Southeast Iowa Regional Planning Commission

seirpc

COMPREHENSIVE SAFETY ACTION PLAN

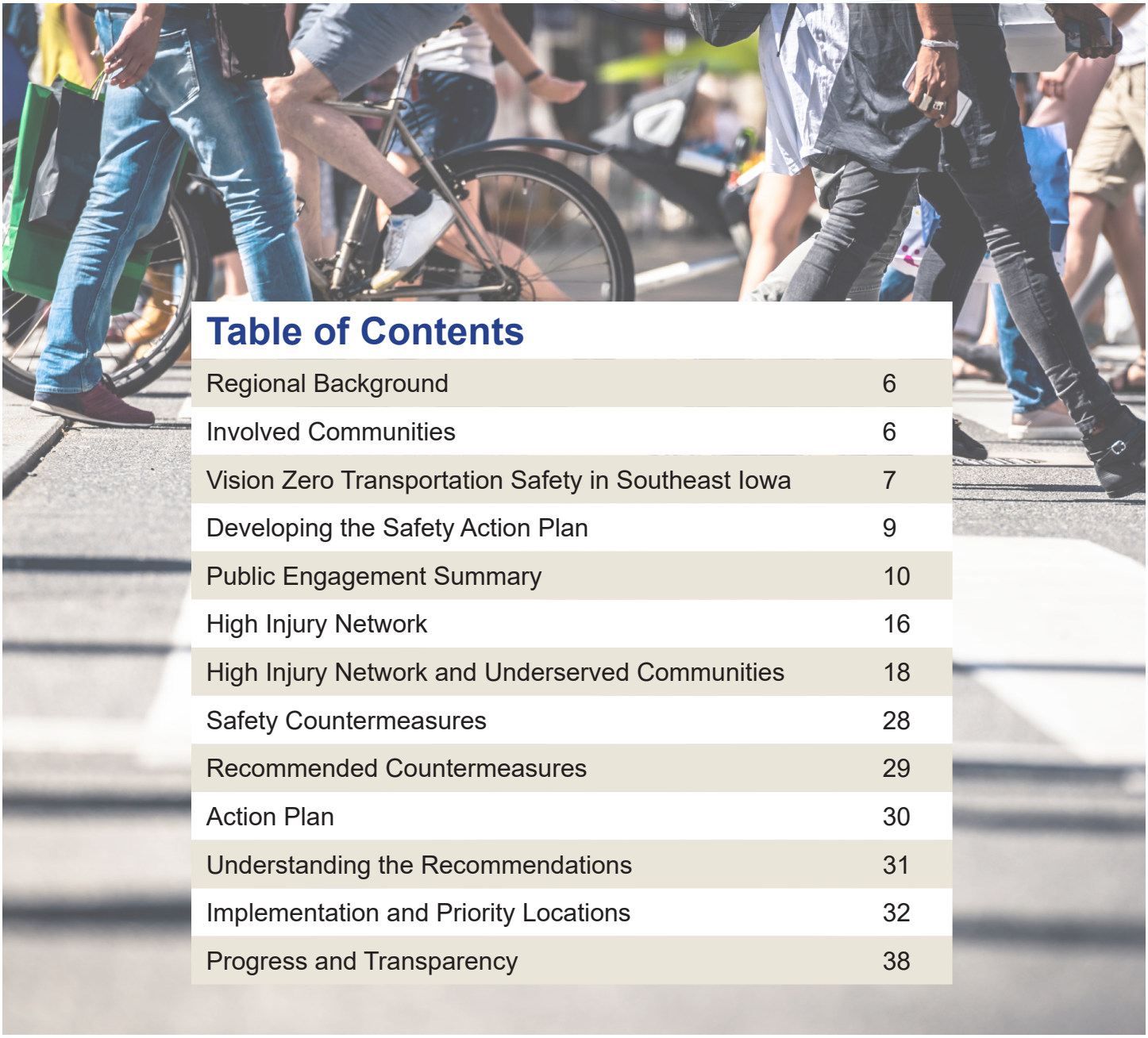


Table of Contents

Cover Image: Aerial photo from Southeast Iowa Regional Planning Commission

Figures

Tables

Appendices

Appendix A:
High Injury Network Tables

Appendix B:
Crash Data

Appendix C:
Public Survey Response Data

Appendix D:
High Injury Network Maps

Organization and Department Abbreviations

Abbreviation	Full Name
COGs	Councils of Governments
IowaDOT	Iowa Department of Transportation
FHWA	Federal Highway Administration
NACTO	National Association of City Transportation Officials
RPA	Regional Planning Affiliation
SEIRPC	Southeast Iowa Regional Planning Commission
USDOT	United States Department of Transportation

List of Abbreviations

Abbreviation	Full Name
ADA	Americans with Disabilities Act
AADT	Average Annual Daily Traffic
CIP	Capital Improvement Plan
CMF	Crash Modification Factor
CSAP	Comprehensive Safety Action Plan
FIRR	Fatal and Injury Representation Ratio
FTYROW	Failure to Yield Right-of-Way
HIN	High Injury Network
ICE	Intersection Control Evaluation
KABCO	KABCO K (Fatal), A (Serious Injury), B (Minor Injury), C (Possible Injury), O (Property Damage Only)
KSI	Killed or Serious Injury (K and A on the KABCO scale)
MUTCD	Manual on Uniform Traffic Control Devices
PROWAG	Public Right-of-Way Accessibility Guidelines
RR	Representation Ratio
SS4A	Safe Streets and Roads for All
SSA	Safe System Approach
SUDAS	Iowa Statewide Urban Design and Specifications
VRU	Vulnerable Road User

Consultant Team

Stanley Consultants INC.

IMAGES INC

Placeholder note for the resolution or commitment.

Placeholder note for the resolution or commitment.

Regional Background

The state of Iowa is composed of seventeen Councils of Governments (COGs) that serve their communities by providing planning, programming, and technical assistance to their respective jurisdictions. The Southeast Iowa Regional Planning Commission (SEIRPC) is the COG overseeing Des Moines, Henry, Lee, and Louisa counties. Within these four counties, there is a total of thirty-one municipalities. The area has a total population just over 100,000 as of 2025. The four largest cities within the SEIRPC region are Burlington, Fort Madison, Keokuk, and Mount Pleasant; additionally, these four municipalities account for roughly 96% of the population.[1] Despite the majority of the population living within cities, only 55% of the population lives within areas classified as urban with the remaining 45% living in rural areas.[2] Des Moines county has the largest percentage of urban population at 73% and Louisa has the smallest urban population with 0% living in urban areas.[3] Understanding the regional characteristics of an area is critical to being able to provide area-specific recommendations.

Because of the differences in transportation needs between rural and urban areas, SEIRPC applied for and received a planning grant through the Safe Streets and Roads for All (SS4A) program to create a Comprehensive Safety Action Plan for the thirty-one incorporated areas within Des Moines, Henry, Lee and Louisa counties. A full list of the incorporated communities can be found in Table 1 below.

Involved Communities

Table 1: Communities Included in the Planning Process

Des Moines County	Henry County	Lee County	Louisa County
Burlington	Hillsboro	Donnellson	Columbus City
Danville	Mount Pleasant	Fort Madison	Columbus Junction
Mediapolis	New London	Franklin	Cotter
Middletown	Olds	Houghton	Fredonia
West Burlington	Rome	Keokuk	Grandview
	Salem	Montrose	Letts
	Wayland	Saint Paul	Morning Sun
	Westwood	West Point	Oakville
	Winfield		Wapello

All roadways within the limits of the incorporated areas listed above are considered in this safety action plan, regardless of roadway ownership. Due to the differences in needs between urban and rural areas, roadways in unincorporated areas of these counties are being considered in a separate SS4A grant.

[1] According to SEIRPC Long Range Transportation Plan, Adopted February 27, 2025
[2] According to SEIRPC Long Range Transportation Plan, Adopted February 27, 2025
[3] According to SEIRPC Long Range Transportation Plan, Adopted February 27, 2025

Vision Zero Transportation Safety in Southeast Iowa

From 2019 to 2023, there were twenty-two fatalities and ninety life-altering injuries resulting from traffic crashes within the study area.[4] These numbers translate to an average of five people losing their life and eighteen experiencing a serious injury annually. Through the establishment of the SEIRPC Comprehensive Safety Action Plan, the region is outlining steps to follow to eliminate transportation related fatalities and serious injuries for all road users within the thirty-one communities by 2060.

What is Vision Zero

The objective of Vision Zero is that transportation injuries and fatalities should not be accepted as the norm and that through design and policy changes the number of roadway fatalities and serious injuries can reach zero.[5] Vision Zero was first implemented in Sweden in the 1990's and has since spread globally with many cities and towns throughout the United States establishing their own Safety Action Plans following Vision Zero strategies.

[4] Based on all reported crashes from 2019 through 2023 per Iowa Crash Analysis Tool (ICAT) crash data https://icat.iowadot.gov/

[5] https://visionzeronetwork.org/about/what-is-vision-zero/

Safe System Approach

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 Federal Highway Administration (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.

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: https://www.transportation.gov/safe-system-approach

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.

Developing the Safety Action Plan

The development of the Safety Action Plan included collaboration with the local communities and an analysis of the crash history. The collaboration with local communities was done through meeting and working with the Regional Safety Committee as well as conducting a survey sent out to each city located within the study region. The investigation into the crash history involved developing a High Injury Network (HIN) which was further analyzed to determine which characteristics could be contributing the most to a higher-than-average frequency of crashes.

Regional Safety Committee

To better understand the needs of the community, a Regional Safety Committee was established by SEIRPC to oversee the safety planning process. This committee consisted of representatives from the regional agency and at least one member from each county within the region. A full list of Regional Safety Committee members, their organization, and role can be found in Table 2 below.

Table 2: Regional Safety Committee Members

Name	Organization	Role
Brian Carroll	Keokuk	Public Works Director
Gary Shahan	Mount Pleasant	Building and Zoning Administrator
Jesse Howe	Burlington	Deputy Public Works Director
Kasi Howard	New London	City Clerk
Laura Liegois	Fort Madison	City Manager
Rebecca Schau	Donnellson	City Clerk
Sam Avery	SEIRPC	Regional Planner
Todd Salazar	Columbus Junction	Public Works Director
Zach James	SEIRPC	Assistant Director

The Regional Safety Committee members met three times during the development of the safety action plan. The purpose of the meetings was to present project related information and receive input. Meetings were held with the Regional Safety Committee on the following days:

- August 7, 2024
- December 16, 2024
- April 8, 2025

Public Engagement Summary

To support the Southeast Iowa Regional Planning Commission (SEIRPC) in developing a Comprehensive Safety Action Plan (CSAP) for Des Moines, Henry, Lee, and Louisa Counties, the project team led robust outreach efforts focused on inclusively gathering community voices representative of the region's demographics and increasing participation in a region-wide roadway safety survey. These efforts helped lay the groundwork for developing a crowd-sourced and data-driven plan to reduce and eliminate serious and fatal traffic injuries on public roads.

An electronic survey was distributed to all thirty-one incorporated areas within SEIRPC's region where residents were given the opportunity to submit feedback. The outreach campaign ran from November 2024 through January 2025 garnering 265 survey participants.

Outreach Strategy

Stakeholder List Development

Members of the Regional Safety Committee and SEIRPC staff engaged key contacts --at their discretion-- from local governments, community organizations, schools, advocacy groups, public safety agencies, and transportation providers across the four-county region. These contacts, which varied by city and county, were engaged to help distribute outreach materials, encourage survey participation, and amplify messaging at the local level.

Online Survey

A regional roadway safety survey was developed and launched in November 2024. It gathered public input on topics such as:

- Travel modes and habits
- Comfort level with various modes of transportation in their community
- Top safety concerns and locations of concern
- Suggestions for safety strategies
- Demographic information

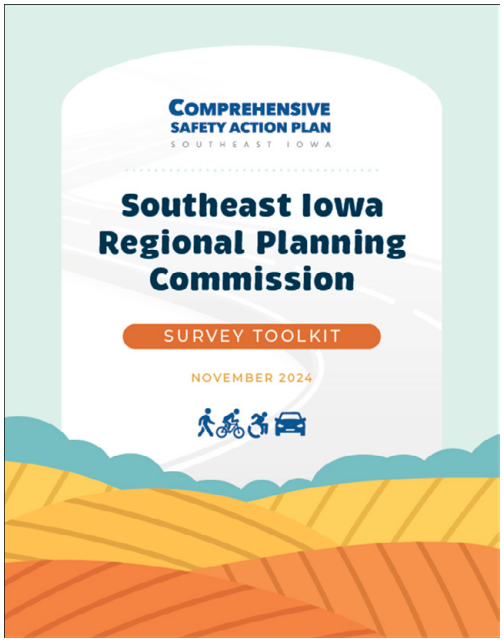
The survey link was included in a toolkit sent to community and partner organizations, with a request for them to share it broadly with their audiences.

Outreach Toolkit for Communities

An Outreach Toolkit was developed to empower local governments and community groups to promote the survey and encourage public participation. The toolkit included:

- Social media content and graphics
- Flyer and poster templates with a QR code
- Eblast copy and newsletter blurbs
- Website content and signature block add-ons
- Instructions for deploying outreach materials effectively

The toolkit made it easy for communities to customize and distribute content through their own distribution/ announcement channels.

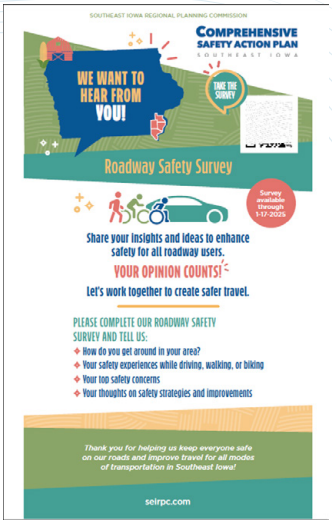


Eblast Campaign

An engaging email campaign was developed and distributed to the stakeholder list and partner organizations. The eblasts:

- Introduced the CSAP initiative
- Explained the purpose of the survey
- Highlighted how feedback would inform safety improvements
- Included a direct link and QR code to the survey

Community organizations and agencies were encouraged to send the eblast to their distribution lists.



Social Media Campaign

The toolkit included social media graphics and content to encourage participation. This included:

- Three sets of pre-written posts with varying tones and calls to action
- Coordinated messaging to align with SEIRPC's goals
- Optimized graphics for Facebook, Twitter/X, Instagram, and LinkedIn
- Posting timeframe recommendations

Community partners and stakeholders were encouraged to share posts and tag local organizations to expand reach and participation. In addition, they were encouraged to use the graphics on their websites.

Flyers and Posters

To encourage direct interaction, print materials including flyers and posters were designed and included in the toolkit. Stakeholders and partner organizations were encouraged to share the materials at:

- Festivals and community events
- City Council meetings
- Schools, libraries, and other civic locations

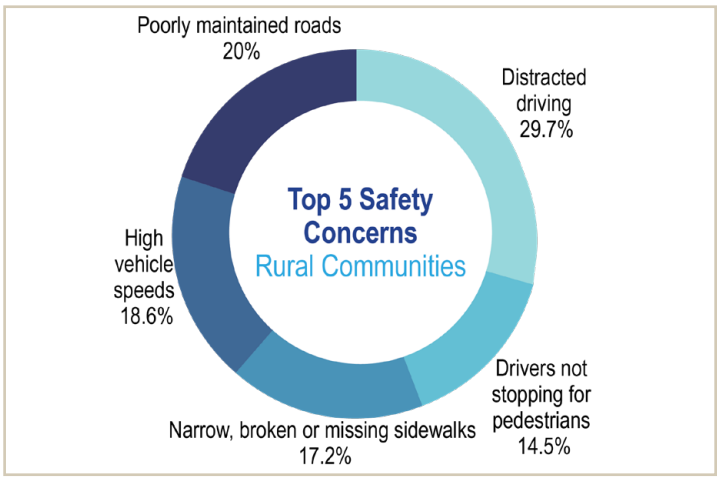
An interactive poster allowed event attendees to write their best traffic safety idea and take a photo with it.

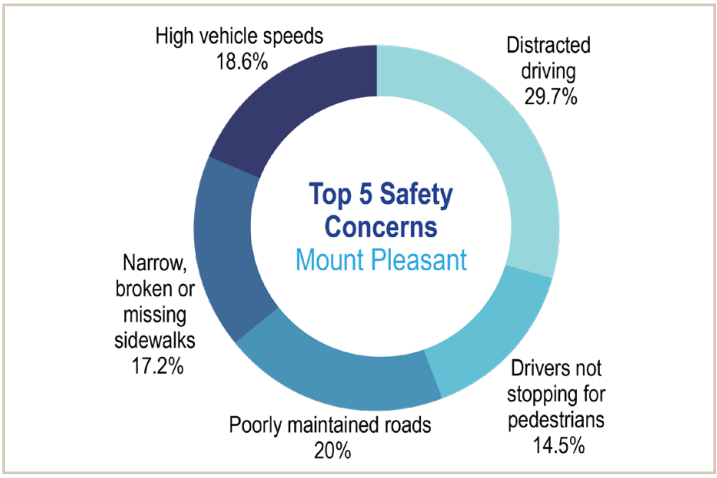
Public Feedback Results

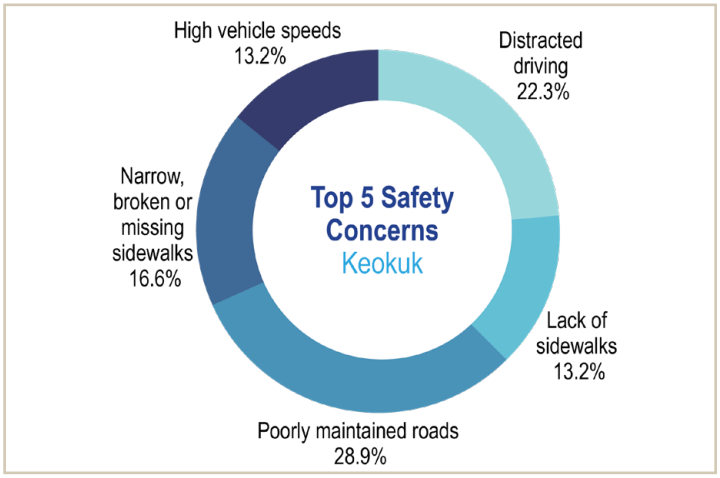
The survey outreach campaign supported SEIRPC's goal of creating a safer regional roadway network by ensuring public feedback played a central role in shaping the Comprehensive Safety Action Plan. A combination of strategic communication, accessible digital tools, and tailored messaging helped build momentum and participation. Overall, there was public support for making our streets safer, particularly for pedestrians and bicyclists. The public input survey included 14 questions covering demographics, mode choice, comfort level while traveling, safety concerns, strategies, and ideas for improving safety. Highlights from the public responses are broken down into the largest populations areas within SEIRPC (Burlington, Ft Madison, Mt Pleasant, and Keokuk) and all other urban areas collectively called the Rural Communities. Distracted driving and high vehicle speeds were consistently the most common traffic safety concern within the communities. Improving sidewalks and dangerous intersections are locations that the public experiences these issues the most.

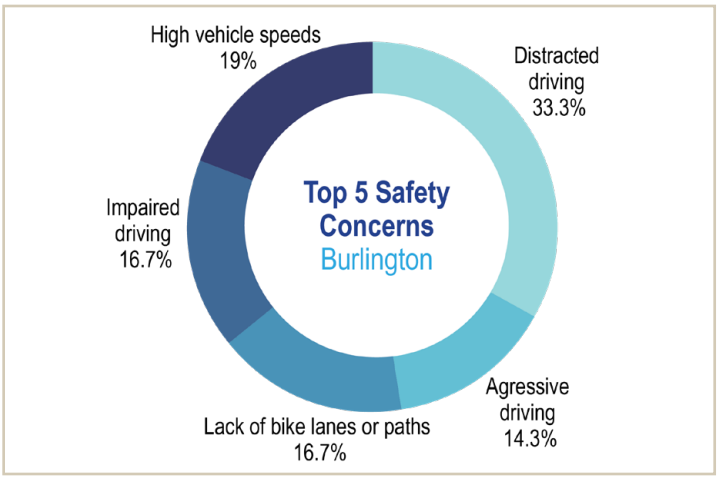
PROMPT POSED:

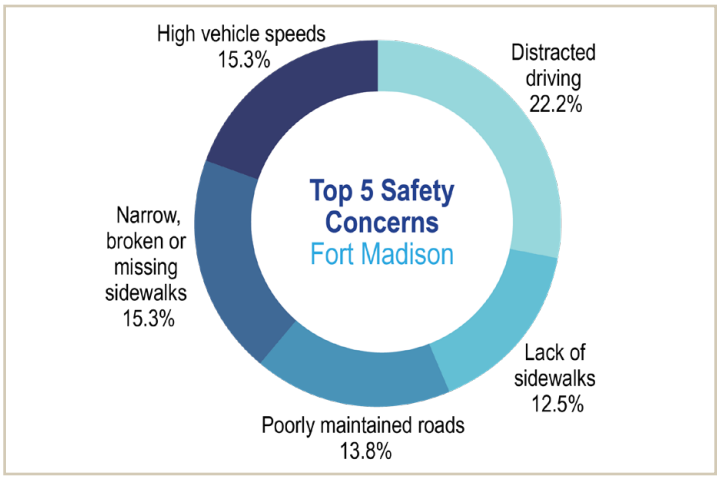
What are your top 5 traffic safety concerns in your community?
(Ranking)











PROMPT POSED:

Thinking about your Top 5 traffic safety concerns from the previous question, are there specific locations you can provide where you experience these concerns? (Ranking description: 1 is the most identified location with 10 the least identified location.)

