INRCOG
Iowa Northland Regional
Council of Governments

Safe Streets and Roads for All

Downtown Comprehensive Safety Action Plan

Waterloo, Iowa

February 2025

CITY OF WATERLOO

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Attachment A: East 1st Street and Sycamore Street Concept Plan
Attachment B: US-218 Underpass Concept Plan
Attachment C: West 9th Street at Washington Street (US-218) and West 11th Street at Washington Street (US-218) Concept Plan
Attachment D: Implementation Matrix

Appendices

Appendix A: Steering Committee and Council Meeting Presentations
Appendix B: Public Involvement Process

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COUNCIL RESOLUTION PLACEHOLDER

Introduction

SAFE STREETS AND ROADS FOR ALL AND THE SAFE SYSTEM APPROACH

The 2021 Bipartisan Infrastructure Law (BIL) brought a renewed focus on safety for all users of the transportation system.

As part of the USDOT's National Roadway Safety Strategy released in January 2022, the Safe System Approach (SSA) was adopted as a guiding principle to advance roadway safety. As described by the FHWA, the SSA involves a paradigm shift to "improve safety culture, increase collaboration across all safety stakeholders, and refocus transportation system design and operation on anticipating human mistakes and lessening impact forces to reduce crash severity and save lives." Understanding this paradigm shift is the key to incorporating the SSA into local safety planning efforts.

Implementing this approach requires a deliberate change from the traditional ways we think about measuring and improving safety – moving from a reactive approach to a proactive one; focusing on countermeasures that reduce deaths and serious injuries; and using design interventions to reduce vehicle speeds rather than relying solely on education and enforcement to encourage people to deliberately slow down. The paradigm shift illustration on this page shows the differences between the traditional and Safe System approaches.

Source: FHWA

One of the signature new grant programs contained in the BIL is the Safe Streets and Roads for All (SS4A) program, which is providing $5 Billion in grant funds over five years for local agencies to conduct local road planning processes using the Safe System Approach. The Iowa Northland Regional Council of Governments (INRCOG) applied for and received a planning grant through the SS4A program to create a local road safety plan for the Downtown Waterloo area. INRCOG serves as the umbrella agency for the Black Hawk County Metropolitan Planning Organization.

The Safe System Approach aligns closely with Vision Zero efforts using the following principles:

Death and Serious Injuries are Unacceptable

People should be able to use the roads without fear of being injured or killed.

Humans Make Mistakes

People make mistakes that sometimes lead to crashes, but the roadway system and vehicles can be designed and operated so that crashes do not result in deaths or serious injuries.

Humans are Vulnerable

A human body has limits to how much energy and force it can withstand before it is injured. The roadway system should be human-centric and accommodate these limits.

Source: FHWA.

Responsibility is Shared

Everyone involved in the transportation system has a part in making the system safe. The people who design, build, and maintain roads; everyone who travels on them; the people who design and build vehicles, bicycles and other devices that are used to navigate them; the people who make and enforce safety laws; and the people who respond to crashes when they occur; all have a role to play in the safety of the whole system.

Safety is Proactive

We need to identify the conditions that make crashes more likely to occur, and work towards preventing them before they happen.

Redundancy is Crucial

A safe transportation system requires the use of multiple safety features so that if one part of the system fails, the other parts still protect people.

For more information:

Vision Zero and the Safe System Approach: https://highways.dot.gov/safety/zero-deaths

PLANNING STRUCTURE

A Steering Committee was established by INRCOG to oversee the safety planning process. This committee consisted of representatives from INRCOG, the City of Waterloo, Main Street Waterloo, Waterloo Complete Streets, Cedar Valley Bicycle Collective, the Waterloo Police Department, and the Black Hawk County Public Health Department. Members included:

- Aldina Dautović - INRCOG
- Bethany Fratzke – Black Hawk County
- John Dornoff – City of Waterloo
- Mohammad Elahi – City of Waterloo
- Aric Schroeder – City of Waterloo
- Tara Thomas-Gettman – City of Waterloo
- Kyle Durant - INRCOG
- Nick Fratzke - INRCOG
- Jessica Rucker – Main Street Waterloo
- Kathryn Gilbery – Black Hawk County Public Health/Cedar Valley Bicycle Collective
- Curtis Young – Cedar Valley Bicycle Collective
- Brock Weliver – City of Waterloo
- Robert Duncan – Waterloo Police

Meetings were held with the full Steering Committee on May 23rd and October 30th, 2024. The project team also presented to the City of Waterloo City Council on December 16, 2024. The purpose of the meeting was to present the findings of the Comprehensive Safety Action Plan and solicit feedback.

Meeting presentations are included in Appendix A.

Evaluation of Crash Data

OVERVIEW OF CRASH DATA

Five-year crash data was analyzed as part of this project. There were 951 total crashes within the project area that occurred from January 1, 2019, through December 31, 2023. Figure 1 shows the locations of all reported crashes within the analysis period. Of the 951 total crashes, two crashes resulted in fatalities, and fourteen in serious injuries which are shown in Figure 2. Fifteen crashes involved a pedestrian of which one resulted in a fatality and three resulted in a serious injury. Twenty-one crashes that occurred involved a bicyclist of which one resulted in a fatality. A map of the crash locations involving a pedestrian or bicyclist can be seen in Figure 3.

Figure 1: Map of All Crashes from 2019 through 2023 within the Project Area

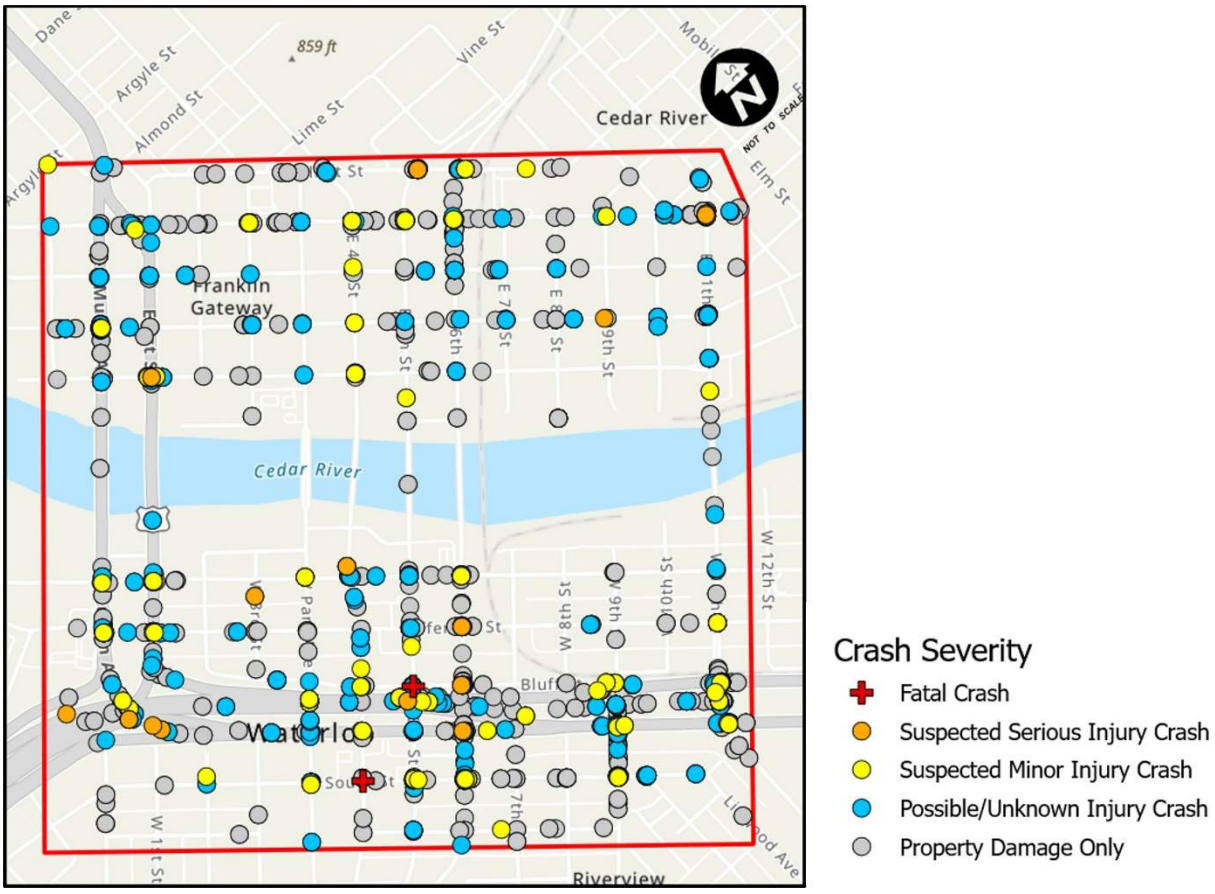


Figure 2: Map of Fatal and Serious Injury Crashes from 2019 through 2023 within the Project Area

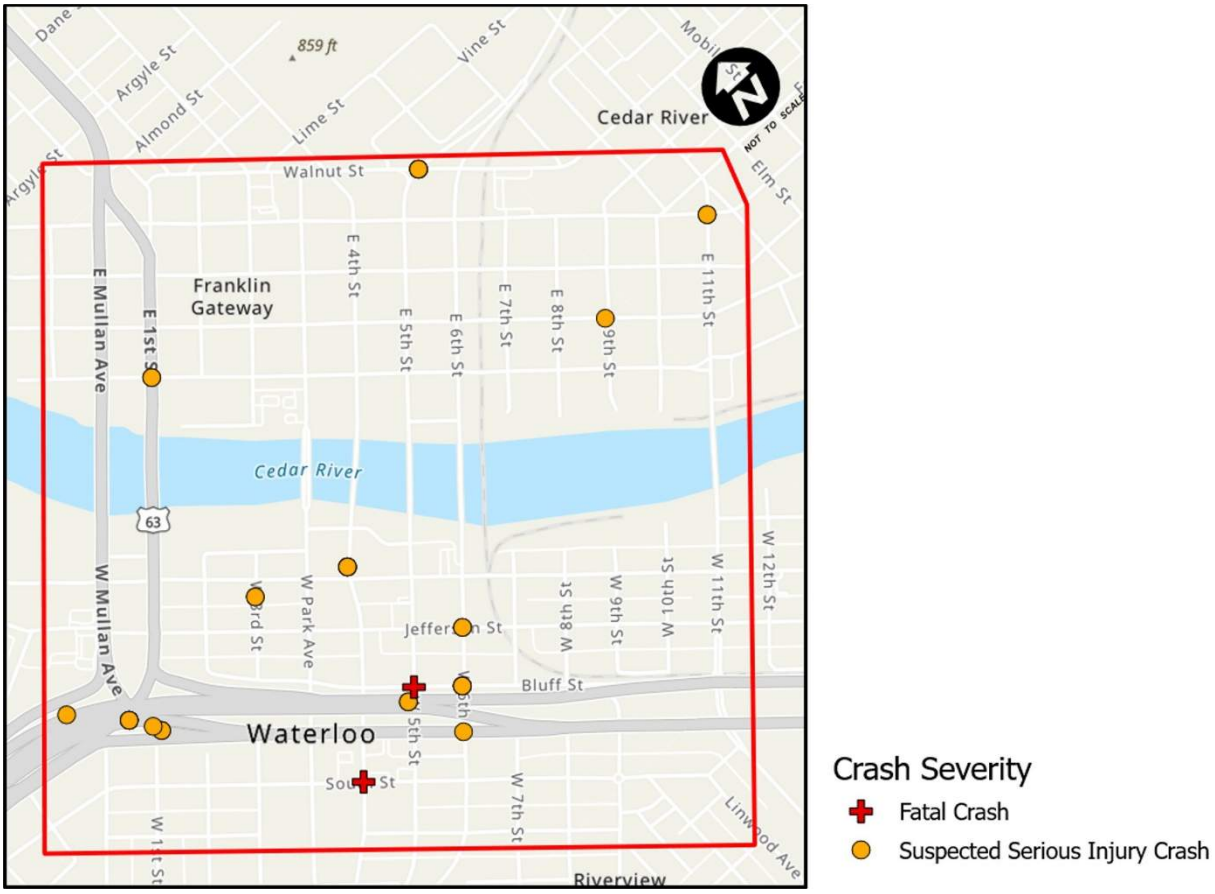
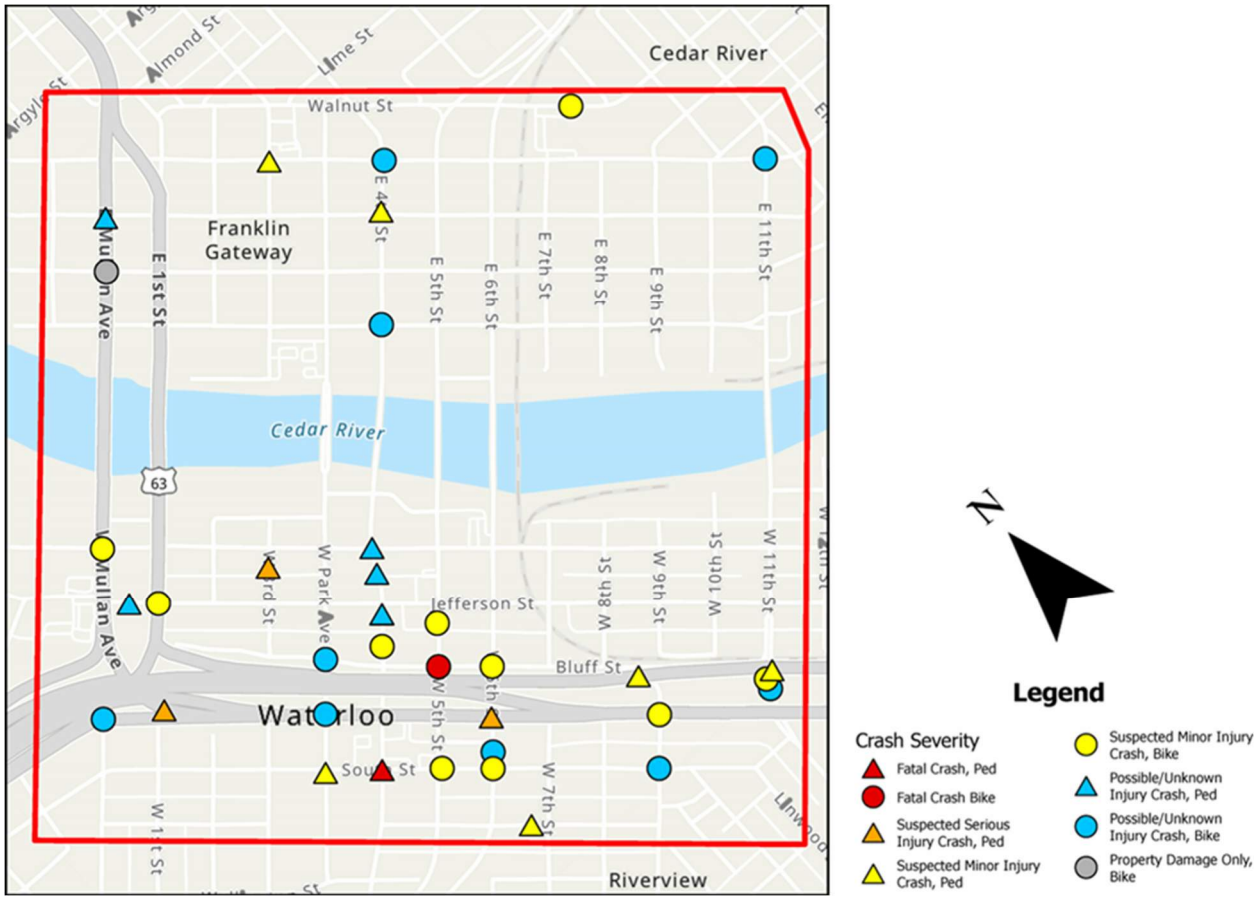


Figure 3: Map of Pedestrian / Bicyclist Involved Crashes from 2019 through 2023 Within the Project Area



CRASH ANALYSIS BY TIME PERIODS

Total crashes by year reveals a drop in crashes during the pandemic year of 2020, with crashes rising above pre-pandemic levels in 2021. The drop in crashes from 2021 through 2023 may be due to road and bridge closures in the area. Crashes are fairly evenly distributed throughout the year, with the highest number occurring in January, which may be expected due to winter weather events. Similarly, crashes are fairly evenly distributed throughout the week, with the lowest number of crashes occurring on Sundays, which is common in areas of high business concentration. The total number of crashes within the study area by year, month, and day of week can be seen in Figure 4, Figure 5, and Figure 6, respectively.

Figure 4: Total Crashes by Year (2019 – 2023)

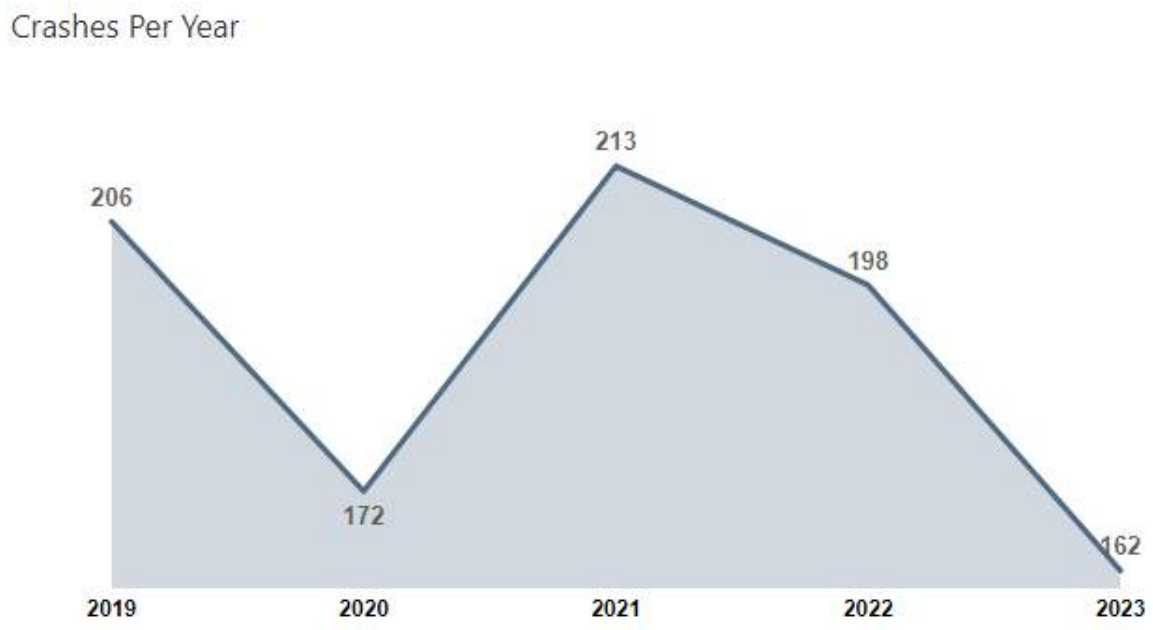


Figure 5: Total Crashes by Month (2019 – 2023)

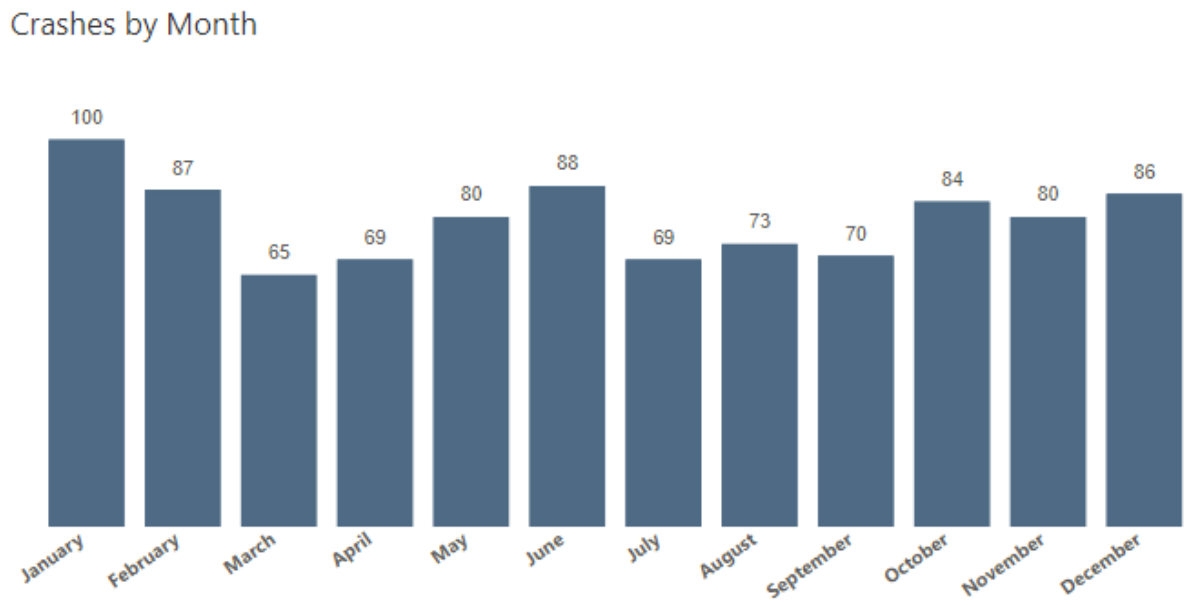
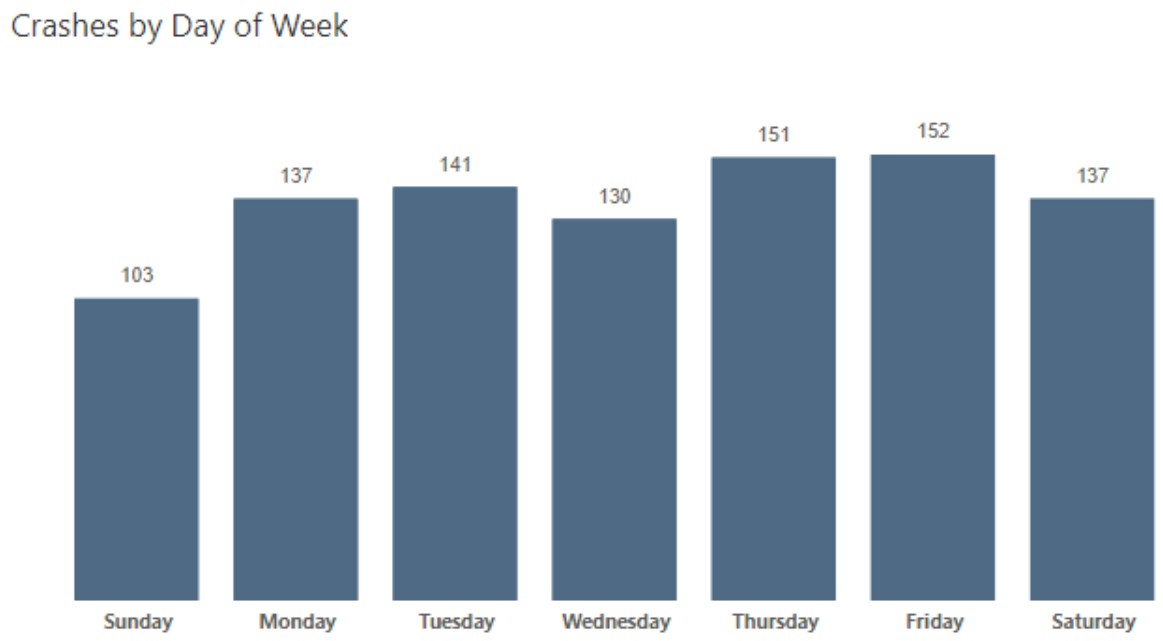


Figure 6: Total Crashes Within the Project Area by Day of Week (2019 – 2023)



When analyzed by time of day, crash distribution is unusual in that it shows a peak between 2:00 pm and 6:00 pm, however when only fatal and serious injury crashes are considered the pattern becomes more regular with peaks in the morning between 8:00 am and 10:00 am, and in the afternoon between 4:00 pm and 6:00 pm. Total crashes within the project area by time of day and fatal and serious injury crashes within the project area by time of day can be seen in Figure 7 and Figure 8, respectively.

Figure 7: Total Crashes within Project Area by Time of Day (2019 – 2023)

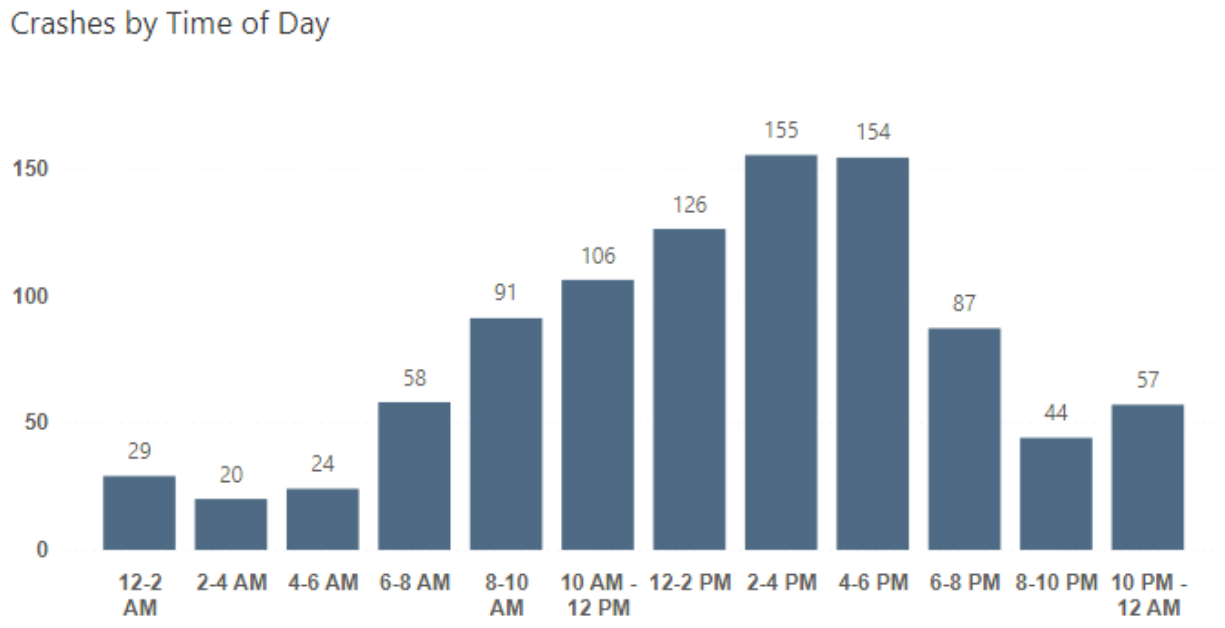
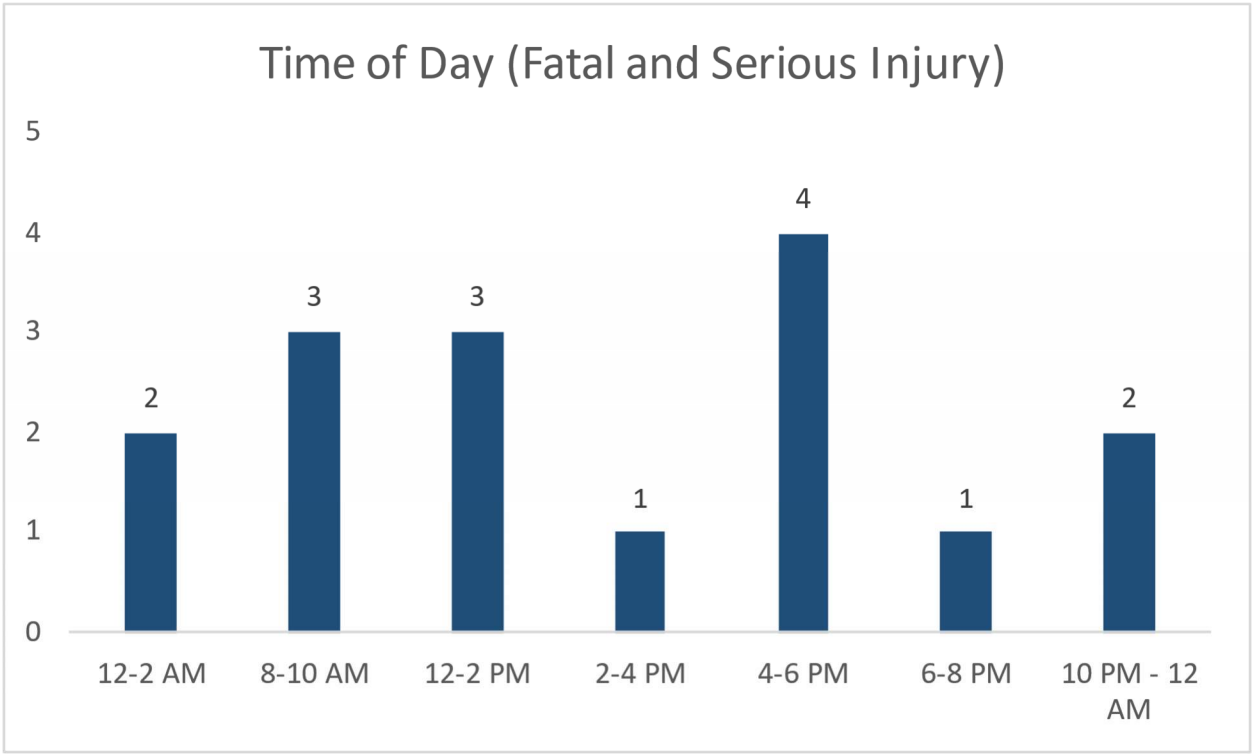


Figure 8: Fatal and Serious Injury Crashes within the Project Area by Time of Day (2019 – 2023)



CRASH ANALYSIS BY MAJOR CAUSE

“Ran Traffic Signal” is the most common major cause of crashes in the project area, however, together crashes coded as “Unknown” and “Other” are a considerable portion of crashes. Crashes at stop-controlled intersections (“Failure to Yield Right-of-Way from Stop Sign” and “Ran Stop Sign”) together make up the third most common major cause of crashes in the project area. “Ran Traffic Signal” is also the most common major cause of fatal and serious injury crashes, followed by “Exceeded Authorized Speed”. Two crashes in this category were reported as having no improper action, however the crash report narratives revealed that in one case, a bicyclist riding on the sidewalk entered the intersection while the pedestrian signal was red, and in the other case, a pedestrian walked in front of the vehicle from between two stopped trucks and was not in a crosswalk. Major cause of crash for all crashes within the project area and for fatal and serious injury crashes within the project area can be seen in Figure 9 and Figure 10, respectively.

