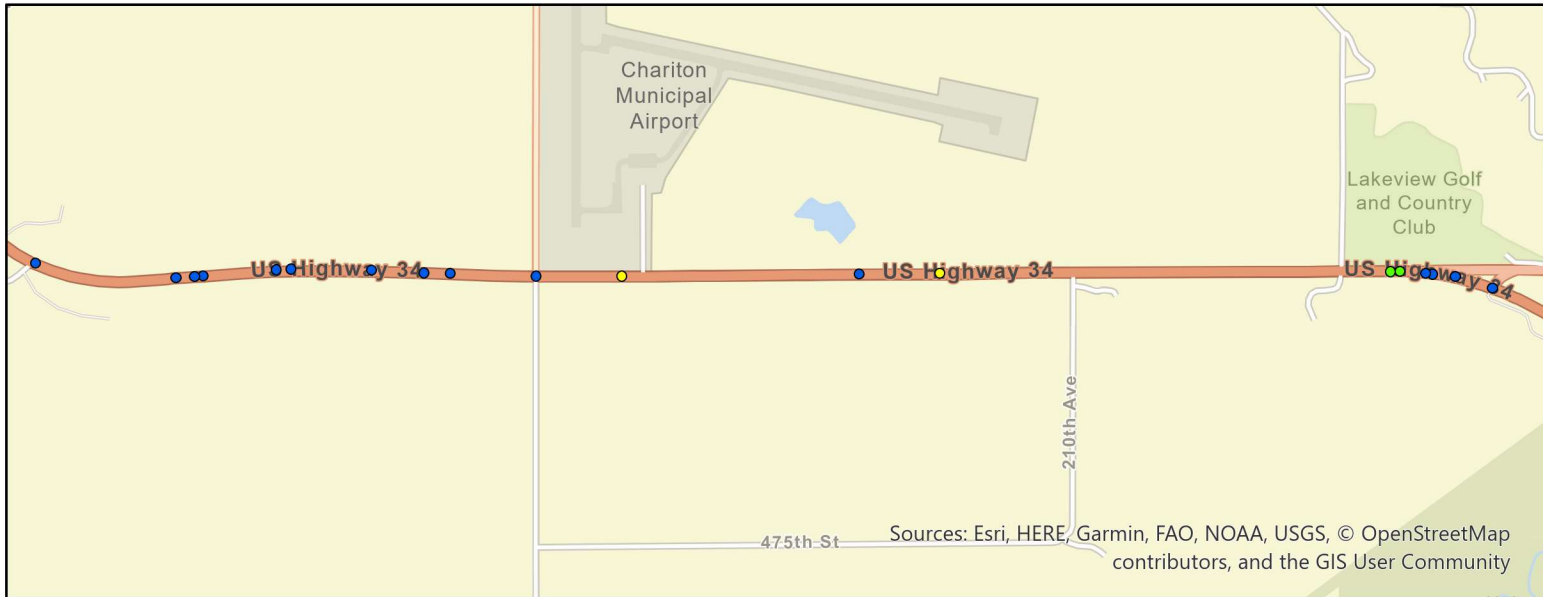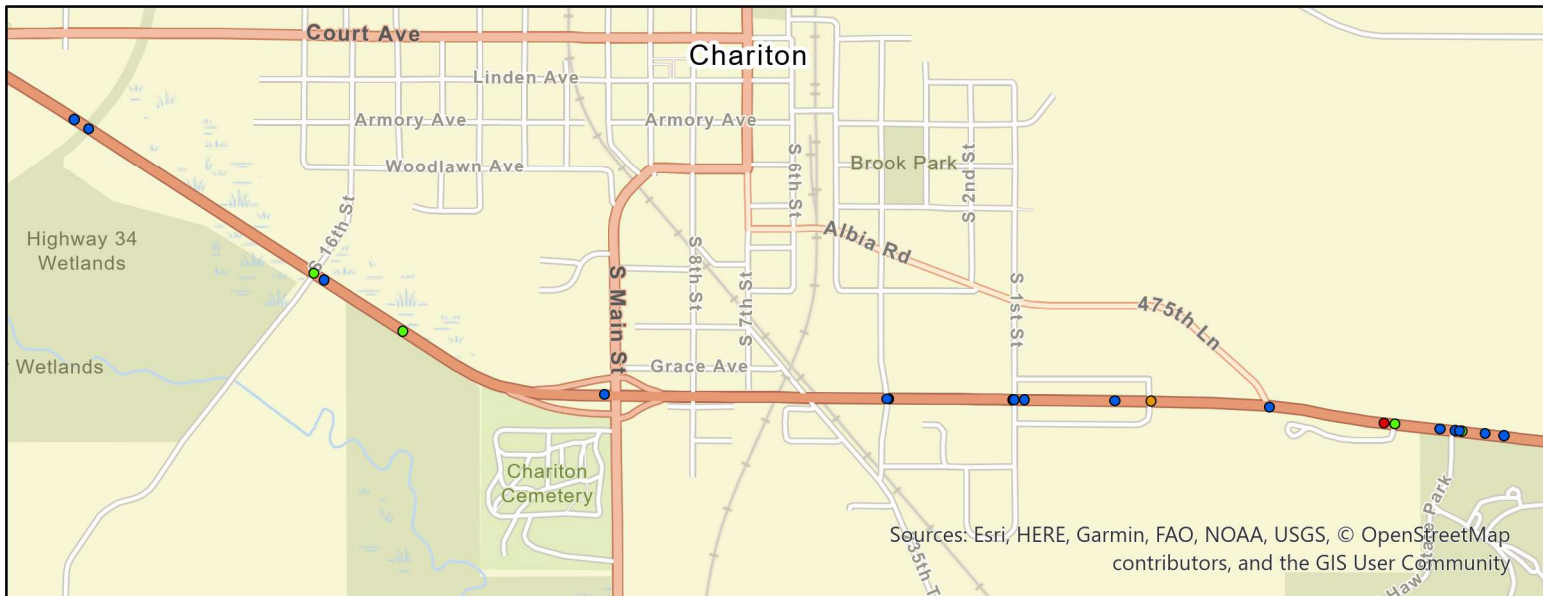- Minor Injury
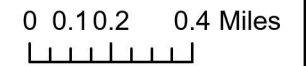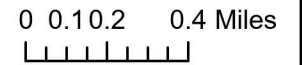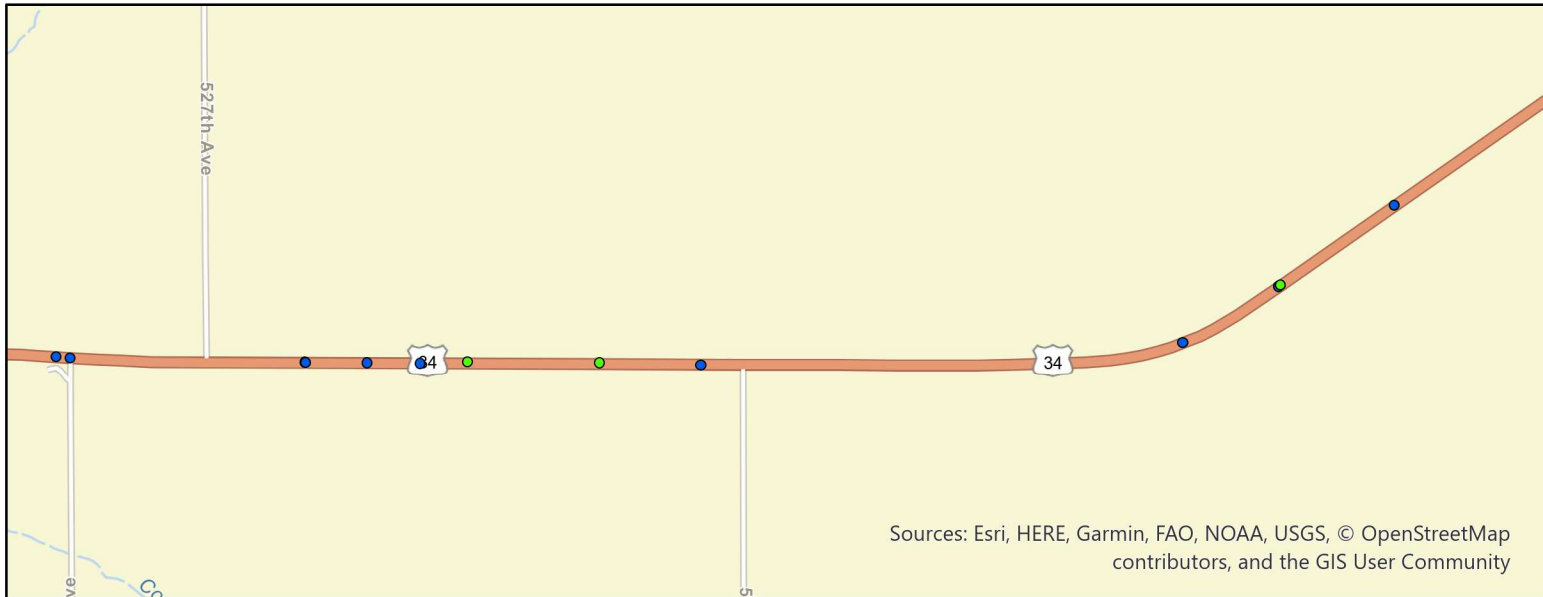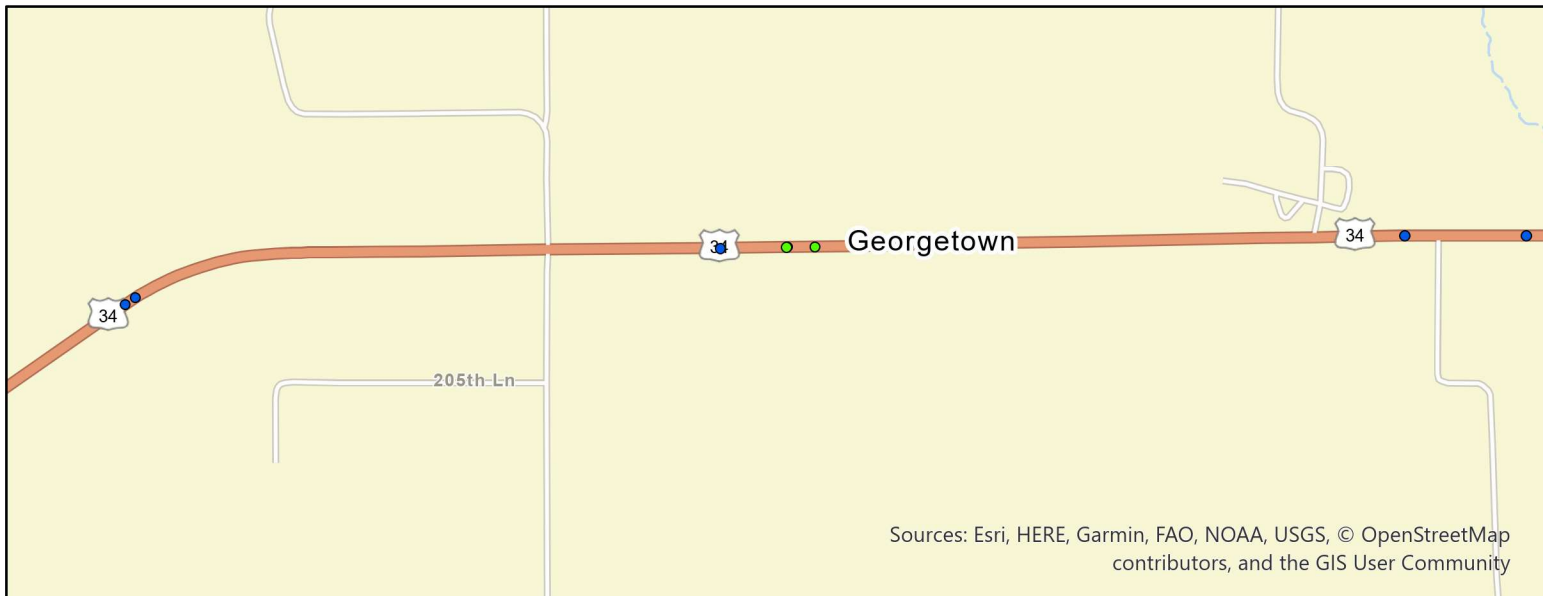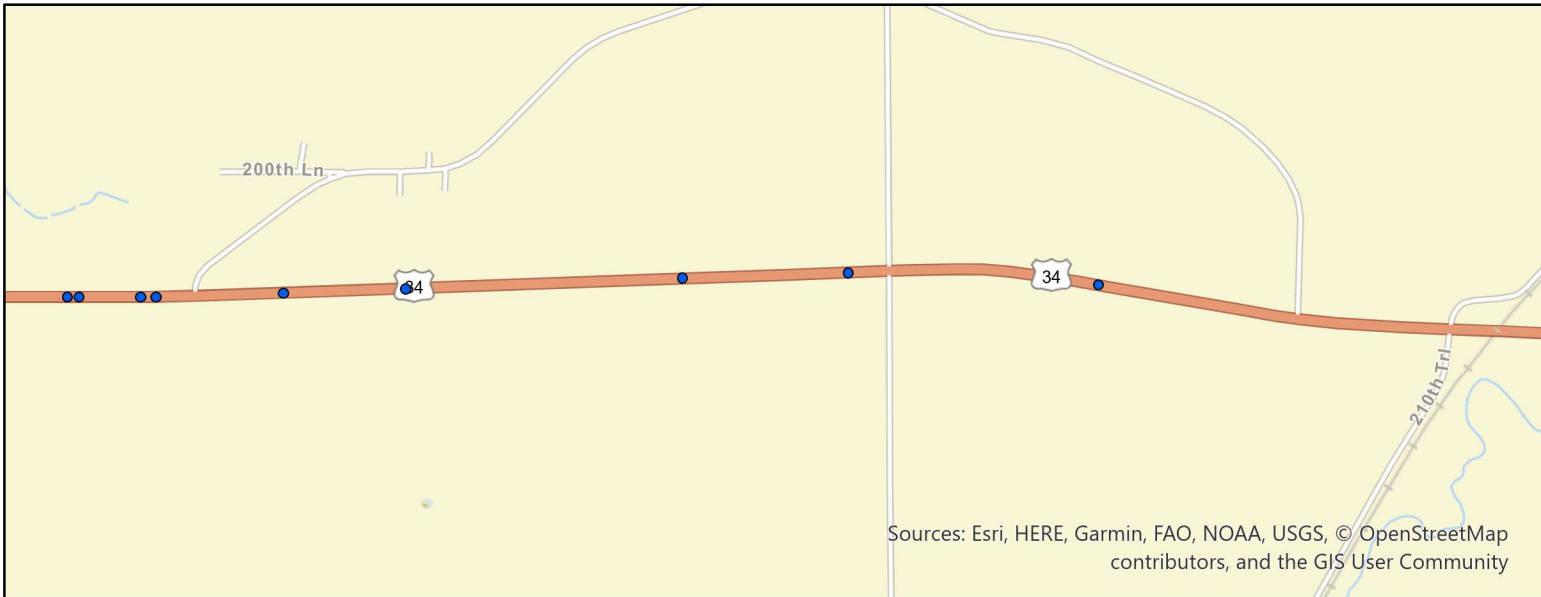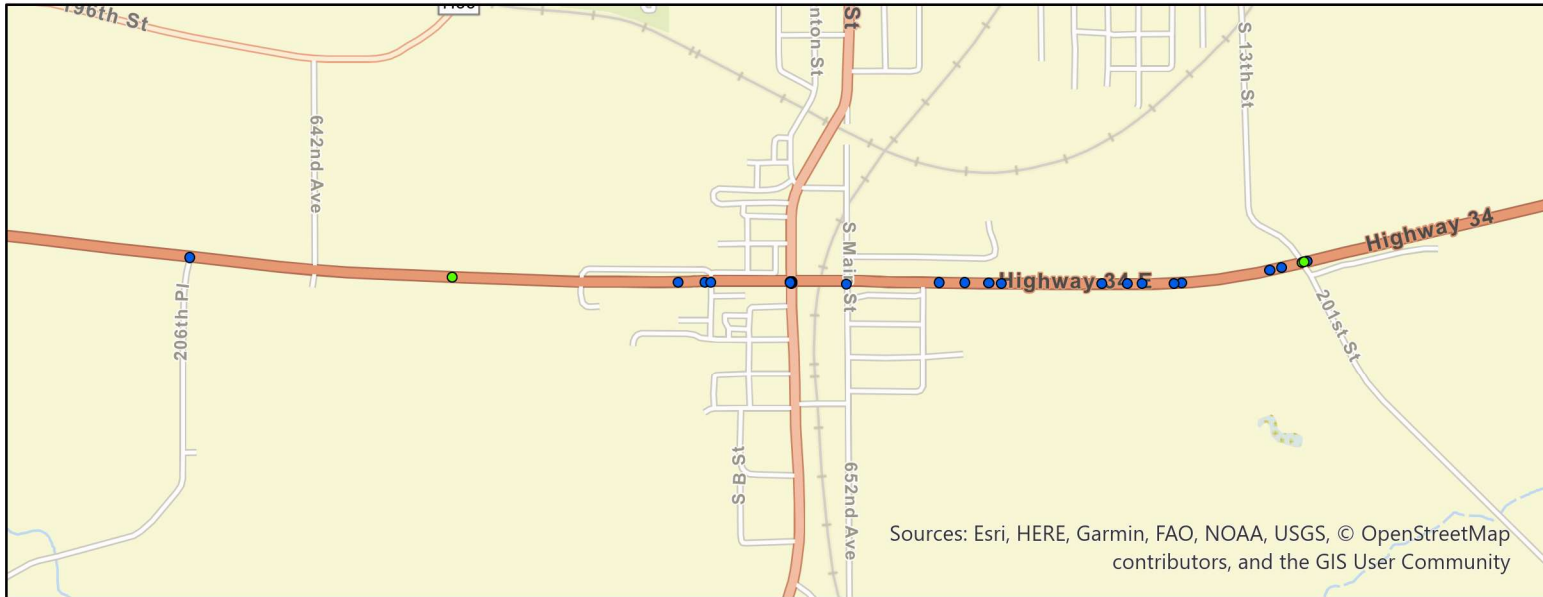- Major Injury
- Fatality
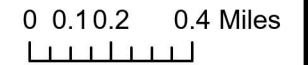
N

0 0.1 0.2 0.4 Miles

Page 12

Notes:
Crash data are courtesy of Iowa Department of Transportation and encompass 2017 through 2021

APPENDIX B—CRASH SEVERITY AND PCR RESULTS

	Description						Crash Counts							Potential Crash Reduction Information			
Location ID	Location Type	Study Site Name	Location Description	MP Begin	MP End	Length (miles)	Fatal	Major Injury	Minor Injury	Possible/Unknown Injury	Property Damge Only	Fatal and Injury Crashes	Total Crashes	PCR Tier - All Crashes	PCR - All Crashes	PCR Tier - Injurious Crashes Crashes	PCR - Injurious Crashes
1	Segment	Seg1	Segment ID: 6013	102.27	113.76	11.49	2	1	5	1	38	9	47	Negligible (≤0)	-0.41326	Negligible (≤0)	0
2	Intersection		US 34 & Clarke Union Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.04	Negligible (≤0)	-0.01
4	Intersection	Int1	US 34 & 130th Ave	N/A	N/A	N/A			1	1	5	2	7	Negligible (>0)	0.02	Negligible (>0)	0.01
6	Intersection		US 34 & 135th Ave	N/A	N/A	N/A					1	0	1	N/A	N/A	N/A	N/A
8	Intersection	Int2	US 34 & 150th Ave	N/A	N/A	N/A			1	1	1	2	3	Negligible (≤0)	-0.02	Negligible (≤0)	0
10	Intersection		US 34 & 160th Ave	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
12	Intersection		US 34 & Lacelle Rd/CO R25	N/A	N/A	N/A					2	0	2	Negligible (≤0)	-0.07	Negligible (≤0)	-0.01
14	Intersection		US 34 & 190th Ave	N/A	N/A	N/A					2	0	2	Negligible (>0)	0.02	Negligible (≤0)	0
16	Intersection	Int3	US 34 & 205th Ave	N/A	N/A	N/A				1		1	1	Medium	0.3	Negligible (≤0)	-0.03