CONCERNED LOCATIONS	RURAL COMMUNITIES	MT PLEASANT	KEOKUK	BURLINGTON	FORT MADISON	TOTAL
Sidewalks & Pedestrian Areas	1	1	1	1	1	1
Dangerous Intersections & Traffic Signals	2	2	3	2	6	2
Speeding Hotspots	4	4	5	4	5	3
Near Schools & School Zones	5	3	4	3	4	4
Highways & Major Roads	3	5	8	6	3	5
Bike Lanes & Cycling Areas	6	9	6	5	2	6
Downtown & Business Districts	7	8	2	7	9	7
Poor Lighting & Visibility	9	7	9	8	7	8
Residential Streets & Neighborhoods	8	6	10	9	8	9
Poor Road Conditions & Potholes	10	10	7	10	10	10

PROMPT POSED:

Which of the following transportation strategies should be a top priority? Rank your top 3 items (Ranking description: 1 is the most identified strategy with 10 the least identified strategy.)

STRATEGIES	RURAL COMMUNITIES	MT PLEASANT	KEOKUK	BURLINGTON	FORT MADISON	TOTAL
Stricter Enforcement	1	2	3	2	4	1
Better Road Maintenance	3	4	1	5	1	2
Making Walking Safer	2	1	2	3	3	3
Complete Street Elements	3	3	4	1	2	4
Reducing Speeds	5	6	7	5	7	6
Making Biking Safer	6	7	5	4	4	6
Signage and Striping Improvements	8	8	6	11	7	7
Installing Roundabouts	9	5	11	5	10	7
Improve Roadway Safety	7	8	9	10	6	9
Safe Driving Education	10	8	8	5	7	10
Other	12	11	10	12	12	11
More Transit Services	10	13	13	12	10	12
Prohibiting Right Turn on Red	13	11	11	5	12	12

PROMPT POSED:

Please let us know your best idea for improving safety (Top themes ranked in order of # of responses)

	RURAL COMMUNITIES	MT PLEASANT	KEOKUK	BURLINGTON	FORT MADISON
1	Lower Speeds & Enforcement	Sidewalks & Pedestrian Safety	Sidewalks & Pedestrian Safety	Bicycle Safety	Sidewalks & Pedestrian Safety
2	Sidewalks & Pedestrian Safety	Lower Speeds & Enforcement	Lower Speeds & Enforcement	Lower Speeds & Enforcement	Bicycle Safety
3	More Police Presence	Lighting	Lighting	Sidewalks & Pedestrian Safety	Lower Speeds & Enforcement
4	Roundabouts & Intersections	Education & Awareness	Roundabouts & Intersections	Roundabouts & Intersections	Lighting
5	Lighting	Roundabouts & Intersections	Road Maintenance	Lighting	Roundabouts & Intersections

WHAT IS YOUR BEST IDEA FOR IMPROVING SAFETY?

Sidewalks & Pedestrian Safety

- New or extended sidewalks, especially near schools and residential neighborhoods
- Crosswalk more visible and providing refuge island
- Better maintenance of poor sidewalk condition
- Safer routes for pedestrians in high traffic areas

Lower Speeds & Enforcement

- Install speed bumps or rumble strips
- Reduce speed in high-risk areas
- Increase enforcement of speeding and distracted driving
- Radar or speed feedback signs

Lighting

- Improving lighting at crosswalks, public parks, school zones and intersections
- Add lighting in poorly lit areas
- Upgrade existing lighting

Roundabouts & Intersections

- Install roundabouts to slow traffic and reduce crashes
- Improve traffic signals and stop signs at key intersections
- Improve signage and visibility at rural and suburban locations
- Roundabouts at high crash locations

High Injury Network

The High Injury Network (HIN) was established by analyzing crash data within the study region to determine which segments of roadways and which intersections saw the highest number of crashes resulting in a fatality or injury. Additional feedback was received from the Regional Safety Committee and the public feedback from the survey to finalize the tiered list of locations. All roadways, regardless of jurisdiction, within the thirty-one incorporated communities were included in the analysis. The crash analysis included all road users. The HIN identifies and analyzes the specific road segments and intersections within the region that have a disproportionately high incidence of severe injury and fatal crashes. By pinpointing these critical areas, the focus is directed towards high risk locations in the region's transportation network. Understanding the HIN is crucial for prioritizing systemic safety improvements and resource allocation. This section will detail the methodology used to identify the HIN, highlight the most problematic areas, and propose targeted interventions to enhance safety and reduce the occurrence of severe crashes in these high-risk locations.

Representation Ratio (RR), HIN, and Underserved Communities

Representation Ratio

The representation ratio (RR) is used to quantify the proportion of KSI crashes to a given attribute (e.g., intersection type, race, transportation mode, etc.). A RR of 1.0 means that KSI crashes are equally represented to the attribute; 3.0 would mean KSI crashes are three-times over-represented; and 0.5 means KSI crashes are only half of what would be expected.

Segment HIN

The HIN was created using the Fatal and Injury Representation Ratio (FIRR) instead of the KSI representation ratio. This choice was made because using the KSI ratio would have distorted the HIN due to the small number of KSI crashes. By using the FIRR, the data is more reliable and less likely to be skewed by just one or two crashes at a specific location. This method provides a more accurate picture of where fatalities and injuries are most likely to occur.

Table 3 below shows the results of the HIN analysis. It shows that the top 1.33 percent of streets have 21 percent of injury crashes and 11 percent of KSI crashes. This HIN Tier 1 was established by including streets with a FIRR greater than 10 times more than the network average. These streets are also 3 times more likely to be within a disadvantaged census tract than the average street. HIN Tier 2 streets are another 1.46 percent of the street network. Tier 2 was determined by selecting streets with a FIRR above 6.5. Tier 3 was determined by selecting streets with a FIRR at least 1.69. This resulted in a total HIN network of 7.6% including over half of all injury crashes, and over four out of ten KSI and Pedestrian and Bicycle Crashes.

Table 3: Overview of the Segments within the High Injury Network

HIN Tier	Miles	% Miles	Disad.	% Disad.	INJ	KSI	Ped Bike	Repr. Ratio	% Inj	% KSI	% Ped Bike
1	8.7	1.33%	6.43	74%	257	12	16	>10	21%	11%	17%
2	9.5	1.46%	3.36	35%	151	9	8	>6.5-10	12%	8%	8%
3	31.5	4.82%	15.89	50%	247	23	20	1.6-6.5	20%	22%	21%
Total HIN	49.7	7.60%	25.68	52%	655	44	44		54%	42%	46%
Total Network	654	100%	159.36	24%	1,215	106	95		1,218	106	95

Intersection HIN

The intersection HIN was developed from the intersections experiencing the highest crash frequency. Intersections with five or more injury crashes within the 10-year study period were included in the HIN as shown in Table 4. Tier 1 intersections include locations with six or more injury crashes, and Tier 2 intersections have 5 crashes per intersection. The Tier 1 and Tier 2 Intersection HIN ranges were chosen as they formed a distinct cluster of intersections with higher severity representing less than 1% of all intersections. These intersections accounted for a quarter of all injury crashes and over one in five KSI crashes despite accounting for one in 120 intersections. Only one intersection in Tier 1 was unsignalized, while six intersections in the Tier 2 network were unsignalized. Additionally, the intersections in the Intersection HIN were disproportionately within disadvantaged tracts, being overrepresented by over double compared to the whole network.

Table 4: Overview of the Intersections within the High Injury Network

HIN Tier	Miles	% Miles	Disad.	% Disad.	INJ	KSI	Ped Bike	Repr. Ratio	% Inj	% KSI	% Ped Bike
1	15	0.42%	10	67%	161	7	3	40.83	17%	9%	4%
2	15	0.42%	7	47%	75	9	4	19.02	8%	12%	5%
HIN Total	30	0.84%	17	57%	236	16	7	29.9	25%	21%	9%

High Injury Network and Underserved Communities

As part of the requirements for SS4A federal grants, safety action plans must include an analysis on social economic analysis and the identification of underserved communities throughout the study area. Due to recent policy changes at the executive level, community equity data has been removed from federal databases and replaced with Underserved Community designations. Underserved Communities within SEIRPC are shown in Figure 1. Underserved Communities within SEIRPC are Burlington, West Burlington and Keokuk[6]. These communities have the most representation on the high injury network within SEIRPC correlating well between underserved communities and the HIN. Figures 3 through 10 includes maps of the HIN at the county and community level. Figures 11 and 12 overlay the HIN on the Underserved Community boundary to highlight the correlation.

To verify safety investments are equitably distributed, the Regional Planning Affiliation (RPA) should conduct additional equity analysis at the Census block groups and blocks level to supplement the initial assessment. This finer-grain analysis will help identify underserved communities and pockets of disadvantage that may be obscured at the Census tract level. The results will be used to inform project prioritization so that safety improvements directly address the specific needs of historically underserved populations along the High-Injury Network (HIN). This approach supports the RPA's commitment to advancing equity through targeted, data-driven safety interventions.

Priority Locations within Tier 1 are identified within the report with applicable countermeasures. Summary tables of all tiered locations are included in Appendix A. Priority of the segments and intersections was not established within the tiers.

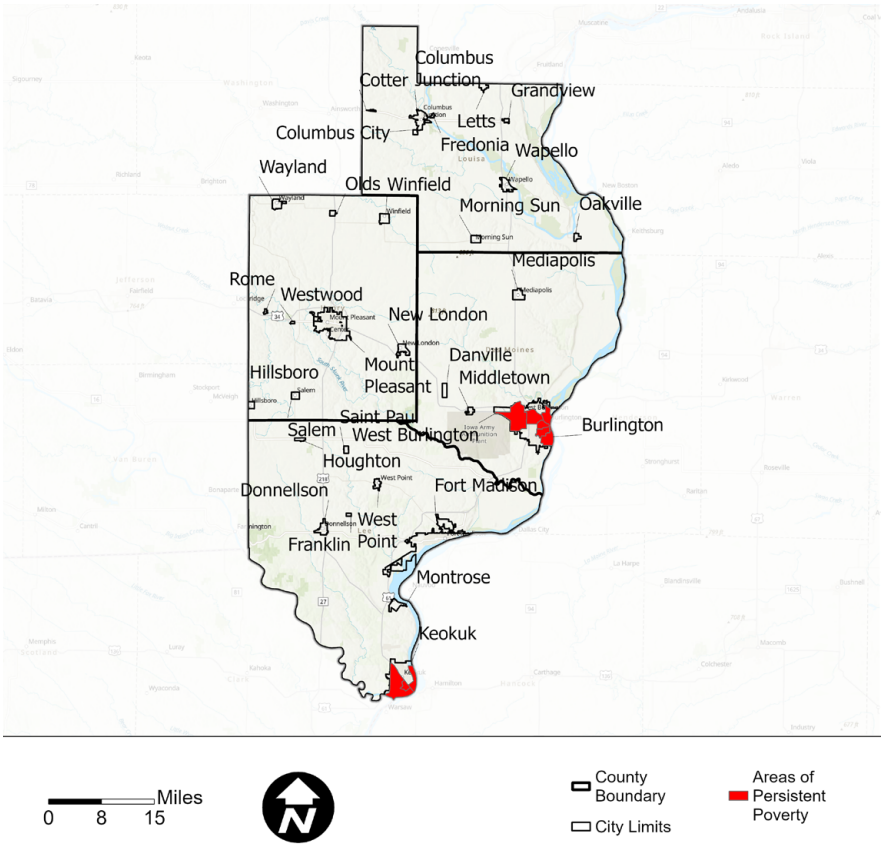


Figure 1: Map of SEIRPC Underserved Communities: Keokuk, Burlington and West Burlington

[6] According to SS4A Underserved Communities Tool: https://usdot.maps.arcgis.com/apps/dashboards/9806be8527b14f93be311f0fb57d336e