Figure 9: Total Crashes within the Project Area by Major Cause (2019 – 2023)

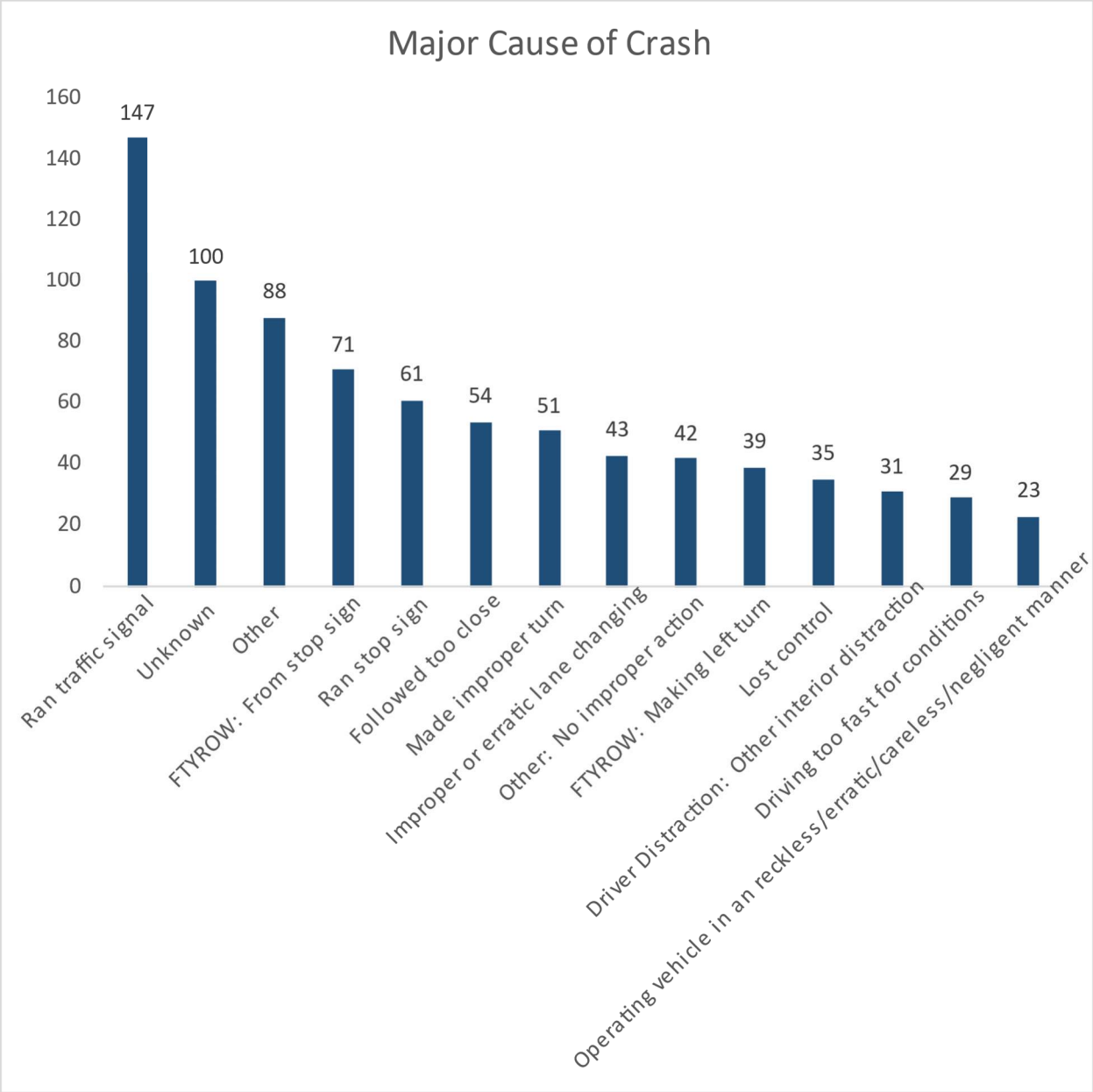
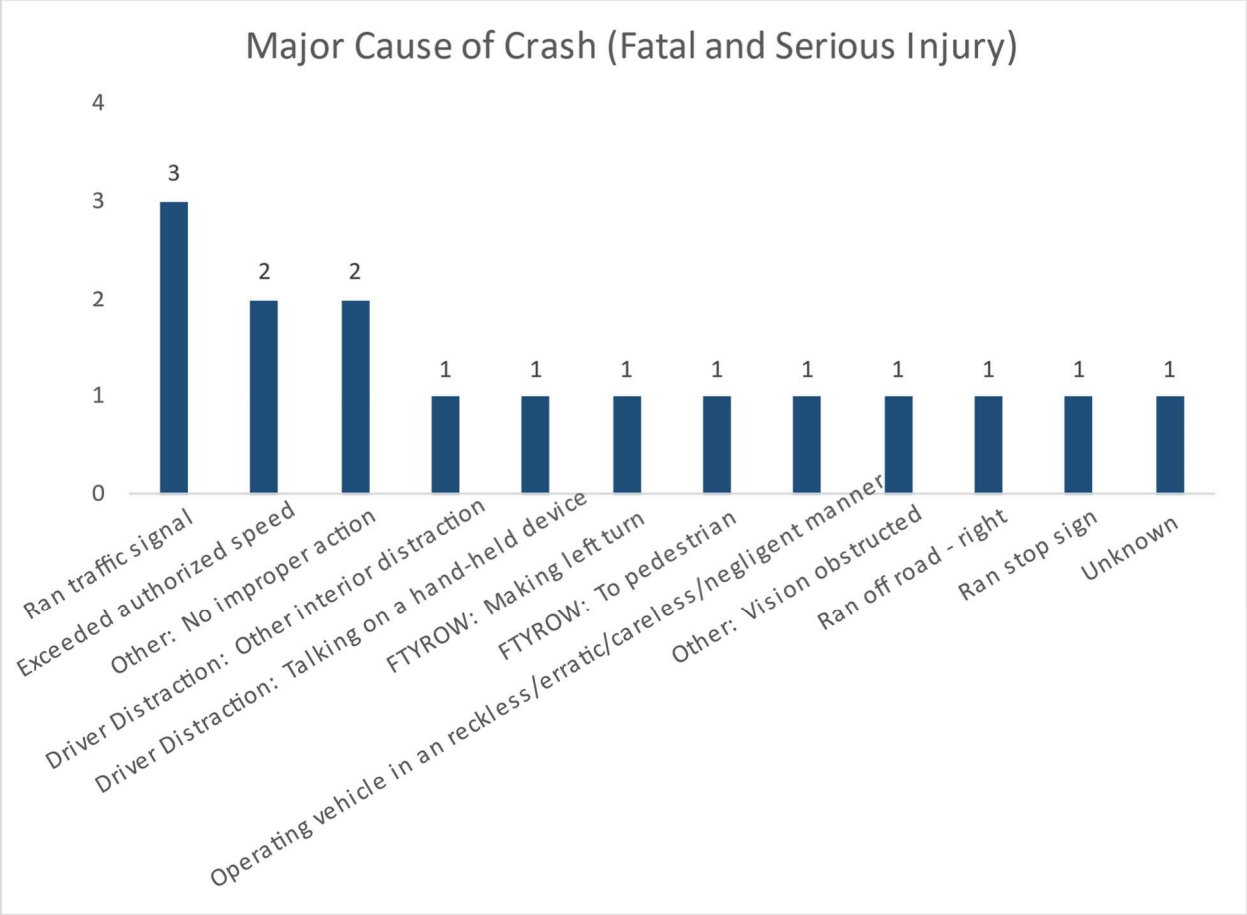


Figure 10: Fatal and Serious Injury Crashes within the Project Area by Major Cause (2019 – 2023)



CRASH ANALYSIS BY TYPE

The most common crash type in the project area was broadside crashes (38%). Rear-end (19%), same-direction sideswipe crashes (18%) and non-collision crashes (14%) make up the next three most common crash types. Non-collision crashes were the most common crash type to cause fatal or serious injures, however all pedestrian- and bicyclist-involved crashes are coded as non-collision crashes, and account for both of the fatal crashes and three of the serious injury crashes. When these crashes are removed from the data, broadside and single-vehicle crashes account for the majority (8 out of 11) of serious injury crashes. Unsurprisingly, the majority of broadside crashes were caused by running a traffic signal (131 out of 357) with an additional 124 out of 357 caused by failure to yield at or running a stop sign. Crash type for all crashes within the project area, crash type for fatal and serious injury crashes within the project area, and major cause of crash for broadside crashes within the project area can be seen in Figure 11, Figure 12, and Figure 13, respectively.

Figure 11: Total Crashes within the Project Area by Type of Crash (2019 – 2023)

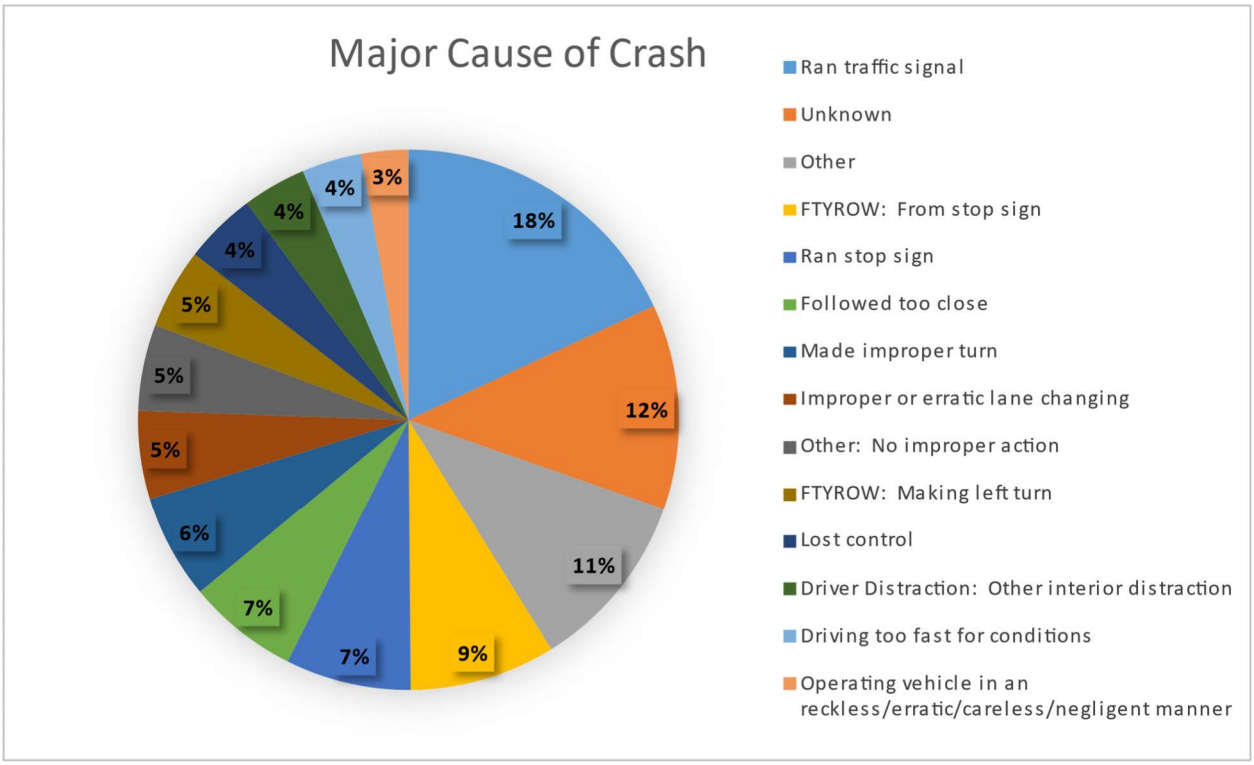


Figure 12: Fatal and Serious Injury Crashes within the Project Area by Type of Crash (2019 – 2023)

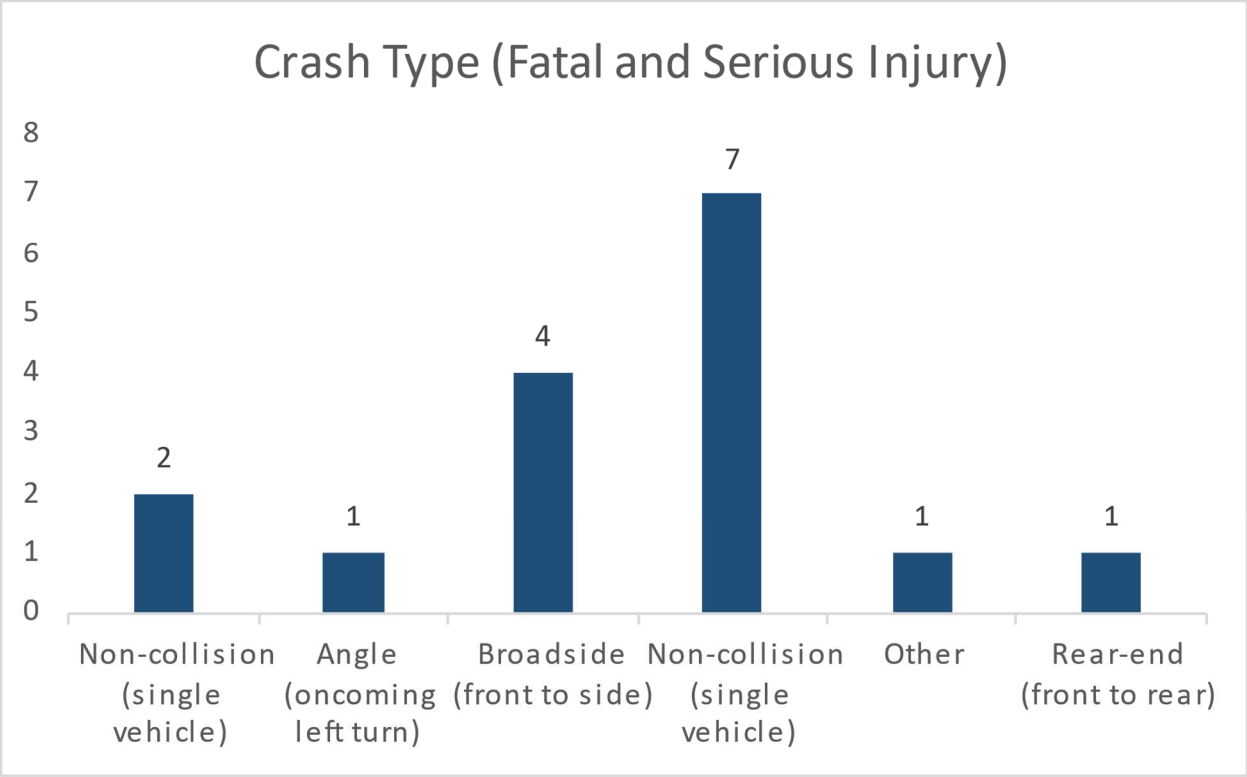
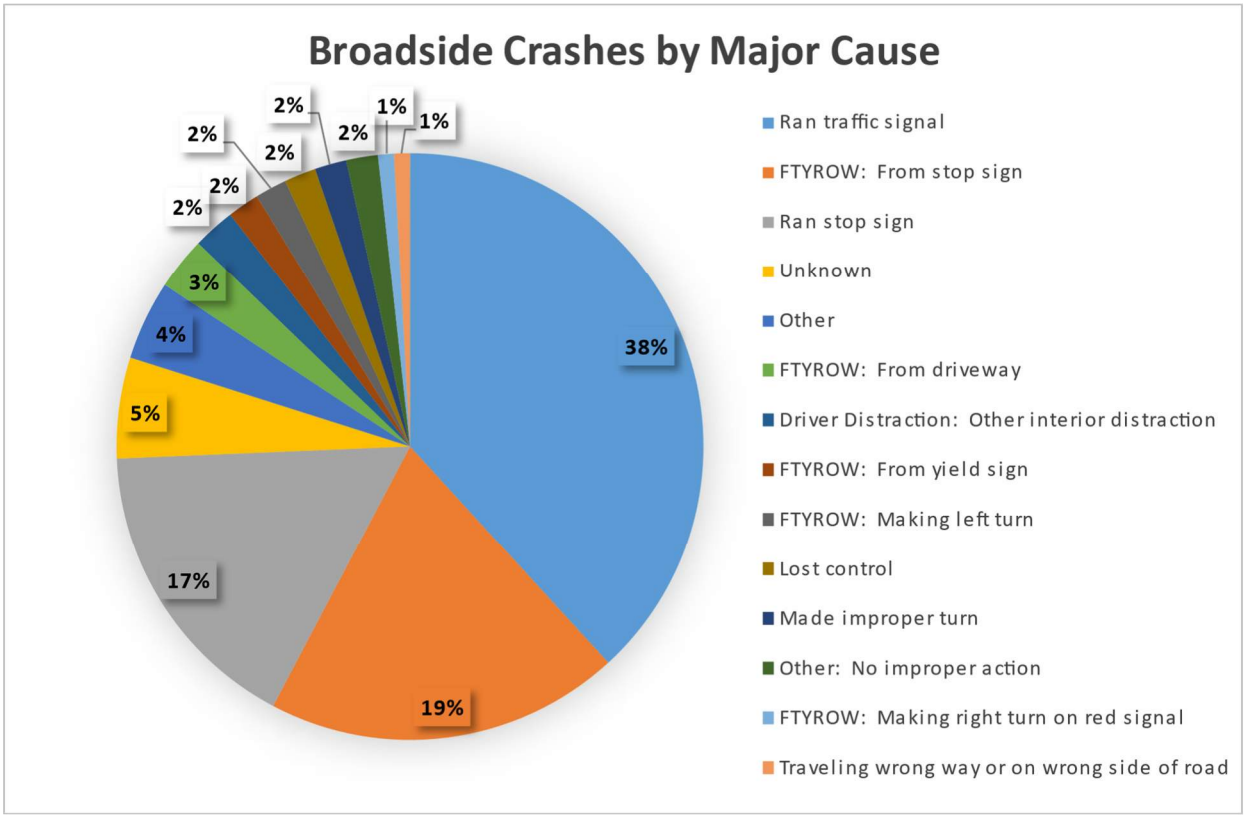


Figure 13: Broadside Crashes within the Project Area by Major Cause of Crash (2019 – 2023)



CRASH ANALYSIS BY LIGHTING CONDITIONS

The majority of total crashes occurred during daylight conditions. Most fatal and serious injury crashes occurred during daylight conditions but one of the two fatal crashes occurred during twilight and the other during daylight conditions. Total crashes by lighting conditions and fatal and serious injury crashes by lighting conditions can be seen in Figure 14 and Figure 15, respectively.

Figure 14: Total Crashes within the Project Area by Lighting Conditions (2019 – 2023)

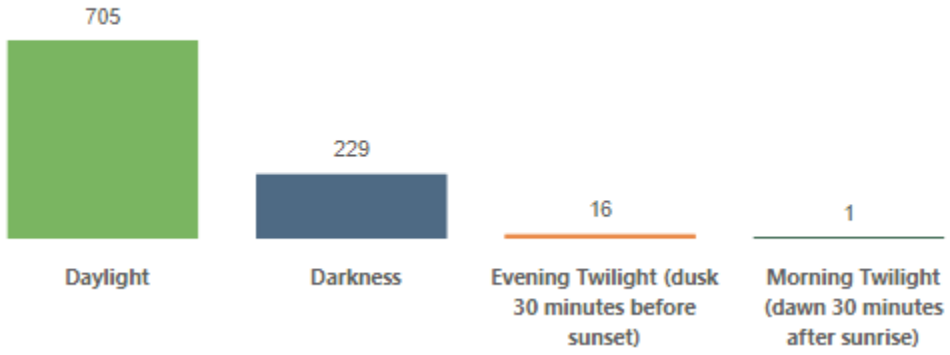
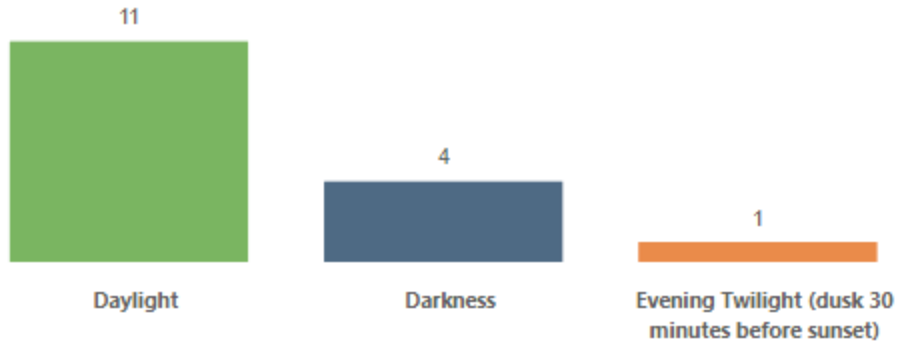


Figure 15: Fatal and Serious Injury Crashes within the Project Area by Lighting Conditions (2019 – 2023)



CRASH ANALYSIS BY WEATHER AND ROAD SURFACE CONDITIONS

Based on questions asked during the initial Steering Committee Meeting, additional crash analysis was performed regarding weather conditions. The majority of crashes occurred during clear weather (70%) with an additional 19% occurring during cloudy conditions. Similarly, the majority of crashes occurred on dry pavement (77%), with 22% (wet 11%, snow 6%, ice/frost 4% and slush 1%) occurring when the pavement was not dry. Likewise, the 14 of 16 fatal and serious injury crashes occurred during clear weather, and 77% on dry pavement. Total crashes by weather condition, total crashes by road surface conditions, fatal and serious crashes by weather condition, and fatal and serious crashes by road surface conditions can be seen in Figure 16, Figure 17,

Figure 18, and Figure 19, respectively.

Figure 16: Total Crashes within the Project Area by Weather Condition (2019 – 2023)

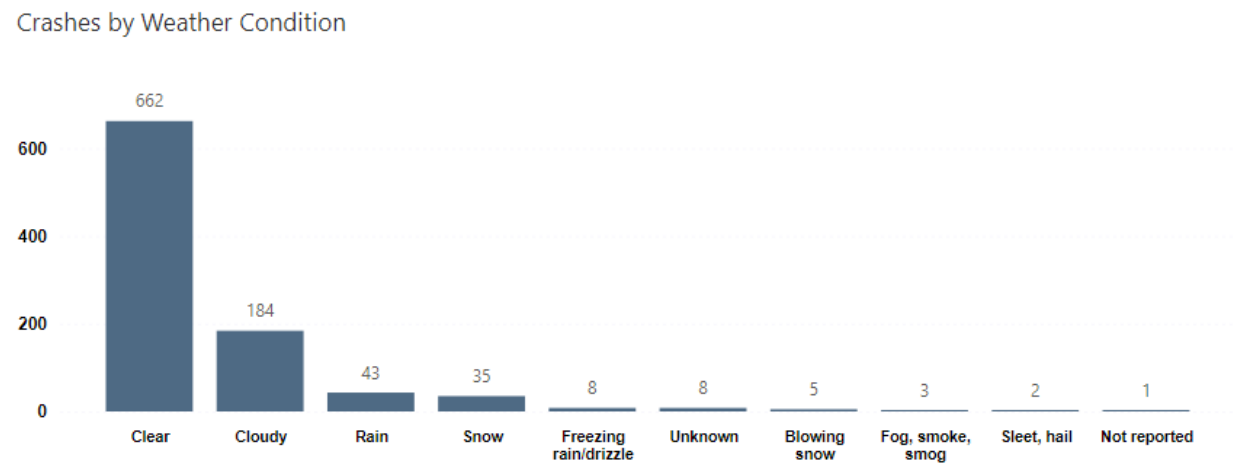


Figure 17: Total Crashes within the Project Area by Road Surface Condition (2019 – 2023)

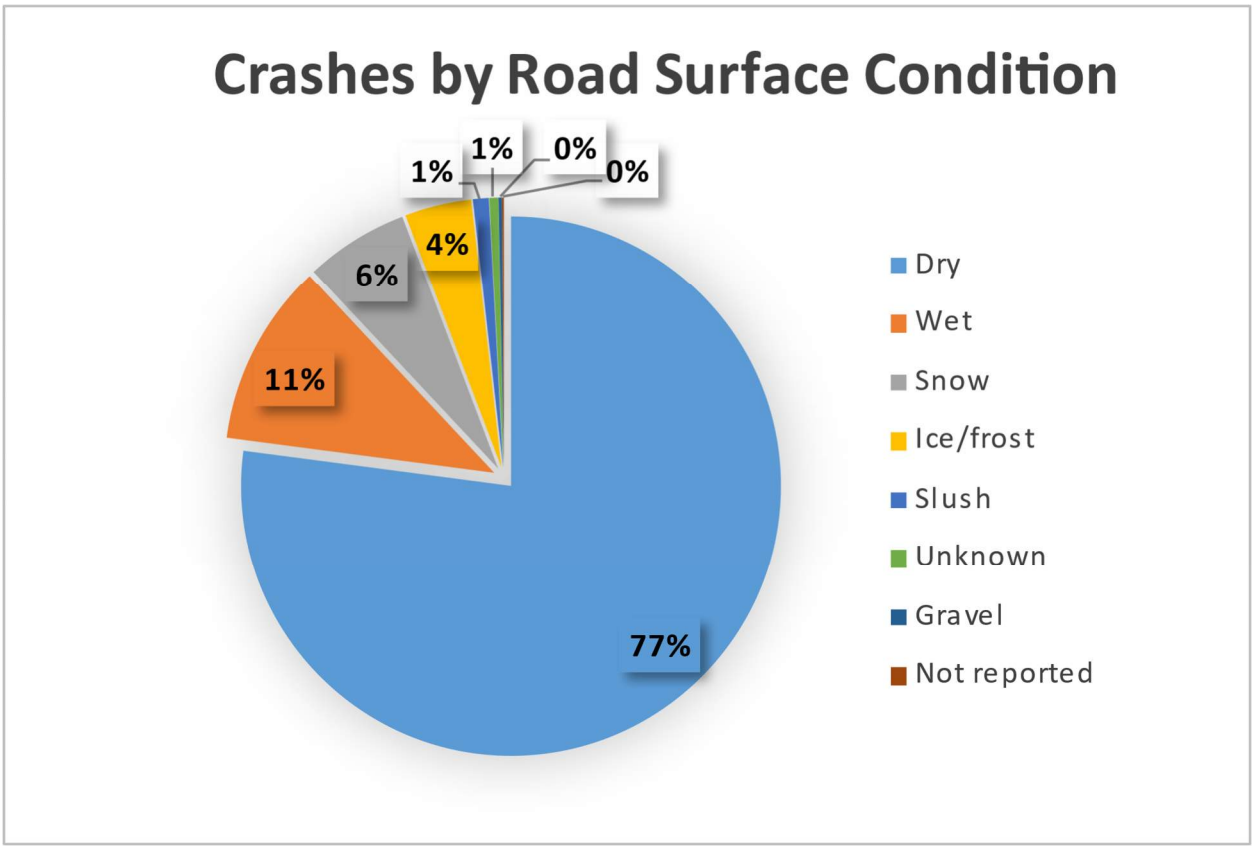


Figure 18: Fatal and Serious Injury Crashes within the Project Area by Weather Condition (2019 – 2023)