18	Segment		Segment ID: 5598	113.764	114.033	0.27						0	0	Negligible (>0)	0.144322	Negligible (≤0)	-0.01
19	Intersection	Int4	US 34 & Southwest Blvd	N/A	N/A	N/A			2	1	6	3	9	High	1.25	Medium	0.24
21	Intersection	Int5	US 34 I-35 SB Ramps	N/A	N/A	N/A				3	12	3	15	N/A	N/A	N/A	N/A
22	Segment		Segment ID: 7584	114.033	114.112	0.08						0	0	Negligible (≤0)	-0.39663	Negligible (≤0)	-0.01
23	Segment		Segment ID: 5001	114.112	114.131	0.02						0	0	Negligible (≤0)	-0.11356	Negligible (≤0)	0
24	Segment		Segment ID: 6379	114.131	114.25	0.12					1	0	1	Negligible (≤0)	-0.16044	Negligible (≤0)	-0.01
25	Intersection	Int6	US 34 I-35 NB Ramps	N/A	N/A	N/A	1		1	3	12	5	17	Medium	0.33	Medium	0.11
26	Segment	Seg2	Segment ID: 4919	114.25	114.68	0.43			1	1	3	2	5	Negligible (≤0)	-0.09303	Medium	0.12
27	Intersection	Int7	US 34 & Warren Ave	N/A	N/A	N/A			2	1	9	3	12	Negligible (>0)	0.16	Negligible (>0)	0.03
29	Segment	Seg3	Segment ID: 5620	114.68	114.90	0.23			1			1	1	Negligible (≤0)	-0.9791	Negligible (>0)	0.05
30	Intersection		US 34 & Furnas Dr	N/A	N/A	N/A					3	0	3	Negligible (≤0)	-0.11	Negligible (≤0)	-0.01
32	Segment		Segment ID: 5663	114.903	114.957	0.05						0	0	Negligible (≤0)	-3.20745	Negligible (≤0)	-0.02
33	Segment	Seg4	Segment ID: 4929	114.96	116.22	1.26		1	1	1	20	3	23	Negligible (≤0)	-1.89771	Negligible (≤0)	0
34	Intersection	Int8	US 34 & S Ridge Rd	N/A	N/A	N/A	1				7	1	8	Medium	0.93	Negligible (>0)	0.01
36	Intersection		US 34 & S McPherson St	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.1	Negligible (≤0)	0
38	Intersection		US 34 & S Gustin St	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.1	Negligible (≤0)	0
40	Intersection		US 34 & S Dearborn St	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.12	Negligible (≤0)	0