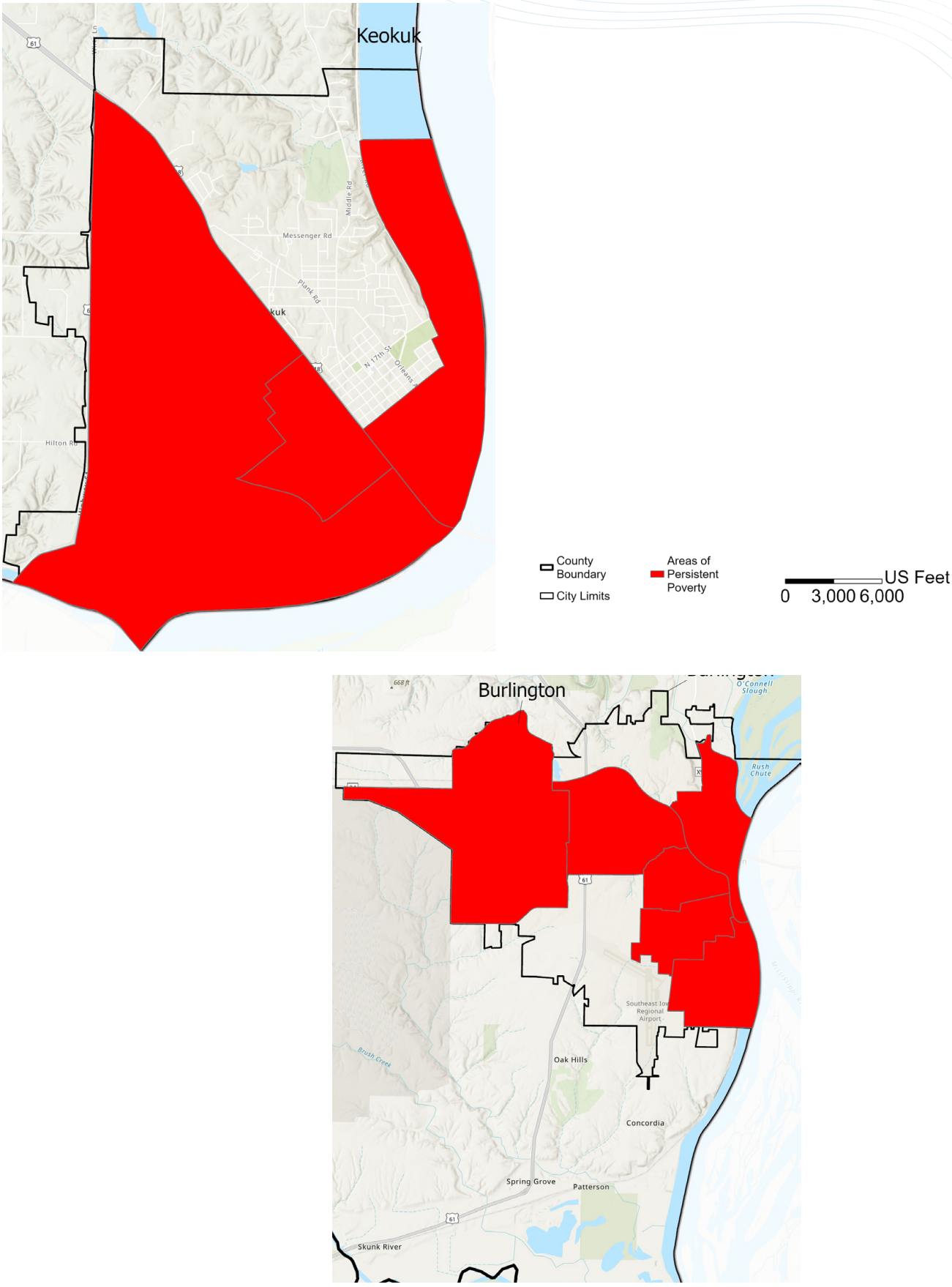


Figure 2: Enlarged map of SEIRPC Underserved Communities

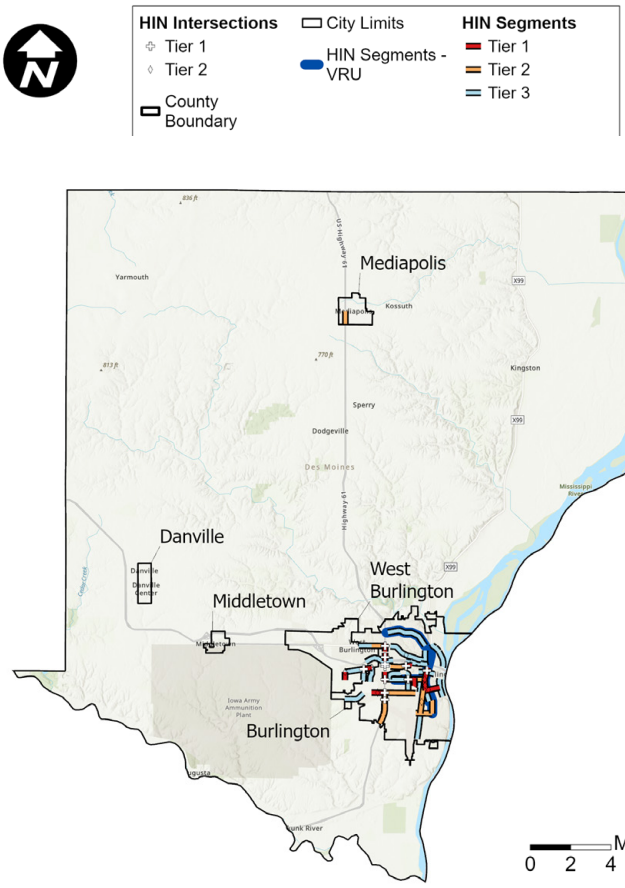


Figure 3: Des Moines County HIN

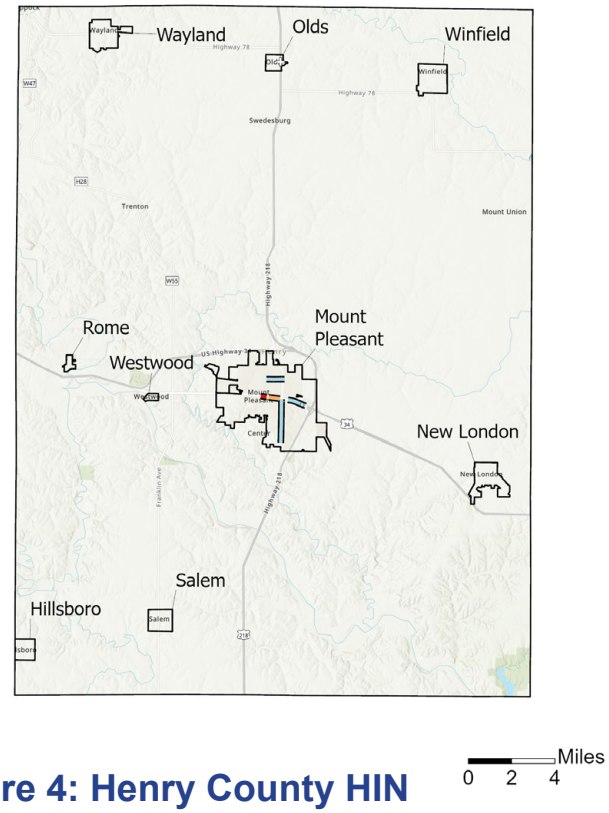


Figure 4: Henry County HIN

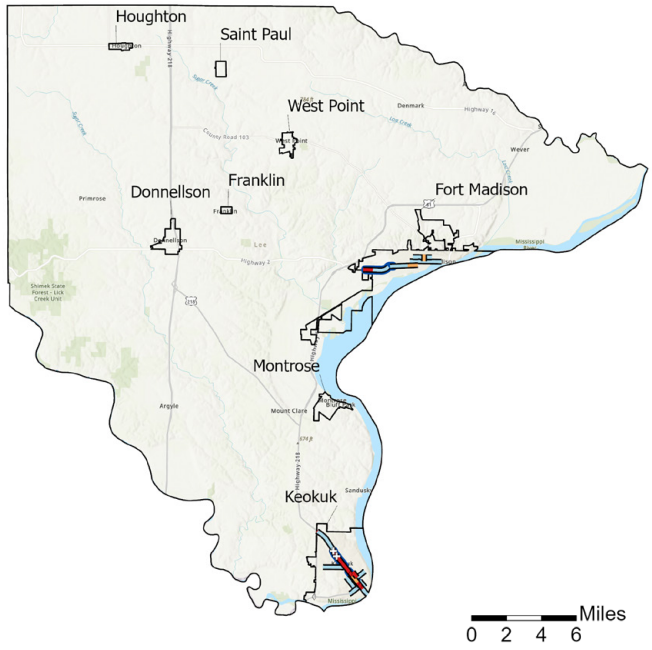


Figure 5: Lee County HIN

Figure 6: Louisa County HIN

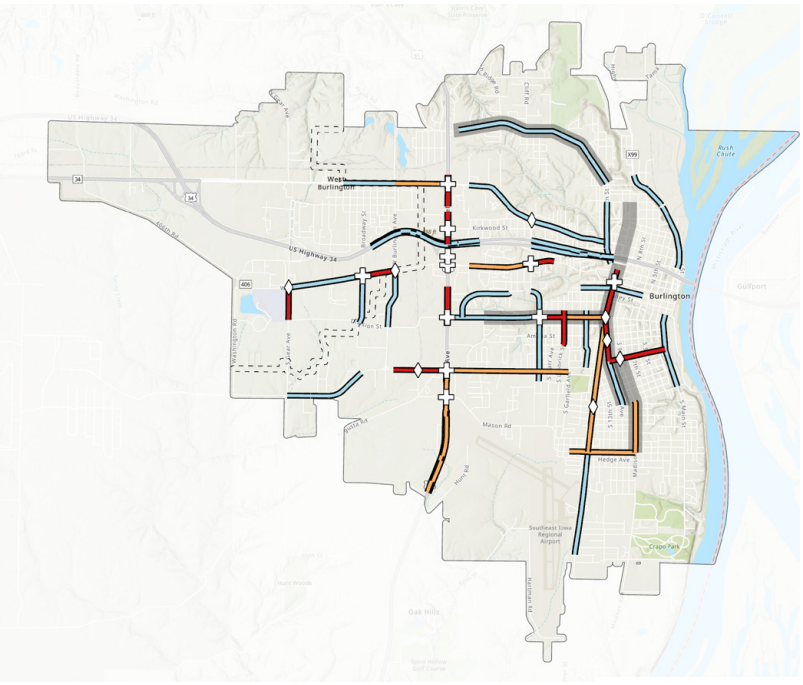


Figure 7: Burlington and West Burlington HIN

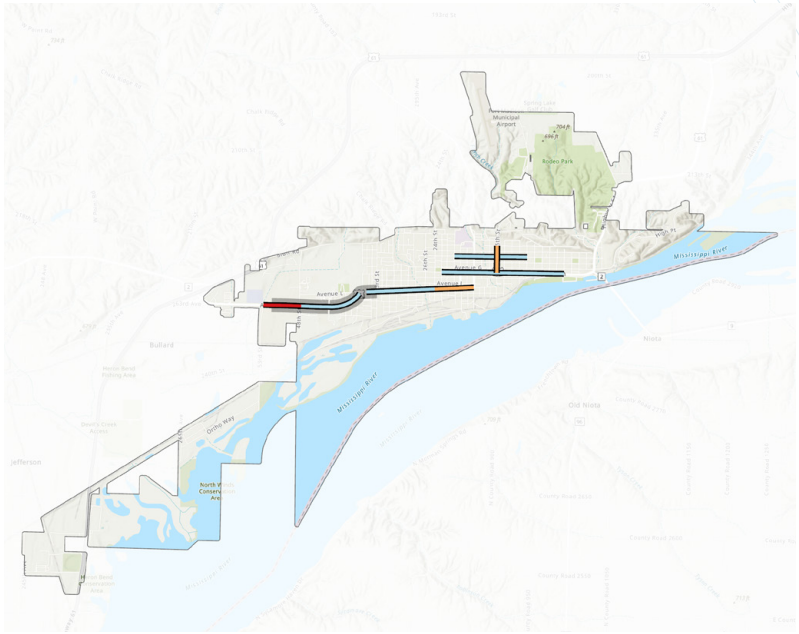


Figure 8: Fort Madison HIN

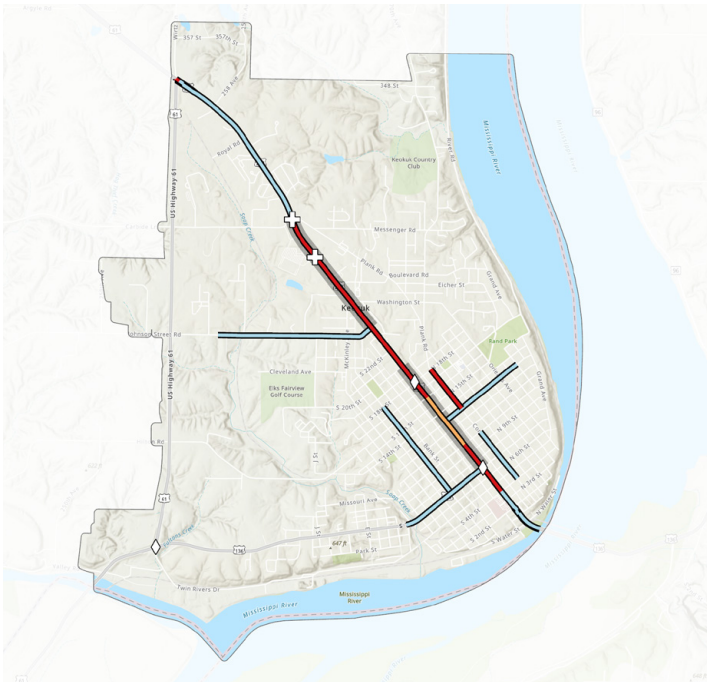


Figure 9: Keokuk HIN

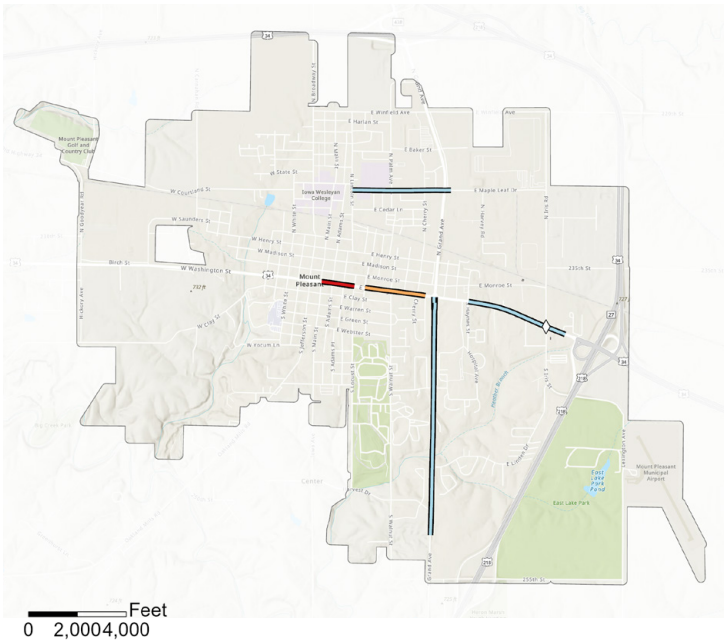


Figure 10: Mount Pleasant HIN

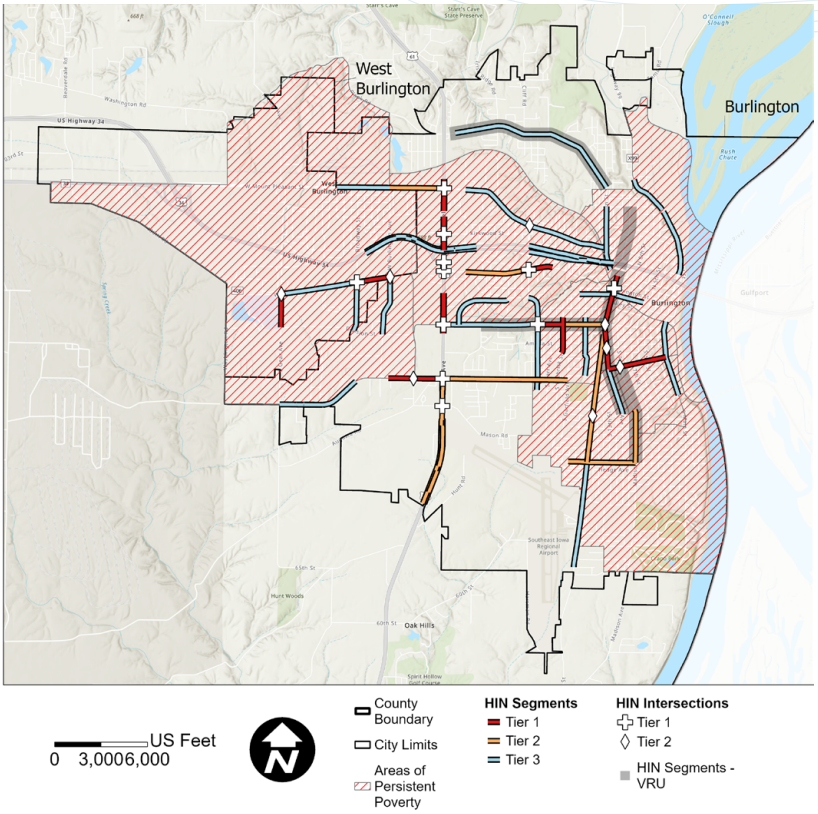


Figure 11: Burlington / West Burlington HIN and Underserved Community Overlay

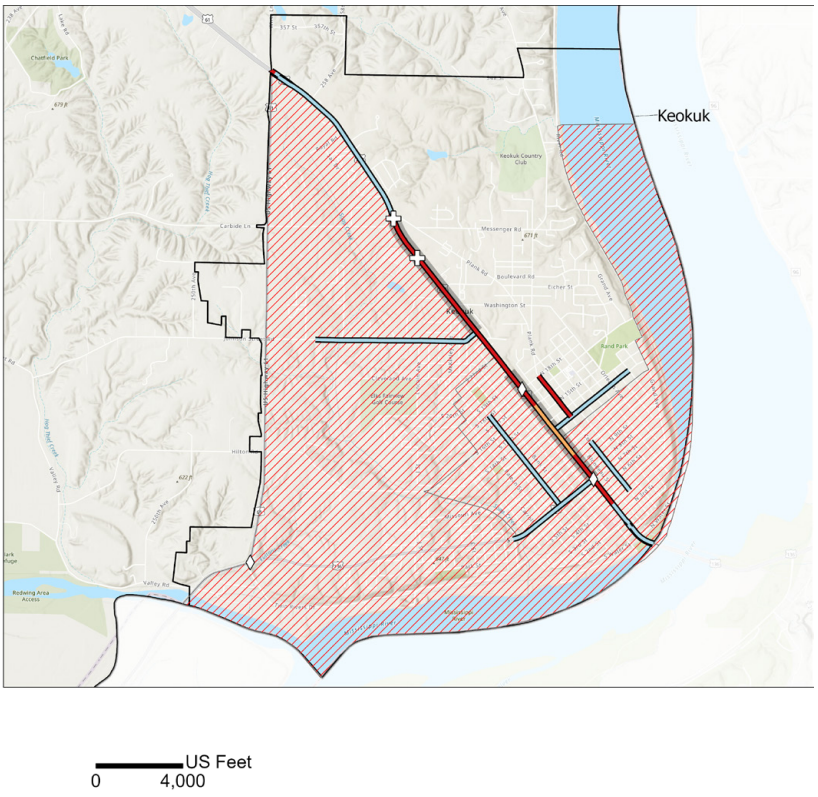


Figure 12: Keokuk HIN and Underserved Community Overlay

Key Findings from the Crash Analysis

A crash analysis was performed using crash data from 2019 – 2023. The crash data only included crashes within the SEIRPC region that occurred within city limits. Some measurers of the crash analysis were broken up by city. The four largest cities (Burlington / West Burlington, Fort Madison, Keokuk, and Mount Pleasant) were analyzed independently then crash data for the rest of the cities was analyzed together. This is due to the differences in populations and needs of the communities. The analysis included crash severity, crashes involving vulnerable road users, annual crash trends, crashes by time-of-day, and major causes of crashes. Burlington and West Burlington were analyzed together since many of the roadways along the border split jurisdiction lines.

Crash Severity

When looking at crash severity over the past five years, 22 of them resulted in a fatality and 90 caused a life-changing injury. Often crashes involve more than one individual. Looking at the total number of people as opposed to the total number of crashes reveals that 24 people were killed and 103 experienced a major injury as a result of car crashes between 2019 and 2023. The full data for crash severity by number of crashes and crash severity by number of people can be found in Table 5 and Table 6 below, respectively.

Table 5: Severity by Number of Crashes

KABCO Value	Total Crashes	% of Total Crashes
K	22	0.4%
A	90	1.7%
B	394	7.5%
C	750	14.4%
O	3967	76.0%
TOTAL	5223	100.0%

Table 6: Severity by Number of People

Injury Type	# People Involved	% of Total People
Fatal	24	0.2%
Major Injury	103	0.9%
Minor Injury	455	3.9%
Possible / Unknown Injury	904	7.8%
No Injury	10070	87.1%
TOTAL	11556	100.0%

Vulnerable Road Users

Road users include more than just motor vehicles. With the exception of limited access facilities (such as interstate routes) roads should be able to safely accommodate multiple modes of transportation. Alternative modes of transportation include public transit, bicyclists, and pedestrians. Vulnerable road users, such as bicyclists and pedestrians, are those who are at a higher risk of being in a fatal or serious injury crash. Crash data was analyzed to determine the percentage of total crashes that involved motor vehicles and the percent that involved bicyclists and pedestrians. Additionally, crash data was analyzed to determine the number of crashes that resulted in a fatal or serious injury that involved motor vehicles and the percent that involved bicyclists and pedestrians. The percentage of total crashes involving bicyclists and pedestrians accounts for between 1.5% and 3.2% depending on the city. Despite the low percentage of crashes involving bicyclists and pedestrians, they account for between 9.1% and 24.4% of fatal and serious injury crashes for the area. City specific data about crash rates for road users can be found in Figure 13 below.

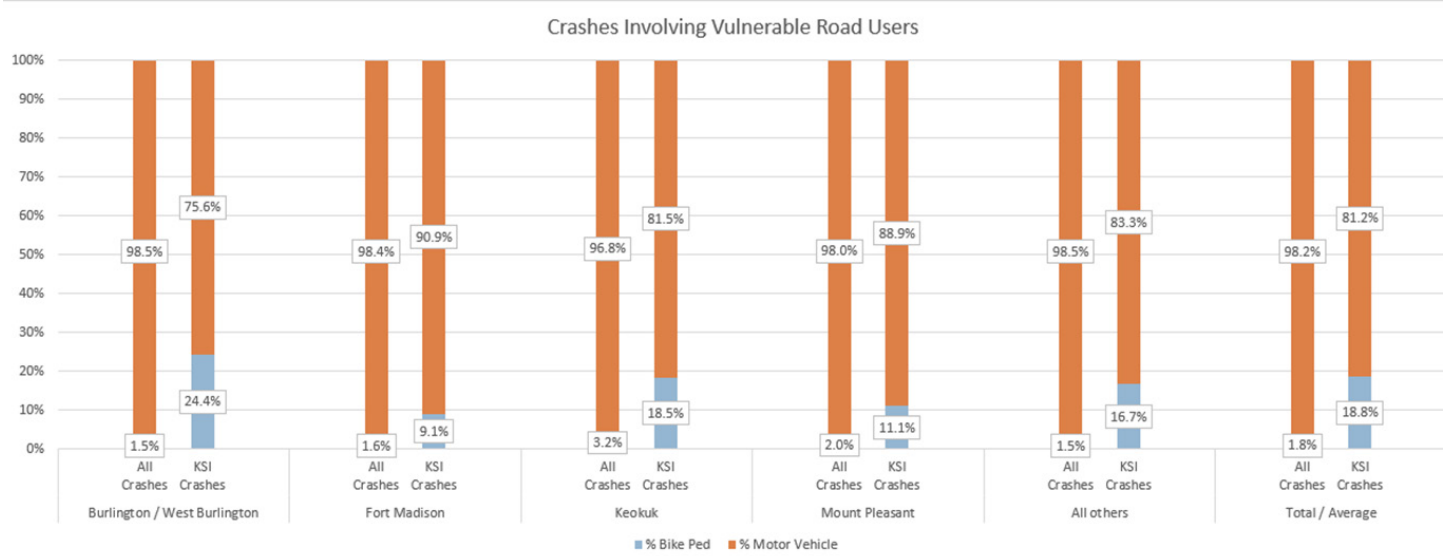


Figure 13: Percentage of Crashes Involving Motor Vehicles and Vulnerable Road Users (2019 – 2023)

Annual Crash Trends

For the years analyzed, 2021 had the highest total number of crashes and the highest number of crashes resulting in a fatality or serious injury. While 2020 had the lowest number of total crashes, 2022 had the lowest number of fatal and serious injury crashes. Crashes by year including the total number of crashes, crashes resulting in a fatal or serious injury, and crashes not involving a fatal or serious injury are shown in Figure 14.

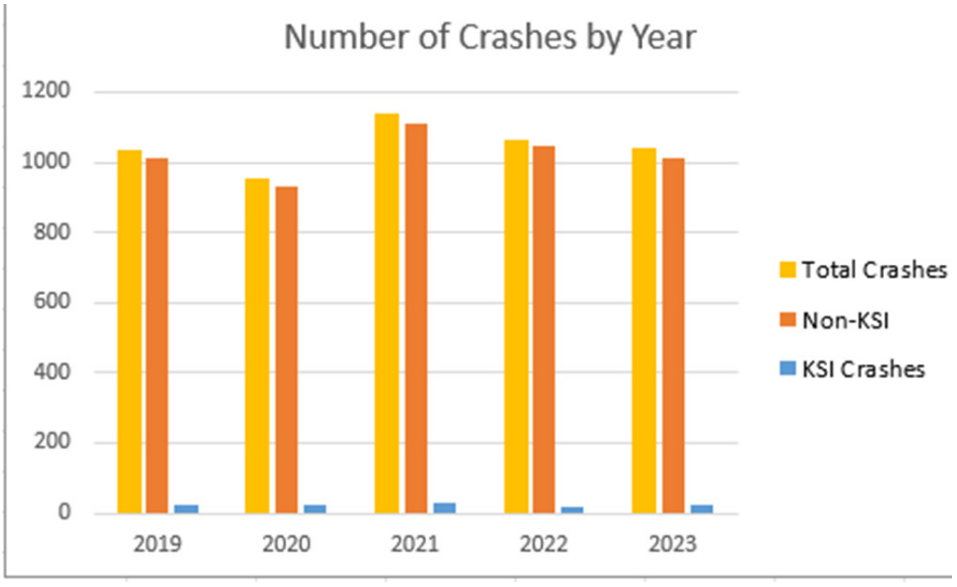


Figure 14: Crashes by Year (2019 – 2023)

Crashes by Time of Day

When looking at the crash data by time of day, it shows that the majority of crashes occurred between the time periods from 12:00PM – 2:59 PM and 3:00PM – 5:59PM. These time periods are consistent with lunch rushes and typical evening commutes times, when roads often see their peak traffic volumes. However, a larger percentage of crashes occurring during non-daylight hours result in fatal and serious injury crashes. Crash data by time of day can be found in Figure 15 below.