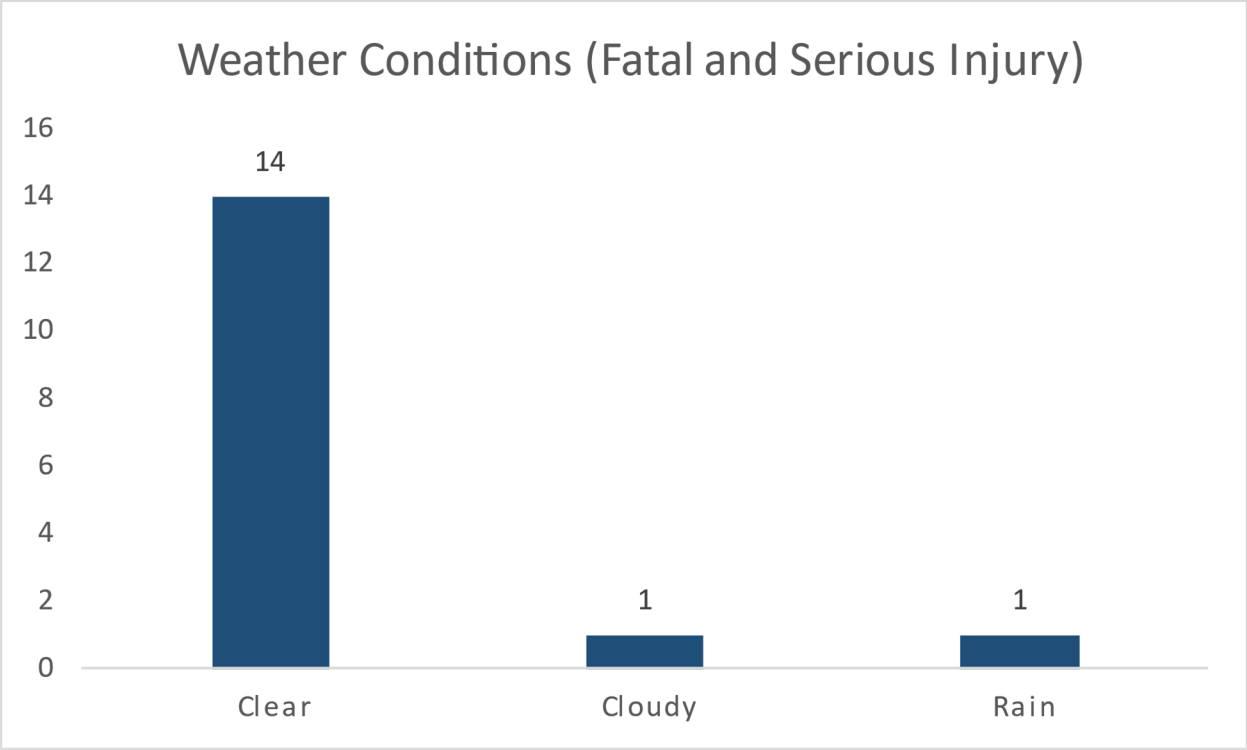
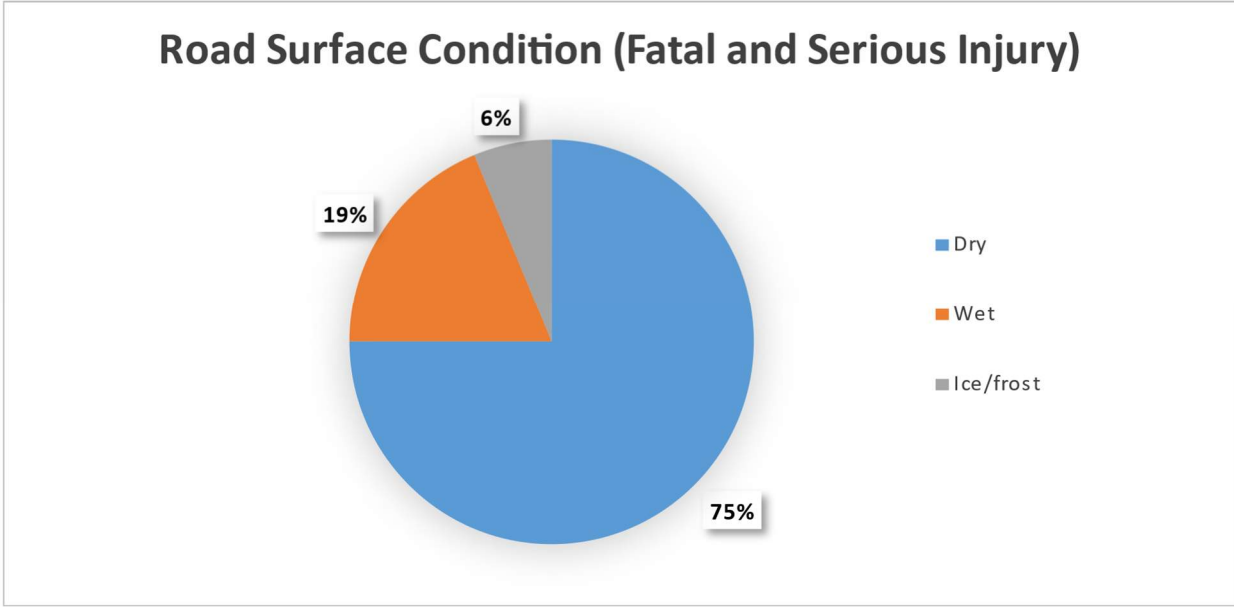


Figure 19: Fatal and Serious Injury Crashes within the Project Area by Road Surface Condition (2019 – 2023)



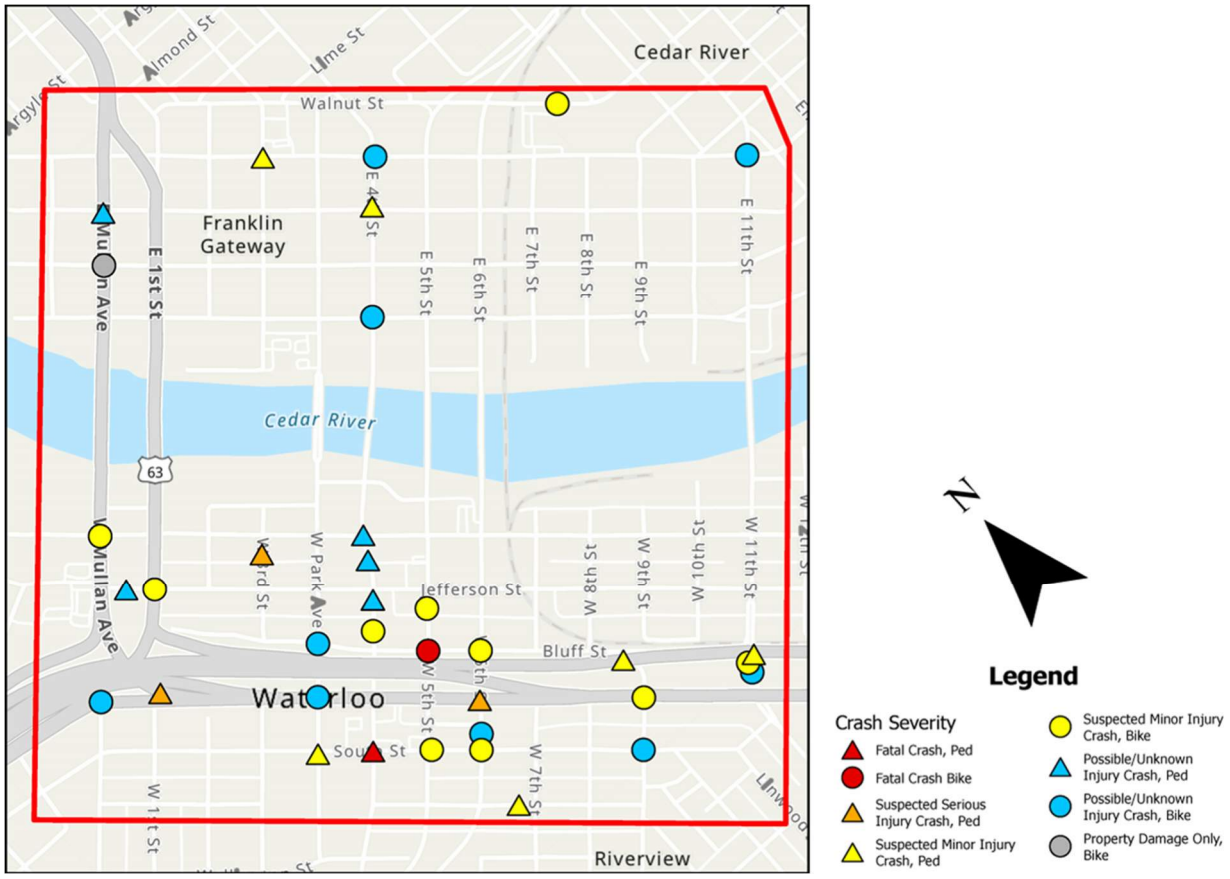
BICYCLE AND PEDESTRIAN CRASH ANALYSIS

There were 36 total crashes involving either a bicyclist or pedestrian in the project area that occurred from January 1, 2019 through December 31, 2023 including one fatal bicycle crash, one fatal pedestrian crash, and three pedestrians who were seriously injured. Figure 20 shows a map of the pedestrian and bicycle involved crashed within the project area. Crash data retrieved from the Iowa Crash Analysis Tool was missing non-motorist fields for the years 2019, 2020, and 2023. Redacted police report narratives were obtained for all pedestrian and bicycle-related crashes. Report narratives for were read and analyzed for coding discrepancies and to determine the crash type. Crash types from the Pedestrian and Bicyclist Crash Analysis Tool (PBCAT) were used to gain insight into the crashes.

Notable results from the analysis include the following:

- 71% (15/21) of bicycle crashes occurred when the bicyclist was riding on the sidewalk
- 52% (11/21) of bicycle crashes occurred when the bicyclist was riding against traffic
- 48% (10/21) of bicycle crashes occurred when the bicyclist was riding both against traffic and on the sidewalk
- 29% (6/21) of bicycle crashes occurred where the bicyclist was in a marked crosswalk.
- 40% (6/15) of pedestrian crashes occurred where the pedestrian was in a marked crosswalk, all of which were by left-turning vehicles.
- 33% (12/36) of all bicycle and pedestrian crashes occurred in marked crosswalks.

Figure 20: Pedestrian and Bicycle Crashes within the Project Area – Mapped (2019 – 2023)



SEVERE AND FATAL INJURY CRASH ANALYSIS

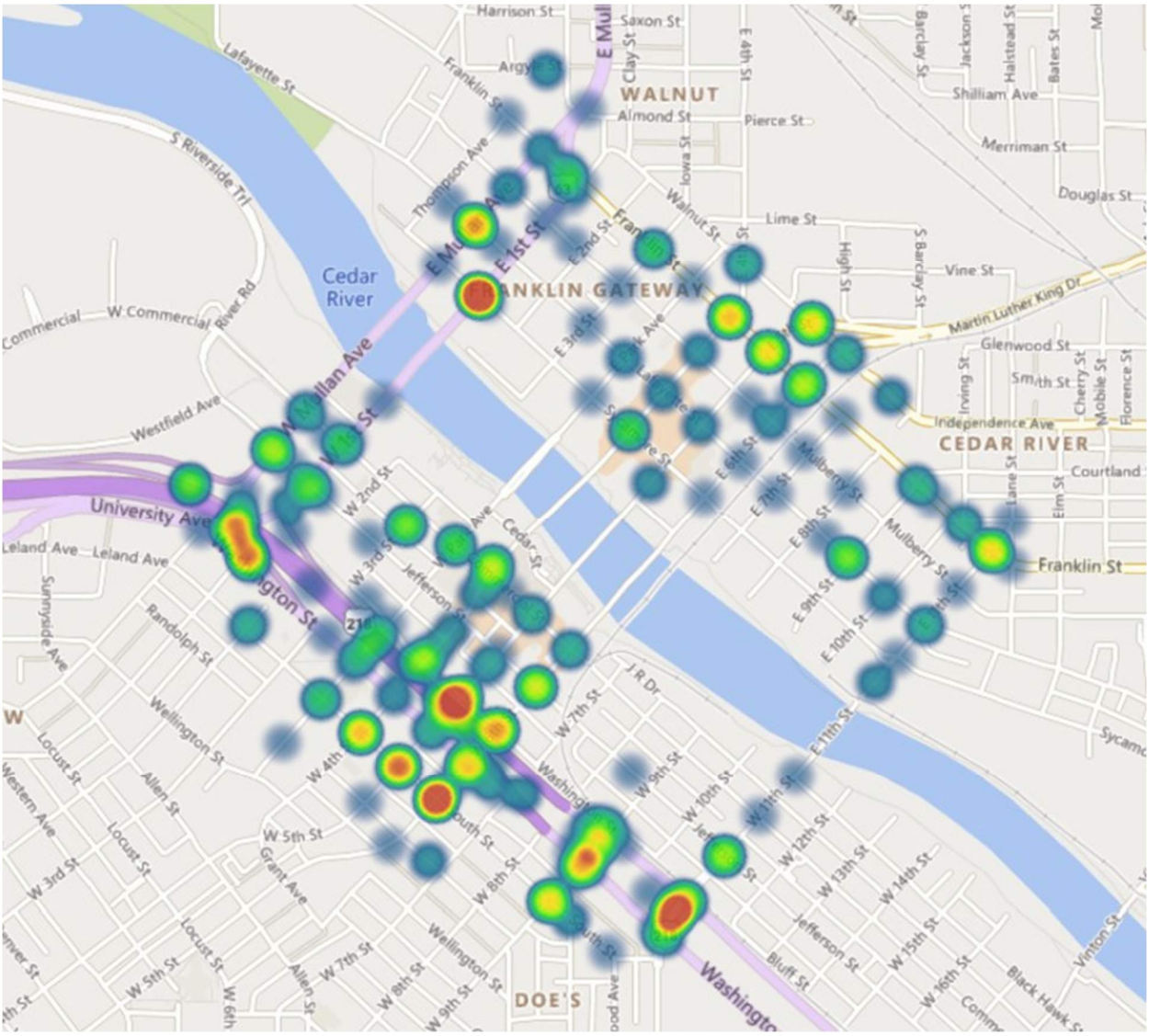
There were 16 total fatal and severe crashes between 2019 and 2023 in the project area (see Figure 2). Of the two fatal crashes, one was of a bicycle rider, and one of a pedestrian. Redacted police report narratives were obtained for all fatal and serious injury crashes. Report narratives for were read and analyzed for coding discrepancies and to integrate data from bicycle and pedestrian fatal and serious injury crashes. The main crash type was Single Vehicle with 9 crashes, however 4 of these were with a non-motorist, and there were no other correlated factors. 44% (7/16) of fatal and serious injury crashes occurred at signalized intersections, however this is likely an artifact of exposure due to greater traffic volumes at signalized intersections.

WEIGHTED CRASH ANALYSIS

Consistent with the Safe System Approach, crash mitigation efforts should focus on fatal and serious injury crashes. With only 16 crashes in these categories, however, patterns and hot-spots cannot be determined with any degree of confidence. Including all crashes in the high-injury visualization, however, would risk overemphasizing locations with a high number of minor injury and property damage only crashes. In order to mitigate this concern, a heat map of

crashes was created using a weighted system, assigning fatal crashes a weight of 10, serious injury crashes a weight of 6, minor injury crashes a weight of 2, and possible injury crashes a weight of 1. The resulting heat map is shown in Figure 21.

Figure 21: Weighted Crash Heat Map



Equity Evaluation

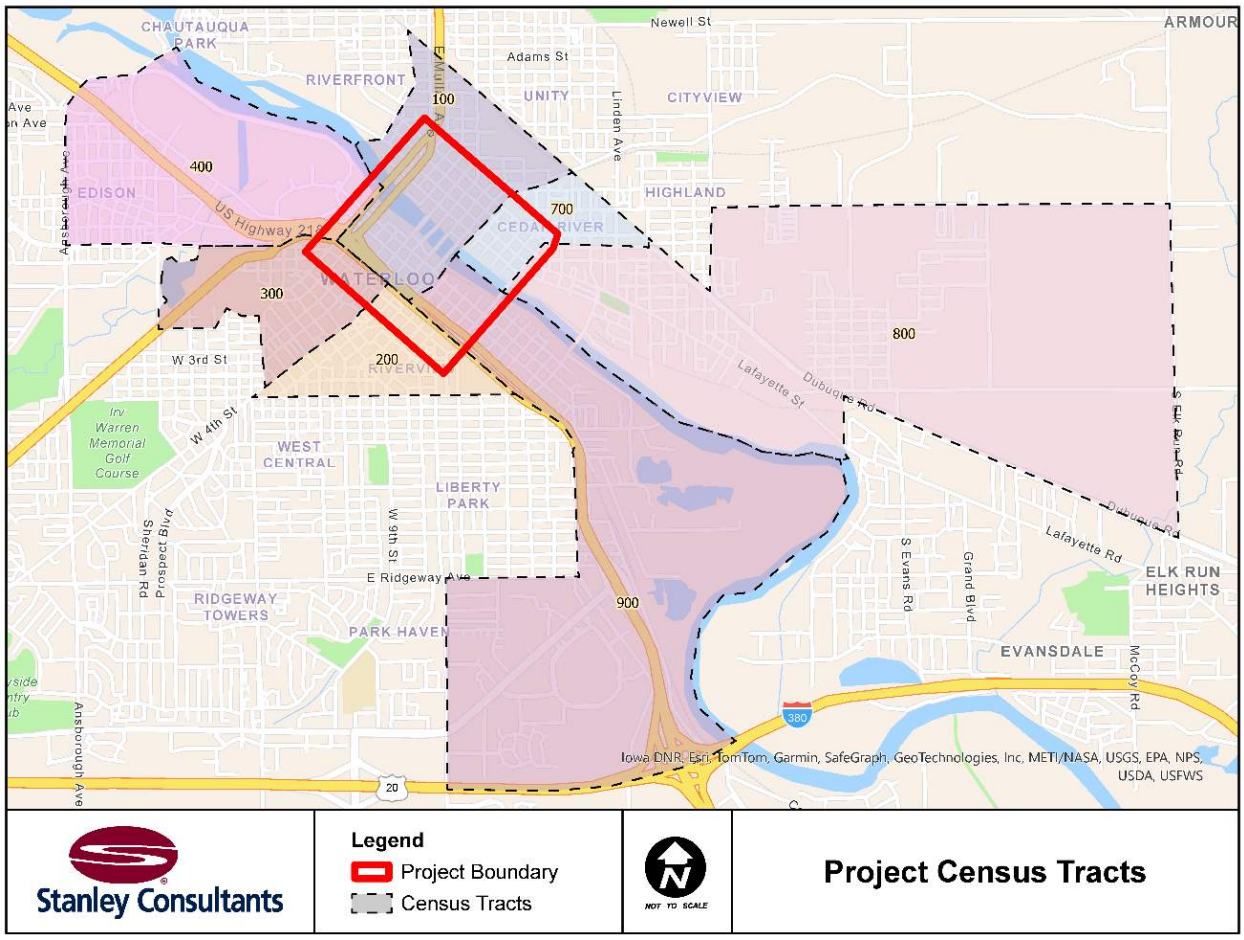
Consistent with the Safe System Approach, an equity analysis was performed using the USDOT Equitable Transportation Community (ETC) Explorer. The ETC Explorer is an interactive web tool that uses 2020 census data to explore the cumulative burden communities experience as a result of transportation underinvestment. The data includes the following five components: Climate and Disaster Risk Burden, Environmental Burden, Health Vulnerability, Social Vulnerability, and Transportation Insecurity. Each of these components is comprised of subcomponents and indicators, with Transportation Insecurity subcomponents including measures of transportation access, transportation cost and transportation safety. Relative disadvantage is expressed as a percentile rank compared to the State of Iowa. A percentile rank of 65 or above is considered disadvantaged. Figure 22 shows that the City of Waterloo is disadvantaged only in the environmental burden component.

Figure 22: City of Waterloo Burder Evaluation

	Components					Transportation Insecurity Sub-Components		
Tract	Climate	Env	Health	Social	Trans	T. Access	T. Cost	T. Safety
Waterloo	N	Y	N	N	N	N	N	N

The project area includes portions of seven different census tracts within the City of Waterloo: 100, 200, 300, 400, 700, 800, and 900. The census tracts are shown in Component percentiles and Transportation Insecurity subcomponent percentiles (as compared to the entire state) for each census tract within the project area were compared to each other, and to Waterloo as a whole.

Figure 23: Waterloo Census Tracts



The seven census tracts of interest are largely similar to each other in measures of disadvantages but show a pattern of considerably greater disadvantage than Waterloo as a whole. All seven are considered disadvantaged in both Environmental Burden and Social Vulnerability. Five out of seven are disadvantaged in Climate and Disaster Risk Burden. Three of the seven are disadvantaged in Health Vulnerability and similar numbers are seen for Transportation Insecurity. Further details on census tracts disadvantages are shown in Figure 24.

Figure 24: Waterloo Census Tract Disadvantages

	Components					Transportation Insecurity Sub-Components		
Tract	Climate	Env	Health	Social	Trans	T. Access	T. Cost	T. Safety
Waterloo	N	Y	N	N	N	N	N	N
100	Y	Y	Y	Y	Y			
200	Y	Y	N	Y	N			
300	Y	Y	Y	Y	Y			
400	Y	Y	N	Y	N			
700	Y	Y	Y	Y	N			
800	N	Y	N	Y	Y			
900	N	Y	N	Y	N			

Taking a deeper look into the Transportation Insecurity Sub-Components, we see that no census tracts in the project area are considered Transportation Access disadvantaged, while all are considered disadvantaged in Transportation Cost. The differences of the two are highlighted in Figure 25. It is worth noting, however, that while the federal data does not indicate that the tracts are disadvantaged in Transportation Access, public health representatives on the TAC reported that many clients indicate that access to transportation is a barrier to accessing healthcare.

Figure 25: Waterloo Census Tract Transportation Insecurities: Access and Cost

	Components					Transportation Insecurity Sub-Components		
Tract	Climate	Env	Health	Social	Trans	T. Access	T. Cost	T. Safety
Waterloo	N	Y	N	N	N	N	N	N
100	Y	Y	Y	Y	Y	N	Y	
200	Y	Y	N	Y	N	N	Y	
300	Y	Y	Y	Y	Y	N	Y	
400	Y	Y	N	Y	N	N	Y	
700	Y	Y	Y	Y	N	N	Y	
800	N	Y	N	Y	Y	N	Y	
900	N	Y	N	Y	N	N	Y	

The Transportation Safety sub-component is based off a single indicator: traffic fatalities per 100,000 people. As such, the measure doesn't paint a very robust picture of traffic safety in general and is unreliable at the tract level where a single fatality can raise the percentile rank significantly, making a formerly "safe" tract rise to the level of disadvantage. This is reflected in Figure 26, where no clear pattern emerges for this sub-component.

Figure 26: Waterloo Census Tract Transportation Insecurities: Safety

	Components					Transportation Insecurity Sub-Components		
Tract	Climate	Env	Health	Social	Trans	T. Access	T. Cost	T. Safety
Waterloo	N	Y	N	N	N	N	N	N
100	Y	Y	Y	Y	Y	N	Y	Y
200	Y	Y	N	Y	N	N	Y	N
300	Y	Y	Y	Y	Y	N	Y	Y
400	Y	Y	N	Y	N	N	Y	N
700	Y	Y	Y	Y	N	N	Y	N
800	N	Y	N	Y	Y	N	Y	Y
900	N	Y	N	Y	N	N	Y	N

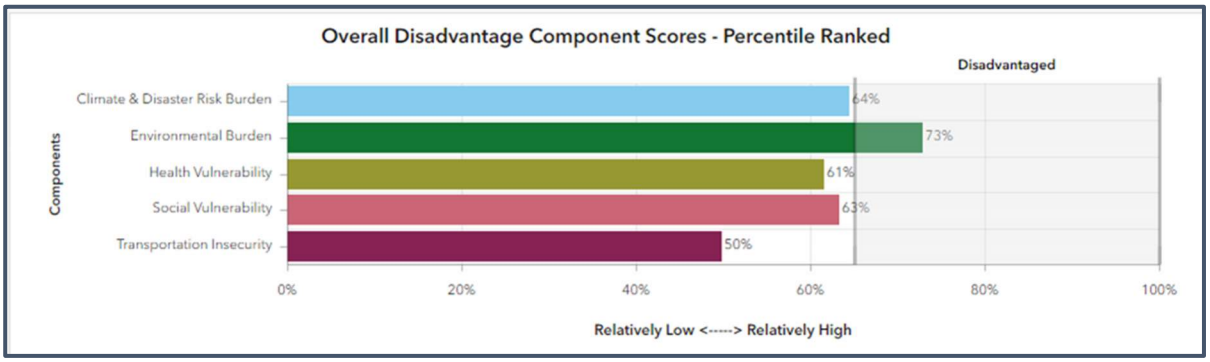
The pattern of relative disadvantage represented in the seven census tracts that intersect with the project area – both compared to the state, as well as compared to the City of Waterloo – indicate that the project area was well chosen to address issues of transportation and general inequality. There is not enough distinction between the tracts, however, to indicate that improvements should be prioritized within the project area according to relative disadvantage.

EQUITY ANALYSIS BY TRACT AS COMPARED TO THE CITY OF WATERLOO

City of Waterloo

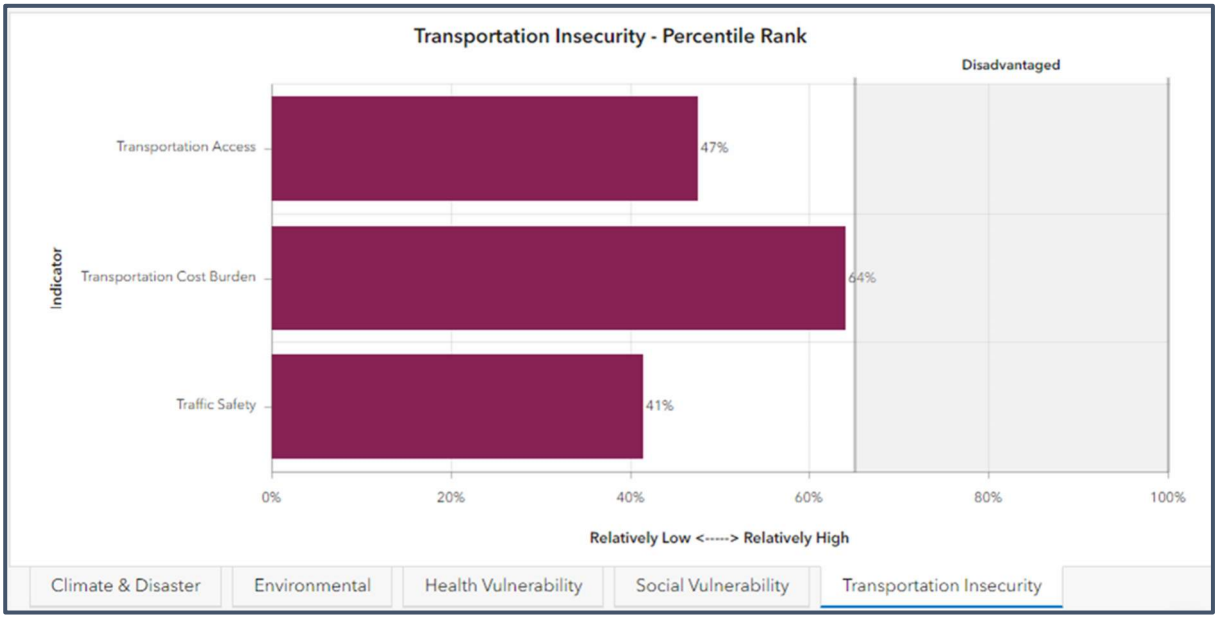
As noted above, the City of Waterloo, as a whole, is considered disadvantaged only on the measure of Environmental Burden, with a percentile rank of 73. Other component scores are Climate and Disaster Risk at the 64th percentile, Social Vulnerability at the 63rd percentile, Health Vulnerability at the 61st percentile, and Transportation Insecurity at the 50th percentile. The disadvantage component scores for the City of Waterloo are shown in Figure 27.

Figure 27: City of Waterloo Overall Disadvantage Component Scores – Percentile Rank



The highest percentile rank of the Transportation Insecurity sub-components is Transportation Cost Burden at the 64th percentile, followed by Transportation Access at the 47th percentile, and Traffic Safety at the 41st percentile. The transportation insecurity percentile rankings for the City of Waterloo can be seen in Figure 28.

Figure 28: City of Waterloo Transportation Insecurity – Percentile Rank



The seven census tracks located within the project area were analyzed. The analysis included the following:

- Percentage of the project area included within the census tract
- Percentage of project area road-miles included within the census tract
- Percentage of total project crashes that occurred within the census tract
- Total number of fatal and serious injury crashes that occurred within the census tract
- Percentage of total project fatal and serious injury crashes that occurred within the census tract

A summary of each census tract analysis is shown below. Additionally, location maps and USDOT information graphics for each census tract are shown below in Figures 29 – 42.