42	Intersection		US 34 & S Vale St	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.12	Negligible (≤0)	0
44	Intersection		US 34 & S Delaware St	N/A	N/A	N/A					3	0	3	Negligible (>0)	0.08	Negligible (≤0)	0
46	Intersection	Int9	US 34 & S Lincoln St	N/A	N/A	N/A			1		1	1	2	Negligible (≤0)	-0.16	Negligible (≤0)	-0.01
48	Intersection	Int10	US 34 & S Temple St	N/A	N/A	N/A		1			2	1	3	Negligible (>0)	0.15	Negligible (≤0)	0
50	Intersection	Int11	US 34 & S Jackson St	N/A	N/A	N/A			1			1	1	Negligible (≤0)	-0.32	Negligible (>0)	0.04
52	Intersection	Int12	US 34 & S Fillmore St	N/A	N/A	N/A			1	1	3	2	5	Medium	0.68	Medium	0.08
54	Intersection		US 34 & S Court St	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
56	Intersection	Int13	US 34 & US 69	N/A	N/A	N/A			1	1	16	2	18	High	1.62	Negligible (>0)	0.04
58	Intersection		US 34 & S Park St	N/A	N/A	N/A					1	0	1	Negligible (≤0)	-0.04	Negligible (≤0)	-0.01
60	Intersection		US 34 & S Sunset Dr	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
62	Intersection		US 34 & S Adams	N/A	N/A	N/A					1	0	1	Negligible (≤0)	-0.2	Negligible (≤0)	-0.01
64	Intersection	Int14	US 34 & S Kossuth St	N/A	N/A	N/A		1			1	1	2	Negligible (≤0)	0	Negligible (>0)	0.04
66	Intersection		US 34 & S Dewey St	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.03	Negligible (≤0)	0
68	Intersection		US 34 & S View Dr	N/A	N/A	N/A				2	1	2	3	Negligible (>0)	0.02	Negligible (>0)	0.02
70	Segment	Seg5	Segment ID: 6637	116.22	116.48	0.25			1			1	1	Negligible (≤0)	-1.22387	Negligible (>0)	0.03
71	Intersection		US 34 & Harkin Hill Rd	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
73	Segment	Seg6	Segment ID: 4909	116.48	130.97	14.49			4	3	57	7	64	Negligible (>0)	0.130162	Negligible (≤0)	-0.03
74	Intersection	Int15	US 34 & Idaho St	N/A	N/A	N/A			1			1	1	Negligible (≤0)	0	Negligible (≤0)	0
76	Intersection		US 34 & 260th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