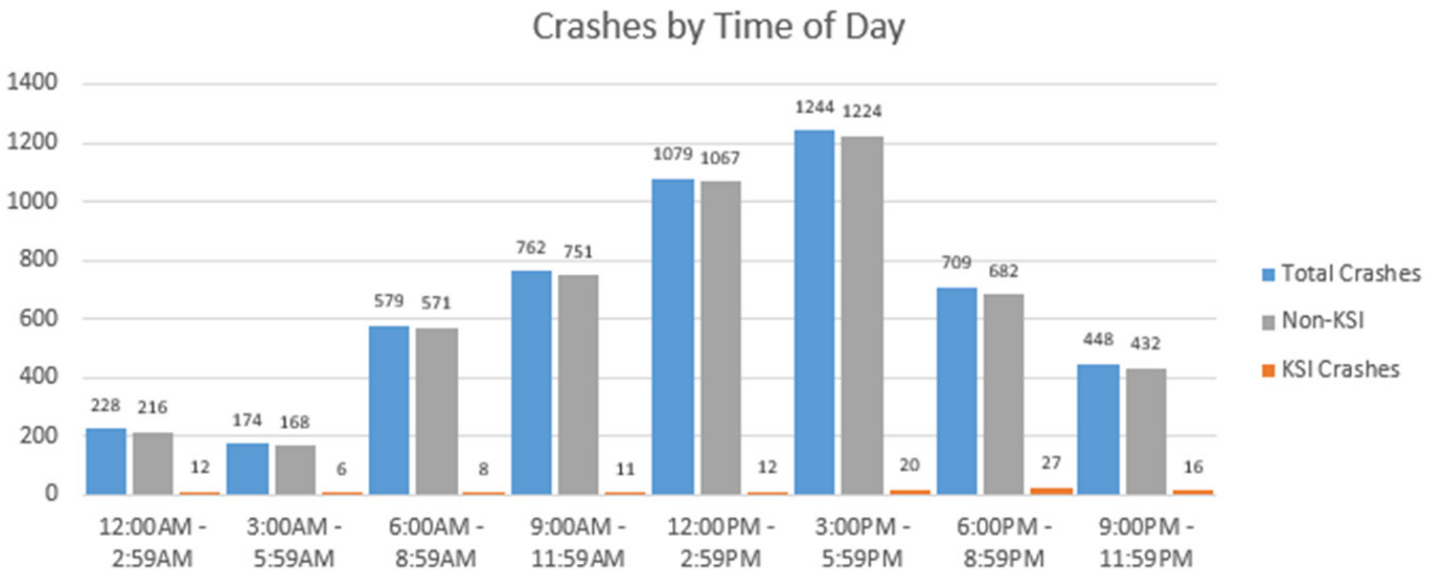


Figure 15: Crashes by Time of Day (2019 – 2023)

What Causes Crashes?

While there can be multiple factors that contribute to the cause of a crash, there is often a primary action that results in the incident. By understanding what factors most frequently contribute to crashes, it can help to determine what safety measures could be implemented to most effectively reduce the number of crashes. The top ten causes of all crashes account for 63% of all crashes, and 18% of those crashes had an official cause of “Other” or “Unknown”. When reviewing the top ten causes for crashes resulting in a fatal or serious injury, the number one known cause was determined to be “exceeded authorized speed”. Additionally, 16% of the serious and fatal injury crashes involved drivers not properly following traffic control (i.e. red light, stop sign running and not properly yielding the right of way). The top ten major causes, as noted on the police report, for all crashes and for crashes resulting in a fatal or serious injury can be found below in Figure 16 and Figure 17, respectively. The top ten causes for crashes within the five major cities and the remaining cities can be found in Appendix B.

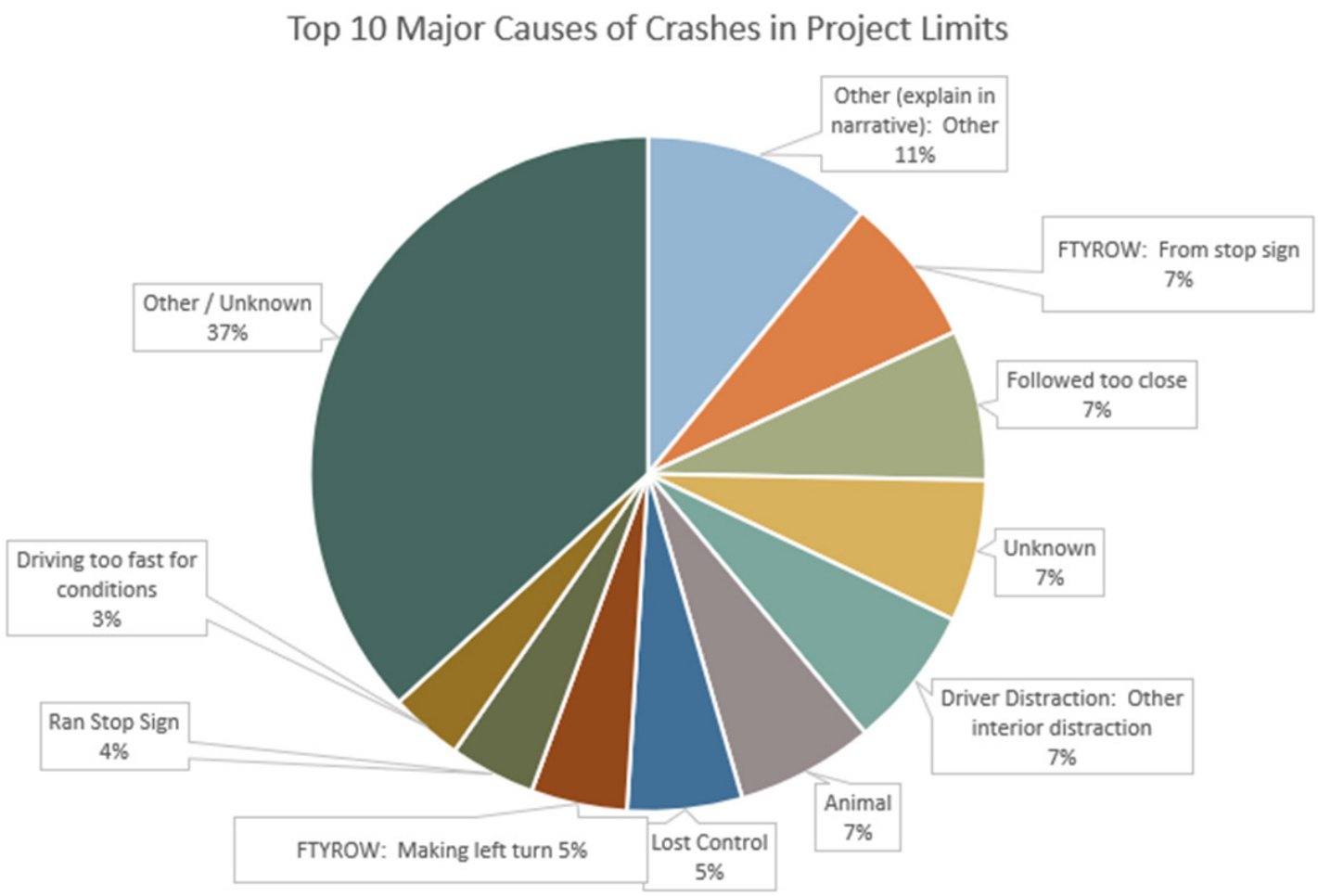


Figure 16: Top Ten Major Causes of Crashes within the Project Limits (2019 – 2023)

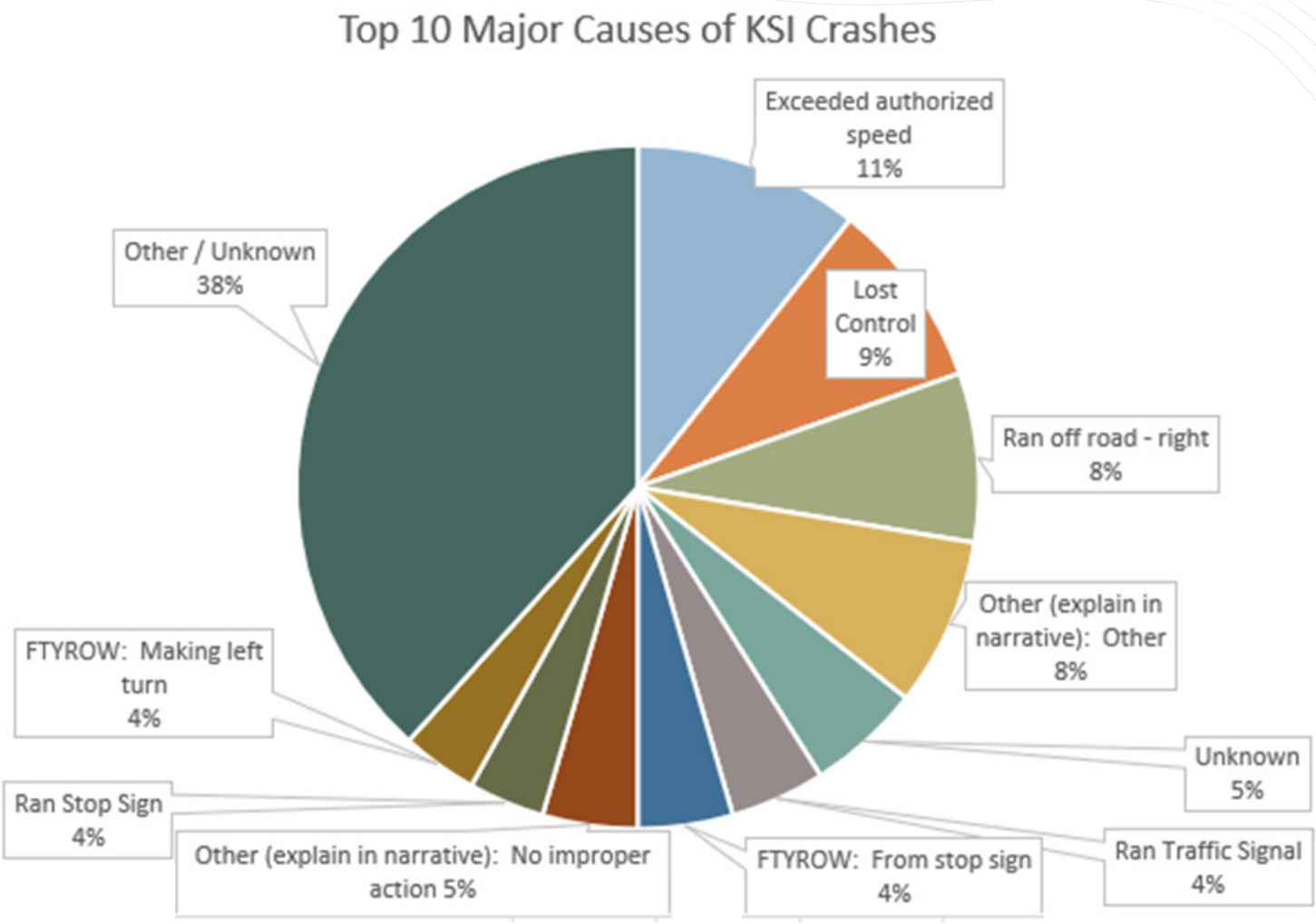


Figure 17: Top Ten Major Causes of Serious and Fatal Injury Crashes within the Project Limits (2019 – 2023)

Safety Countermeasures

Improving road safety does not always involve elaborate roadway redesigns and large projects. There are many proven safety countermeasures that can be implemented using lower cost materials and installation methods to provide interim improvements while awaiting funding or they can be used to test how a more permanent solution may impact road safety. Federal and local resources for countermeasures include:

Southeast Iowa Regional Transportation & Development Plan for Des Moines, Henry, Lee, and Louisa Counties[7]

The SEIRPC Long Range Transportation Plan is a document detailing the transportation goals within the region over the next thirty years. Within the 'Vehicle Crashes and Traffic Safety' and 'Safety and Mobility' sections, there are recommendations which include local and state-wide strategies and programs that can be utilized to improve safety.

Iowa DOT Safety Analysis Guide[8]

This Iowa-specific guide provides methodology for analyzing safety processes and procedures. Its purpose is to standardize safety analysis and procedures throughout Iowa and can be utilized by local agencies and regional planning offices in some cases. This guide can be used to measure the effectiveness of implemented measures in order to monitor progress towards Vision Zero.

FHWA Proven Safety Countermeasures[9]

The FHWA has compiled a list of twenty-eight proved safety countermeasures. These countermeasures range in implementation timelines and associated costs. The FHWA has included an online tool for refining these countermeasures to best fit the specific needs of the roadway or intersection.

Crash Modification Factors Clearinghouse[10]

A crash modification factor (CMF) is a way to predict the total number of crashes at a location (intersection or roadway segment) following the implementation of a safety improvement measure. A CMF equal to one indicates no expected change in the number of crashes, a CMF less than one is expected to reduce the total number of crashes, and a CMF greater than one is expected to increase the total number of crashes.

[7] https://irp.cdn-website.com/64aae904/files/uploaded/Region_16_CEDS_-_LRTP_Plan_with_RSP_1-21-25-0036ab78.pdf
[8] https://iowadot.gov/traffic/documents/2021-12-20-Draft-SAG-V5.pdf
[9] https://highways.dot.gov/safety/proven-safety-countermeasures/search
[10] https://cmfclearinghouse.fhwa.dot.gov/index.php

Recommended Countermeasures

The following countermeasures as shown in Tables 7 -10 have been selected based on the Safety Countermeasure resources to assist SEIRPC in evaluating various treatments which have proven effectiveness to reduce crash severity. These countermeasures have been divided into categories of countermeasures to address crashes within various contexts both rural, urban as well as segments or intersections and also specifically targeting Vulnerable Road User (VRU) crashes. Additional countermeasures may be applicable to specific project locations that aren't identified in the tables but are noted in the resources. Priority locations are identified with specific countermeasures that may be applicable based on the context of the location and safety issues present.

Table 7: Corridor/Segment Countermeasures

Countermeasure	Purpose	Example(s)
Road Lane Reconfiguration (4-to-3 Lane Conversions)	Calm traffic and reduce crash points	One lane each way with center turn lane, parking and/or bicycle accommodations
Corridor Access Management	Reduce conflict points along segment	Restrict driveways to right-in / right-out and reduce access points to main highway.

Table 8: Intersection Safety Enhancements Countermeasures

Countermeasure	Purpose	Example(s)
Roundabouts	Eliminate right-angle and head-on collisions	Analyze stop-controlled and signalized intersections for conversion to roundabout, such as, Division St at West Burlington Ave
Reduced Left-Turn Conflict Intersections	Decrease left-turn related crashes	J-turns, indirect left turns, such as, Hwy 218 and East School Ave in Olds
Dedicated Left- and Right-Turn Lanes at Intersections	Improve intersection flow and reduce delays	Channelized or protected turn lanes

Table 9: Roadway Departure Countermeasures

Countermeasure	Purpose	Example(s)
Wider Edge Lines	Improve lane guidance and visibility	6-inch white edge lines on rural roads
Enhanced Delineation for Horizontal Curves	Warn drivers early on curves	Chevron signs, curve warning signs, reflective pavement markers
Roadside Design Improvements at Curves	Reduce run-off-road crash severity	Slope flattening, fixed object removal, guardrail / barrier installation

Table 10: Pedestrian/Bicyclist Countermeasures

Countermeasure	Purpose	Example(s)
Bike Lanes	Provide safer, dedicated space for bicyclists	On-street painted lanes, buffered bike lanes
Crosswalk Visibility Enhancements	Improve driver awareness at crossings	High-visibility markings, lighting, signage
Install continuous pedestrian facilities	Eliminate pedestrian / bicycle facility gaps	Sidewalks, shared-use paths, pedestrian bridges, such as, at US 61 and US 34

Action Plan

Vision Zero is more than just a tag line and requires actions to be taken to achieve the goal of eliminated roadway deaths and serious injuries. With the input from the community and establishment of the HIN, strategies and action items that meet the needs of the area can be deployed. These recommendations focus on design, policy, practices, and programs to create a safer system for all. Reaching Vision Zero in the thirty-one cities within SEIRPC's region will take a commitment from the community members and officials as well as multi-agency coordination for any design changes along any state routes within Iowa DOT's jurisdiction.

This section will provide key action items that should be taken to work towards Vision Zero. Each action item works to address a specific problem. Each action item has been assigned a safe system element, time frame, and cost. Some action items include additional resources. Action items are categorized by location with some applying to the region as a whole with others applying to one of the four major cities or the remaining twenty-six cities. The action items for the entire region are focused on policy, practices, and programs as well as design changes for area-wide deficiencies that were observed. City-specific recommendations focus on crash data, observations, and community feedback for the regions. While some of the recommendations are city-specific, the action item could still be applied to other cities. The action items can be found after the following section.

Understanding the Recommendations

Safe System Element

The FHWA Safe System Approach focuses on five Safe System Elements. These elements work together to build additional layers of protection for road users to help prevent death and serious injuries.

The five Safe System Elements are as follows:

- Safe Road Users – this element addresses the safety of all road users. It emphasizes that each road user is equal and deserves safety as well as addresses the importance of each road user's responsibility to operate, to the best of their ability, within their boundaries.
- Safe Vehicles – this element addresses active design elements of vehicles such as automated brakes as well as passive elements such as wearing a seat belt.
- Safe Speeds – this element focuses on roadway speeds. Impact speed is directly related to the risk of a fatal or serious injury. Adjusting speeds can improve crash survival rates by reducing impact forces, providing additional reaction time, and improving visibility.
- Safe Roads – this element focuses on roadway designs that help reduce the occurrence and consequences human error.
- Post-Crash Care – this element focuses on what occurs after a crash. It includes first responders and medical care, crash investigation, media coverage, engineering analysis, and justice.

Cost

The cost provided with each action item is an estimate on the total cost to implement each action item. For on-going action items, the cost estimate is an annual cost estimate. Cost estimates are divided into the following three categories:

- $ - Low (less than $100k)
- $$ - Medium (between $100k and $500k)
- $$$ - High (greater than $500k)

Timeline

The timeline provided with each action item is an estimate on the total time to complete the action item. The total time estimates accounts for any design or administrative efforts that may be required. Time estimates are divided into the following four categories:

- Short – less than one year
- Medium – between one and two years
- Long – greater than two years
- On-Going – an action item that requires continued effort

Implementation and Priority Locations

The Safety Action Plan provides guidance on the types of projects, policy changes, programs, and practices that should be funded and established. Making these improvements is a critical piece in reaching Vision Zero. Location specific projects should focus on the established HIN and proactive measures can be taken at similar locations where crashes could occur. General improvements should also be made following the recommendations outlined in the Action Plan. When possible, effort should be made to combine Vision Zero projects with other upcoming projects to help maximize funding opportunities and minimize construction timelines.

The following recommendations are based on feedback from public input, as well as a review of key findings, safety countermeasures, and meetings with the Regional Safety Committee. The Tier 1 projects will be the best candidates for location-specific countermeasures, both along the HIN Segments and HIN intersection locations. The treatments will need to be established considering contextual factors such as the manner of crashes occurring, as well as the adjacent roadway characteristics such as vehicle speeds, adjacent land use, number of lanes, and available right-of-way.

Primary four-lane streets that go through towns with commercial businesses are prevalent within the HIN. These corridors are good candidates for projects that implement Proven Safety Countermeasures.

Implementation of specific solutions to the HIN requires a deeper dive into the local needs and crash characteristics of each of those locations. For example, HIN Tier 1 corridors shown in Table 12, such as US-218 in Keokuk or Washington St in Mt. Pleasant, would be excellent candidates for a lane reconfiguration. The narrowing or reduction of lanes provides opportunities to visually communicate to drivers that they should drive at a lower speed. Additionally, it improves visibility and left-turning safety for vehicles. Other corridors, such as Central Ave and Division St in Burlington, have segments that are both HIN Tier 1 for segments, intersections, and Vulnerable Road User (VRU) locations. The intersection of Division St and Plane St, which is on the HIN Tier 1 and VRU HIN 1, lacks accessible ramps for each crossing, stop bars, channelized turn lanes, accessible push buttons and crosswalks across Division St. The 30-mph speed limit is also difficult to enforce. Improved pavement markings, high-visibility backplates, channelized turn lanes, updating ADA compliance and providing a narrowing or reduction in lanes, together with the inclusion of protected bicycle lanes, would all be potential options to evaluate to gauge public support and overall feasibility of the solution given additional supplemental planning.

Various quick-build solutions can fill the gap between available funding and immediately identified needs. These solutions could include the installation of flex post delineators, rubberized speed humps, curb extensions, low rubber curbing, etc., to facilitate the design of self-enforcing streets that require less law enforcement presence to maintain safe speeds. Implementation of these solutions, such as through the SS4A Demonstration Grant projects, could provide a jump start on locations within the Tier 1 HIN Segment, Intersection, and Segment VRU networks. Priority locations are identified in Table 11 that include countermeasures applicable to the project location and safety issues.