Census Tract 100

- 49% of project area
- 50% of project road-miles
- 52% of total crashes
- 1 fatal crash (bicycle rider)
- 10 serious injury crashes
- 69% of fatal & serious injury crashes

Figure 29: Census Tract 100

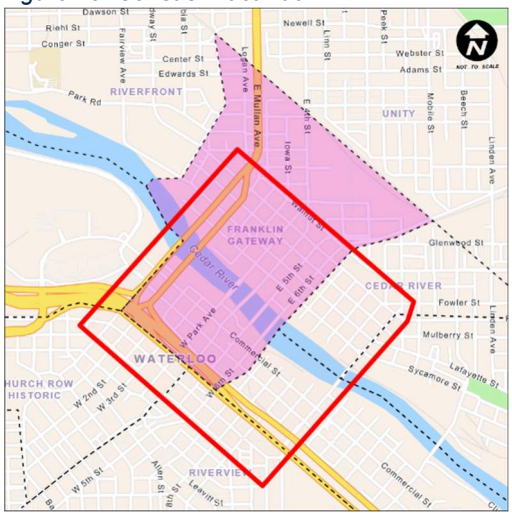
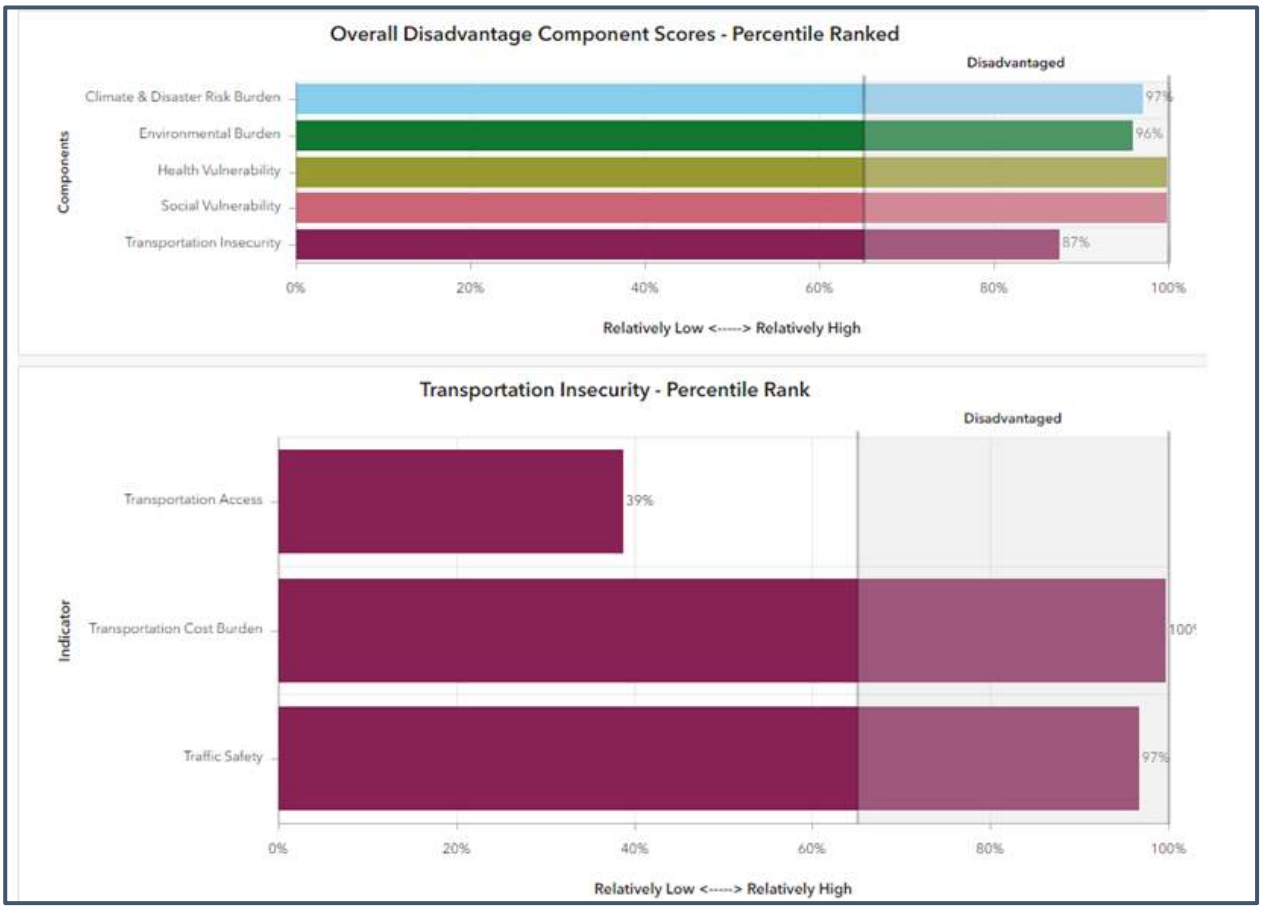


Figure 30: Census Tract 100 Overall Disadvantage Component Scores and Transportation Insecurity



Census Tract 200

- 10% of project area
- 11% of project road-miles
- 18% of total crashes
- 0 fatal crashes
- 1 serious injury crash
- 6% of fatal & serious injury crashes

Figure 31: Census Tract 200

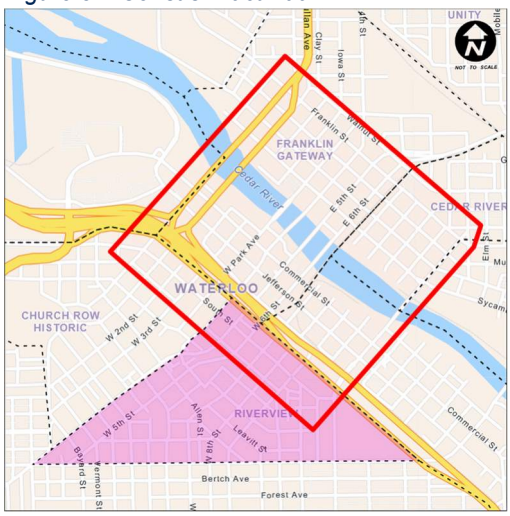
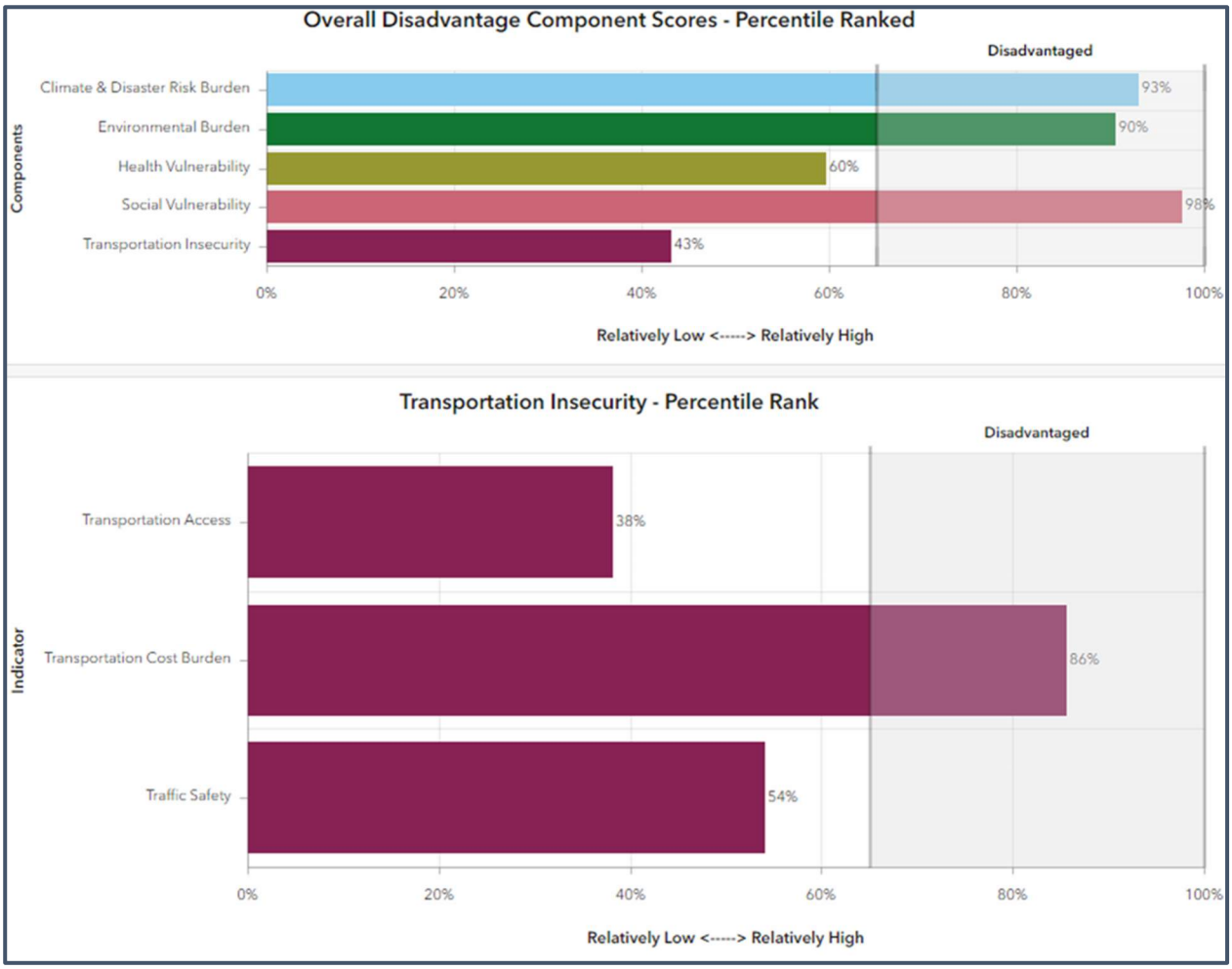


Figure 32: Census Tract 200 Overall Disadvantage Component Scores and Transportation Insecurity



Census Tract 300

- 7% of project area
- 7% of project road-miles
- 4% of total crashes
- 1 fatal crash (pedestrian)
- 0 serious injury crashes
- 6% of fatal & serious injury crashes

Figure 33: Census Tract 300

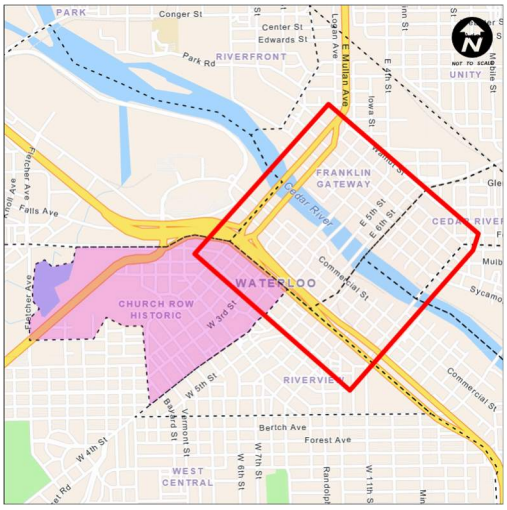
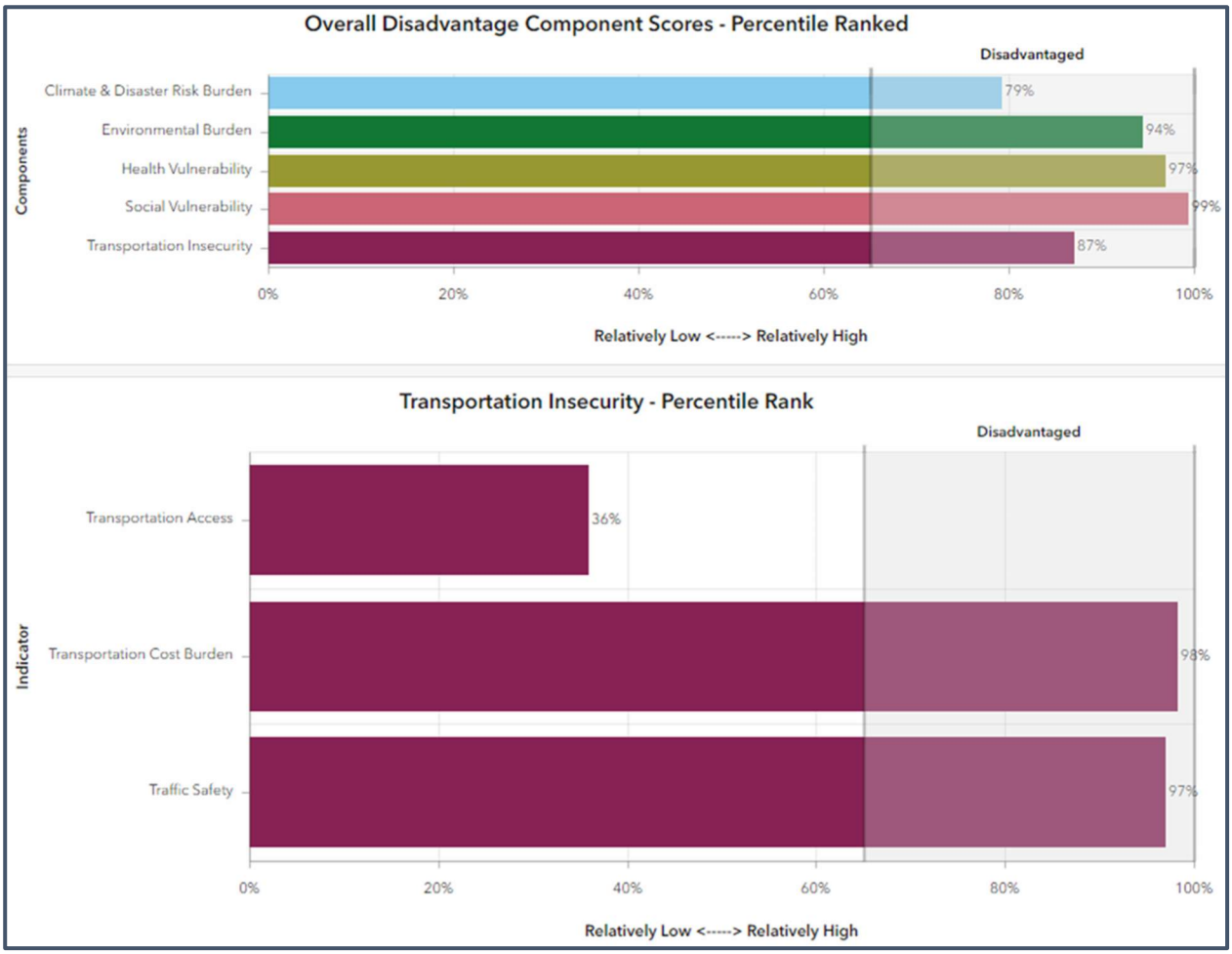


Figure 34: Census Tract 300 Overall Disadvantage Component Scores and Transportation Insecurity



Census Tract 400

- 4% of project area
- 7% of project road-miles
- 3% of total crashes
- 0 fatal crashes
- 1 serious injury crash
- 6% of fatal & serious injury crashes

Figure 35: Census Tract 400

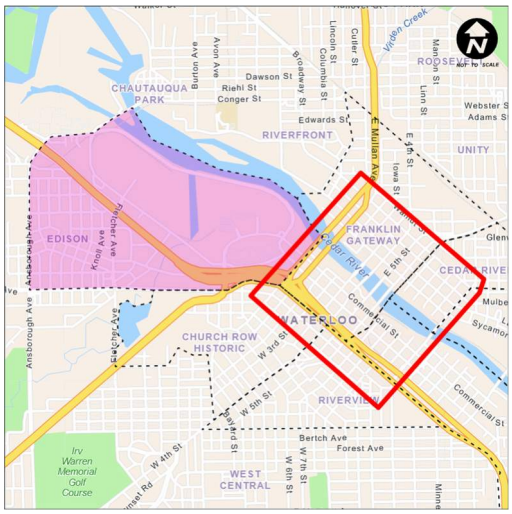
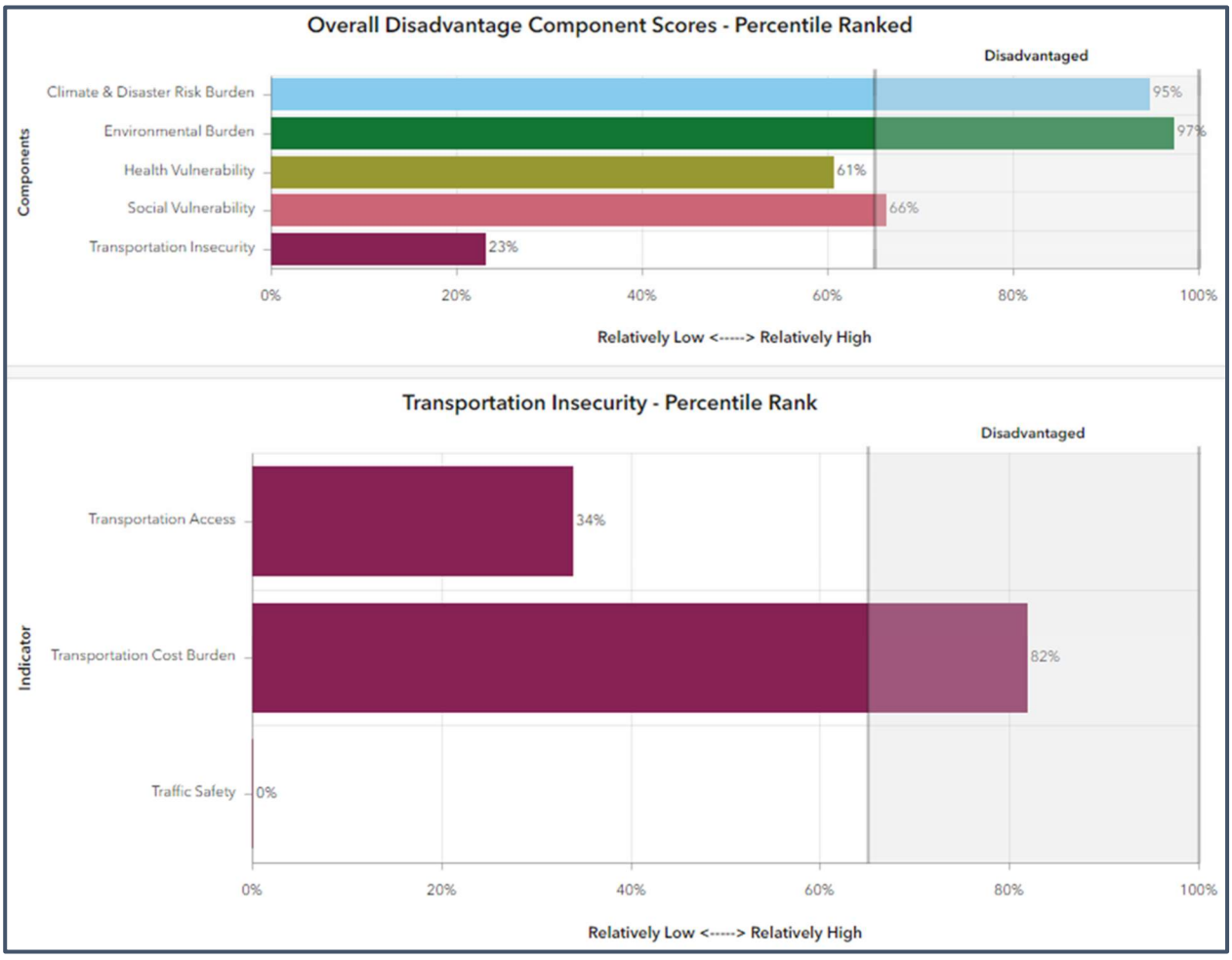


Figure 36: Census Tract 400 Overall Disadvantage Component Scores and Transportation Insecurity



Census Tract 700

- 15% of project area
- 14% of project road-miles
- 9% of total crashes
- 0 fatal crashes
- 2 serious injury crashes
- 13% of fatal & serious injury crashes

Figure 37: Census Tract 700

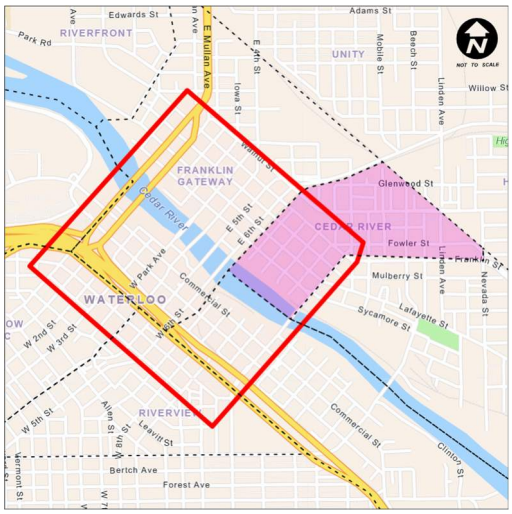
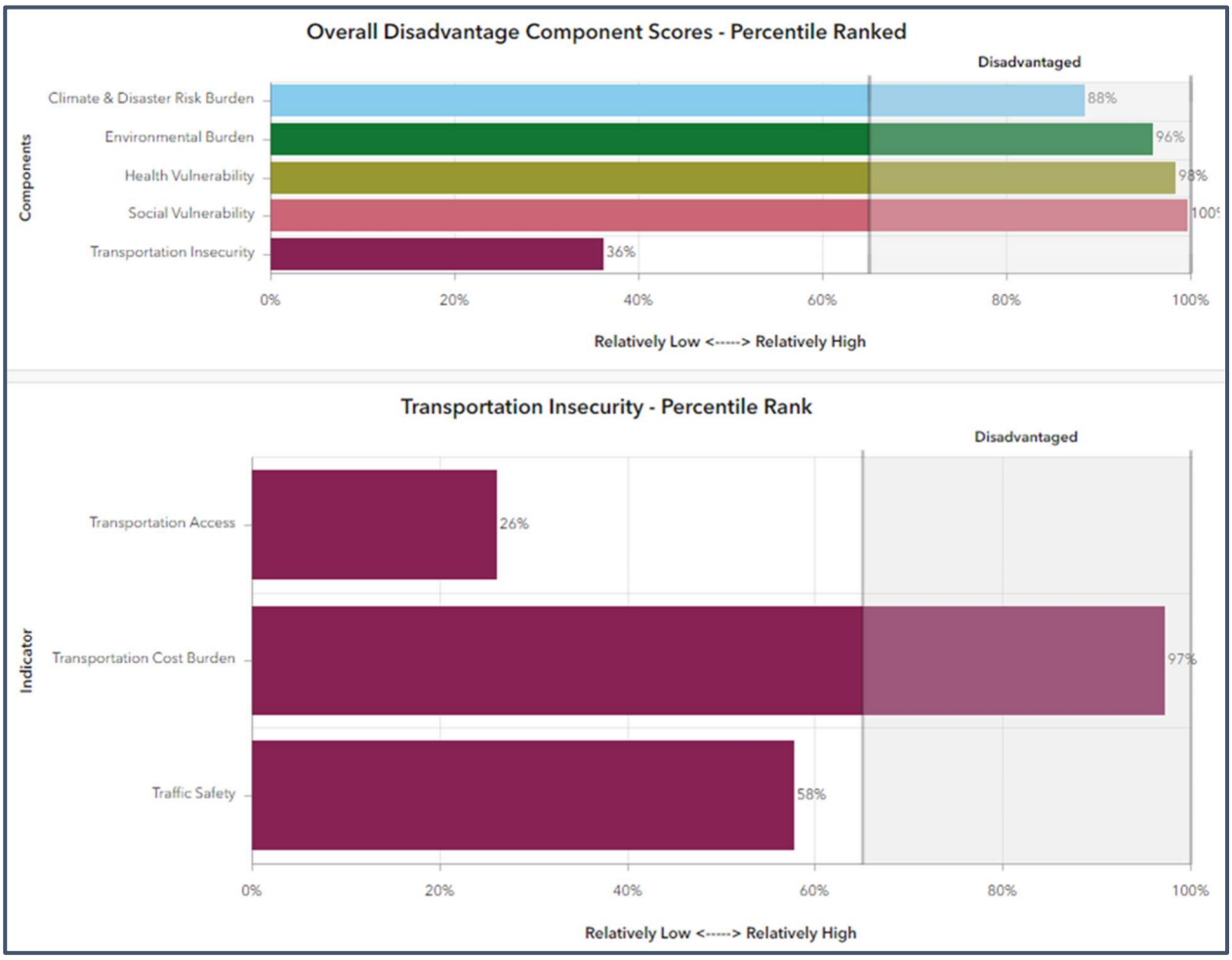


Figure 38: Census Tract 700 Overall Disadvantage Component Scores and Transportation Insecurity



Census Tract 800

- 2% of project area
- 1% of project road-miles
- 1% of total crashes
- 0 fatal crashes
- 0 serious injures
- 0% of fatal & serious injury crashes

Figure 39: Census Tract 800

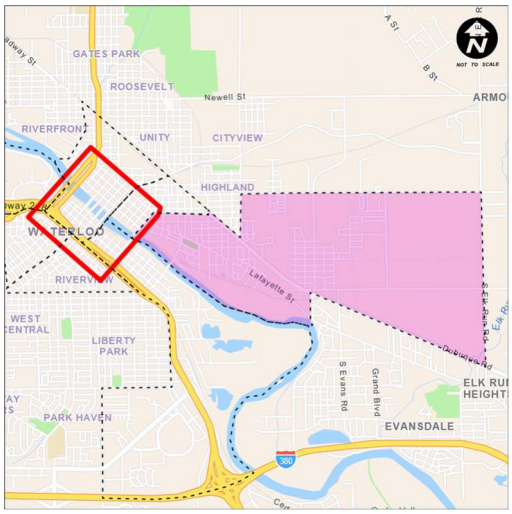
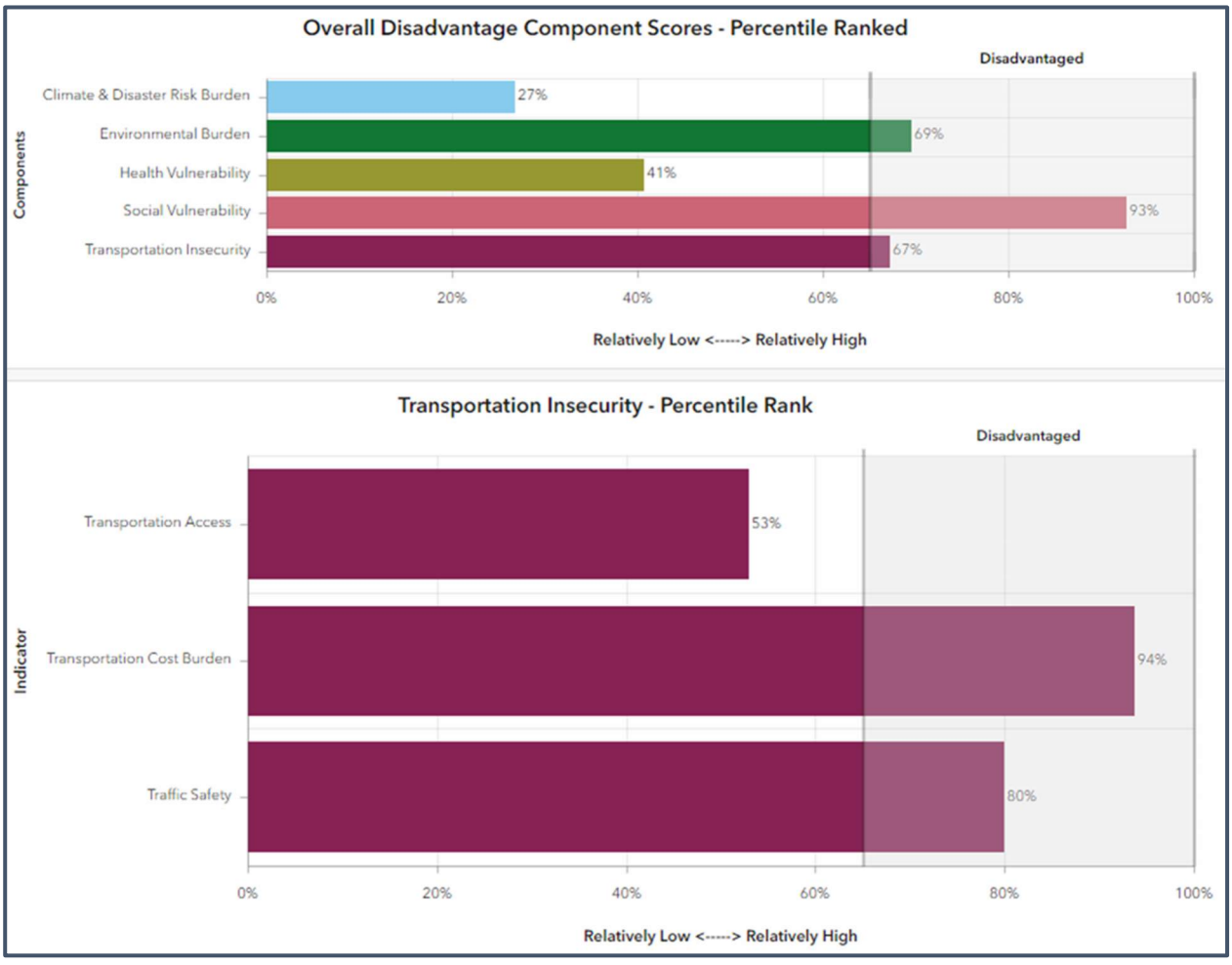


Figure 40: Census Tract 800 Overall Disadvantage Component Scores and Transportation Insecurity



Census Tract 900

- 14% of project area
- 12% of project road-miles
- 13% of crashes
- 0 fatal crashes
- 0 serious injury crashes
- 0% of fatal & serious injury crashes