78	Intersection	Int16	US 34 & 270th St	N/A	N/A	N/A					1	0	1	Medium	0.47	Negligible (≤0)	-0.02
80	Intersection		US 34 & 280th St	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
82	Intersection		US 34 & 288th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
84	Intersection		US 34 & Liberty Hwy	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.03	Negligible (≤0)	0
86	Intersection		US 34 & 297th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
88	Intersection		US 34 & 300th Ave	N/A	N/A	N/A					1	0	1	Negligible (>0)	0.02	Negligible (≤0)	0
90	Intersection		US 34 & 307th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
92	Intersection		US 34 & 315th Ave (North)	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
94	Intersection		US 34 & 315th Ave (South)	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
96	Intersection		US 34 & 330th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.09	Negligible (≤0)	-0.01
98	Intersection		US 34 & 332nd Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
100	Intersection		US 34 & 100th Ave	N/A	N/A	N/A					1	0	1	Negligible (>0)	0.02	Negligible (≤0)	0
102	Intersection		US 34 & 120th Ave	N/A	N/A	N/A					1	0	1	Negligible (>0)	0.02	Negligible (≤0)	0
104	Intersection	Int17	US 34 & 127th Ave	N/A	N/A	N/A			1			1	1	Medium	0.43	Negligible (≤0)	-0.02
106	Intersection		US 34 & 135th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
108	Intersection		US 34 & 137th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
110	Segment		Segment ID: 6604	130.965	131.111	0.15						0	0	Negligible (>0)	0.118813	Negligible (≤0)	0
111	Intersection		US 34 & US 65	N/A	N/A	N/A				1	2	1	3	Negligible (>0)	0.02	Negligible (≤0)	0
112	Segment	Seg7	Segment ID: 5232	131.11	131.67	0.56			1		3	1	4	Negligible (>0)	0.174365	Negligible (>0)	0.04