Table 11: Priority Segments

HIN Street	Segment	City	KSI	Bike / Ped Crashes	Safety Countermeasures	Quick Build Candi-date?
Division Street	Plane Street to Leebrick Street	Burlington	3	2	Road Lane Reconfiguration	Y
Central Avenue	Angular Street to Division Street	Burlington	1	0	Road Lane Reconfiguration, Curb Extensions	Y
US-61	Mt. Pleasant Street to Winegard Drive	Burlington	1	3	Reduced Left-Turn Conflict Intersections, Shared-use Path	N
Angular Street	Central Avenue to Main Street	Burlington	1	1	Curb Extensions, Protected Bike Lane	Y
West Avenue	Nelson Drive to US-61	Burlington	1	1	Road Lane Reconfiguration, Curb Extensions, Speed Feedback Signs	Y
Avenue O	53rd Street to 48th Street	Fort Madison	1	1	Lane Narrowing / Median Installation / Access Control	Y
*US-218	Carbide Lane to Joyce Park Road	Keokuk	0	1	Lane Narrowing / Median Installation / Access Control	Y
*US-218	25th Street to 20th Street	Keokuk	1	0	Lane Narrowing / Median Installation / Access Control	Y
Concert Street	18th Street to 13th Street	Keokuk	0	1	Curb Extensions, Raised Crosswalk	Y
Wash-ington Street	Main Street to Locust Street	Mount Pleasant	2	1	Lane Narrowing / Median Installation / Access Control	Y
*Gear Avenue	Division Street to *Agency Street	West Burlington	1	0	Road Lane Reconfiguration	Y

*Indicates intersections where a CIP or planned project has been identified

Table 12: Priority Intersections

Primary Street	Intersecting Street	City	KSI	Bike / Ped Crashes	Safety Countermea-sures	Quick Build Candi-date?
*Roosevelt Avenue (US-61)	Mason Road	Burlington	1	0	Signal Phasing Safety Enhancements	Y
*Division Street	Plane Street	Burlington	0	2	Turn Lane, Signal Phasing Enhancements, High Visibility Crosswalk, ADA Enhancements	Y & N
*Main Street (US-218)	Carbide Lane / Plank Street	Keokuk	1	0	Turn Lane, Signal Phasing Enhancements	Y & N
*Main Street (US-218)	North Park Drive / Commercial Access	Keokuk	0	1	Turn Lane, Signal Phasing Enhancements	Y
US-218 (IA-27)	East School Avenue	Olds	2	0	Reduced Left-Turn Conflict Intersection	N
Agency Road	*Broadway Street	West Burlington	0	0	Access Management / Medians / Turn Lanes / Phasing Modifications	N

*Indicates intersections where a CIP or planned project has been identified

In addition to stand-alone safety-oriented projects, additional steps should be taken to make traffic safety a policy. Particularly good opportunities to infuse safety into the process arise during rehabilitation projects and adjacent to new development when roadwork is already being done. Policies such as Intersection Control Evaluation (ICE) or lane reconfigurations, such as narrowing or reducing the number of lanes, can assist in lowering vehicle speeds and improving safety when feasible and warranted by local conditions. Likewise, for new roadway projects, updating engineering design criteria for the local municipalities and counties to have a safety-first design approach will have a multiplicative effect on safety over time.

Taken together, these various types of action items with the HIN locations set a strong foundation for building a data-driven network of priority locations and treatment from which to begin the next phase of implementing safety improvements from the network. An evaluation of the various implementation options is shown on the next page in Table 13.

Table 13: Implementation Matrix

Action Item	Problem(s) Addressed from Action Item	Safe System Element	Time Frame	Cost	Additional Resources	Location
Implement safety improvements on the HIN.	The high injury network shows which corridors and intersections are at the highest risk of crashes occurring. By prioritizing these locations, safety can be improved for all road users.	"Safe Speeds Safe Roads"	Short - Long	$ - $$$	FHWA Proven Safety Countermeasures, CMF Clearinghouse, SEIRPC Long Range Transportation Plan	All
Develop and deploy a multimodal safety education and enforcement campaign focusing on local and region-wide issues. Share announcements through social media platforms, agency websites, and utility bills.	Education campaigns provide the public with an understanding of why policies are in place. Combining education with enforcement can be beneficial to reminding the public of the importance of safety on roadways.	Safe Road Users	On-Going	$$		All
Improve crash reporting techniques. Limit use of reporting the major cause of crash as "other" except when necessary.	Analyzing crash data is a beneficial tool for improving safety but in order to properly understand where safety concerns originate concise crash reporting is needed.	Post-Crash Care	Short	$		All
Identify and implement systematic programs and practices that reduce speeding and distracted driving region-wide.	Exceeded authorized speed and some form of distracted driving contributed to 18% of KSI crashes. Distracted road users were mentioned in over half of survey responses when asked about areas of concern.	"Safe Road Users Safe Speeds"	Medium	$$	FHWA Proven Safety Countermeasures, CMF Clearinghouse, SEIRPC Long Range Transportation Plan	All
Establish a permanent, dedicated funding source for Vision Zero implementation and coordination.	Provides a dedicated source of funding for the ongoing efforts needed to reach Vision Zero.	"Safe Speeds Safe Roads Post-Crash Care"	On-Going	$$$		All
Create a Vision Zero program with dedicated staff from around the region.	Establishes a dedicated team that works to organize and improve efforts establishes within the Action Plan.	"Safe Speeds Safe Roads"	On-Going	$$		All
Conduct an annual review of Vision Zero successes and challenges to keep the public informed.	Provides the public with insight on how the program is performing and allows for an understanding of how action items are impacting the region.	Post-Crash Care	On-Going	$		All
Install backplates and yellow retroreflective strips on all signal heads - prioritizing intersections within the HIN.	Improve visibility and awareness of signal heads and can reduce red light running.	Safe Roads	Short	$	FHWA Proven Safety Countermeasures	All
Install red retroreflective sign-post strips on stop signs. Install advanced warning signs at stop-controlled intersections that may not be expected by the road user.	Improve visibility and awareness of upcoming stop-controlled intersection and can reduce stop sign running. Failure to yield the right-of-way at stop signs is the number two top cause of crashes within the area.	Safe Roads	Short	$	FHWA Proven Safety Countermeasures	All
Conduct road safety audits for HIN segments and intersections to develop specific countermeasures, such as, roundabouts, road diets, access control, intersection control type, improved visibility for crosswalks, etc.	Supplemental planning can be conducted to further analyze countermeasures on the HIN to be used for demonstration projects or implementation projects.	"Safe Speeds Safe Roads"	Short	$$	FHWA Proven Safety Countermeasures, CMF Clearinghouse, SEIRPC Long Range Transportation Plan	All

Table 13: Implementation Matrix

Action Item	Problem(s) Addressed from Action Item	Safe System Element	Time Frame	Cost	Additional Resources	Location
Install stop bars at all signalized intersections.	Ran traffic signal is one of the top ten causes of crashes within Burlington / West Burlington. The rate is higher at intersections without stop bars.	Safe Roads	Short	$		Burlington / West Burlington
Check visibility and signal timing for signalized left-turn movements within the HIN. Make adjustments to the phasing (converting to protected-only when sight visibility is not met) and timing (adjusting clearance intervals and / or phase length) when needed.	Failure to yield right-of-way while making a left-turn is a frequent cause of collisions at signalized intersections within the HIN.	Safe Roads	Medium	$$	FHWA Proven Safety Countermeasures	Burlington / West Burlington
Continue expanding the pedestrian and bicycle network focusing on HIN routes and those identified within the Greater Burlington Bicycle and Pedestrian Plan. Expand the number of protected pedestrian crossings, especially on wide, high-speed facilities. Upgrade pedestrian signals to be compliant with ADA and PROWAG standards.	Pedestrians and bicyclists were involved in 1.5% of crashes in Burlington and West Burlington between 2019 - 2023 but account for 24.4% of fatal and serious injuries. Public survey responses also highlight a community desire for increase pedestrian and bicycle connectivity.	Safe Roads	High	$$$	FHWA Proven Safety Countermeasures	Burlington / West Burlington
Invest in wild life crossings.	Collisions with an animal are the top cause of crashes within Fort Madison accounting for over 12% of all crashes.	Safe Roads	Medium - Long	$$ - $$$	CMF	Fort Madison
Improve visibility at stop-controlled intersection by installing advanced warning signs and removing / relocating sight obstructions such as overgrown vegetation and signtage.	Two of the top ten causes of crashes within Fort Madison are failure to yield the right-of-way from stop sign and ran stop sign, accounting for almost 12% of all crashes.	Safe Roads	Low	$	FHWA Proven Safety Countermeasures	Fort Madison
Install passing zones on two-lane arterials.	The second leading cause of crashes within Fort Madison is following too closely. Giving drivers a passing zone can allow them to properly pass slower vehicles.	Safe Roads	Medium - High	$$ - $$$	CMF Clearinghouse, SEIRPC Long Range Transportation Plan	Fort Madison
Upgrade signal heads with 8-inch bulbs to 12-inch LED bulbs.	12-inch signal heads improve visibility.	Safe Roads	Medium - High	$$ - $$$	CMF Clearinghouse	Keokuk
Daylight intersections within the HIN by removing parking, installing curb bulb outs, and removing sight obstructions at the crosswalks.	Many intersections within the HIN have nearby on-street parking and other sight obstructions. Daylighting the intersections will improve sight visibility and remove conflicts between parking vehicles and those driving through the intersection.	"Safe Roads Safe Speeds"	Low	$	NACTO	Keokuk
Improve visibility at stop-controlled intersection by installing advanced warning signs and removing / relocating sight obstructions such as overgrown vegetation and signtage.	The number two cause of crashes within Keokuk is failure to yield right-of-way from stop sign.	Safe Roads	Low	$	FHWA Proven Safety Countermeasures	Keokuk

Table 13: Implementation Matrix

Action Item	Problem(s) Addressed from Action Item	Safe System Element	Time Frame	Cost	Additional Resources	Location
Improve routine road maintenance, focusing on pavement quality.	Survey responses including frequent mentioned pot holes and road quality and stated that they often have to change lanes to avoid roadway damages.	Safe Roads	Medium	$$		Keokuk
Expand the sidewalk network and improve the existing sidewalks.	Roughly 30% of survey responses from Keokuk mentioned a desire for increased sidewalk connectivity and improvements to deteriorated sidewalks. Pedestrian and bicycle crashes accounted for 3.2% of all crashes in Keokuk from 2019 - 2023 and 18.5% of fatal and serious injury crashes.	Safe Roads	High	$$$	FHWA Proven Safety Countermeasures	Keokuk
Improve visibility at stop-controlled intersection by installing advanced warning signs and removing / relocating sight obstructions such as overgrown vegetation and signtage.	The top two causes of crashes within Mount Pleasant are failure to yield the right-of-way from stop sign and ran stop sign, accounting for almost 20% of all crashes.	Safe Roads	Low	$	FHWA Proven Safety Countermeasures	Mount Pleasant
Improve visibility at stop-controlled intersection by installing advanced warning signs and removing / relocating sight obstructions such as overgrown vegetation and signtage.	Two of the top ten causes of crashes within all other cities are failure to yield the right-of-way from stop sign and ran stop sign, accounting for almost 14% of all crashes.	"Safe Roads Safe Speeds"	Low	$	FHWA Proven Safety Countermeasures	Other Cities
Invest in wild life crossings.	Collisions with an animal are the top cause of crashes within all other cities accounting for over 11% of all crashes.	Safe Roads	Medium - Long	$$ - $$$	CMF	Other Cities
Install shoulder rumble strips - prioritizing two-lane rural roads with low visibility. This task can be implemented during resurfacing projects.	Over 25% of crashes outside of the four major cities are single-vehicle collisions. Additionally, over 10% of crashes are caused by vehicles running off the road.	Safe Roads	Short - Medium	$ - $$	FHWA Proven Safety Countermeasures	Other Cities
Install 6-inch edge lines - prioritizing two-lane rural roads with low visibility.	Over 25% of crashes outside of the four major cities are single-vehicle collisions. Additionally, over 10% of crashes are caused by vehicles running off the road.	Safe Roads	Short	$	FHWA Proven Safety Countermeasures	Other Cities

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 the Safety Action Plan on a public website; and
2. Reporting yearly on implemented projects that are intended to help reach the goal of zero fatalities and serious injuries; and
3. Report yearly on fatal and serious injury reductions towards a goal of zero.

The Regional Safety Committee should establish a regular venue and schedule for public progress reporting.

- Benefits of this include 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.

Appendix A: High Injury Network Tables

List of HIN Segments

The HIN segments were categorized into three tiers to help determine which streets should be prioritized for safety improvements. Tiers 1 through 3 are shown in Table 14 below. An asterisk symbol is included to indicate where a capital improvement plan (CIP) or planned project has been identified. The project may not overlap exactly with the segment and would be a good candidate to evaluate if the project should be adjusted in the CIP to incorporate proven safety countermeasures and adjust the logical termini to align with the HIN segment.

Table 14: High Injury Network Segments

	HIN Street	Segment	City
TIER 1	US-61	Mount Pleasant St to Wine-gard Dr	Burlington
	US-61	Sylvania Dr to US-34	Burlington
	US-61	US-34 to Agency St	Burlington
	US-61	Division St to Market St	Burlington
	Central Avenue	Court St to Jefferson St	Burlington
	Central Avenue	Division St to Jefferson St	Burlington
	Central Avenue	Angular St to Division St	Burlington
	Division Street	Plane St to Leebrck St	Burlington
	Agency Street	Gratton St to Mercer St	Burlington
	Leebrick Street	Spray St to Smith St	Burlington
	Angular Street	Central Ave to Main St	Burlington
	West Avenue	Nelson Dr to US-61	Burlington
	*Agency Road	* Broadway St to Burlington Ave	Burlington
	Avenue O	53rd St to 48th St	Fort Madison
	*US-218	Carbide Ln to Joyce Park Rd	Keokuk
	*US-218	US-61 to Navaho Dr	Keokuk
	*US-218	Joyce Park Rd to 25th St	Keokuk
	*US-218	20th St to 16th St	Keokuk
	*US-218	25th St to 20th St	Keokuk

*Indicates segments where a CIP or planned project has been identified

Table 14: High Injury Network Segments

	HIN Street	Segment	City
TIER 1	*US-218	10th St to 4th St	Keokuk
	Concert Street	18th St to 13th St	Keokuk
	Washington Street	Main St to Locust St	Mount Pleasant
	*Gear Avenue	Division St to *Agency St	West Burlington
TIER 2	Madison Avenue	* Harrison Street to South Street	Burlington
	Summer Street	* Harrison Street to West Avenue	Burlington
	Division Street	Leebrick Street to Central Avenue	Burlington
	Agency Street	Columbus Drive to Gratton Street	Burlington
	West Avenue	Lawrence Street to Garfield Avenue	Burlington
	*Harrison Street	Delmar Street to Madison Street	Burlington
	US-61	71st Street to West Avenue	Burlington
	*Mt. Pleasant Street	Burlington Avenue to US-61	Burlington
	Summer Street	West Avenue to Aetna Street	Burlington
	IA-92	2nd Street to Fairground Road	Columbus Junction
	15th Street	US-61 to Avenue C	Fort Madison
	US-61	24th Street to 18th Street	Fort Madison
	*US-218	16th Street to 10th Street	Keokuk
	US-61	Mack Lane to Main Street	Mediapolis
	Washington Street	Jay Street to Wilson Street	Mount Pleasant
	US-61	Townsend Avenue to Franklin Street	Wapello
TIER 3	Sunnyside Avenue	Diamond Ridge Drive to Cliff Road	Burlington
	Osborn Street	Wells Street to Oak Street	Burlington

*Indicates segments where a CIP or planned project has been identified

Table 14: High Injury Network Segments

	HIN Street	Segment	City
TIER 3	Mt. Pleasant Street	Cottonwood Ct to Osborn Street	Burlington
	Jefferson Street	Gunnison Street to 6th Street	Burlington
	Central Avenue	South Street to Angular Street	Burlington
	Higbee Avenue	Grove Street to Smith Street	Burlington
	Mt. Pleasant Street	Summer Street to Burlington Avenue	Burlington
	Flint Hills Drive	Division Street to Shield Street	Burlington
	Division Street	US-61 to Plane Street	Burlington
	Sunnyside Avenue	Cliff Road to Osborn Street	Burlington
	Burlington Avenue	Division Street to Agency Street	Burlington
	Main Street	South Street to Market Street	Burlington
	Plane Street	Green Street to Curran Street	Burlington
	West Avenue	Gear Avenue to Sierra Drive	Burlington
	Summer Street	Sioux Street to *Harrison Street	Burlington
	Bluff Road	US-34 to Cash Street	Burlington
	US-34	Broadway Street to US-61	Burlington
	US-34	Currin Street to Wells Street	Burlington
	G36	2nd Street to Locust Street	Columbus Junction
	US-61	34th Street to 24th Street	Fort Madison
	US-61	48th Avenue to Avenuenue L	Fort Madison
	Avenue E	21st Street to 11th Street	Fort Madison
	Avenue H	23rd Street to 6th Street	Fort Madison
	Jackson Street	US-61 Bypass to Columbia Street	Grand View
	Concert Street	10th Street to 4th Street	Keokuk
	US-218	US-61 to Carbide Lane	Keokuk
	US-136	A Street to US-218	Keokuk
	US-136	Mississippi River to 4th Street	Keokuk

*Indicates segments where a CIP or planned project has been identified

Table 14: High Injury Network Segments

	HIN Street	Segment	City
TIER 3	13th Street	US-218 to Seymour Street	Keokuk
	Timea Street	18th Street to US-136	Keokuk
	Johnson Street Road	Henkel Road to US-218	Keokuk
	US-34	Haynes Street to Past Iris Street	Mount Pleasant
	Maple Leaf Drive	Lincoln Street to Grand Avenue	Mount Pleasant
	Grand Avenue	Past Harvest Drive to US-34	Mount Pleasant
	US-61	Locust Street to G-62	Wapello
	US-61	Townsend Avenue to Marshall Street	Wapello
	Broadway Street	Division Street to Agency Street	West Burlington
	Agency Street	Gear Street to Broadway Street	West Burlington

*Indicates segments where a CIP or planned project has been identified

List of HIN Intersections

The HIN intersections were categorized into two tiers to help determine which intersections should be prioritized for safety improvements. Tiers 1 and 2 are shown in Table 15 below. An asterisk symbol is included to indicate where a capital improvement plan (CIP) or planned project has been identified. The project may include only one street at the intersection and would be a good candidate to evaluate if the project termini should be adjusted in the CIP to incorporate proven safety countermeasures and adjust the logical termini to align with the HIN intersection.