Figure 41: Census Tract 900

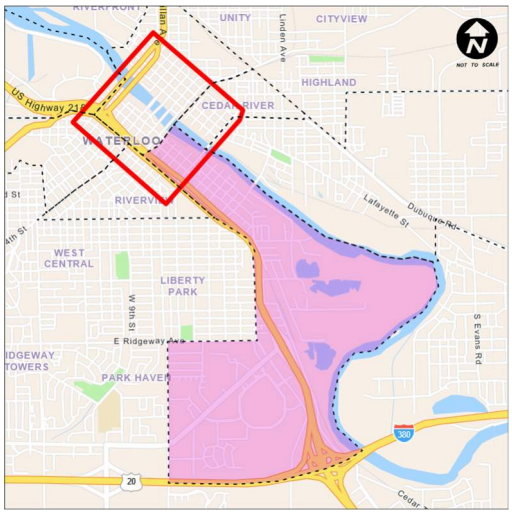
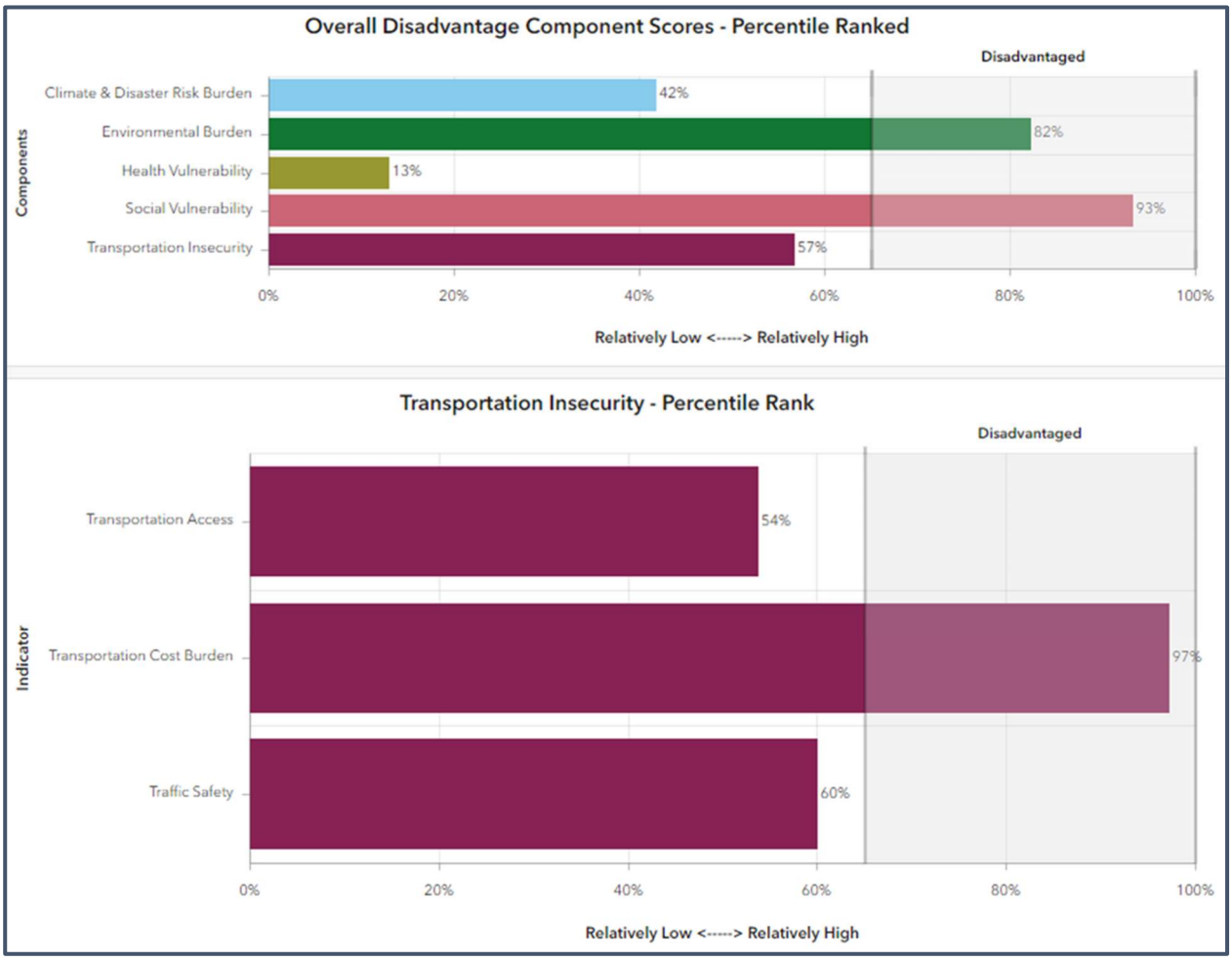


Figure 42: Census Tract 900 Overall Disadvantage Component Scores and Transportation Insecurity



Public Participation

OVERVIEW

Effective public involvement is crucial for shaping the future of Waterloo.

As stewards of the public trust in making our roads safer for all (SS4A), INRCOG was enlisted to solicit and consider public comment and participation in its formal planning process. The process included creating an oversight committee, developing and implementing a marketing strategy for public feedback, offering timely public notice, full access to information, and continued public involvement. For this, they chose to work with Stanley Consultants and McConville Consulting.

Educating the community about how the Black Hawk County MPO was awarded a Safe Streets and Roads for All (SS4A) safety grant was important. This grant program is part of a nationwide effort to prevent roadway injuries and fatalities by supporting the concept of “Vision Zero.”

The community-driven program is aimed at making a difference. Feedback was needed to shape the new plan’s success. Public input activities included:

- A public notice posted on the Black Hawk County MPO website.
- Two informational meetings were held for public input (one virtual and one in-person) asking for public feedback and to share their concerns/stories.
- Hard copies and posters promoting the virtual and in-person outreach events were posted at local businesses.
- News stories were run in the local newspaper and radio stations
- A survey was created in multiple languages to reach underserved populations (English, Spanish, Bosnian, Burmese, French, and Haitian Creole).
- A paid targeted digital advertising campaign ran in September to increase the number of survey participants
- The grant summary was presented to an oversight committee that included members from organizations such as Black Hawk County Public Health, City of Waterloo, Main Street Waterloo, Waterloo Complete Streets, Waterloo Fire Rescue and the Waterloo Police Department.
- A direct email outreach campaign to organizations representing stakeholder populations was conducted.
- An emailed request for public input was sent to the interested parties email list.
- Marketing and Public Engagement Outreach
    - Marketing materials were developed to help create awareness for the public outreach campaign (with links to the survey) including, but not limited to:

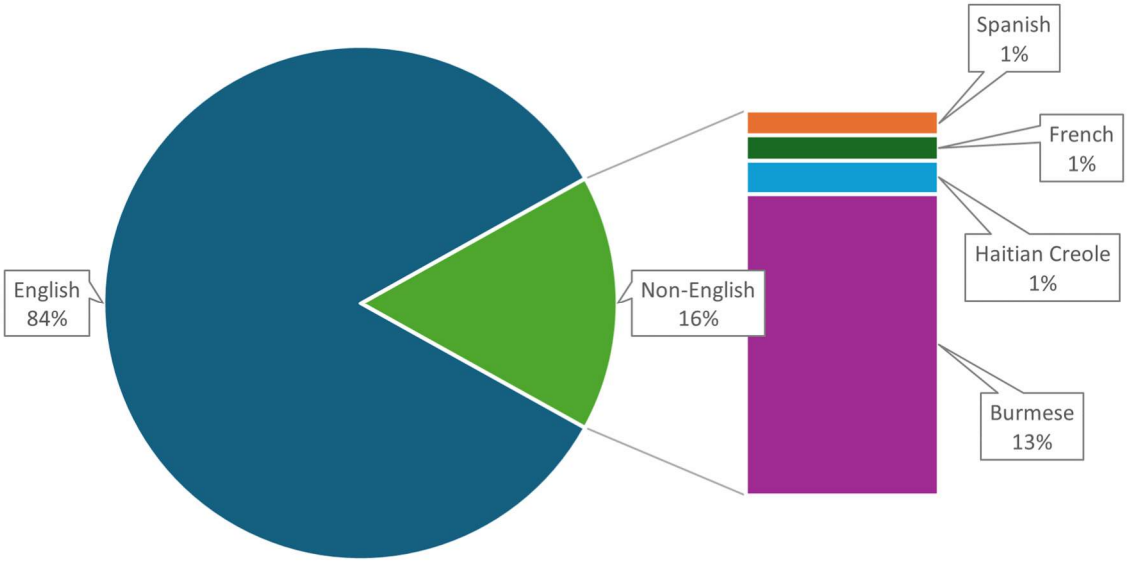
- Dedicated project webpage on the Black Hawk County MPO website
- QR Code for use in all marketing
- News Releases and FAQ
- Small and large posters
- Social media posts/ads/videos on a new Waterloo Safe Streets Facebook page
- Paid digital advertising
- Human interest stories/videos on the website (link)
- Best Idea for Making our Streets Safer posters
- Business cards
- Flyers
- Email letters
- Hashtags dedicated to the campaign

Complete results of the public involvement process can be found in Appendix B.

SURVEY RESPONSE ASSESSMENT

Overall, 285 responses to the SS4A survey were received. 239 respondents filled out the English survey, 36 filled out the Burmese survey, four filled out the Haitian-Creole survey, and three responses were received each in French and Spanish. An overview of the languages of the received survey responses can be seen in Figure 43.

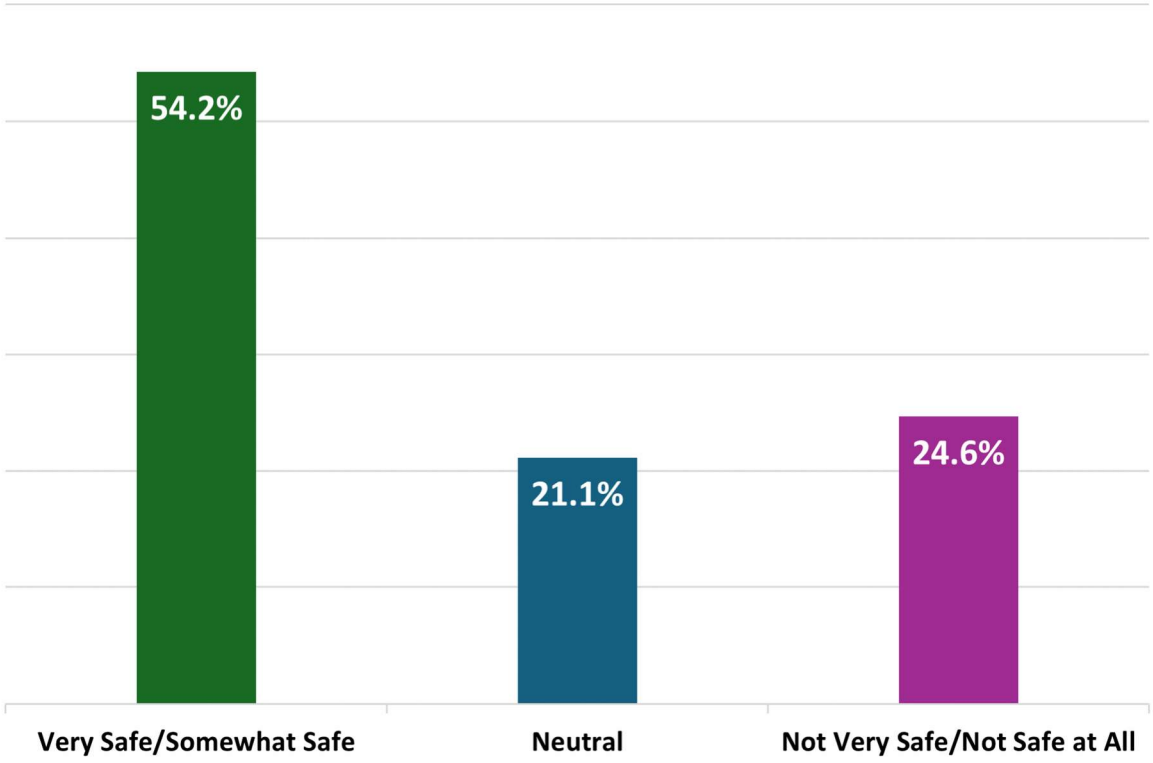
Figure 43: Survey Responses by Language



Due to the small number of Haitian-Creole, Spanish, and French responses, this analysis groups all non-English responses into a single category.

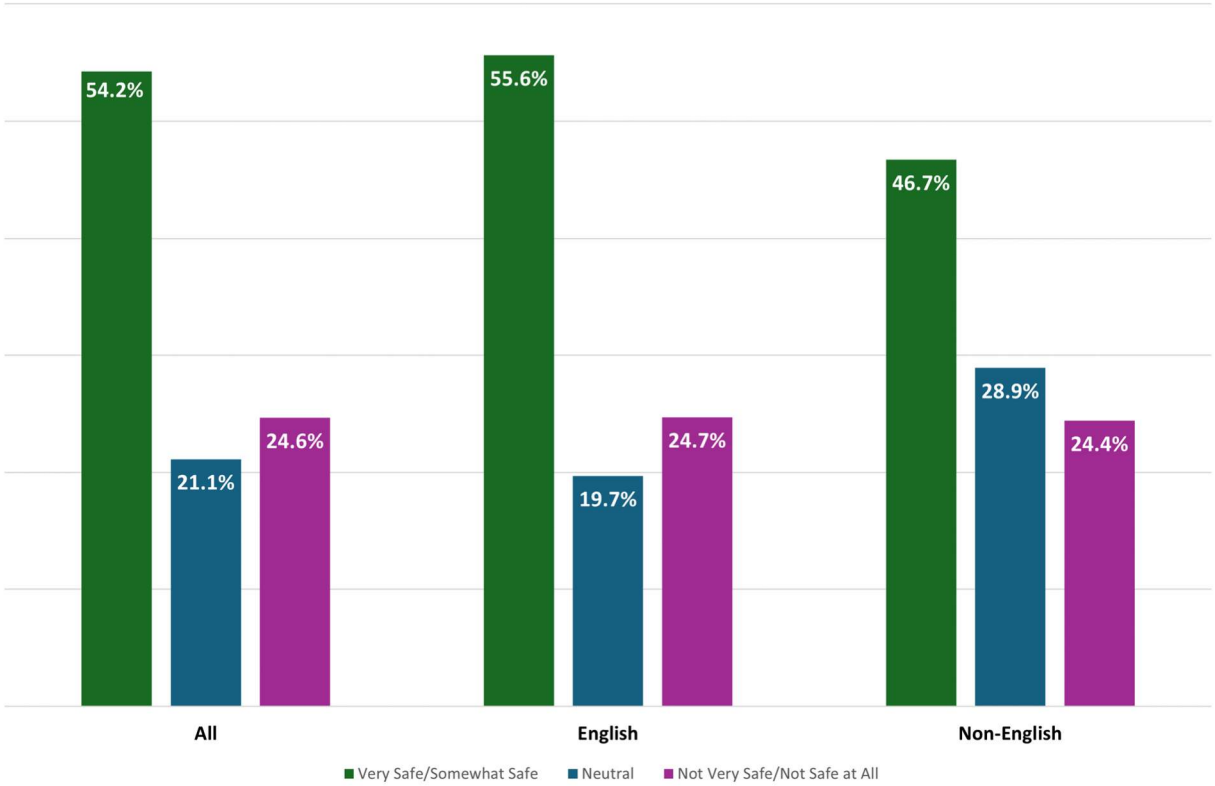
Overall, respondents feel relatively safe driving in downtown Waterloo, with 54.2% indicating that they felt “Very Safe” or “Somewhat Safe”, and only 24.6% indicating that they feel “Not Very Safe or “Not Safe at All”. 21.1% indicated that they felt “Neutral” about their safety. A graph of survey responses regarding safety in downtown Waterloo can be found in Figure 44.

Figure 44: Percent of Respondents by How Safe They Feel Traveling in Downtown Waterloo



Some differences were noted between English and non-English responses, with only 46.7% of non-English respondents indicating that they feel “Very Safe” or “Somewhat Safe”, compared to 55.6% of similar responses from English surveys. Interestingly, the share of responses who feel “Not Very Safe” or “Not Safe at All” is similar in each group (24.7% for English responses, and 24.4% for non-English responses). A graph of survey responses regarding safety in downtown Waterloo broken down by language can be found in Figure 45.

Figure 45: Percent of Respondents by How Safe They Feel Traveling in Downtown Waterloo – Categorized by Language of Response



Differences between English and non-English responses were also noted when asked what modes they use to travel in the area, with non-English respondents nearly three times more likely to drive a motorcycle/motor scooter or use a stand-up scooter, and over nine times more likely to ride the bus than English survey respondents. A comparison of travel modes that survey respondents use categorized by language can be seen in Figure 46.

Figure 46: Survey Responses About Travel Modes by Language

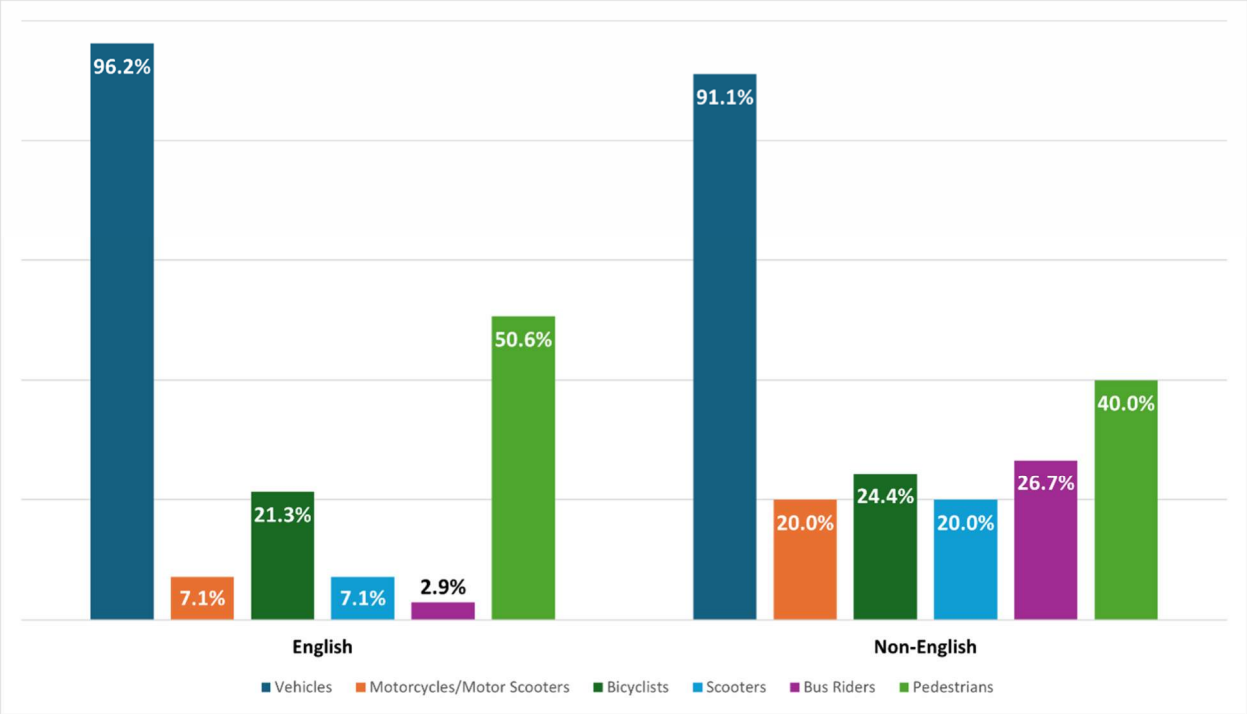
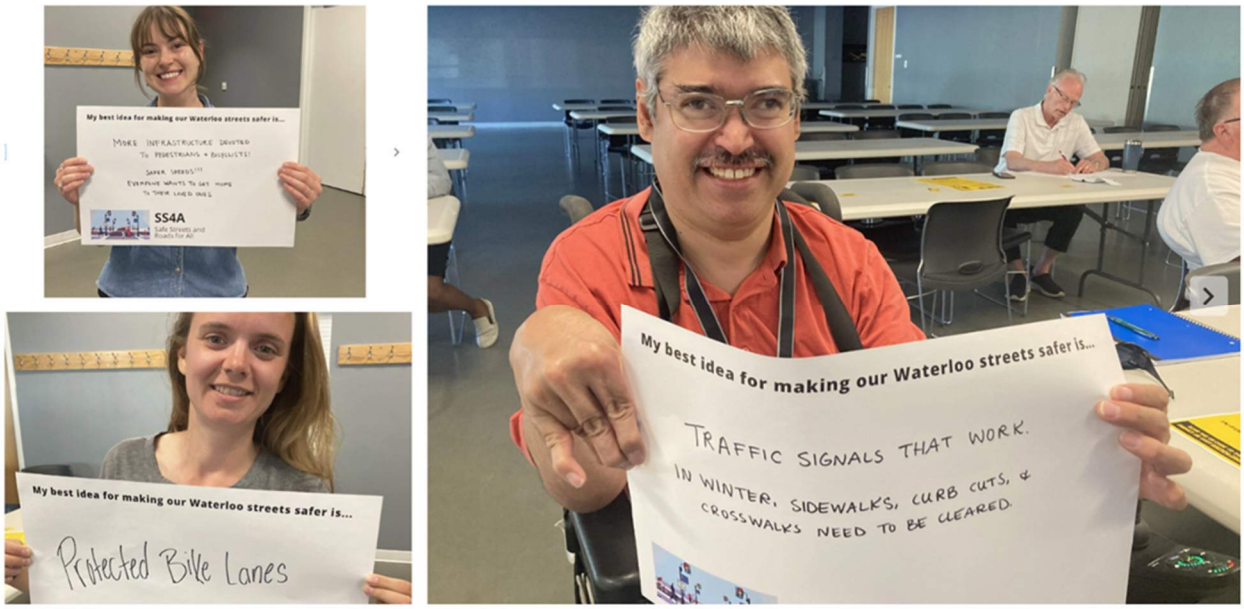


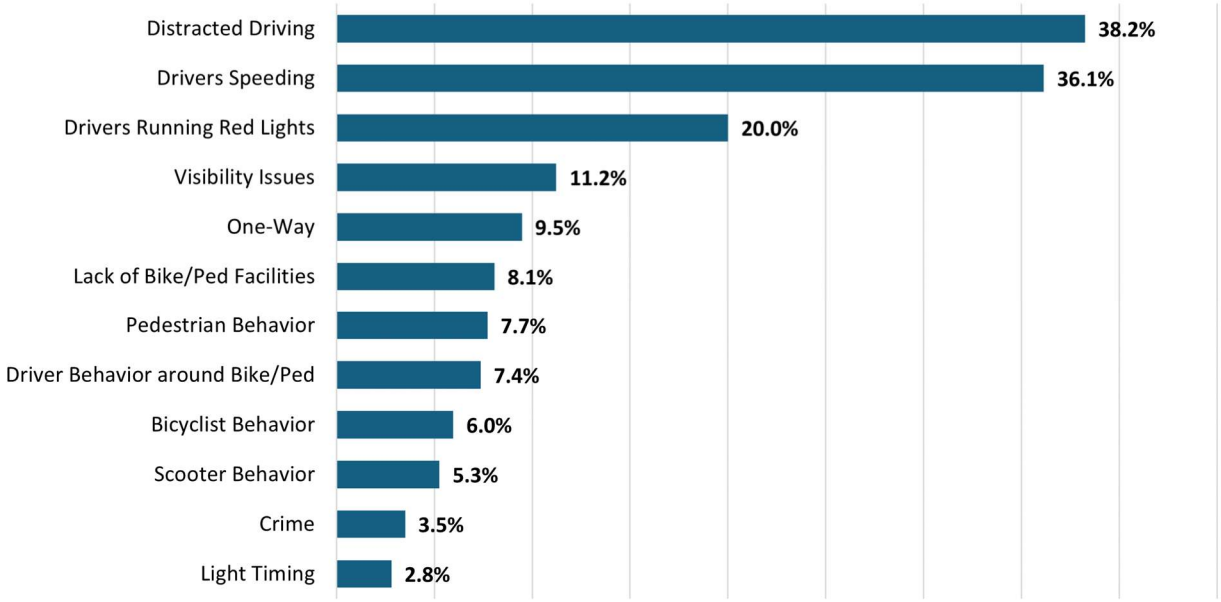
Figure 47: Traffic Safety Concerns at the Community Meeting



Overall, distracted driving (38.2% of responses), and speeding (36.1%) were the most commonly reported safety concerns, followed next by red-light running and visibility issues (20% and 11.2% respectively). While this question was presented as a free-form answer with no limit to the number of issues a respondent could list, these four issues were given as example

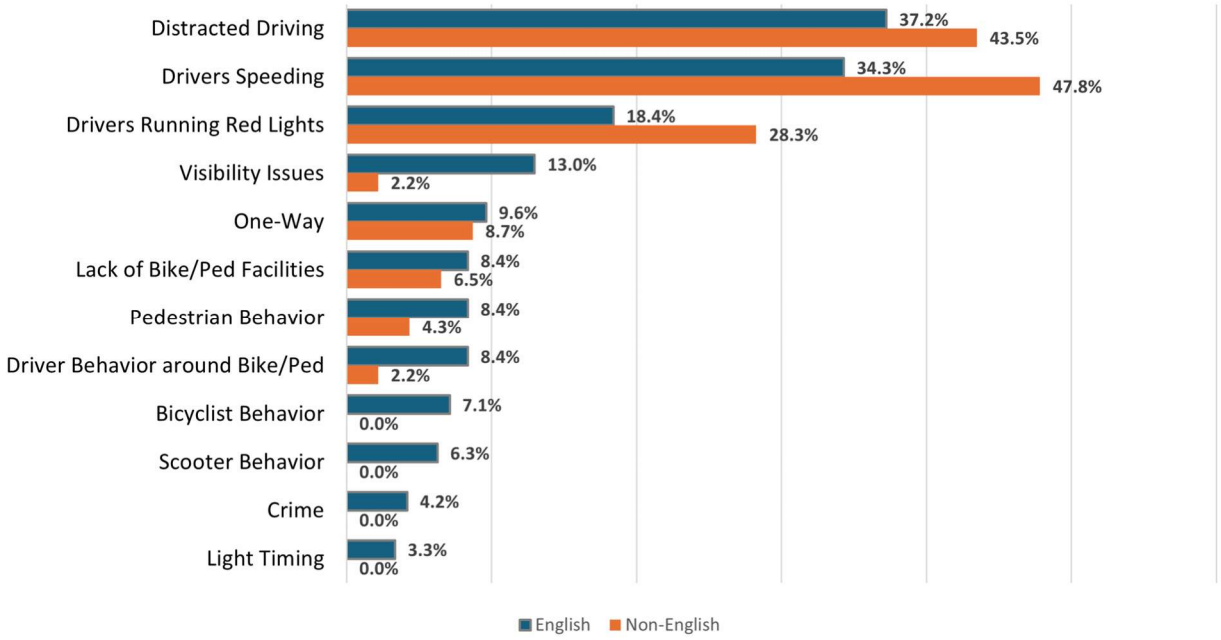
answers to the question, which may have increased the number of responses received that listed these issues. No other issues were noted by more than 10% of respondents, however confusion over the One-Way streets (9.5%) a lack of bicycle or pedestrian facilities (8.1%), pedestrian, bicyclist, and scooter-rider behavior (7.7%, 6.0%, and 5.3% respectively) and driver behavior around pedestrians and bicyclists (7.4%) were noted by many respondents. The frequency of concerns voiced by all respondents can be seen in Figure 48.

Figure 48: Traffic Safety Concerns from All Respondents



When English and non-English responses are compared, non-English respondents were more likely than English respondents to list speeding, distracted driving, and red-light running as concerns, and less likely to list any other issue. The frequency of concerns voiced by all respondents but broken down by language can be seen in Figure 49.

Figure 49: Traffic Safety Concerns by Survey Respondents by Language



Traffic safety related ideas were grouped into 15 categories and ranked with the idea coming up most often being an increase in police presence in the downtown area (suggested by 12.6% of respondents). Bicycle and pedestrian safety enhancements such as bike lanes, and enhancements to pedestrian crossings and sidewalks were also often suggested (10.5%, 9.5% and 7.4% respectively). 6.7% of respondents suggested installing more roundabouts, while only 2.5% suggested removing them. The top ideas for improving traffic safety within Waterloo are shown in Figure 50.