113	Intersection		US 34 & Division St/US 65	N/A	N/A	N/A					1	0	1	Negligible (≤0)	-0.23	Negligible (≤0)	-0.06
114	Segment	Seg8	Segment ID: 5095	131.67	137.09	5.42	1		5	2	27	8	35	Medium	0.364749	Negligible (>0)	0.02
115	Intersection		US 34 & 167th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
117	Intersection		US 34 & 177th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
119	Intersection		US 34 & 179th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
121	Intersection		US 34 & 185th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
123	Intersection		US 34 & 190th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
125	Intersection		US 34 & 480th Ln	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
127	Intersection		US 34 & 200th Ave	N/A	N/A	N/A					1	0	1	Negligible (>0)	0.02	Negligible (>0)	0.03
128	Segment	Seg9	Segment ID: 5274	137.09	138.71	1.62			2	1	1	3	4	Negligible (≤0)	-0.45057	Negligible (≤0)	0
129	Intersection		US 34 & 210th Ave	N/A	N/A	N/A						0	0	Negligible (>0)	0.01	Negligible (≤0)	0
131	Intersection		US 34 & 215th Trl	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
133	Segment	Seg10	Segment ID: 6301	138.71	138.76	0.05					2	0	2	Medium	0.298872	Negligible (≤0)	0
134	Segment	Seg11	Segment ID: 6712	138.76	138.80	0.04					1	0	1	Medium	0.328091	Negligible (≤0)	0
135	Segment		Segment ID: 6432	138.80	138.88	0.08						0	0	Medium	0.217992	Negligible (≤0)	0
136	Intersection		US 34 & Court Ave	N/A	N/A	N/A			1		1	1	2	Negligible (≤0)	-0.03	Negligible (≤0)	-0.03
137	Segment		Segment ID: 5811	138.88	138.95	0.07						0	0	Medium	0.235792	Negligible (≤0)	0
138	Segment		Segment ID: 5151	138.946	140.112	1.17				1	3	1	4	Negligible (≤0)	-0.02677	Negligible (≤0)	-0.01
139	Intersection		US 34 & S 16th St	N/A	N/A	N/A			1			1	1	Negligible (≤0)	-0.15	Negligible (≤0)	-0.07