Table 15: High Injury Network Intersections

	Primary Street	Intersecting Street	City
TIER 1	Washington Street	Central Avenue	Burlington
	Agency Street	Curran Street	Burlington
	*Roosevelt Avenue (US-61)	Mason Road	Burlington
	*Roosevelt Avenue (US-61)	West Avenue	Burlington
	*Roosevelt Avenue (US-61)	*Division Street	Burlington
	*Roosevelt Avenue (US-61)	Agency Street	Burlington
	*Roosevelt Avenue (US-61)	US-34 (IA-163) EB Off Ramp	Burlington

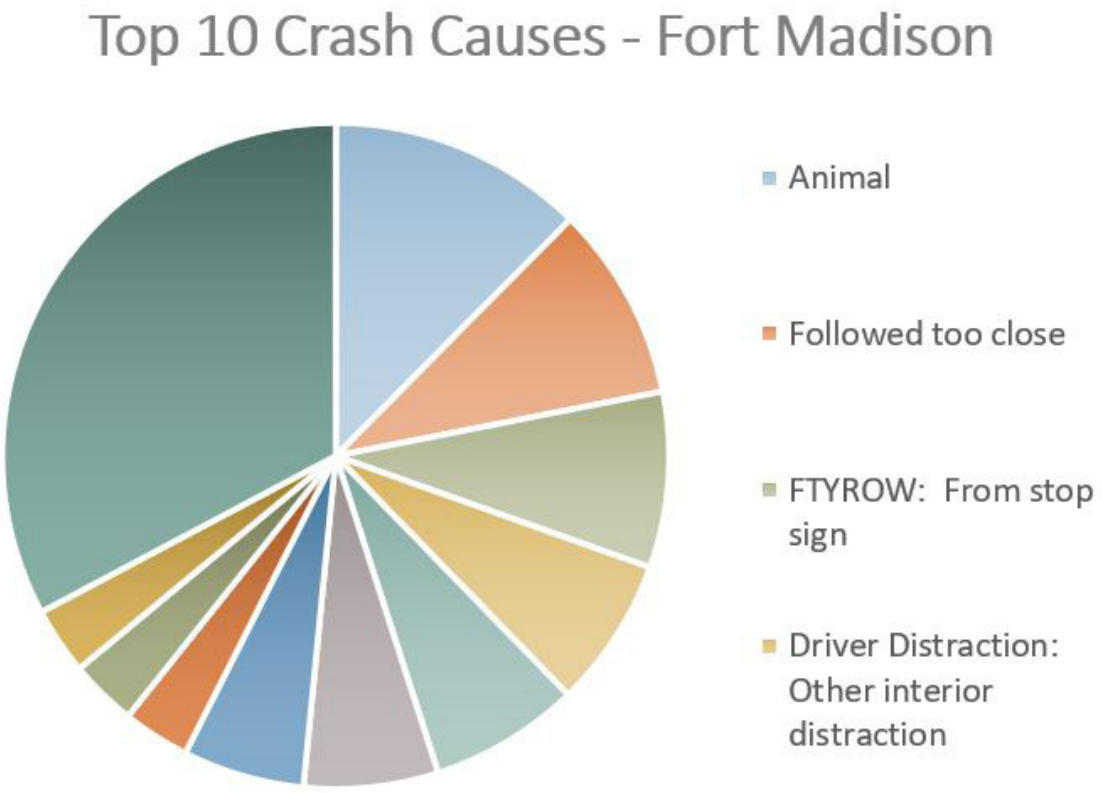
*Indicates intersections where a CIP or planned project has been identified

Table 15: High Injury Network Intersections

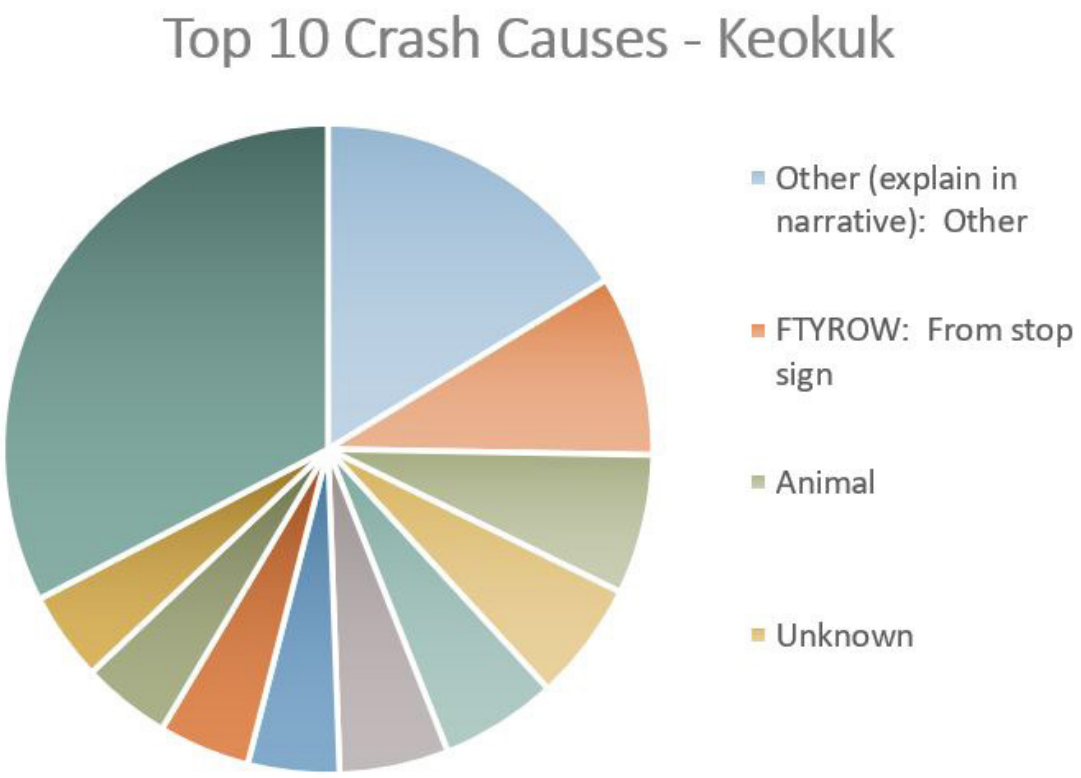
	Primary Street	Intersecting Street	City
TIER 1	*Roosevelt Avenue (US-61)	Kirkwood Street	Burlington
	*Roosevelt Avenue (US-61)	*Mt. Pleasant Street	Burlington
	*Division Street	Plane Street	Burlington
	*Main Street (US-218)	Carbide Lane / Plank Street	Keokuk
	*Main Street (US-218)	North Park Drive / Commercial Access	Keokuk
	US-218 (IA-27)	East School Avenue	Olds
	Agency Road	*Broadway Street	West Burlington
TIER 2	Angular Street	9th Street	Burlington
	Maple Street	Central Avenue	Burlington
	*Division Street	Central Avenue	Burlington
	West Avenue	Howard Road / Commercial Access	Burlington
	*Mt. Pleasant Street	Curran Street	Burlington
	South Street	Summer Street	Burlington
	Agency Street	*W. Burlington Avenue	Burlington / West Burlington
	US-61 / US-136	US-61 / Twin Rivers Drive	Keokuk
	*Main Street (US-218)	S. 7th Street (US-136) / N. 7th Street	Keokuk
	*Main Street (US-218)	S. 18th Street / N. 18th Street	Keokuk
	E. Washington Street (US-34)	*S. Iris Street	Mount Pleasant
	*Agency Road	*Gear Avenue	West Burlington

*Indicates intersections where a CIP or planned project has been identified

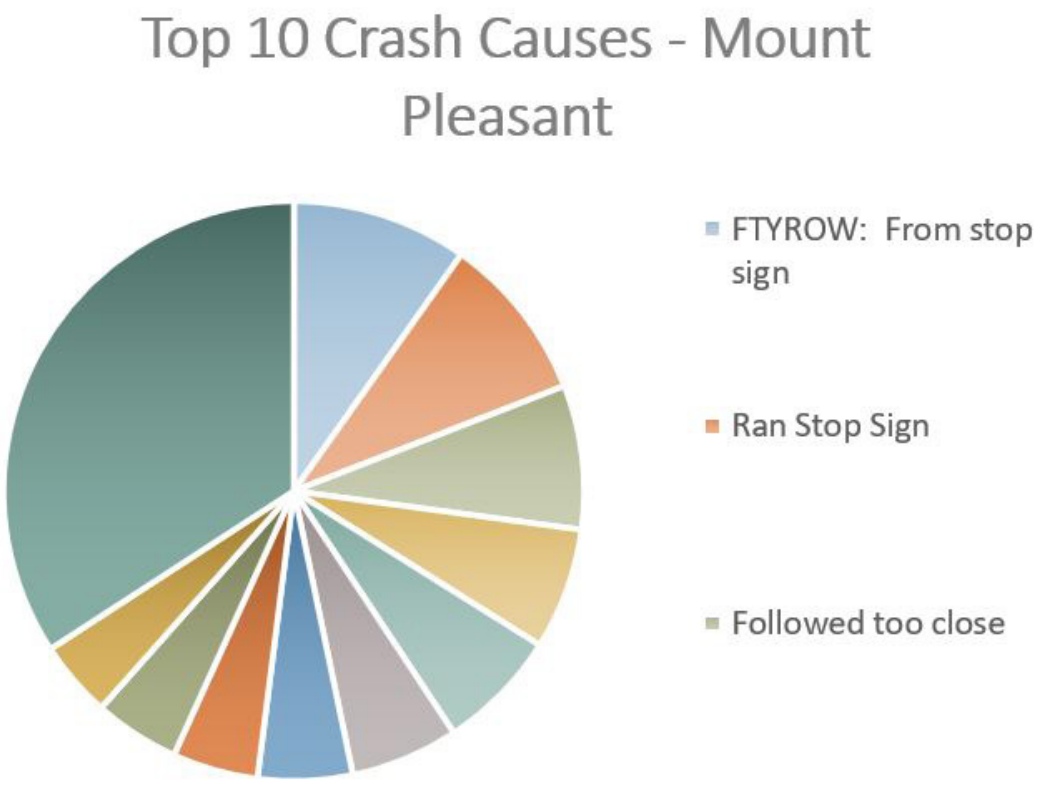
Appendix B: Crash Data



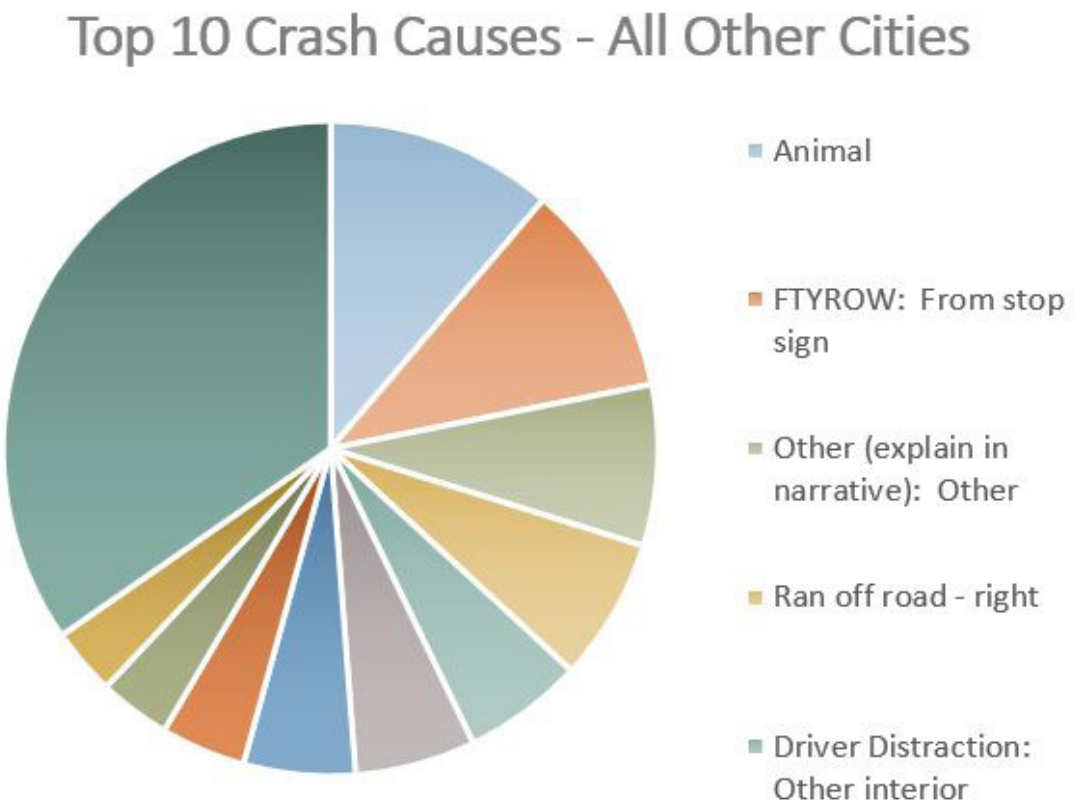
Description	Count	%
Animal	80	12.4%
Followed too close	61	9.5%
FTYROW: From stop sign	55	8.5%
Driver Distraction: Other interior distraction	47	7.3%
Other (explain in narrative): Other	47	7.3%
Unknown	42	6.5%
Lost Control	38	5.9%
Ran Stop Sign	21	3.3%
FTYROW: Making left turn	21	3.3%
Ran off road - right	21	3.3%
All Others	211	32.7%
TOTAL	644	



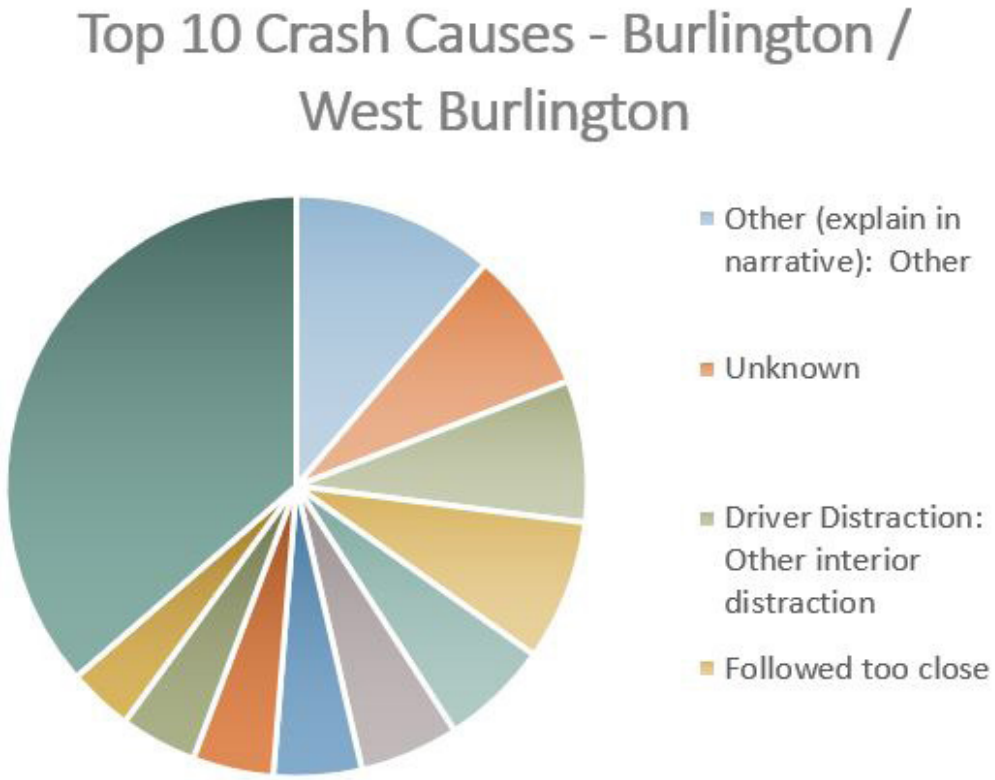
Description	Count	%
Other (explain in narrative): Other	129	16.3%
FTYROW: From stop sign	71	9.0%
Animal	55	7.0%
Unknown	47	5.9%
Ran Stop Sign	46	5.8%
Followed too close	43	5.4%
Driver Distraction: Other interior distraction	36	4.6%
Lost Control	36	4.6%
Ran Traffic Signal	35	4.4%
FTYROW: Making left turn	35	4.4%
All Others	258	32.6%
TOTAL	791	



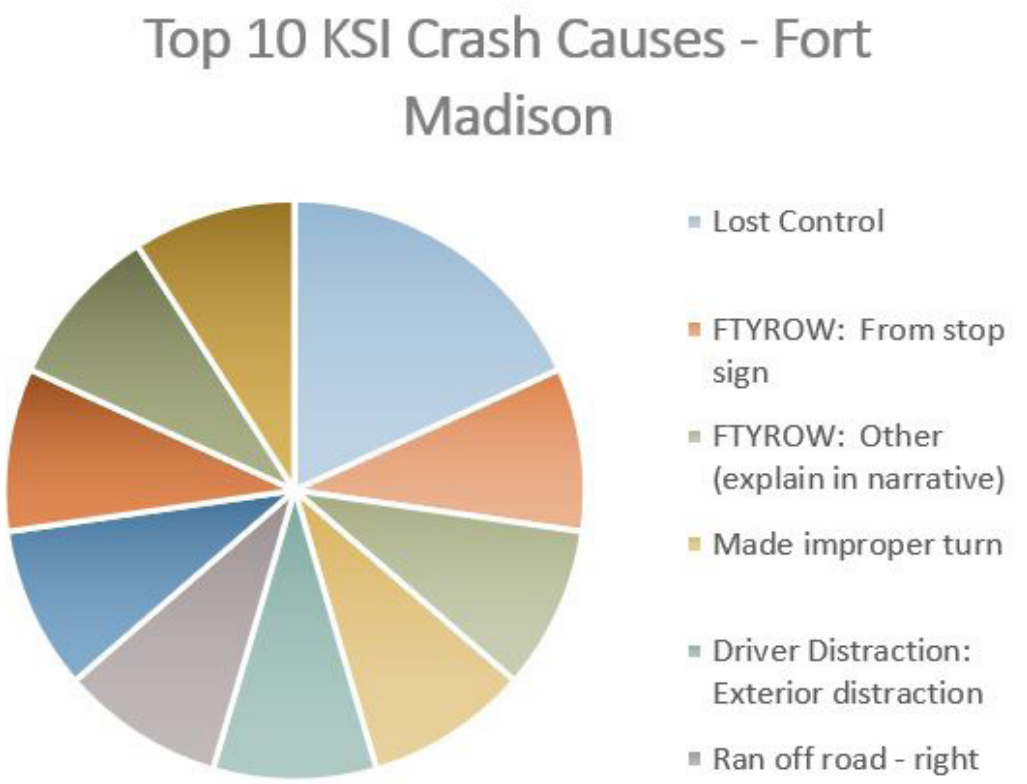
Description	Count	%
FTYROW: From stop sign	39	9.8%
Ran Stop Sign	37	9.3%
Followed too close	32	8.0%
Animal	27	6.8%
Other (explain in narrative): Other	27	6.8%
FTYROW: Making left turn	24	6.0%
Operating vehicle in an reckless, erratic, careless, negligent manner	21	5.3%
Ran Traffic Signal	19	4.8%
Driving too fast for conditions	19	4.8%
Other (explain in narrative): No improper action	17	4.3%
All Others	136	34.1%
TOTAL	398	



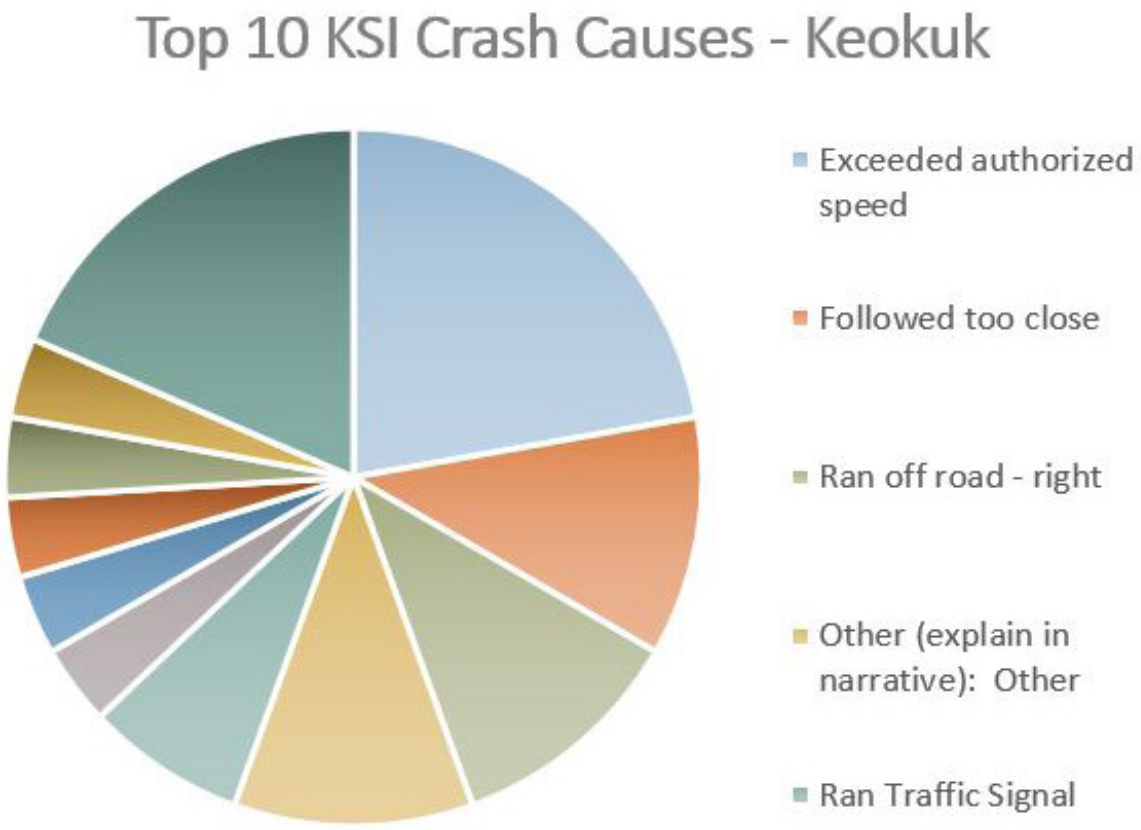
Description	Count	%
Animal	51	11.3%
FTYROW: From stop sign	48	10.6%
Other (explain in narrative): Other	36	7.9%
Ran off road - right	32	7.1%
Driver Distraction: Other interior distraction	27	6.0%
Unknown	27	6.0%
Lost Control	25	5.5%
Improper Backing	19	4.2%
Ran off road - left	16	3.5%
Ran Stop Sign	15	3.3%
All Others	157	34.6%
TOTAL	453	