Figure 50: Traffic Safety Ideas by All Respondents

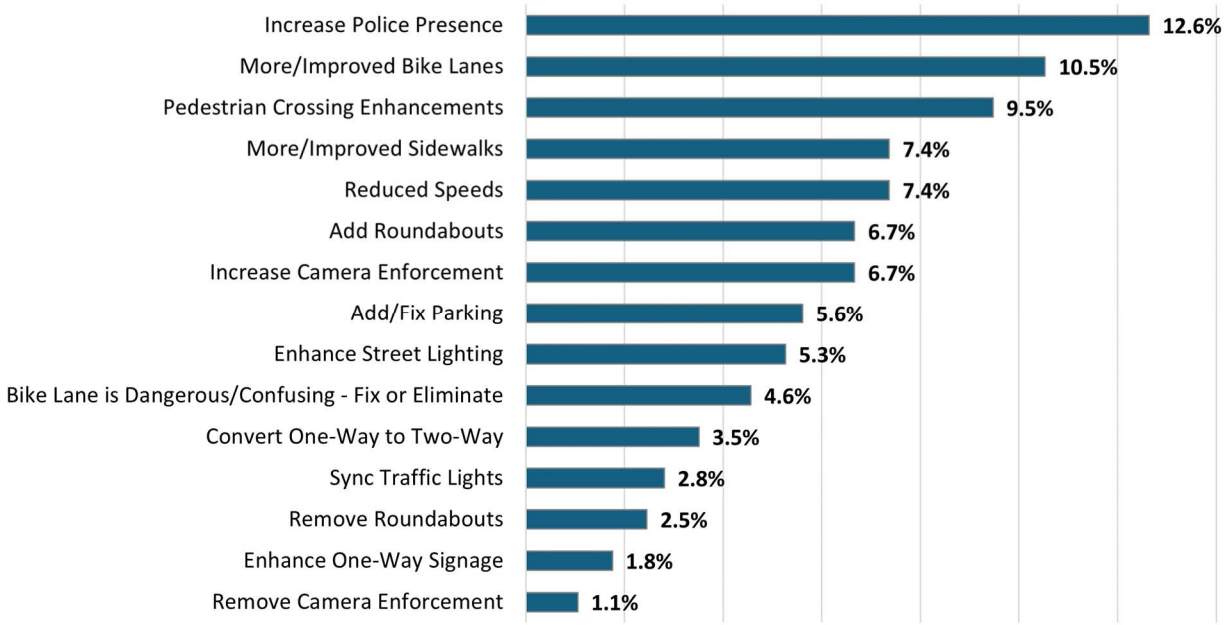
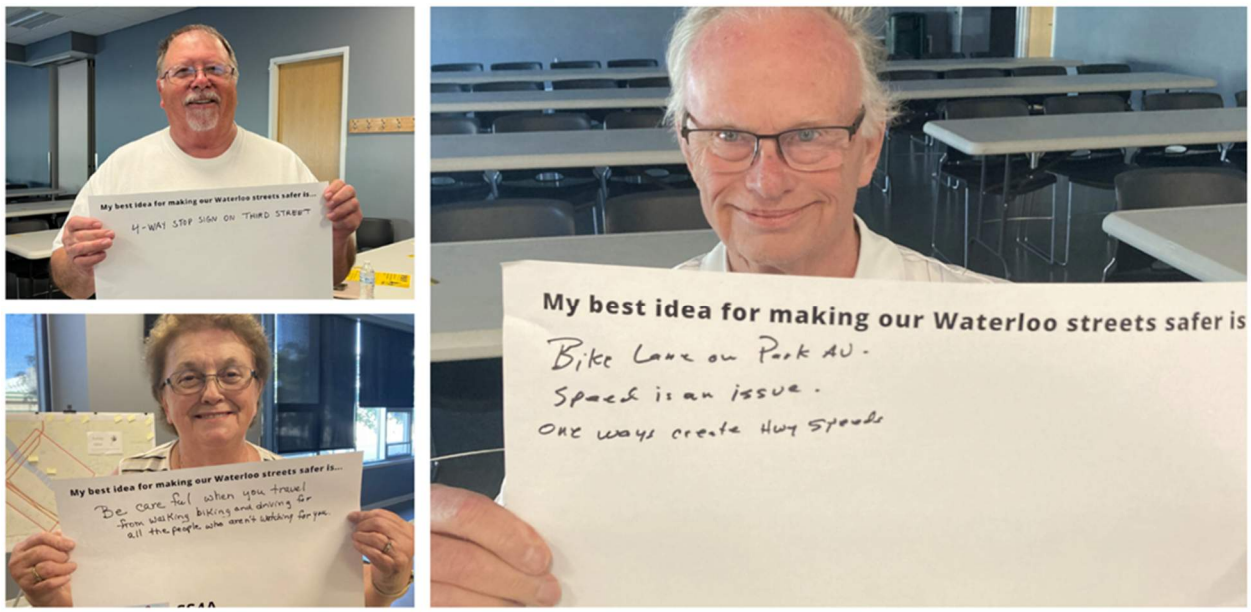
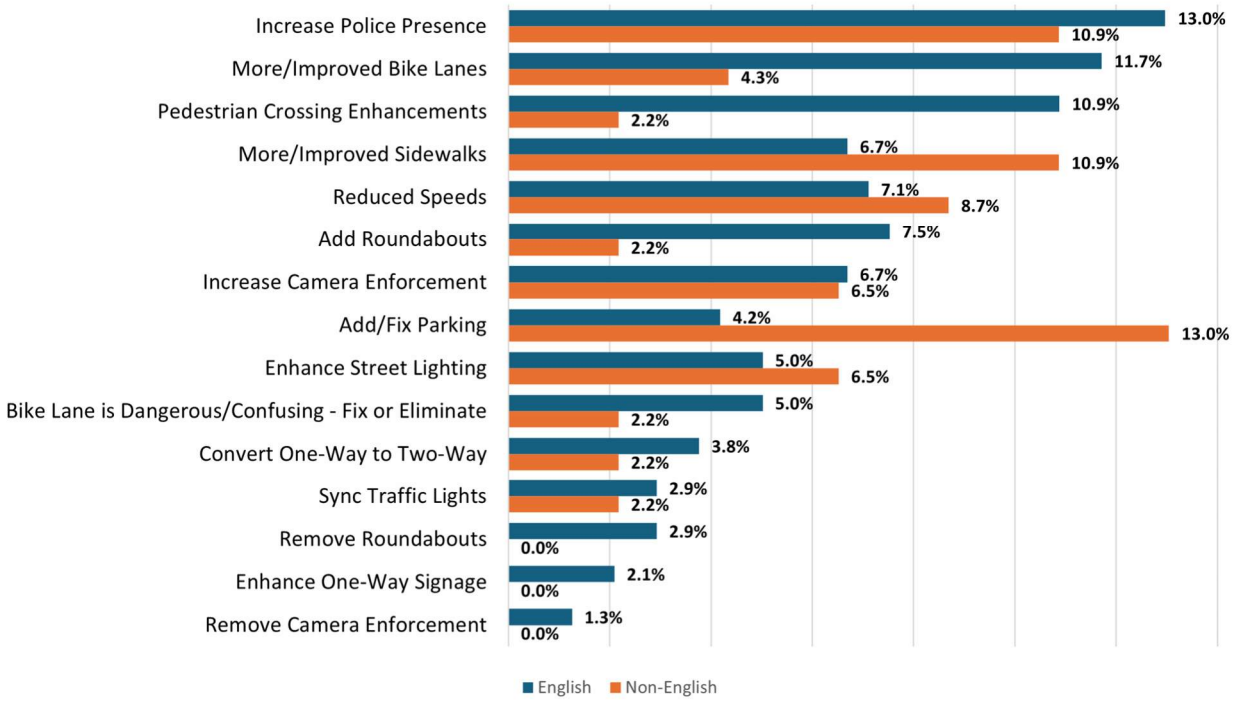


Figure 51: Traffic Safety Improvement Ideas at the Community Meeting



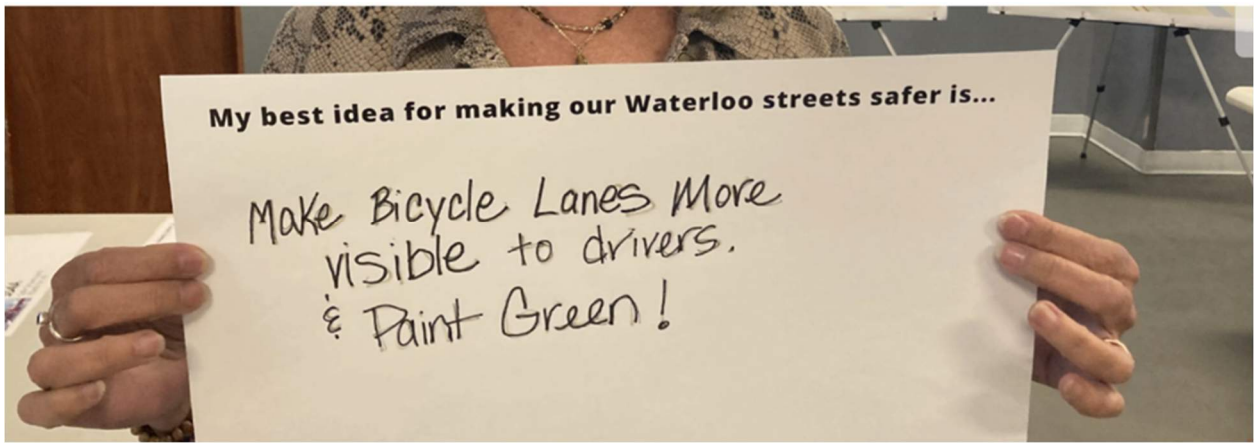
When English and non-English responses were compared, the most common suggestion on non-English surveys was to fix the parking (either by adding more parking or better delineation). Enhanced sidewalks were more commonly suggested by non-English survey respondents (10.9% versus 6.7% of English survey respondents). Increasing police presence was one of the most commonly suggested ideas for both English and non-English survey respondents (13.0% and 10.9% respectively). The top ideas for improving traffic safety within Waterloo broken down by language are shown in Figure 52.

Figure 52: Traffic Safety Ideas by Survey Respondents by Language



While darkness or lack of street lighting wasn't mentioned in any responses to the traffic safety concerns question, 17 responses mention needing more street lighting in either the "Tell us your Ideas" or "Additional Comments" sections. Additionally, positive comments about roundabouts occurred nearly three times as often as negative comments.

Figure 53: Traffic Safety Improvement Ideas at the Community Meeting



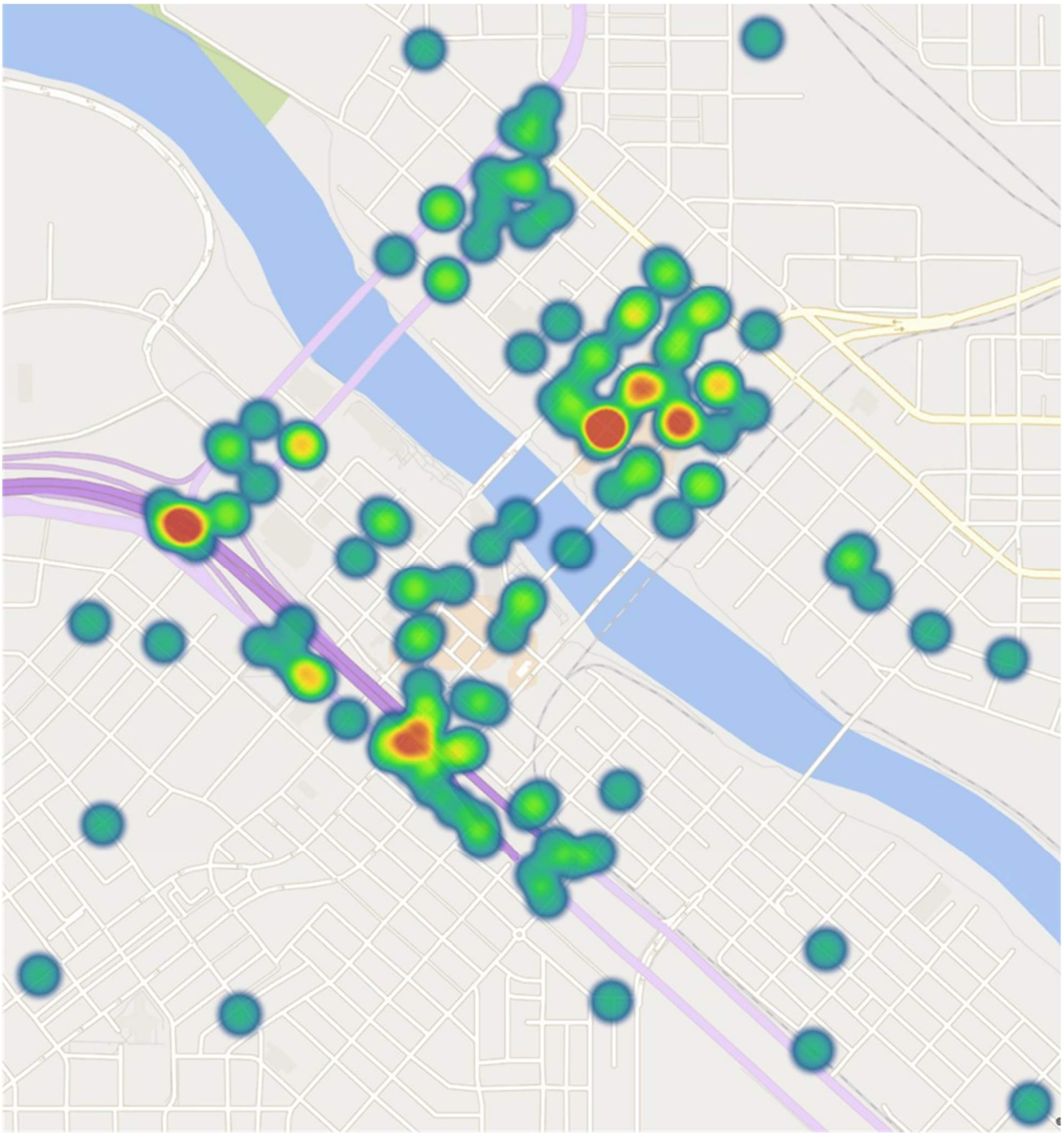
LOCATION INFORMATION

Survey respondents were given the opportunity to place a pin on a virtual map where they felt the most unsafe when walking, biking or driving. The top 8 locations chosen were:

1. 4th Street & Sycamore Street
2. 1st Street and University Avenue Underpass
3. US-218 & W 5th Street
4. Lafayette Street & E 5th Street
5. Lafayette Street & E 4th Street
6. Mulberry Street & E 5th Street
7. W Park Avenue & Washington Street
8. Commercial Street & 1st Street

A heat map of locations is shown in Figure 54.

Figure 54: Heat Map of Where Waterloo Residents Feel Most Unsafe



FACEBOOK PAGE COMMENTS

Eleven comments were received on the Waterloo Safe Streets Facebook page (www.facebook.com/profile.php?id=61564993457384) including two thankful/supportive comments, five generalized negative comments, one comment supportive of roundabouts (with

an offer to run a car wash to raise money for one), one negative comment about roundabouts, and one very reasonable question: “Will anything actually be done with this information?”

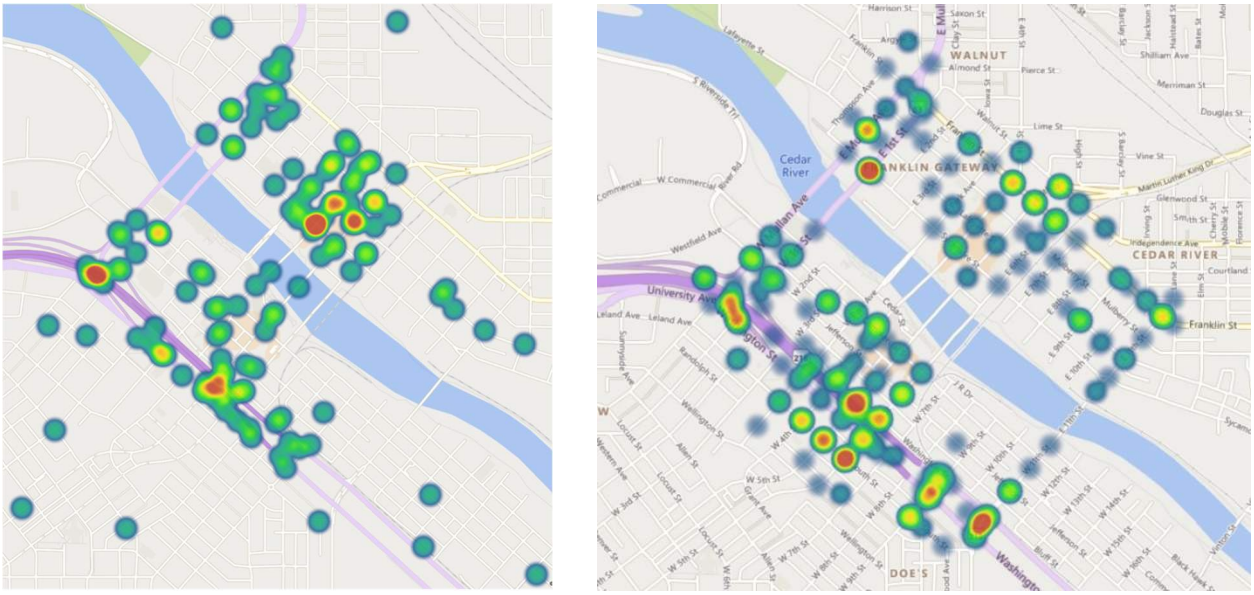
The information gathered during this process has been used to refine the prioritization of intersections/corridors for improvements in the project area. When two or more potential infrastructure or behavioral interventions were identified for similar problems, interventions that had more overall support expressed for them in the survey were prioritized when possible.

Priority Improvement Locations Selection Process

Final priority locations were selected by overlaying information gathered through the public involvement process, particularly the unsafe locations question, and the weighted high injury heatmap. Figure 55 shows the heatmap from the public questionnaire on the left, and the weighted high injury heatmap on the right.

The locations from the public questionnaire do not directly correspond to high-crash locations, however some overlap was noted. In particular, the second and third most often chosen locations (1st Street and University Avenue Underpass, and US-218 at W. 5th Street) are locations that correspond strongly to the weighted heat map. Interestingly, three locations clustered around the business district (4th Street at Sycamore Street, Lafayette Street at E 5th Street, and Lafayette Street at E 4th Street) were the first, third and fourth most often chosen locations (respectively), however these locations have no fatal or serious injury crashes and very few minor or suspected injury crashes. A comparison between the survey result heat map and the weighted crash heat map can be seen in Figure 55.

Figure 55: Survey Results Heat Map (Left) and Crash Analysis Heat Map (Right)

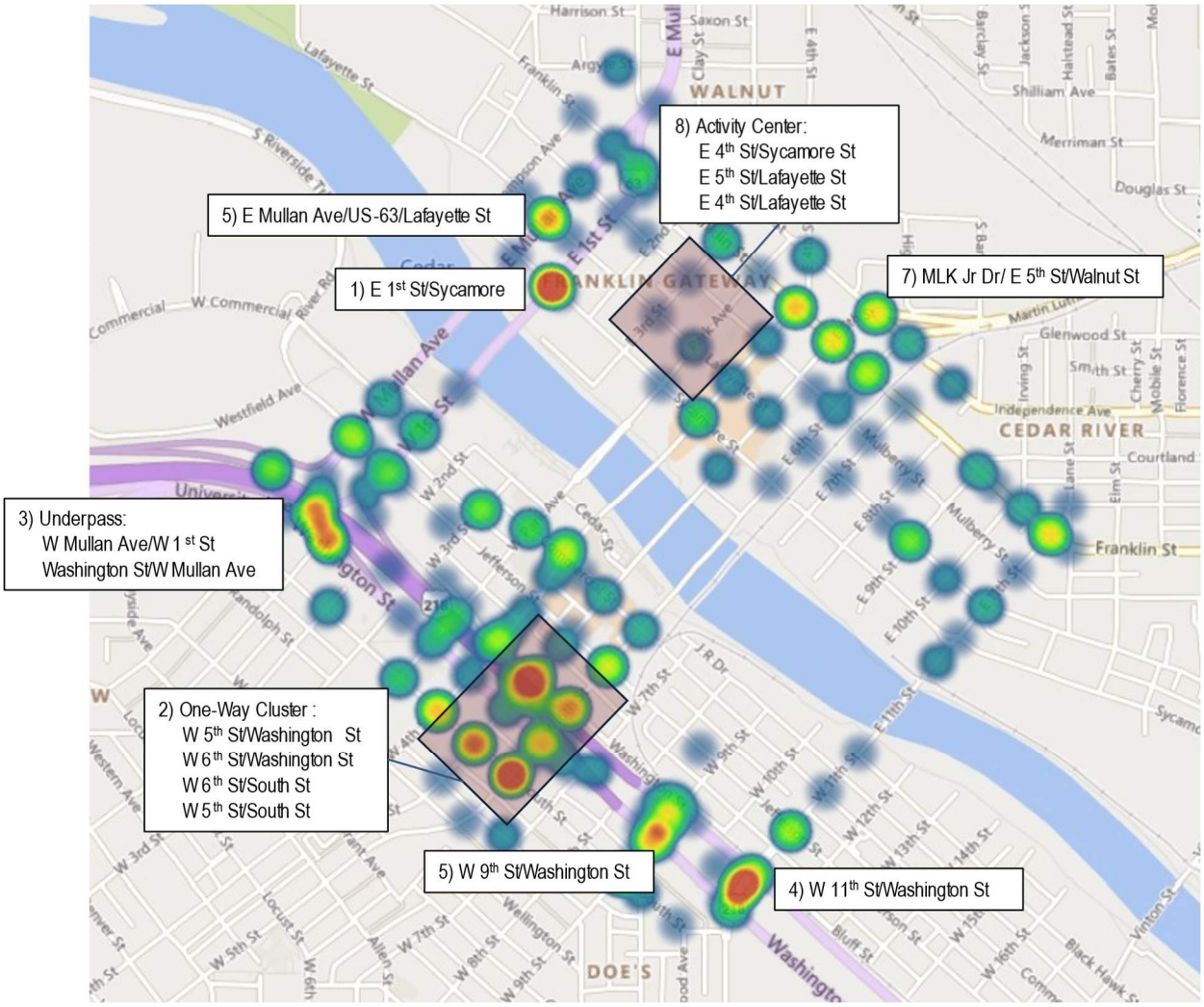


Based on this information, locations with similar roadway features and safety issues were grouped together, and eight preliminary priority locations, shown in Figure 56, were identified and presented to the steering committee. The preliminary priority locations presented to the steering committee are as follows:

1) East 1st Street (US-63 N) at Sycamore Avenue
2) One-Way Cluster, consisting of:
    a. West 5th Street at Washington Street
    b. West 6th Street at Washington Street
    c. West 5th Street at South Street

   d. West 6th Street at South Street
3) Underpass, consisting of:
   a. West Mullan Avenue (US-63 S) at West 1st Street
   b. University Avenue at Washington Street
4) West 11th Street at Washington Street (US-218)
5) West 9th Street at Washington Street (US-218)
6) East Mullan Avenue (US-63 N) at Lafayette Street
7) Martin Luther King Jr. Drive / East 5th Street at Walnut Street
8) Activity Center, consisting of:
   a. East 4th Street at Sycamore Street
   b. East 5th Street at Lafayette Street
   c. East 4th Street at Lafayette Street

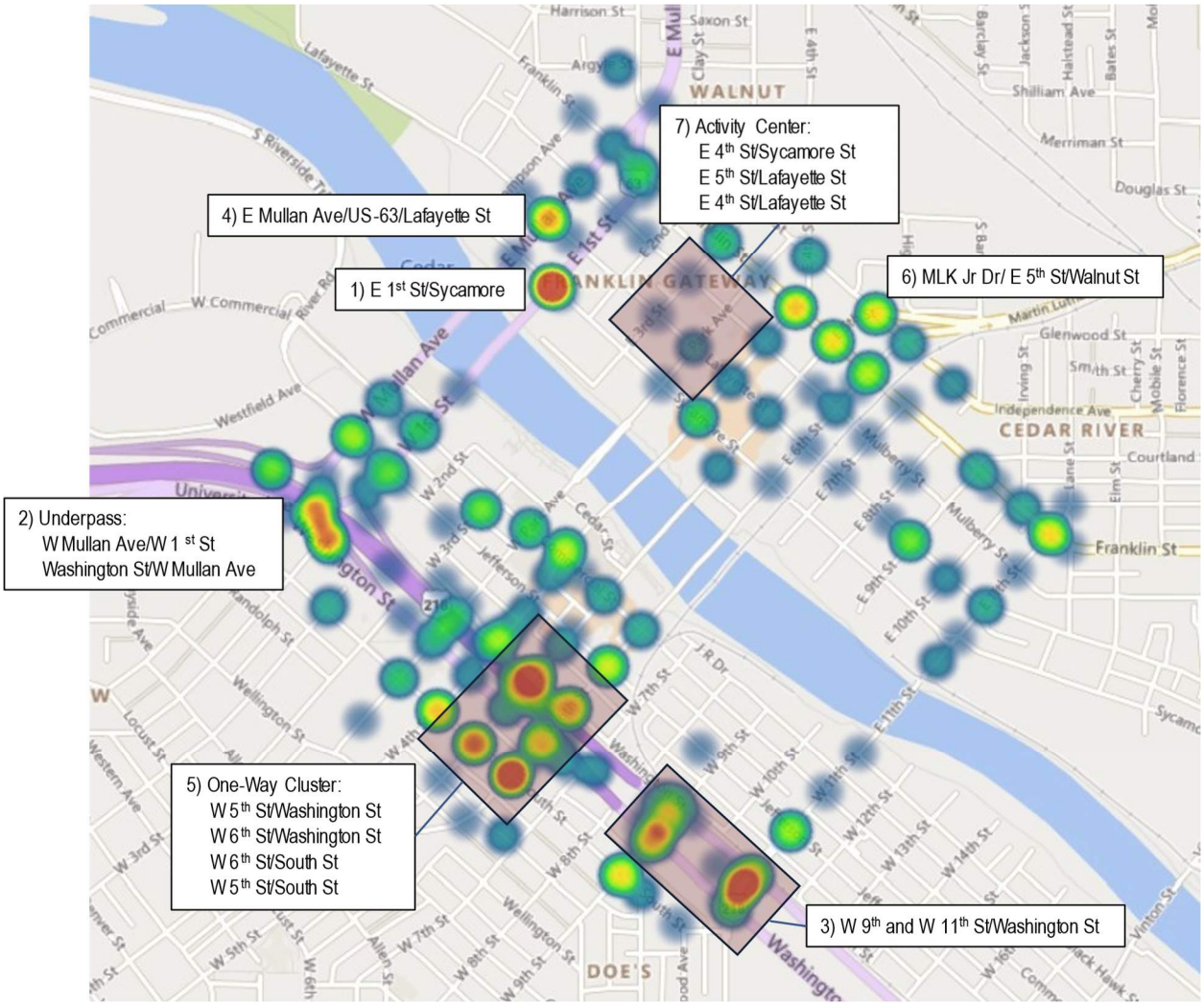
Figure 56: Heat Map of Preliminary Priority Locations



After discussing each location and based upon current traffic changes and other ongoing efforts affecting the Activity Center and the proposed one-way to two-way conversion of West 5th Street and West 6th Street, the committee finalized the following priority location list shown in Figure 57. Basic layout of recommendations and planning-level cost estimates are provided for the top three priority locations. The finalized priority locations are as follows:

1) East 1st Street (US-63 N) at Sycamore Street
2) East Mullan Avenue at University Avenue (US-218 Underpass)
3) West 9th Street and West 11th Street at Washington Street (grouped)
4) East Mullan Avenue (US-63 S) at Lafayette Street
5) One-Way Cluster
6) Martin Luther King Jr. Drive / East 5th Street at Walnut Street
7) Activity Center

Figure 57: Heat Map of Finalized Priority Locations



Recommendations

OVERALL

Throughout the study area, there were problems that were routinely identified at the intersections. The most common cause of crashes was due to drivers failing to follow proper traffic control, at both signalized and unsignalized intersections. This was also a consistent theme throughout the survey responses where residents of Waterloo commented on frequent red light and stop sign running. Due to the widespread prevalence of these issues, area wide recommendations are as follows:

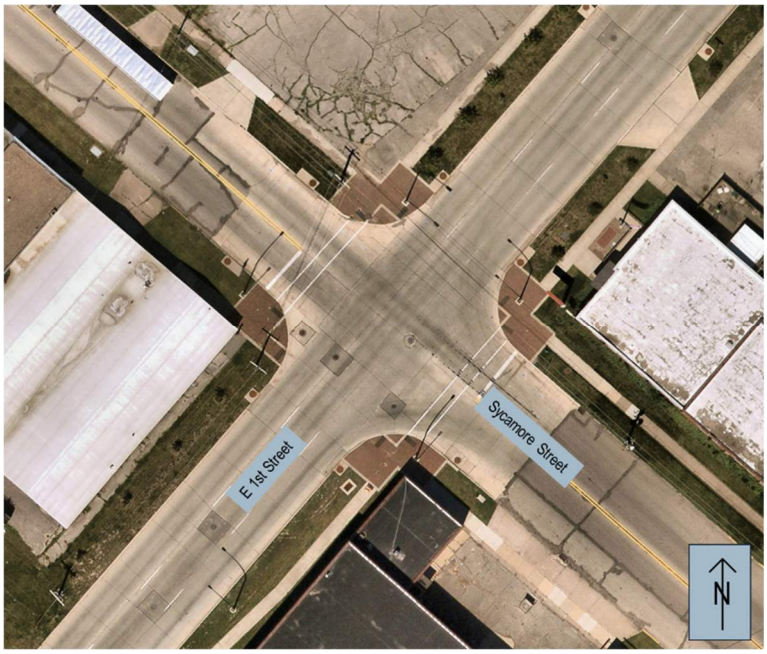
- Conduct a road safety audit that evaluates intersections with an elevated number of crashes that are caused by red light running to determine common trends among the intersections.
  - Benefits of this include understanding why these intersections have a higher-than-average frequency of crashes occurring from red-light running and making improvements based on the findings.
  - If it is concluded that yellow clearance intervals contribute to red-light running, consider revising the city yellow clearance interval timing policy.
- Install backplates with 1-to-3-inch yellow retroreflective border on all signal heads.
  - Benefits of this include increasing signal head visibility to drivers during all lighting conditions.
- Evaluate all the stop signs for retroreflectivity and upgrade as needed. Install red retroreflective strips along existing sign posts with Stop (R1-1) signs.
  - Benefits of this include increasing stop sign visibility to drivers during all lighting conditions.
- Perform a crash analysis for the entire city of Waterloo to determine if adding retroreflective markers to signal heads and sign posts would be beneficial city-wide, and if so, consider a design standard or policy change to incorporate such.