141	Segment		Segment ID: 4960	140.112	140.361	0.25					1	0	1	Negligible (>0)	0.136469	Negligible (≤0)	0
142	Segment		Segment ID: 6647	140.361	141.379	1.02					2	0	2	Negligible (>0)	0.117443	Negligible (≤0)	-0.01
143	Intersection		US 34 & S 8th St	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.11	Negligible (≤0)	-0.02
145	Intersection	Int18	US 34 & S 4th St	N/A	N/A	N/A			1		1	1	2	Negligible (>0)	0.04	Negligible (≤0)	0
147	Intersection	Int19	US 34 & S 1st St	N/A	N/A	N/A	1				1	1	2	Negligible (≤0)	-0.09	Negligible (≤0)	0.03
149	Intersection	Int20	US 34 & Frontage Rd/E Lincoln Ave	N/A	N/A	N/A		1				1	1	N/A	N/A	N/A	N/A
151	Segment		Segment ID: 6422	141.379	141.609	0.23						0	0	Negligible (≤0)	-0.04154	Negligible (≤0)	0
152	Intersection		US 34 & 475th Ln	N/A	N/A	N/A					1	0	1	Negligible (≤0)	-0.12	Negligible (≤0)	-0.02
154	Segment	Seg12	Segment ID: 5047	141.61	166.34	24.73	1	2	4	12	90	19	109	Negligible (>0)	0.156892	Negligible (≤0)	-0.01
155	Intersection		US 34 & 472nd Ln	N/A	N/A	N/A					1	0	1	N/A	N/A	N/A	N/A
157	Intersection		US 34 & Red Haw State Park	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
159	Intersection		Us 34 & 260th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
161	Intersection		US 34 & 265th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
163	Intersection		US 34 & 265th Ave	N/A	N/A	N/A						0	0	Negligible (>0)	0.02	Negligible (≤0)	0
165	Intersection	Int21	US 34 & 277th Ave	N/A	N/A	N/A	1				1	1	2	Negligible (≤0)	0	Negligible (≤0)	0
167	Intersection		US 34 & 280th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.06	Negligible (≤0)	-0.01
169	Intersection		US 34 & 285th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
171	Intersection		US 34 & 290th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.17	Negligible (>0)	0.03