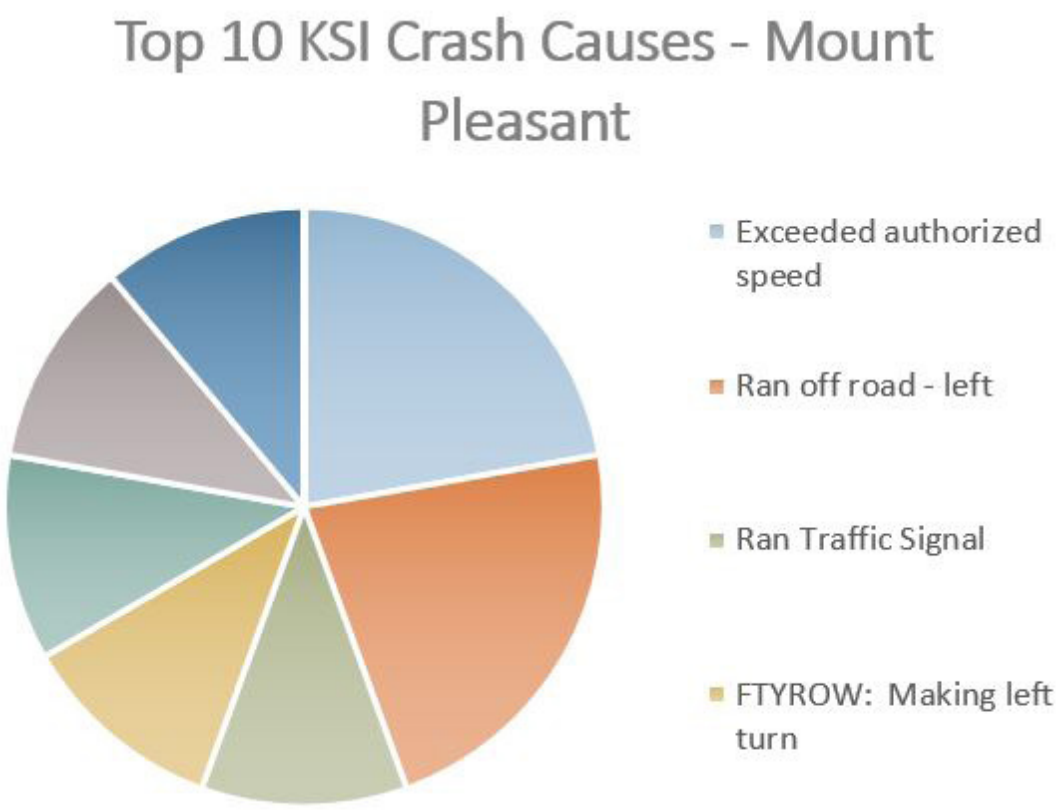
Description	Count	%
Other (explain in narrative): Other	330	11.2%
Unknown	232	7.9%
Driver Distraction: Other interior distraction	231	7.9%
Followed too close	230	7.8%
Lost Control	177	6.0%
FTYROW: From stop sign	162	5.5%
FTYROW: Making left turn	144	4.9%
Animal	132	4.5%
Driving too fast for conditions	125	4.3%
Ran Traffic Signal	106	3.6%
All Others	1068	36.4%
TOTAL	2937	



Description	Count	%
Lost Control	2	18.2%
FTYROW: From stop sign	1	9.1%
FTYROW: Other (explain in narrative)	1	9.1%
Made improper turn	1	9.1%
Driver Distraction: Exterior distraction	1	9.1%
Ran off road - right	1	9.1%
Ran off road - straight	1	9.1%
Swerving/Evasive Action	1	9.1%
Over correcting/over steering	1	9.1%
Other (explain in narrative): Other	1	9.1%
All Others	0	-0.1%
TOTAL	11	

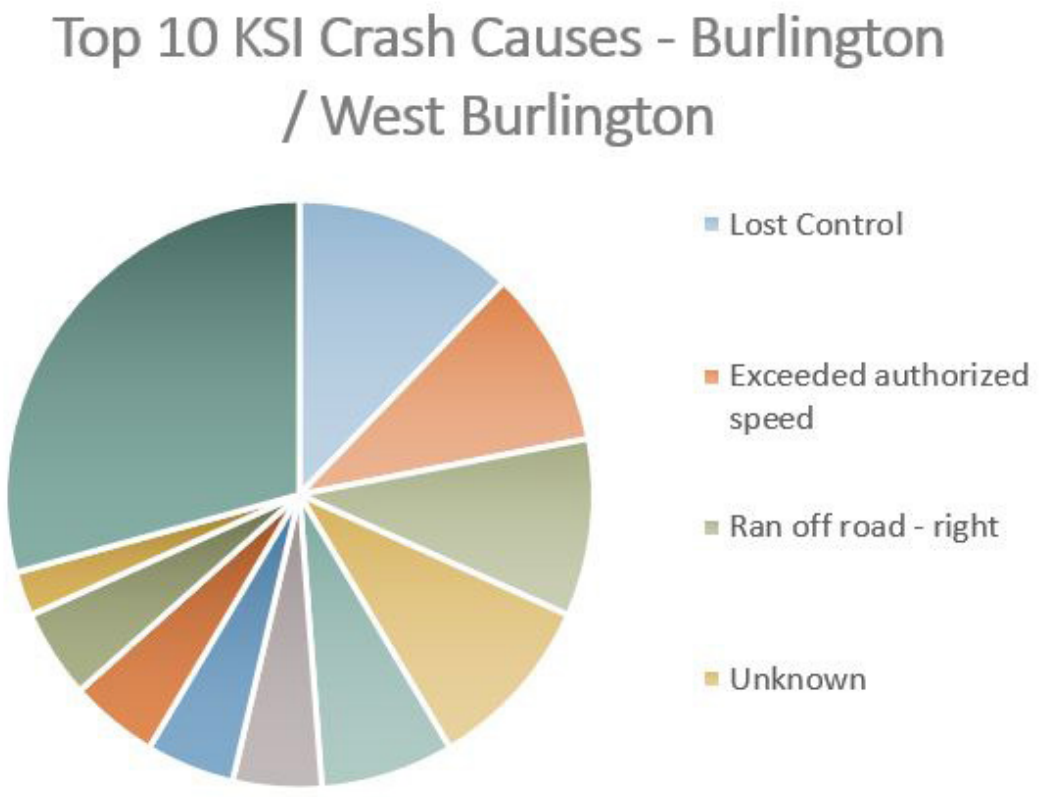


Description	Count	%
Exceeded authorized speed	6	22.2%
Followed too close	3	11.1%
Ran off road - right	3	11.1%
Other (explain in narrative): Other	3	11.1%
Ran Traffic Signal	2	7.4%
Ran Stop Sign	1	3.7%
Failed to yield to emergency vehicle	1	3.7%
FTYROW: At uncontrolled intersection	1	3.7%
FTYROW: From stop sign	1	3.7%
FTYROW: Making left turn	1	3.7%
All Others	5	18.6%
TOTAL	27	



Description	Count	%
Exceeded authorized speed	2	22.2%
Ran off road - left	2	22.2%
Ran Traffic Signal	1	11.1%
FTYROW: Making left turn	1	11.1%
FTYROW: To pedestrian	1	11.1%
Driver Distraction: Other interior distraction	1	11.1%
Lost Control	1	11.1%
Animal	0	0.0%
Ran Stop Sign	0	0.0%
Failed to yield to emergency vehicle	0	0.0%
All Others	0	0.1%
TOTAL	9	

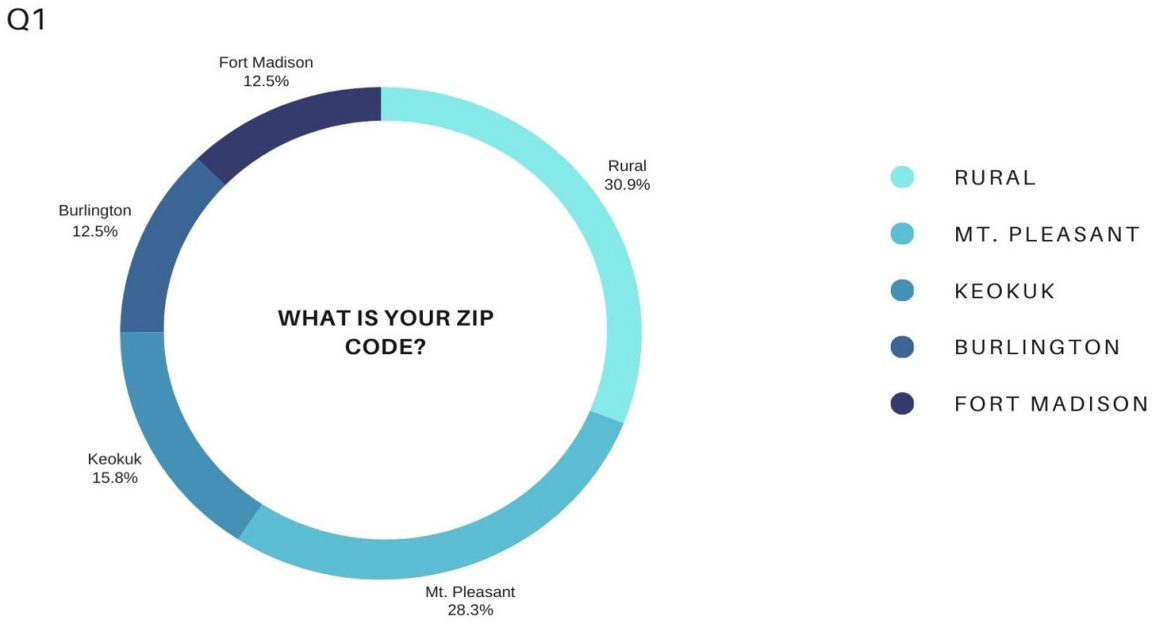
Description	Count	%
FTYROW: From stop sign	3	12.5%
Operating vehicle in an reck-less, erratic, careless, negligent manner	3	12.5%
Ran Stop Sign	2	8.3%
Ran off road - straight	2	8.3%
Lost Control	2	8.3%
Swerving/Evasive Action	2	8.3%
Other (explain in narrative): Other	2	8.3%
Other (explain in narrative): No improper action	2	8.3%
Ran Traffic Signal	1	4.2%
FTYROW: Other (explain in narrative)	1	4.2%
All Others	4	16.8%
TOTAL	24	



Description	Count	%
Lost Control	5	12.2%
Exceeded authorized speed	4	9.8%
Ran off road - right	4	9.8%
Unknown	4	9.8%
Other (explain in narrative): Other	3	7.3%
Animal	2	4.9%
FTYROW: Making left turn	2	4.9%
Driver Distraction: Other interior distraction	2	4.9%
Other (explain in narrative): No improper action	2	4.9%
Ran Traffic Signal	1	2.4%
All Others	12	29.3%
TOTAL	41	

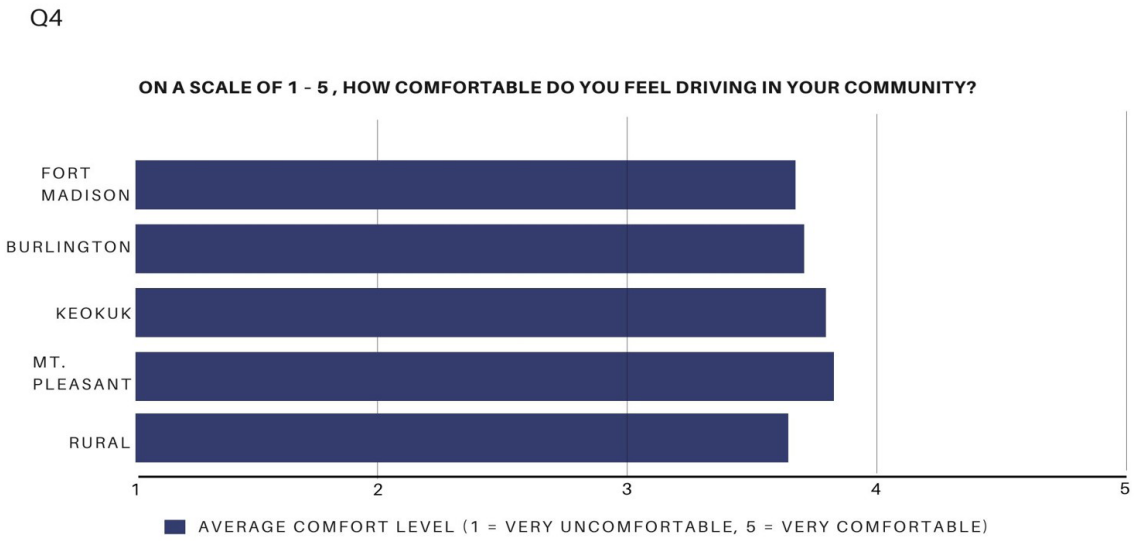
Appendix C: Public Survey Response Data

Q1 - What zip code do you live in?



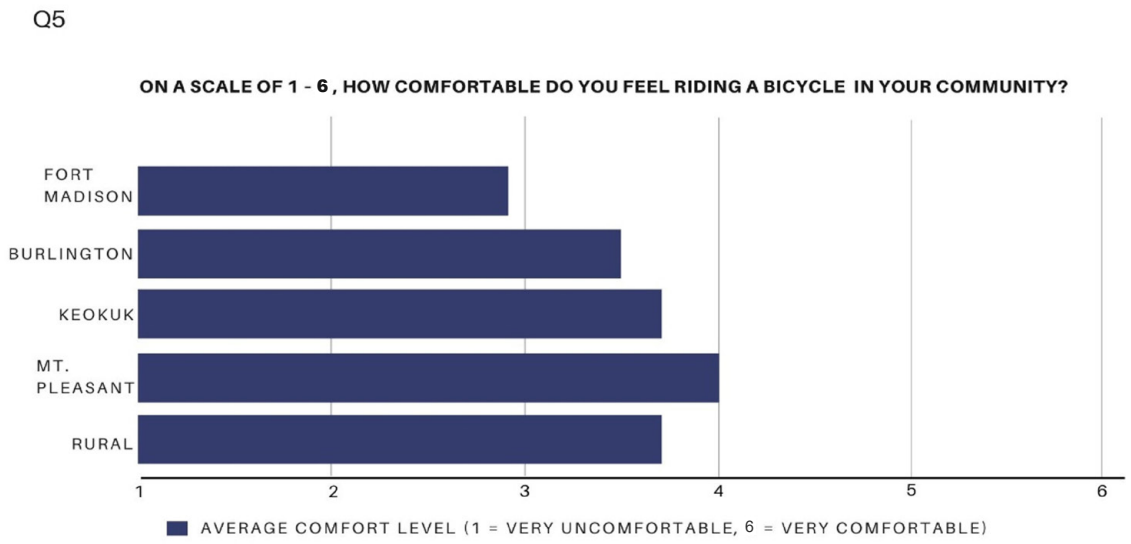
Municipality	Zip Code	Count
Rural		82
Mt. Pleasant	52641	75
Keokuk	52632	42
Burlington	52601	33
Fort Madison	52627	33
Total		265

Q4 - On a scale of 1 – 5 (where 1 is very uncomfortable and 5 is very comfortable), how comfortable do you feel driving in your community?



Municipality	Zip Code	1	2	3	4	5
Rural		10	8	11	26	27
Mt. Pleasant	52641	10	1	11	24	29
Keokuk	52632	2	3	9	16	12
Burlington	52601	3	6	2	9	13
Fort Madison	52627	2	5	4	13	9

Q5 - On a scale of 1 – 6 (where 1 is very uncomfortable and 6 is very comfortable), how comfortable do you feel driving in your community?



Municipality	Zip Code	1	2	3	4	5	6
Rural		7	15	15	21	7	17
Mt. Pleasant	52641	6	15	15	7	1	31
Keokuk	52632	1	14	9	4	0	14
Burlington	52601	4	10	5	2	4	8
Fort Madison	52627	6	9	9	3	0	5

Q6 - On a scale of 1 – 5 (where 1 is very uncomfortable and 5 is very comfortable), how comfortable do you feel walking in your community?

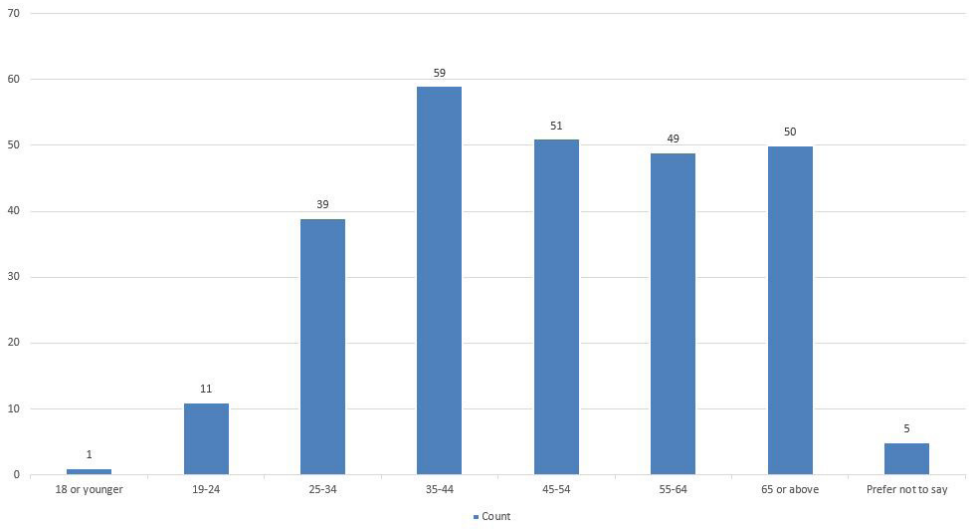
Municipality	Zip Code	1	2	3	4	5
Rural		7	12	19	28	16
Mt. Pleasant	52641	6	14	11	28	16
Keokuk	52632	0	8	19	10	5
Burlington	52601	2	6	6	13	6
Fort Madison	52627	4	4	10	6	9

Q11 - If you were given a choice, how would you like to learn about current safety issues? Pick 2.

Municipal-ity	Zip Code	Social media	On a web-site	On tele-vision	On radio	Email	In my utility bill	Newspa-per	Other
Rural		51	24	4	13	19	16	16	2
Mt. Pleasant	52641	40	27	5	18	11	20	10	3
Keokuk	52632	32	13	0	5	7	6	11	0
Burlington	52601	22	12	1	7	8	3	4	3
Fort Madison	52627	22	11	5	2	9	4	10	1
	Total	167	87	15	45	54	49	51	9

Q12 - What best describes your age?