It should be noted that any work performed on any road that falls within the Iowa Department of Transportation jurisdiction or at any intersection with at least one approach that is within the Iowa Department of Transportation jurisdiction will require coordination and approval of work from the agency.

EAST 1ST STREET (US-63 N) AT SYCAMORE STREET

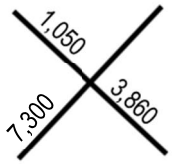
Safety Summary

- Weight: 22
- 29 Crashes – 23 daylight (79%)
- 0 Fatalities
- 1 Serious Injury
- 28 Broadside Crashes
- Major Causes
  - 18 Ran Stop Sign
  - 8 Failute to Yield Right of Way (FTYROW) From Stop Sign
- 1 Survey Comment
  - The large amount of traffic coming down from the interstate at an elevated speed has caused issues with proper distances between cars and trying to beat red lights



Location Description

- Classification: Other Principal Arterial (East 1st Street) / Collector (Sycamore Street)
- Cross Section: 3-Lane One-Way (East 1st Street) / 2-Lane (Sycamore Street)
- AADT:



- Posted Speed Limit: 35 mph (East 1st Street) / Unposted (Sycamore Street)
- Existing Facilities: Sidewalks in both directions, ADA ramps on all corners.

Narrative

Safety issues at the intersection of East 1st Street (US-63 N) and Sycamore Street were determined through the analysis of the intersection crash history, review of survey responses from community members, and observations from a field visit that occurred on Tuesday, November 5, 2024. Crash history from the most recent five years (2019 – 2023) shows that 90% of reported crashes were the result of vehicles running the stop sign or failing to yield the right of

way from the stop sign. Because 79% of the intersection crashes occurred during daylight hours, the crashes are not lighting related. There was one survey comment received about this intersection which mentioned high vehicle speeds traveling northbound along East 1st Street (US-63 N). Observations from the field visit include large turn radii and limited sight distances (less than 200 feet) from the eastbound and westbound approaches along Sycamore Street due to the buildings located in the southeast and southwest corners of the intersection. Based on *A Policy on Geometric Design of Highway and Streets by the* American Association of State Highway and Transportation Officials (AASHTO), the eastbound approach requires a minimum intersection sight distance of 390 feet and the westbound approach requires a minimum of 335 feet which is not met for either approach. The intersection, which currently operates as two-way stop-control, was previously signalized until the removal sometime between 2016 and 2019. Based on these observations, the intersection crash history is likely to originate from user noncompliance with the existing intersection traffic control, vehicles driving above the posted speed limit, and inadequate sight distances. Based on an average annual daily traffic (AADT) of 7,300 vehicles per day, East 1st Street (US-63 N) is overbuilt.

Recommended Projects/Strategies

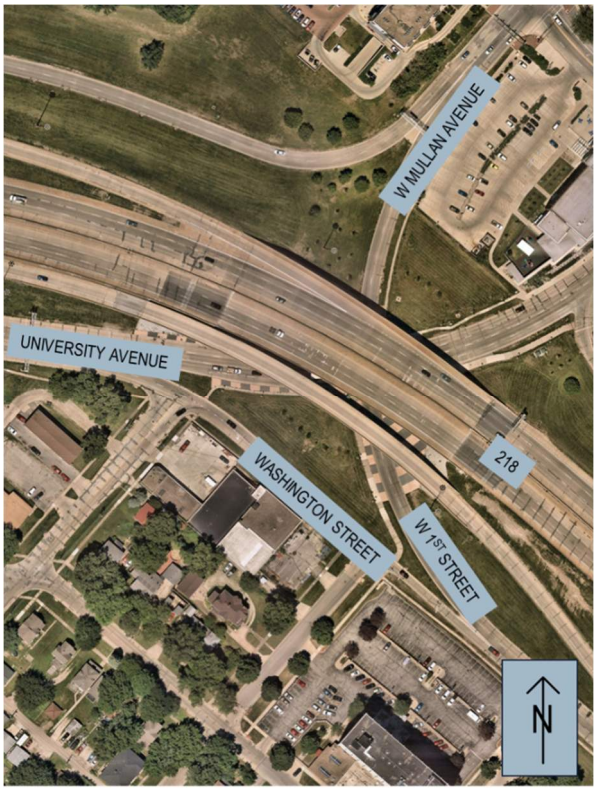
The recommendations to mitigate existing deficiencies at the intersection are as follows:

- Install curb bulb outs with flexible delineators along Sycamore Street to reduce lane widths to approximately 12 feet.
  - Benefits of this include reducing vehicle turning speeds and reducing pedestrian crossings distances, and improved sight distances.
- Study the reduction of northbound East 1st Street (US-63 N) from three to two lanes.
  - Benefits of this include reducing conflicts between northbound through vehicles and westbound right-turning vehicles and reducing northbound vehicle speeds. The traffic lanes would be shifted to improve sight distance.
- Install speed feedback signs for the northbound approach along East 1st Street (US-63 N) prior to the intersection with Sycamore Street.
  - Benefits of this include more compliance with the speed limit along East 1st Street (US-63 N).
- Install high-visibility crosswalk and appropriate pedestrian crossing warning signs for the pedestrian crossing across the northern and southern legs of the intersection.
  - Benefits of this include improving visibility for the existing pedestrian crossing across East 1st Street (US-63 N).
- Analyze the need for additional traffic control at the intersection by conducting a warrant analysis for a pedestrian hybrid beacon and a warrant analysis for a traffic signal at the intersection by following the guidelines in Chapter 4 of the MUTCD.
  - Benefits of this include providing pedestrians with a protected crossing phase. Additionally, it would reduce sight distance limitations for eastbound and westbound vehicles if a traffic signal is installed.

A concept drawing for proposed intersection improvements can be seen in Attachment A. **The planning level cost of these improvements is estimated at $150,000 for engineering and construction without any traffic signalization. An additional $500,000 should be included for designing and constructing a traffic signal.**

US-218 UNDERPASS

West Mullan Avenue at University Avenue
University Avenue at Washington Street

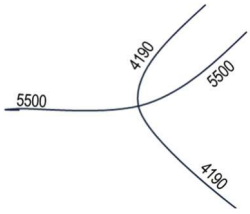


Safety Summary

- Weight: 13/13
- 18 Crashes – 14 daylight (78%)
- 0 Fatalities
- 3 Serious Injuries
- 5 Broadside Crashes / 5 Rear End
- Major Causes
- 5 Ran Traffic Signal
- 9 Survey Comments
  - I see drivers running red lights through the US 63/West Mullan intersection every day.
  - Too many lanes coming together, crossing into other lanes
  - We regularly see vehicles travelling on W. Mullan Ave. who run the stop light where it crosses W. 1st St./University Avenue.
  - Drivers very often run the red lights under the overpass because the traffic lights change too quickly from yellow to red. I see people routinely run both sets of lights on my daily commute. Also, the warning caution lights for 63 northbound do not turn on until the red light is on. What is the point of even having them if that is all they do? The should turn on when the light is still green to warn drivers that the light is changing soon and to slow down.
  - Drivers routinely run red lights and speed through the intersection while traveling southbound on Mullan Ave where it intersects 1st street under hwy 218.
  - Round abouts are dangerous
  - Complicated area to drive
  - Cars coming off highway
  - Very busy road and low visibility of the oncoming traffic
  - Intersection is dangerous. People are speeding, run the red light, change lanes without signaling, drive too close to vehicle in front of them and in general drive badly in that area.

Location Description

- Classification: Other Principal Arterial (all)
- Cross Section: 2-Lane One-Way (W. Mullan Avenue) / 4-Lane One-Way (University Avenue) / 2-Lane One-Way (Washington Street)
- AADT:



- Posted Speed Limit: 35 mph (all)
- Existing Facilities: Sidewalks on both sides of University Avenue and east side of W. Mullan Avenue.

Narrative

Safety issues at the intersection of University Avenue and West Mullan Avenue were determined through the analysis of the intersection crash history, review of survey responses from community members, and observations from a field visit that occurred on Tuesday November 5, 2024. Crash history from the most recent five years (2019 – 2023) shows that 78% of the crashes occurred during daylight conditions and that 28% of crashes were the result of vehicles running red lights. Additionally, 17% of the crashes resulted in a suspected serious injury. There was a total of nine survey responses for this intersection with the primary issues highlighted being related to speeding, complicated intersection geometry, and red light running / possible signal timing issues. Field observations revealed poor lighting conditions at the underpass, visibility issues with the signal heads, and a low contrast between the roadway and sidewalk making it difficult for drivers to identify the edge of pavement. Since the sidewalk was recently reconstructed using federal funding, any new work done should be coordinated with the respective federal agencies to remain in compliance with previous funding requirements. Based on the analysis and observations, it appears that the intersection deficiencies are derived from poor visibility and confusing intersection geometry.

Recommended Projects/Strategies

The recommendations to mitigate existing deficiencies at the intersection are as follows:

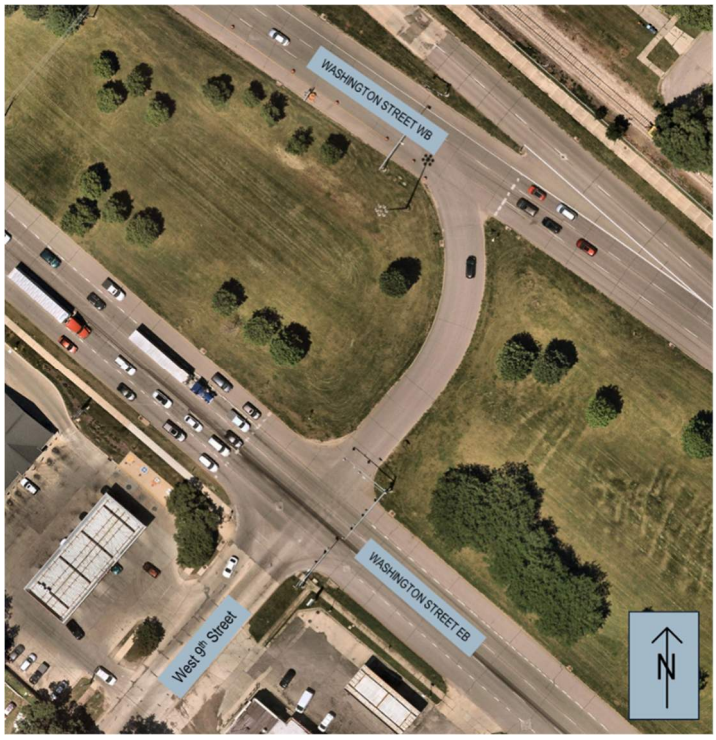
- Construct overhead traffic signal heads for the southbound approach of West Mullan Avenue.
  - Benefits of this include increased visibility for drivers and less confusing signal head configurations that could mitigate red light running.
- Redesign the landscaping under the bridge, focusing on a high contrast between the roadway and sidewalks, to provide a better designation between the two areas.

- Benefits of this include increased visibility for drivers to help mitigate vehicles driving off the road onto the sidewalk and also contributing to the look of narrower streets which can help slow driving speeds.

- Install additional under-bridge lighting to provide adequate light levels during both daytime and nighttime hours.
  - Benefits of this include increased visibility at the underpass and less drastic lighting shifts during daylight hours so drivers have an easier adjustment time.

A concept drawing for proposed intersection improvements can be seen in Attachment B. **The planning level cost of these improvements is estimated at $600,000 for engineering and construction.**

WEST 9TH AND 11TH STREETS AT WASHINGTON STREET (US-218)



West 9th Street at Eastbound Washington Street (US-218)

Safety Summary

- Weight: 11
- 24 Crashes – 15 daylight (62.5%)
- 0 Fatalities
- 0 Serious Injuries
- 8 Rear End / 6 Sideswipe / 4 Broadside
- Major Causes
  - 9 Unknown or Other
  - 3 Made Improper Turn
  - 3 Followed Too Close
- 1 Survey Comment
  - Too many people going in and leaving. Now there is the round a bout, it gets backed up. I sat on Washington while getting honked at and couldn't move.

West 9th Street at Westbound Washington Street (US-218)

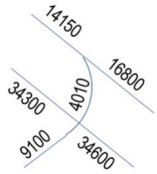
- Weight: 12
- 20 Crashes – 13 daylight (65%)
- 0 Fatalities
- 0 Serious Injuries
- 7 Rear End / 5 Broadside
- Major Causes
  - 9 Unknown or Other
  - 3 Ran Traffic Signal
- 1 Survey Comment
  - Traffic on Washington going NW looks like it's running the red light to drivers entering the expressway from 9th Street.

West 11th Street at Westbound Washington Street (US-218)

- Weight: 10
- 20 Crashes – 8 daylight (40%)
- 0 Fatalities
- 0 Serious Injuries
- 8 Rear End / 8 Broadside
- Major Causes
  - 5 Ran Traffic Signal
  - 4 FTYROW
- No Survey Comments

Location Description

- Classification: Other Principal Arterial (Washington Street) / Minor Arterial (W. 11th Street) / Local (W. 9th Street)
- Cross Section: 5-Lane One-Way (EB Washington Street) / 4-Lane One-Way (WB Washington Street) / 6-Lane Divided (West 11th Street) / 2-Lane (West 9th Street)
- AADT:
  - West 9th Street and Washington Street (US-218)



  - West 11th Street and Washington Street (US-218)

- Posted Speed Limit: 45 mph (Washington Street) / 30 mph (West 9th Street) / 30 mph (West 11th Street)
- Existing Facilities: Sidewalks on both sides of West 11th Street and on West 9th Street south of Washington Street

Narrative

The intersections of West 9th Street at Washington Street (US-218) and West 11th Steet at Washington Street (US-218) were identified as priority intersections during the analysis process.

Subsequent discussion with the Steering Committee resulted in combining the areas into a single priority corridor. Safety issues were determined through the analysis of the intersection crash history, review of survey responses from community members, and observations from a field visit that occurred on Tuesday November 5, 2024. The three intersections have a combined total of 64 crashes over the most recent five years (2019 – 2023) with 56% of those crashes occurring during daylight conditions indicating the possibility of visibility issues during unlighted hours of the day. Survey comments reported potential red light running and backups from nearby intersections flowing into other intersections. Additionally, the Steering Committee indicated that there is a weaving issue with vehicles exiting from US-218 where Washington Street and US-218 merge. In the field, it was observed that the one-way roadway signs have some visibility issues. Additionally, it should be noted that the US-218 road network is overbuilt for the existing traffic volumes (12,900 to 17,150 vpd). Based on these observations, it appears that crashes are the result of confusing intersection geometries and wide roads with many lanes that can encourage in speeding. There are also multiple crashes at West 9th Street and eastbound Washington Street (US-218) that involve wrong-way drivers.

Recommended Projects/Strategies

The recommendations to mitigate existing deficiencies at the intersection are as follows:

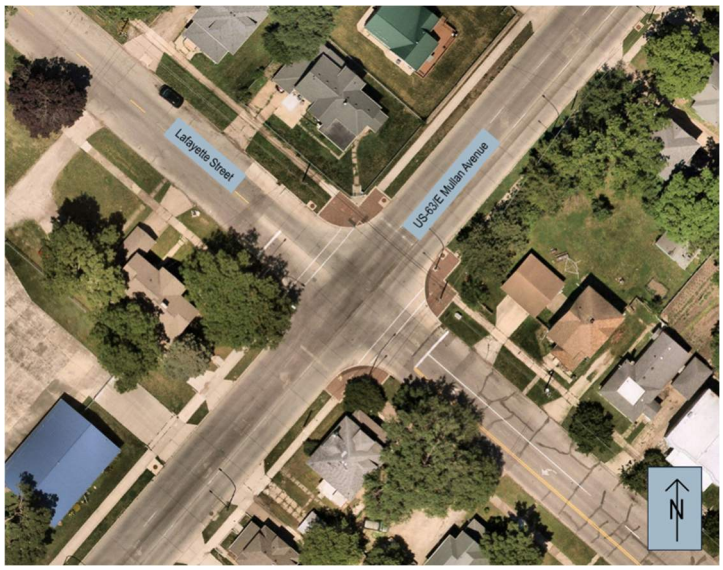
- Install lane reduction striping to remove the left-most lane from the eastbound exit of US-218 and to remove the right-most lane of the eastbound approach of Washington Street, reducing the total amount of eastbound lanes along Washington Street (US-218) from five to three at the intersection of West 9th Street.
  - Benefits of this include reducing vehicle speeds and reducing the amount of lane changes required for vehicles coming off of US-218 to get to the right-turn lane at the intersection with West 9th Street.
- At the intersection of Washington Street (US-218) and West 9th Street, install lane directional pavement markings for all approaches, replace the existing overhead no left turns sign (R3-2) with an oversized no left turns sign (R3-2), install an advanced intersection lane control sign (R3-8 mod) showing a through lane and shared through / right-turn lane for the northbound approach of West 9th Street, and replace the existing circular green signal head to a green through arrow for the left-most signal head on the northbound approach of West 9th Street.
  - Benefits of this include improving visibility for directional requirements which can reduce wrong-way maneuvers.
- At the intersection of Washington Street (US-218) and West 11th Street, convert the right-most westbound lane of Washington Street (US-218) from a shared through / right-turn lane to a channelized right-turn lane by install a concrete channelization island.
  - Benefits of this include reducing weaving conflicts that occur past the intersection and allow for the right-turn lane to be signalized. This would also remove stopped right-turning vehicles from the flow of traffic. Moderate queues can occur when the adjacent railroad crossing is active.

- At the intersection of Washington Street (US-218) and West 11th Street, remove the southbound channelization island and decrease the turn radius.
  - Benefits of this include requiring right-turning vehicles to stop behind the railroad tracks so that they are not getting stopped on the tracks and reducing vehicle turning speeds.
- Install pre-signals in advance of the at-grade railroad crossing on West 11th Street.
  - Benefits of this include better traffic signal visibility and greater compliance with vehicles stopping in advance of the railroad crossing.
- Install lane reduction striping to remove the left-most lane from the westbound approach of Washinton Street (US-218) for a lane drop between West 11th Street and West 9th Street.
  - Benefits of this include reducing weaving conflict.
- At each intersection, remove existing Do Not Enter (R5-1) signs and replace with Wrong Way (R5-1a) signs (42” x 30”). Install new Do Not Enter (R5-1) signs (36” x 36”) approximately 5 feet in front of the stop bar for the one-way approaches (if it is not feasible to install a sign in front of the stop bar, install as close as feasibly possible to do so. Install red retroreflective strips along existing and proposed sign posts.
  - Benefits of this include increasing visibility of one-way roadways.

A concept drawing for proposed intersection improvements can be seen in Attachment C. **The planning level cost of these improvements is estimated at $1,300,000 for engineering and construction.**

EAST MULLAN AVENUE (US-63 S) AT LAFAYETTE STREET

Safety Summary



- Weight: 11
- 27 Total Crashes – 23 daylight (85%)
- 0 Fatalities
- 0 Serious Injuries
- 18 Broadside
- 4 Angle (oncoming left)
- Major Causes
  - 10 Ran Stop Sign
  - 11 FTYROW
- 2 Survey Comments
  - Visibility at the Lafayette/63 intersection is not very good looking to the north
  - When leaving work on the North side of the Cedar River sometimes I travel on Lafayette Street to US 63 South. It is known as E Mullan Avenue. While travelling East on Lafayette Street we have a nice signal at E 1st Street (US 63 Northbound). It would be nice to consider a new signal at E. Mullan Avenue (US 63 Southbound) and Lafayette Street.

Location Description

- Classification: Other Principal Arterial (E. Mullan Avenue) / Collector (Lafayette Street)
- Cross Section: 3-Lane One-Way (E. Mullan Avenue) / 2-Lane Two-Way (Lafayette Street)
- AADT:

- Posted Speed Limit: 35 mph (E. Mullan Avenue) / Unposted (Lafayette Street)
- Existing Facilities: Sidewalks and ADA ramps on all corners

Narrative

Safety issues at the intersection East Mullan Avenue (US-63 S) and Lafayette Street were determined through the analysis of the intersection crash history, review of survey responses from community members, and observations from a field visit that occurred on Tuesday November 5, 2024. Crash history from the most recent five years (2019 – 2023) shows that 85% of the crashes occurred during daylight conditions and that 78% of the crashes were the result of drivers running the stop signs or failing to yield the right of way at the intersection. The two survey respondents highlighted visibility issues and the desire for a traffic signal at the intersection. Field observations revealed that intersection sight distance for the eastbound and westbound approaches are insufficient. Based on AASHTO policy, the westbound approach requires a minimum sight distance of 390 feet and the westbound approach requires a minimum sight distance of 335 feet; however, existing conditions provide approximate sight distances of 100 feet and 250 feet, respectively. Based on the analysis and observations, safety issues appear to originate from visibility deficiencies at the intersection.

Recommended Projects/Strategies

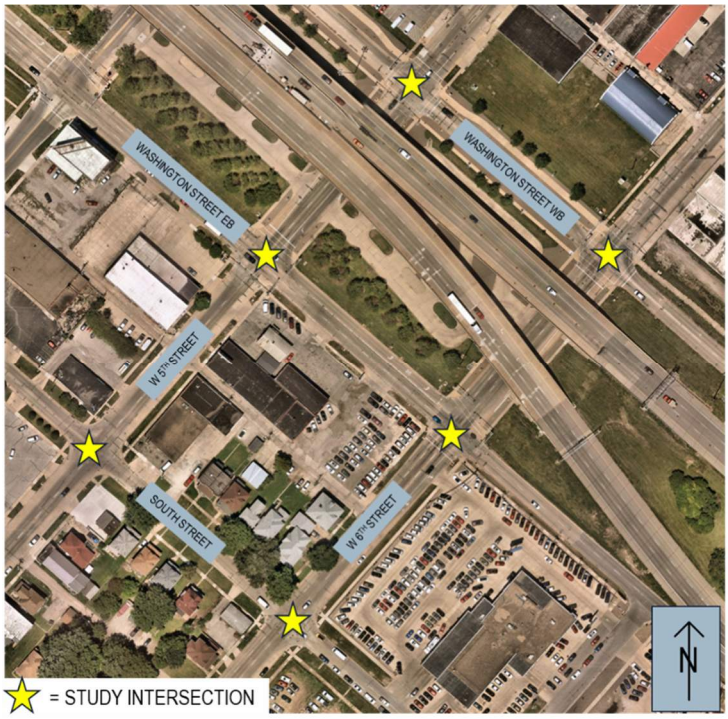
The recommendations to mitigate existing deficiencies at the intersection are as follows:

- Remove the westbound left-turn lane along Lafayette Street and convert the existing through lane to a shared through / left-turn lane.
  - Benefits of this include improving visibility for vehicles at the westbound approach by reducing obstructions from vehicles in the adjacent lane.
- Install curb bulb outs with flexible delineators along at the northeast corner of the intersection.
  - Benefits of this include reducing turning speeds and increasing intersection sight distance for westbound vehicles.
- Install bike lanes along Lafayette Street.
  - Benefits of this include providing a dedicated space for other forms of transportation as well as reducing vehicle lane widths which can reduce speeding.
- Conduct a lane reduction study and demonstration project along East Mullan Avenue (US-63 S).
  - Benefits of this include the potential to reduce the cross-section of East Mullan Avenue (US-63 S) which can reallocate space to other forms of transportation and reduce vehicle speeds throughout the area.

ONE-WAY CLUSTER

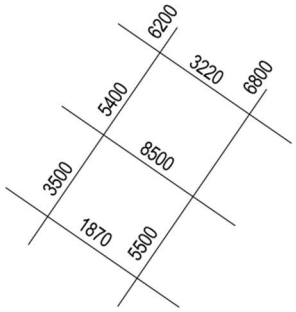
Safety Summary

- 5 out of 6 intersections in top 15 on high-injury network
- Weights: 19, 15, 13, 11, 9
- 94 Total Crashes – 67 daylight (71%)
- 1 Fatality
- 2 Serious Injuries
- 60 Broadside Crashes
- Major Causes
  - 22 Ran Traffic Signal
  - 15 Ran Stop Sign
  - 13 FTYROW From Stop Sign
- 14 Survey Comments
  - wide, fast highway dividing the downtown, pedestrian push buttons don't work, drivers speed through this area with little regards to pedestrian or bicycle activity
  - Have seen cars on Washington or 6th St not stop at the light and crash into other vehicles
  - Right turning traffic Crossing signal that hasn't worked for some time
  - People run red lights on 5th crossing Washington all the time - see it every day.
  - I chose this area (between W 1st Street, Commercial Street, W 10th Street and South St) because that is where red lights are and move people are driving continuously throughout the day.
  - I chose this area because I've seen most accidents happen here. I've also seen people blow past the stop sign near the sacred heart back parking lot because the stop sign was back by a tree.
  - I mainly drive on this road and have seen lots of accidents
  - All along Washington and 218 - busy traffic
  - We need more parking spots and put stop signs to make it safer for all.
  - Busy area with cars making it unsafe
  - Accidents could happen due to tight parking space
  - Drunk driving
  - Mullan Ave, 1st Street, and Washington: cannot change lane fast enough when there's only one. Need extra lane
  - I seen a lot of accidents in here



Location Description

- Classification: Other Principal Arterial (Washington Street) / Minor Arterial (West 5th Street, West 6th Street) / Collector (South Street)
- Cross Section: 2-Lane One-Way (Washington Street) / 3-Lane One-Way (West 5th Street) / 3-Lane One-Way (West 6th Street) 2-Lane (South Street)
- AADT:



- Posted Speed Limit: 45 mph (Washington Street) / 30 mph (West 6th Street) / 35 mph (25 mph through school zone - West 5th Street)
- Existing Facilities: Sidewalks on both sides of West 6th Street and West 5th Street. Sidewalks on north side of WB Washington Street and south side of EB Washington Street.

Narrative

The six intersections within this cluster were grouped together due to similar intersection conditions and crash rates. Safety issues at the intersections were determined through the analysis of the intersection crash history, review of survey responses from community members, and observations from a field visit that occurred on Tuesday November 5, 2024. Crash history from the most recent five years (2019 – 2023) shows five out of six of the intersections are a part of the high injury network, 71% of crashes occurred during daylight conditions, and 53% of the crashes were the result of drivers failing to follow intersection traffic control. There was a total of fourteen survey responses for these intersections with a common theme of drivers failing to follow intersection traffic control, witnessing drivers speed and frequent crashes, traffic control devices not working properly, and a general feeling of being unsafe. Field observations revealed overbuilt intersections and sight distance issues. Based on the analysis and observations, it appears that many of the intersection deficiencies originate from drivers not following intersection traffic control, overbuilt roadways that can encourage speeding, and inadequate intersection sight distances.

Recommended Projects/Strategies

The City of Waterloo has identified plans to convert West 5th Street and West 6th Street from one-way to two-way segments. This conversion should mitigate many of the existing issues.

Because of this proposed project, quick build and lower cost measures were identified. The recommendation to mitigate existing deficiencies at the intersection are as follows:

- Install curb bulb outs with flexible delineators along minor street approaches to reduce lane widths to approximately 12 feet (concept A in the figure).
  - Benefits of this include increased sight distances, reducing vehicle speeds and reducing the crossing distances for pedestrians.

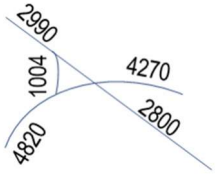
MARTIN LUTHER KING JR. DRIVE / EAST 5TH STREET AND WALNUT STREET

Safety Summary

- Weight: 9
- 7 Total Crashes – 5 daylight (71%)
- 0 Fatalities
- 1 Serious Injury
- 3 Broadside / 2 Angle / 2 Head-On
- Major Causes
  - 3 FTYROW Making Left
- No Survey Comments

Location Description

- Classification: Minor Arterial (East 5th Street / MLK Jr. Drive) / Collector (Walnut Street)
- Cross Section: 3-Lane One-Way (East 5th Street / MLK Jr. Drive) / 2-Lane (Walnut Street)
- AADT:



- Posted Speed Limit: 30 mph (East 5th Street / MLK Jr. Drive) / 30 mph (Walnut Street)
- Existing Facilities: Sidewalks on both sides of Walnut Street and on East 5th Street south of MLK Jr. Drive.