173	Intersection		US 34 & 300th Ave	N/A	N/A	N/A					1	0	1	Negligible (>0)	0.02	Negligible (≤0)	-0.01

			Description				Crash Counts							Potential Crash Reduction Information			
Location ID	Location Type	Study Site Name	Location Description	MP Begin	MP End	Length (miles)	Fatal	Major Injury	Minor Injury	Possible/Unknown Injury	Property Damge Only	Fatal and Injury Crashes	Total Crashes	PCR Tier - All Crashes	PCR - All Crashes	PCR Tier - Injurious Crashes Crashes	PCR - Injurious Crashes
175	Intersection		US 34 & 305th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
177	Intersection		US 34 & 310th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
179	Intersection		US 34 & 320th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
181	Intersection		US 34 & 325th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
183	Intersection		US 34 & 330th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
185	Intersection		US 34 & 337th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
187	Intersection		US 34 & 500th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
189	Intersection		US 34 & 515th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
191	Intersection		US 34 & 520th Ave	N/A	N/A	N/A					1	0	1	Negligible (>0)	0.01	Negligible (≤0)	-0.01
193	Intersection		US 34 & 527th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
195	Intersection		US 34 & 535th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
197	Intersection		US 34 & 555th Ave/560th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.02	Negligible (≤0)	0
199	Intersection		US 34 & 574th Ave	N/A	N/A	N/A						0	0	Negligible (>0)	0.02	Negligible (≤0)	-0.03
201	Intersection		US 34 & 579th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
203	Intersection		US 34 & 197th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