Narrative

Safety issues at the intersection Martin Luther King Jr. Drive / East 5th Street and Walnut Street were determined through the analysis of the intersection crash history, review of survey responses from community members, and observations from a field visit that occurred on Tuesday November 5, 2024. Crash history from the most recent five years (2019 – 2023) shows 71% of crashes occurred during daylight conditions, 43% of crashes were the result of westbound left-turning vehicles failing to yield the right of way, and that 29% of crashes were a head-on collision. The large percentage of failure to yield right of way are likely caused from inadequate gaps to safely make the turn and the high percentage of head-on collisions is likely due to the confusing intersection geometry. No survey responses were received about this

intersection. Field observations revealed large curb radii that encourage high turning speeds. Additionally, the southeast corner of the intersection looks as if it was designed to be a channelized right turn despite not being able to make that maneuver due to Martin Luther King Jr. Drive / East 5th Avenue being a one-way roadway which can lead to confusion for drivers unfamiliar with the area. Based on the analysis and observations, it appears that the intersection deficiencies originate from confusing intersection geometry and existing signal phasing.

Recommended Projects/Strategies

The recommendations to mitigate existing deficiencies at the intersection are as follows:

- Convert the signal to split phasing.
  - Benefits of this include removing left turn conflicts for westbound vehicles which is where almost half of the crashes have occurred.
- Remove the large curb in the southeast corner of the intersection by installing a curb bulb out using armadillo delineators and relocating the west stop bar on Walnut Street approximately 100 feet west.
  - Benefits of this include removing some of the confusing geometry at the intersection and decreasing pedestrian crossing distances.

ACTIVITY CENTER

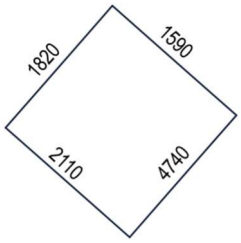
Safety Summary

- Weight: N/A
- 19 Total Crashes – 16 daylight (84%)
- 0 Fatalities
- 0 Serious Injuries
- Major Causes
  - 6 Ran Traffic Signal
  - 6 Unknown or Other
- 14 Survey Comments
  - E 4th Street/Sycamore Street
    - Lots of red lights, stale yellow lights get blown through. Lots of jay walking, scooters on sidewalks. Make east 4th street from Sycamore to Mulberry a pedestrian only zone. Barriers put in place to move traffic, ability to have deliveries though
    - Hi Restaurant and night life area
    - I've seen people run red lights here and a car/ bicycle accident
    - My spouse and I were nearly struck by a vehicle that didn't allow us to cross then they yelled an epithet at us. Very frightening. Definitely, more pronounced pedestrian walkway signage and brighter crosswalk paint.
    - I see speeders here a lot, and people crossing the street in the middle of the street and not looking where they are walking.
    - This intersection and the one in between Screaming Eagle and El Patron are the worst in my opinion for running lights
    - There is a decent amount of pedestrian traffic (Present residents, attendees of the Beer Garden, people dining at restaurants or going to Cigar Store) and have heard 2 accidents that I can recall. Generally people waiting at the light to go NB or turning right. There isn't a great street to make a "ped mall" but could use one.
    - There is is always traffic in this area, driving, walking and the scooters. People don't pay attention to others only what they are doing.

- E 5th Street/Lafayette Street
  - I work near here, so see it every day. People run the red lights/ try to beat the yellow lights on the corner of E. 5th and Lafayette constantly! I see people driving the wrong way down the one way every day. Drivers ignore the crosswalk signals, so even if you as a pedestrian have a walk light, you end up waiting for cars to turn who don't care. Visibility coming out of the parking lots in the area is terrible, especially if there are larger vehicles parked. I think part of this is being so close to the court house, so you have a lot of people driving downtown who may not be familiar with the streets. On Tuesdays, it's when the people who were notified for jury duty are also downtown, and again if they don't normally come downtown they are unfamiliar with the area and the streets. Better crosswalks with some sort of signals to give the pedestrian a head start? (Maybe the light is green for pedestrians only, but stays red for vehicles?) Along with a no turn on red? Better lighting at night. More clearly marked "One Way" streets. I feel like E 4th Street is more safe, simply because there are more businesses there. The lighting is better, there are more people out walking, people seem to drive slower. Once you go even a block off 4th in any direction, it seems like the areas are "forgotten about". We also would like more lighting, and some of the other amenities that seem to get put into E. 4th St. If the whole "downtown" Waterloo area is affected, they need to make improvements in all the areas of downtown, not just one particular street
  - I see a lot of people walking across the street in non-crosswalk areas.
  - The speed on these one ways are not conducive to walking, biking or pedestrians of any sort. Turn 4th street into a ped mall Enhanced bike lanes Enhanced pedestrian zones and cross walk One way to 2 way conversions
- E 4th Street/Lafayette Street
  - All four of the concerns listed above seem to occur fairly regularly at the intersection of East 4th Street and Lafayette Street. This is, of course, one of the busiest commercial areas of downtown and those concerns and the intensity of commercial usage/activity at that corner make it feel less safe
  - I've been sitting at patron and have seen dozens of cars run the red light on 4th by Screaming Eagle.
  - The location on Lafayette St between Park St and 5th St is heavily used for deliveries which I understand are necessary but it causes issues with visibility trying to see around them on such a narrow street also the parking lots with all the angled street parking is full, very difficult to see if cars are coming either direction.

Location Description

- Classification: Minor Arterial (East 5th Street) / Collector (East 4th Street / Sycamore Street / Lafayette Street)
- Cross Section: 2-Lane One-Way (East 5th Street) / 2-Lane (East 4th Street / Sycamore Street / Lafayette Street)
- AADT:



- Posted Speed Limit: 30 mph (East 5th Street) / 25 mph (East 4th Street) / Unposted (Lafayette Street / Sycamore Street)
- Existing Facilities: Sidewalks on both sides of all streets, and ADA ramps on all corners.

Narrative

The four intersections in the activity center were grouped together due to similarities in intersection geometries and the frequencies of survey responses about the general area. Safety issues at the intersections were determined through the analysis of the intersection crash history, review of survey responses from community members, and observations from a field visit that occurred on Tuesday November 5, 2024. Crash history from the most recent five years (2019 – 2023) shows that 84% of crashes occurred during daylight conditions and 32% were the result of drivers running red lights. There was a total of fourteen survey responses for the activity cluster with the general theme of the comments related to heavy pedestrian traffic, drivers failing to yield the right of way to pedestrians, vehicles speeding, and vehicles traveling the wrong way down one-way streets. Field observations noted heavy pedestrian volumes. Analysis and observations show that there does not seem to be many existing deficiencies in the area but that there is a community desire to improve pedestrian facilities within the area.

Recommended Projects/Strategies

Recommendations for improving the area are as follows:

- Daylight the intersections by removing nearby obstructions such as on-street parking too close to the intersection.
  - Benefits of this include improving intersection visibility for both vehicles and pedestrians.
- Install street lighting along East 5th Avenue.
  - Benefits of this include improving visibility during non-daylighted hours.

- Conduct a pedestrian mall trial period by implementing temporary street closures for pedestrian-only days.
    - Benefits of this include having a trial period on how closing some of the streets to pedestrians would impact traffic conditions and nearby businesses as well as gauge an understanding of community feelings towards a permanent pedestrian mall.
- Conduct a study and demonstration project converting the area into a Mini Superblock.
    - Benefits of Superblocks include increasing green space, reducing air pollution levels, reducing crashes and crash severity for all users, maintenance of existing parking. For more information see the following resources:
        - The potential of implementing superblocks for multifunctional street use in cities (www.nature.com/articles/s41893-022-00855-2)
        - Changing the urban design of cities for health: The superblock model (doi.org/10.1016/j.envres.2024.118550)
- Increase police presence in the area.
    - Benefits of this include enforcement of traffic control, and an overall feeling of safety.

An implementation matrix for each focus-area has been developed. The implementation matrix highlights related safety issues, countermeasures, applicable safe system element(s), applicable safe system roadway design hierarchy, estimated time frame, estimated cost, and additional resources. The implementation matrix can be found in Attachment D.

PROGRESS AND TRANSPARENCY

During the implementation phase of any planning process, it is important to keep the public informed of any progress towards the goal. At a minimum, this should be accomplished by
1) publishing this report on a public website; and
2) reporting yearly on recommendation implementation and fatal and serious injury reductions towards a goal of zero.

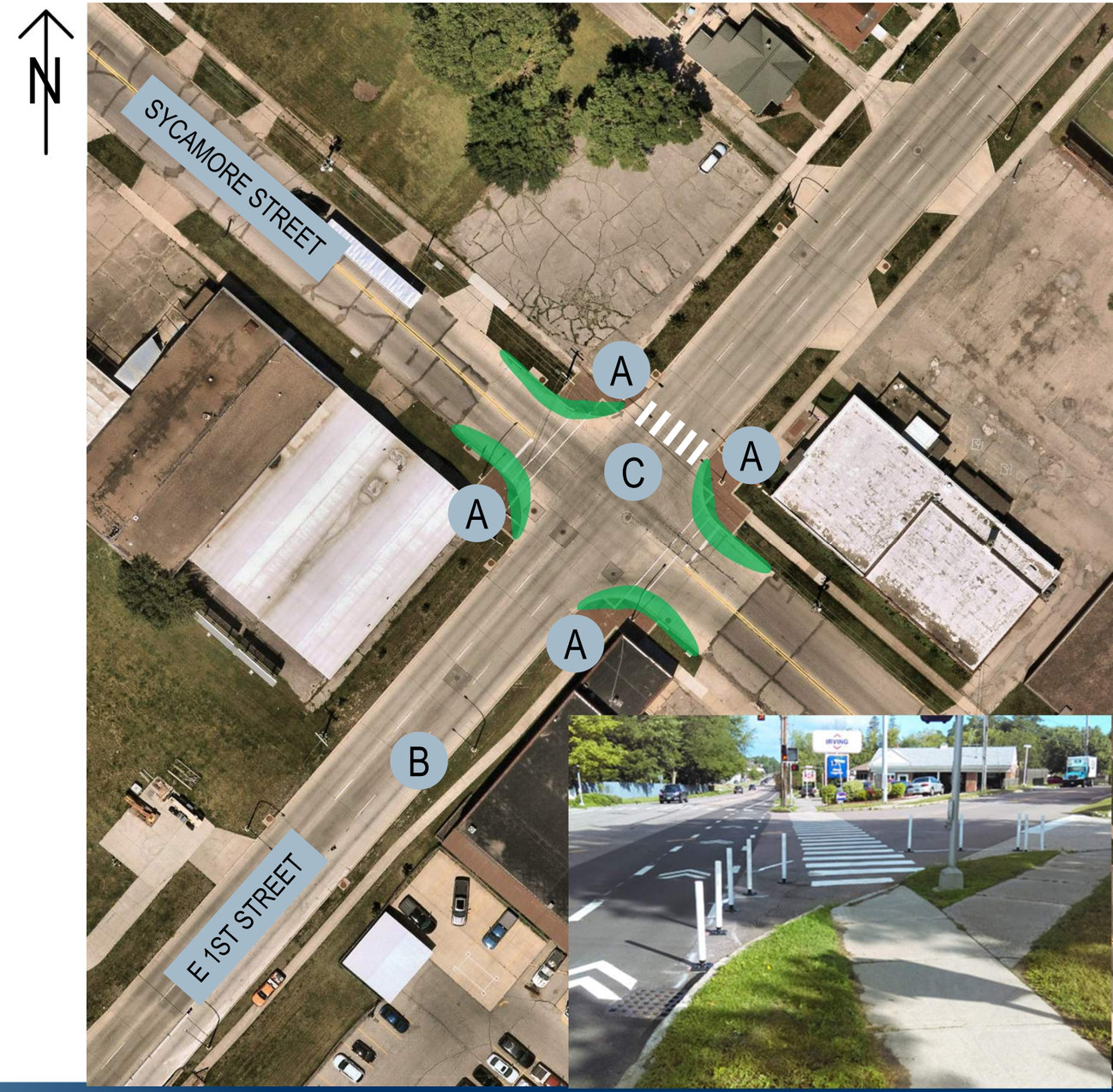
- Work with the Steering Committee to establish a regular venue and schedule for public progress reporting.
  - Benefits of this include providing transparency to the public and creating a regular checkpoint to ensure progress is being made allowing for modification to the implementation plan if progress is not sufficient to reach the established reduction goal.

Attachment A

East 1st Street (US-63 N) and Sycamore Street Concept Plan

E 1st Street and Sycamore Street

- A: Install curb bulb outs with flexible delineators along Sycamore Street to reduce lane widths to approximately 12’ to reduce pedestrian crossing distances and vehicle speeds. See example below.
- B: Study the reduction of removing the right-most northbound lane of E 1st Street to reduce conflicts between northbound through vehicles and westbound right turning vehicles and to reduce northbound travel speeds. Install speed feedback signs
- C: Add high-visibility crosswalks and warning signs for the crosswalks across E 1st Street



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Attachment B US-218 Underpass Concept Plan

US-218 Underpass

SOUTHBOUND W MULLAN AVENUE

EASTBOUND UNIVERSITY AVENUE

- A: Construct overhead traffic signals for the southbound approach of W Mullan Avenue to increase visibility for drivers.
- B: Redesign the landscaping under the bridge to provide a better designation between the roadway and sidewalk.
- C: Install street lighting that is always on to increase visibility under the bridge.

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US-218 Underpass

- D: Reduce the number of lanes on University Avenue from 4 to 2 through the intersection to reduce travel speeds

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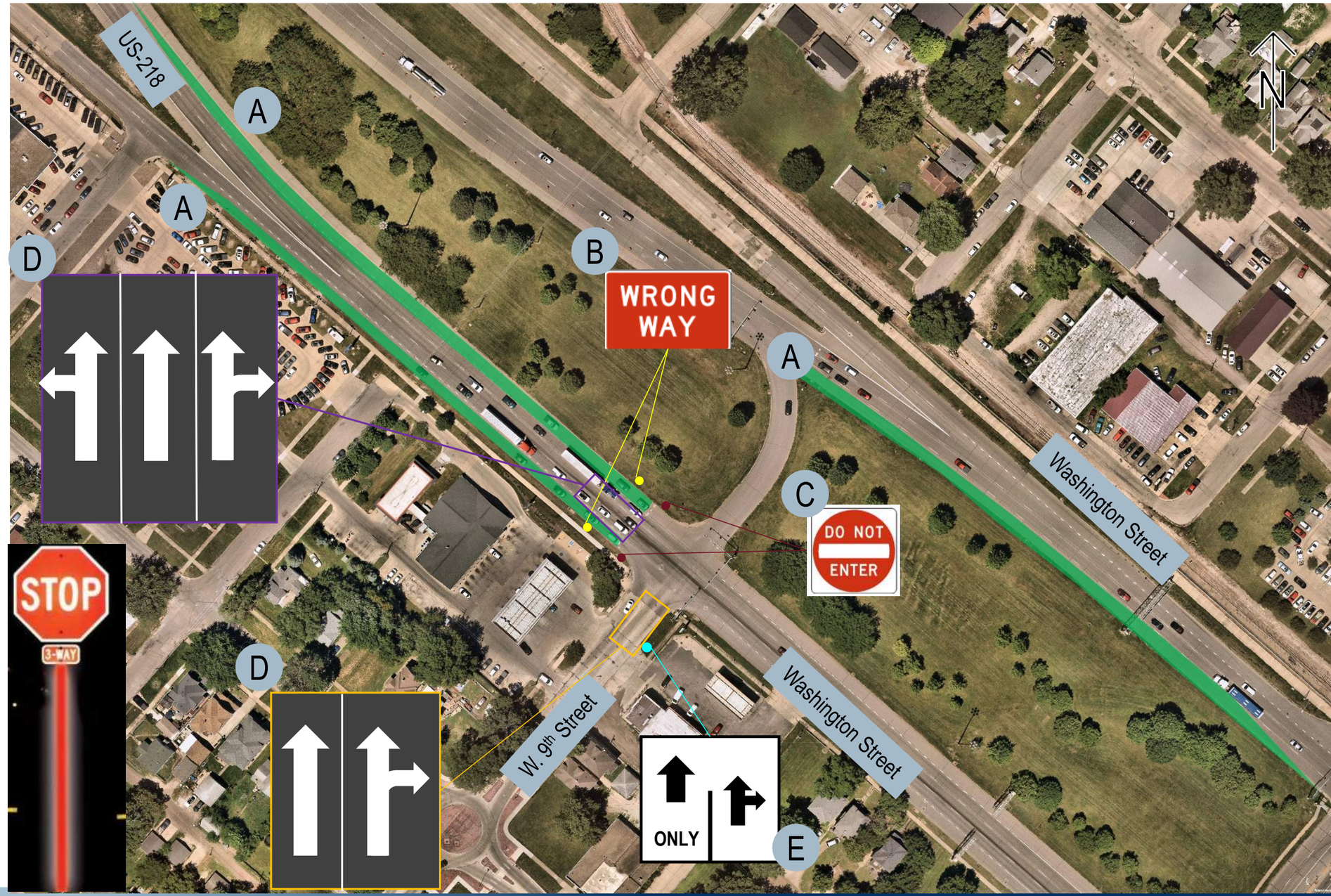
Attachment C

West 9th Street at Washington Street (US-218) and West 11th Street at Washington Street (US-218) Concept Plan

W 9th Street and Washington Street

- A: Install lane reduction striping
- B: Replace Do Not Enter signs with Wrong Way signs on existing sign post. Install red retroreflective border on sign post.
- C: Install Do Not Enter signs with red retroreflective strips on sign posts approximately 30 feet east of existing ones.
- D: Install directional pavement markings.
- E: Install advanced lane contol sign



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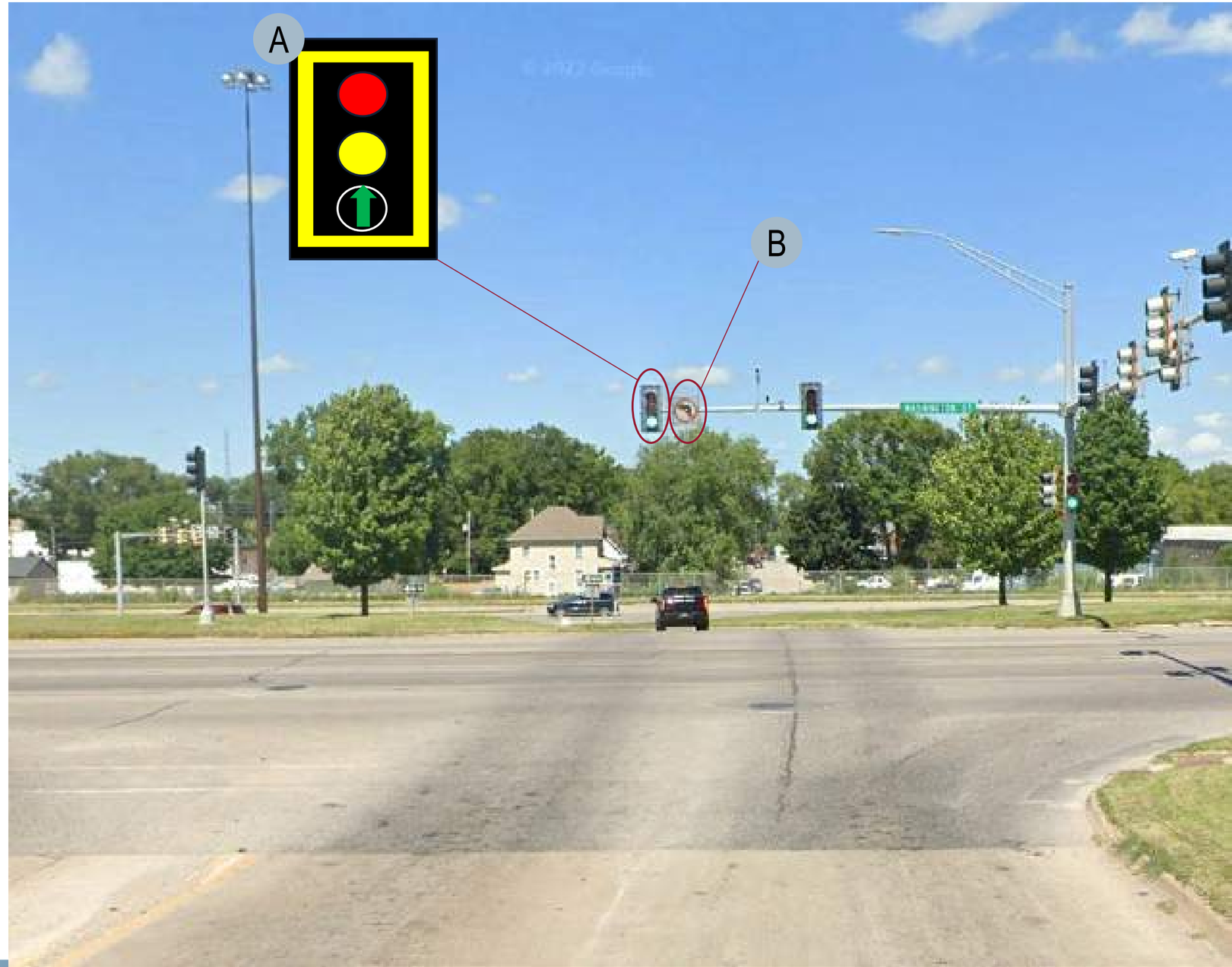
W 9th Street and Washington Street (Northbound approach)

- A: Replace green circular bulb with green arrow pointing straight through the intersection for the left-most signal head only
- B: Remove existing no left turn arrow sign and replace with oversized no left turn sign



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W 11th Street and WB Washington Street

- A: Remove concrete channelization island and decrease the turn radius
- B: Convert the shared through / right-turn lane to a dedicated right-turn lane by Installing a concrete channelization island
- C: Replace Do Not Enter signs with Wrong Way signs on existing sign post. Install red retroreflective border on sign post.
- D: Install Do Not Enter signs with red retroreflective strips on sign posts approximately 70 feet west of existing ones.
- E: Install pre-signals for the traffic signal that are placed in advance of the railroad warning equipment.

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Attachment D Implementation Matrix

Location	Safety Issue	Countermeasures for Consideration	Safe System Element	Safe System Roadway Design Hierarchy	Time Frame	Cost	Additional Resources
Area-wide	Red light Running	Install backplates with retroreflective borders on all traffic signals.	Safer Roads	Tier 4: Increase Attentiveness and Awareness	Short	Low	FHWA Proven Safety Countermeasures
	Red light Running	Confirm yellow clearance intervals and all-red timings are MUTCD compliant - adjust as needed.	Safer Roads	Tier 1: Remove Severe Conflicts & Tier 3: Manage Conflicts in Time	Short	Low	FHWA Proven Safety Countermeasures
	Stop sign Running	Install red retroreflective strips on sign posts with existing Stop (R1-1) signs.	Safer Roads	Tier 4	Short	Low	MUTCD
East 1st Street at Sycamore Street	Stop sign running / failing to yield right of way	Install curb bulb outs with flexible delineators .	Safer Speeds, Safer Roads	Tier 2: Reduce Vehicle Speeds	Short	Low	FHWA Traffic Calming Measures
	Speeding along East 1st Street	Reduce southbound from three lanes to two lanes.	Safer Speeds, Safer Roads	Tier 2	Short	Low	FHWA Proven Safety Countermeasures
	Speeding along East 1st Street	Install speed feedback signs for the southbound approach along East 1st Street.	Safer Speeds, Safer Roads	Tier 2, Tier 4	Short	Low	MUTCD
	Inadequate pedestrian facilities	Install high-visibility crosswalk across the northern leg of the intersection accompanies by pedestrian signage.	Safer Roads	Tier 4	Short	Low	FHWA Proven Safety Countermeasures
West Mullan Avenue at University Avenue (US-218 Underpass)	Red light Running	Redesign the southbound approach traffic signals.	Safer Roads	Tier 3, Tier 4	Long	High	MUTCD
	Inadequate pedestrian facilities / vehicles running off roadway	Redesign the landscaping under the bridge with higher contrast between the roadway and sidewalk.	Safer Roads	Tier 3, Tier 4	Long	High	-
	low visibility	Install street lights at the underpass that remain on at all times.	Safer Roads	Tier 4	Medium	Medium	FHWA Proven Safety Countermeasures
West 9th Street at Washington Street & West 11th Street at Washington Street	Weaving conficts at the US-218 and Washington Street merge and vehicle speeding	Remove the outter most lanes of both US-218 and Washington Street before the merge to reduce the cross section from five to three lanes.	Safer Speeds, Safer Roads	Tier 2	Short	Low	FHWA Proven Safety Countermeasures
	Vehicles traveling wrong direction on one-way roads	Install lane directional pavement markings for all approaches at the intersection of Washington Street at West 9th Steet.	Safer Roads	Tier 4	Short	Low	MUTCD
	Vehicles traveling wrong direction on one-way roads	For the northbound approach of West 9th Street at Washington Street, replace existing overhead no left turns (R3-2) with an oversized R3-2 sign, install an advanced intersection lane control sign (R3-8 mod) to show a through lane and shared through / right-turn lane, and replace the existing circular green signal head over the through lane with a green arrow signal head pointing through the intersection.	Safer Roads	Tier 4	Short	Low	MUTCD
	Vehicles traveling wrong direction on one-way roads	At each intersection, remove existing Do Not Enter (R5-1) signs and replace with Wrong Way (R5-1a) signs (42" x 30") on existing sign post. Install new Do Not Enter (R5-1) signs (36" x 36") approximately 5 ft in front of the stop bar. Install red retroreflective strips along exiting and proposed sign posts.	Safer Roads	Tier 4	Short	Low	MUTCD
	Weaving conficts and railroad conflicts	For the westbound approach of Washington Street at West 11th Street, install a concrete channelization island in the right turn lane to convert it from a shared through / right-turn lane to a dedicated right-turn lane.	Safer Speeds, Safer Roads	Tier 3, Tier 4	Medium	Medium	-
	Vehicle compliance with traffic signal indications and stopped location	For the westbound approach of Washington Street at West 11th Street, install pre-signals for the traffic signal in advance of the railroad equipment.	Safer Roads	Tier 1	Medium	Medium	MUTCD
	Vehicle / Railroad conflict	For the southbound approach of West 11th Street at Washington Street remove the concrete channelization island for the right turn lane and reduce the curb radius.	Safer Speeds, Safer Roads	Tier 3, Tier 4	Medium	Medium	-
	Weaving conflicts along Washington Street (westbound)	Install lane reduction striping to remove the left-most lane along the westbound approach of Washington Street between West 11th Street and West 9th Street.	Safer Speeds, Safer Roads	Tier 2	Short	Low	FHWA Proven Safety Countermeasures

Location	Safety Issue	Countermeasures for Consideration	Safe System Element	Safe System Roadway Design Hierarchy	Time Frame	Cost	Additional Resources
East Mullan Avenue (US-63) at Lafayette Street	Inadequate intersection sight distance	Remove the existing westbound left-turn lane along Lafayette and convert the existing through lane to a shared through / left-turn lane.	Safer Roads	Tier 3	Short	Low	-
	Inadequate intersection sight distance / Vehicle speeds	Install curb bulb outs with flexible delineators in the northeast corner of the intersection.	Safer Speeds, Safer Roads	Tier 2	Short	Low	FHWA Traffic Calming Measures
	Vehicle speeds / Lack of dedicated bike facilities	Install bike lanes on Lafayette Street.	Safer Speeds, Safer Roads	Tier 1, Tier 2	Short - Medium	Low - Medium	FHWA Proven Safety Countermeasures
	Vehicle speeds	Conduct a lane reduction study and demonstration project.	Safer Speeds, Safer Roads	Tier 1, Tier 2, Tier 3, Tier 4	Long	High	FHWA Proven Safety Countermeasures
One-Way Cluster	Inadequate intersection sight distance / Vehicle speeds	Install curb bulb outs with flexible delineators along the minor street approaches to reduce lane widths to approximately 12 feet.	Safer Speeds, Safer Roads	Tier 2	Short	Low	FHWA Traffic Calming Measures
Martin Luther King Jr. Drive / East 5th Street at Walnut Street	westbound left turning vehicles not yielding right of way	Convert the signal into split phasing.	Safer Roads	Tier 1, Tier 3	Medium	Medium	-
	Vehicles traveling wrong direction on one-way roads	Remove the large curb in the southeast corner of the intersection by installing a curb bulb out using armadillo dilineators and relocation the westbound stop bar on Walnut Street approximately 100 feet west.	Safer Speeds, Safer Roads	Tier 1, Tier 2, Tier 4	Short	Low	FHWA Traffic Calming Measures
Activity Center	Pedestrian visibility at crosswalks	Daylight intersections by removing sight obstructions such as nearby on-street parking.	Safer Speeds, Safer Roads	Tier2, Tier 4	Short	Low	FHWA Traffic Calming Measures
	Perception of non-safety	Install additional street lighting along East 5th Avenue.	Safer Roads	Tier 4	Medium	Medium	FHWA Proven Safety Countermeasures
	Improvement of pedestrian facilities	Conduct a pedestrian mall trial period by implementing temporary street closures for pedestrian only days.	Safer Roads	Tier 1, Tier 3	Medium	Low	-
	Perception of non-safety	Increase police presence within the area.	Safer Road Users, Safer Roads	-	Short	Low	-
	Improvement of pedestrian facilities	Apply for additional planning / demonstration grant to conduct more detailed studies in the area.	Safer Speeds, Safer Roads	Tier 1, Tier 2, Tier 3, Tier 4	Medium	Medium	-