205	Intersection		US 34 & 595th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
207	Intersection		US 34 & 197th Ave	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
209	Intersection		US 34 & 210th Trl	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
211	Intersection		US 34 & 610th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
213	Intersection		US 34 & 204th Trl (West)	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
215	Intersection		US 34 & 625th Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	0	Negligible (≤0)	0
217	Intersection		US 34 & 204th Trl (East)	N/A	N/A	N/A					1	0	1	Negligible (≤0)	-0.01	Negligible (≤0)	0
219	Intersection		US 34 & 623rd Ave/196th St	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.07	Negligible (≤0)	-0.01
221	Intersection		US 34 & 206th Pl	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.01	Negligible (≤0)	0
223	Intersection		US 34 & 642nd Ave	N/A	N/A	N/A						0	0	Negligible (≤0)	-0.02	Negligible (≤0)	0
225	Intersection		US 34 & 13th Ave W	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
226	Segment		Segment ID: 7450	166.342	166.738	0.40					1	0	1	Negligible (≤0)	-0.0124	Negligible (≤0)	-0.01
227	Intersection		US 34 & S C St	N/A	N/A	N/A					2	0	2	Negligible (≤0)	-0.11	Negligible (≤0)	0
229	Intersection		US 34 & CR 5	N/A	N/A	N/A				3	8	3	11	Negligible (>0)	0.01	Negligible (>0)	0.01
230	Segment		Segment ID: 7542	166.738	166.973	0.24						0	0	Negligible (≤0)	-0.91772	Negligible (≤0)	-0.01
231	Intersection		US 34 & S Main St	N/A	N/A	N/A					1	0	1	Negligible (>0)	0.1	Negligible (≤0)	0
233	Intersection		US 34 & S Florence St	N/A	N/A	N/A						0	0	N/A	N/A	N/A	N/A
234	Segment	Seg13	Segment ID: 5064	166.97	167.76	0.79					11	0	11	Medium	0.490376	Negligible (≤0)	-0.05
235	Intersection		US 34 & 201st St/S 13th St	N/A	N/A	N/A				2	1	2	3	Negligible (>0)	0.08	Negligible (>0)	0.03