Age Range	Count
18 or younger	1
19-24	11
25-34	39
35-44	59
45-54	51
55-64	49
65 or above	50
Prefer not to say	5



Appendix D: High Injury Network Maps

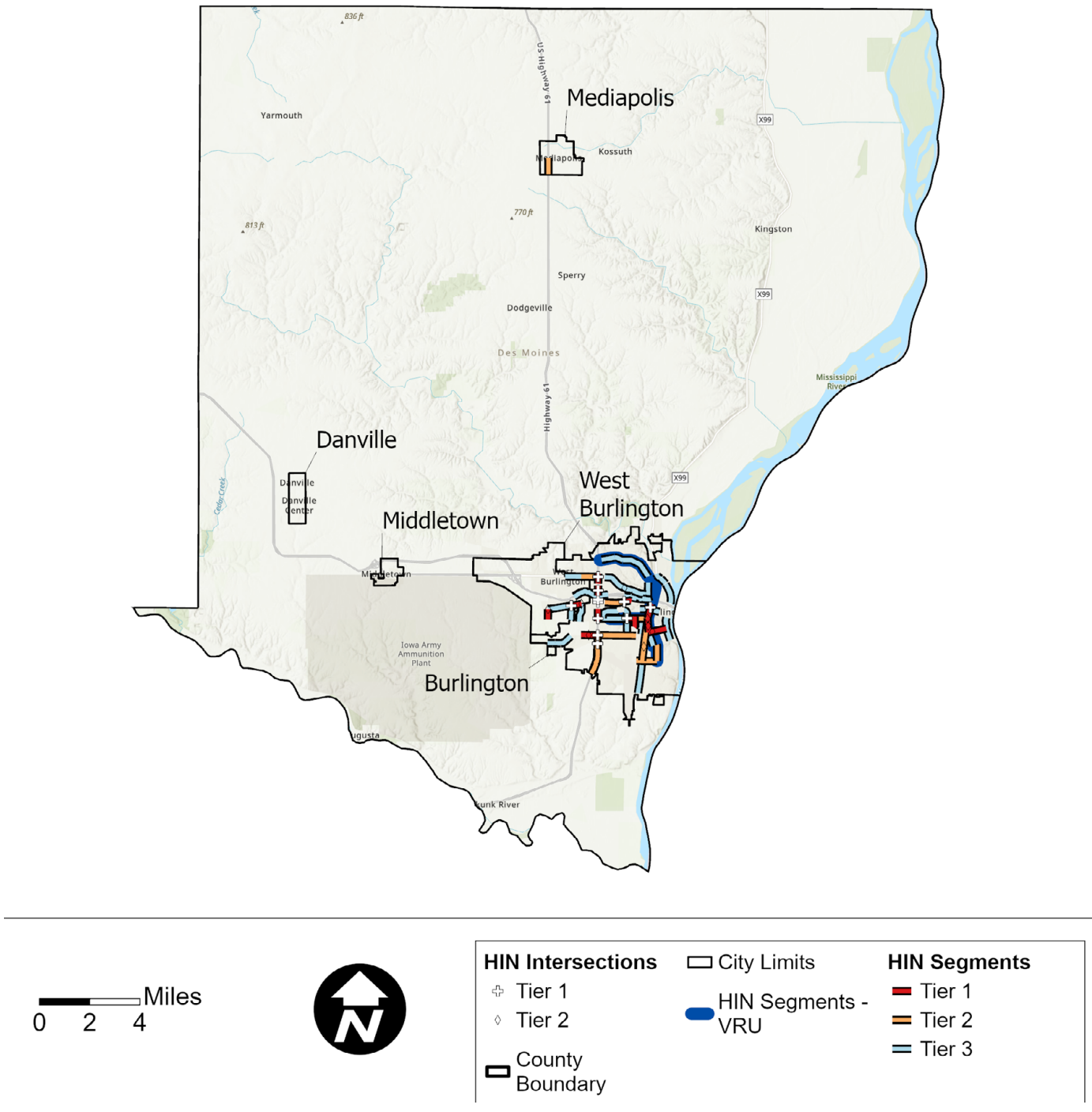


Figure 3: Des Moines County HIN

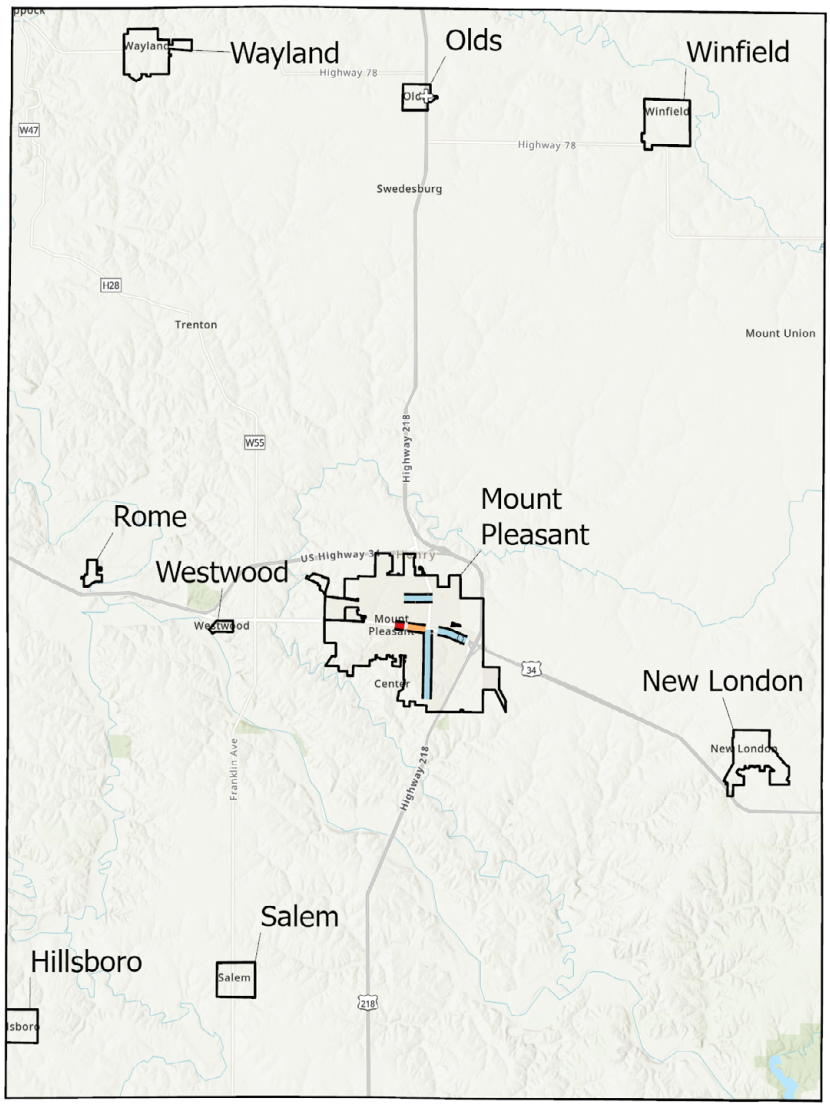


Figure 4: Henry County HIN

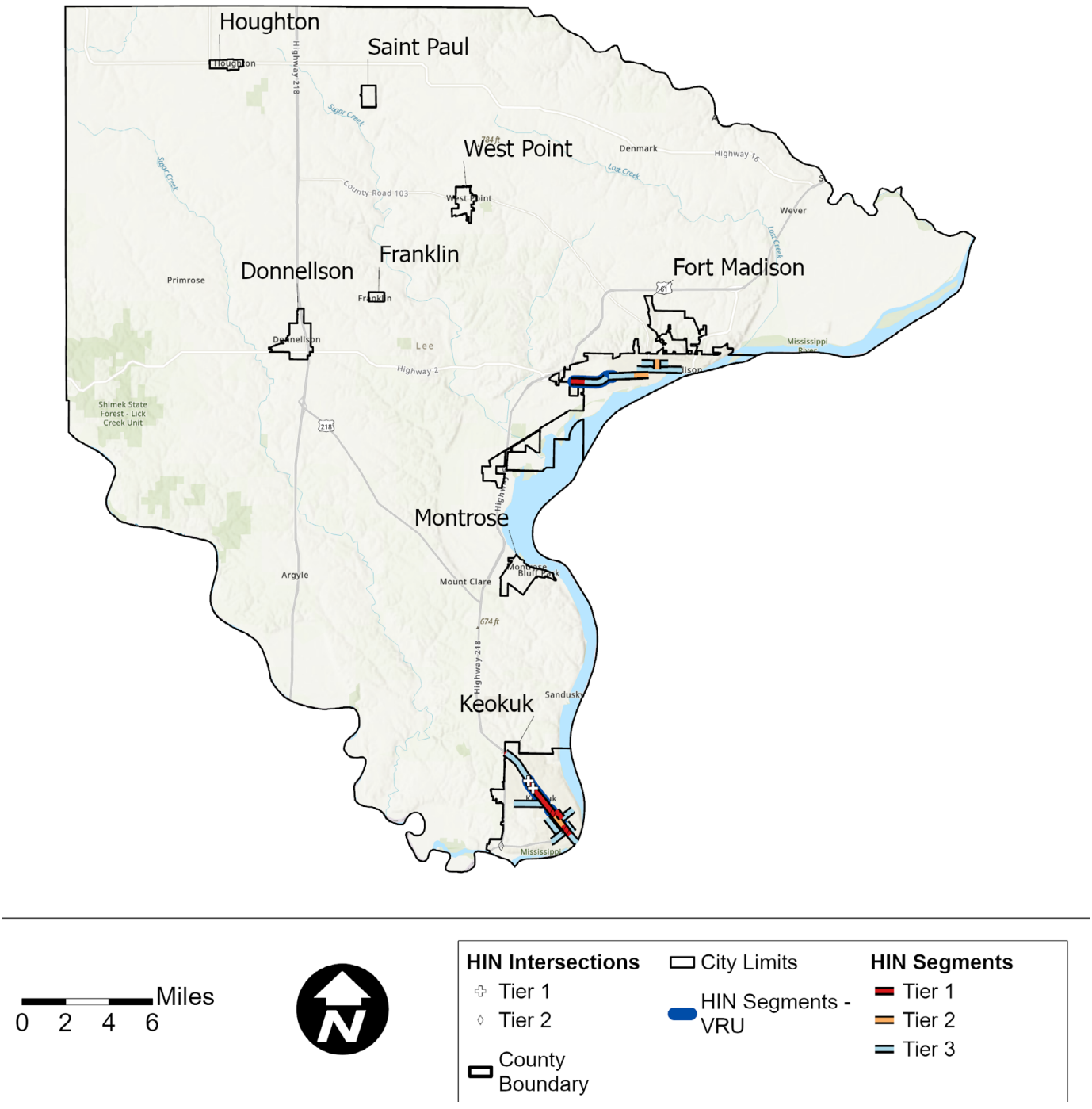


Figure 5: Lee County HIN

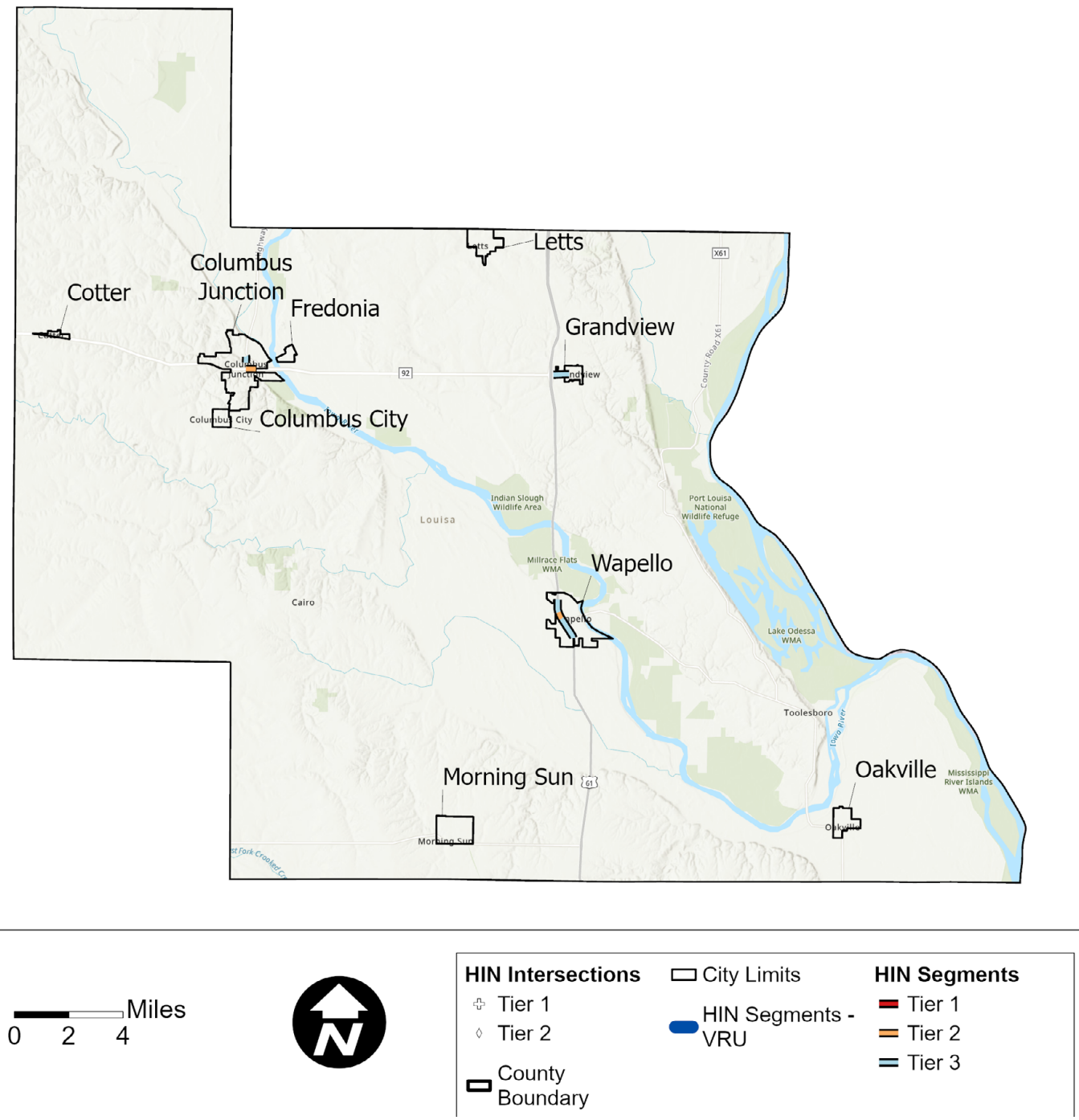


Figure 6: Louisa County HIN

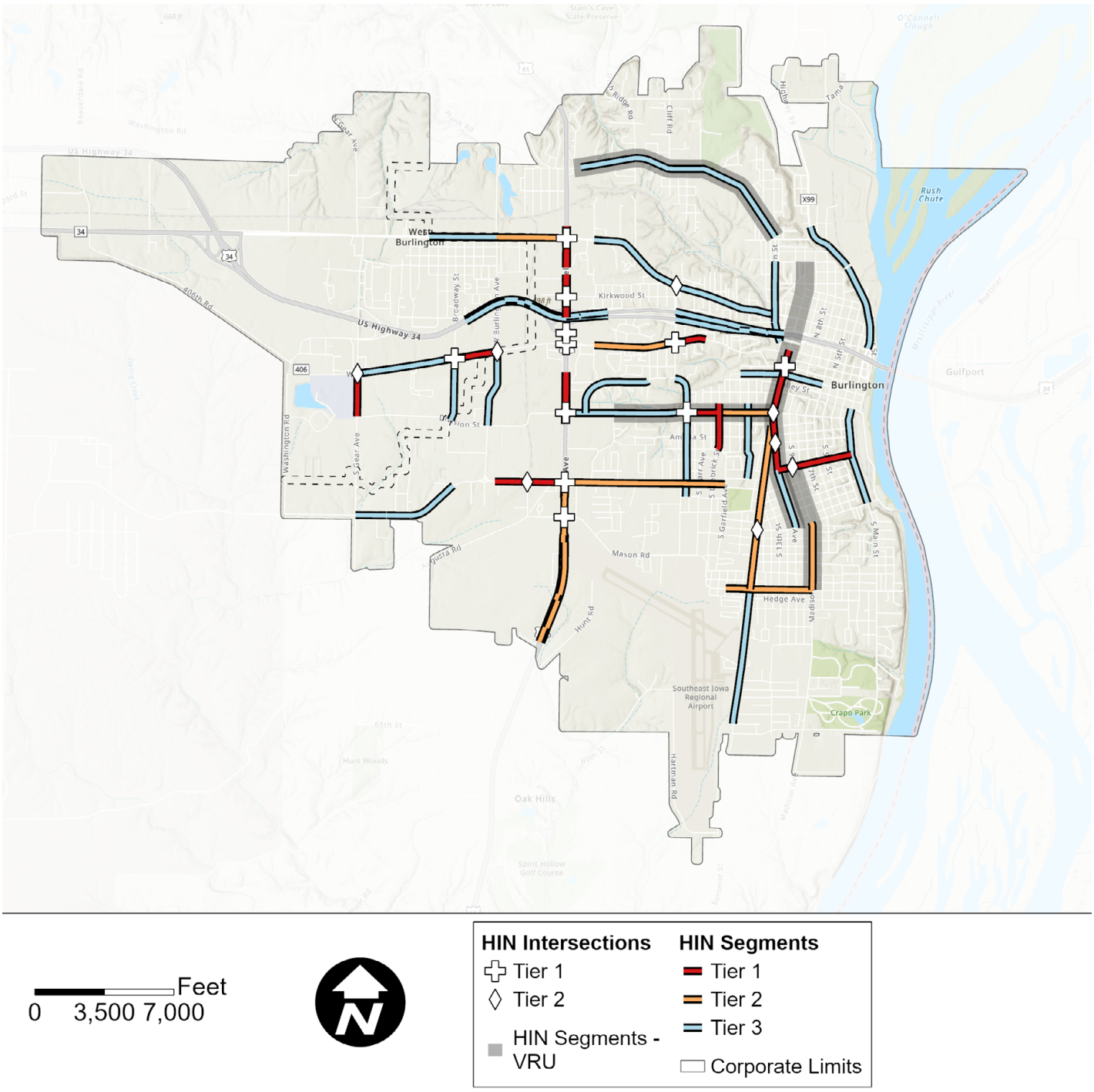


Figure 7: Burlington and West Burlington HIN

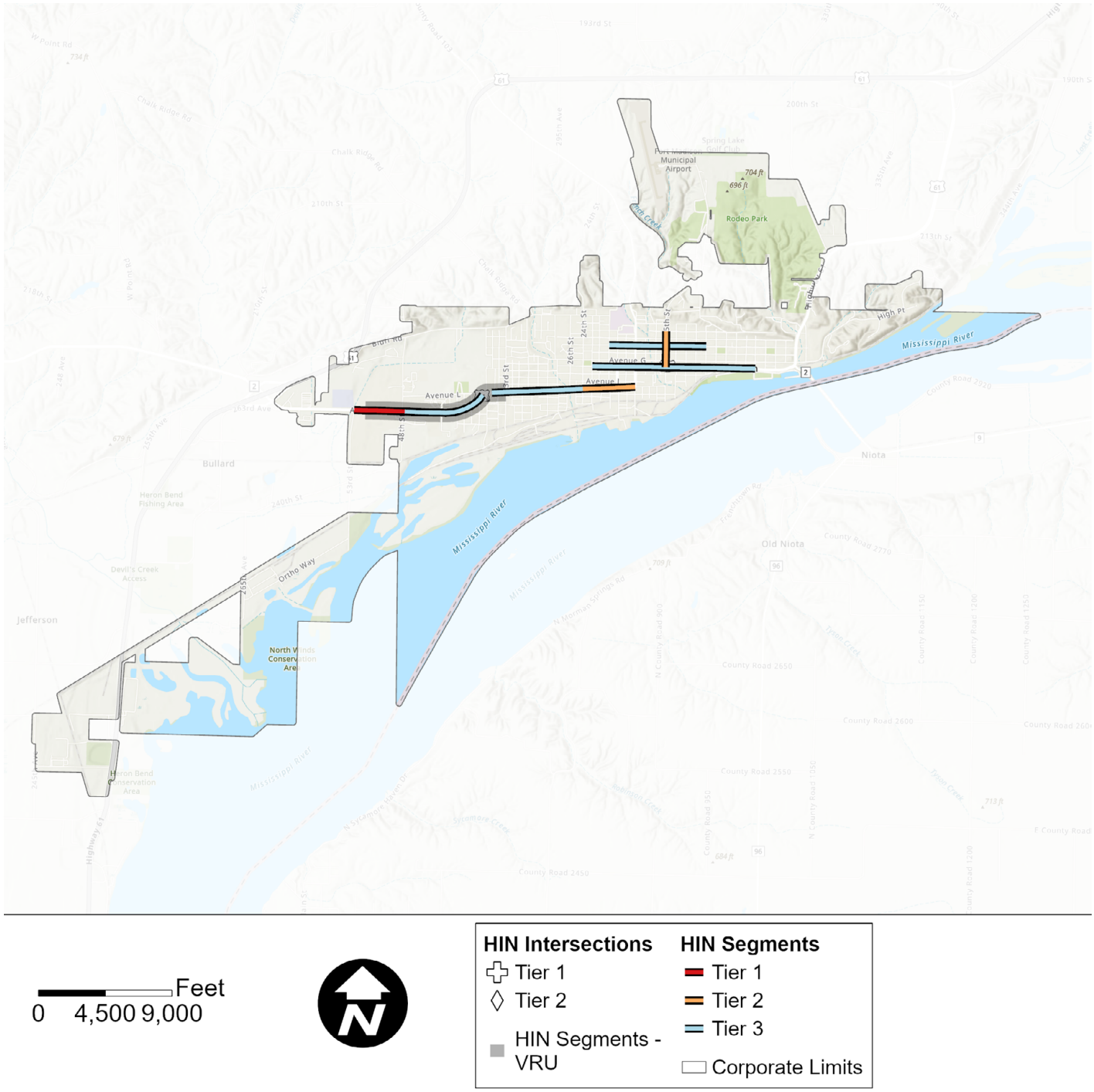


Figure 8: Fort Madison HIN

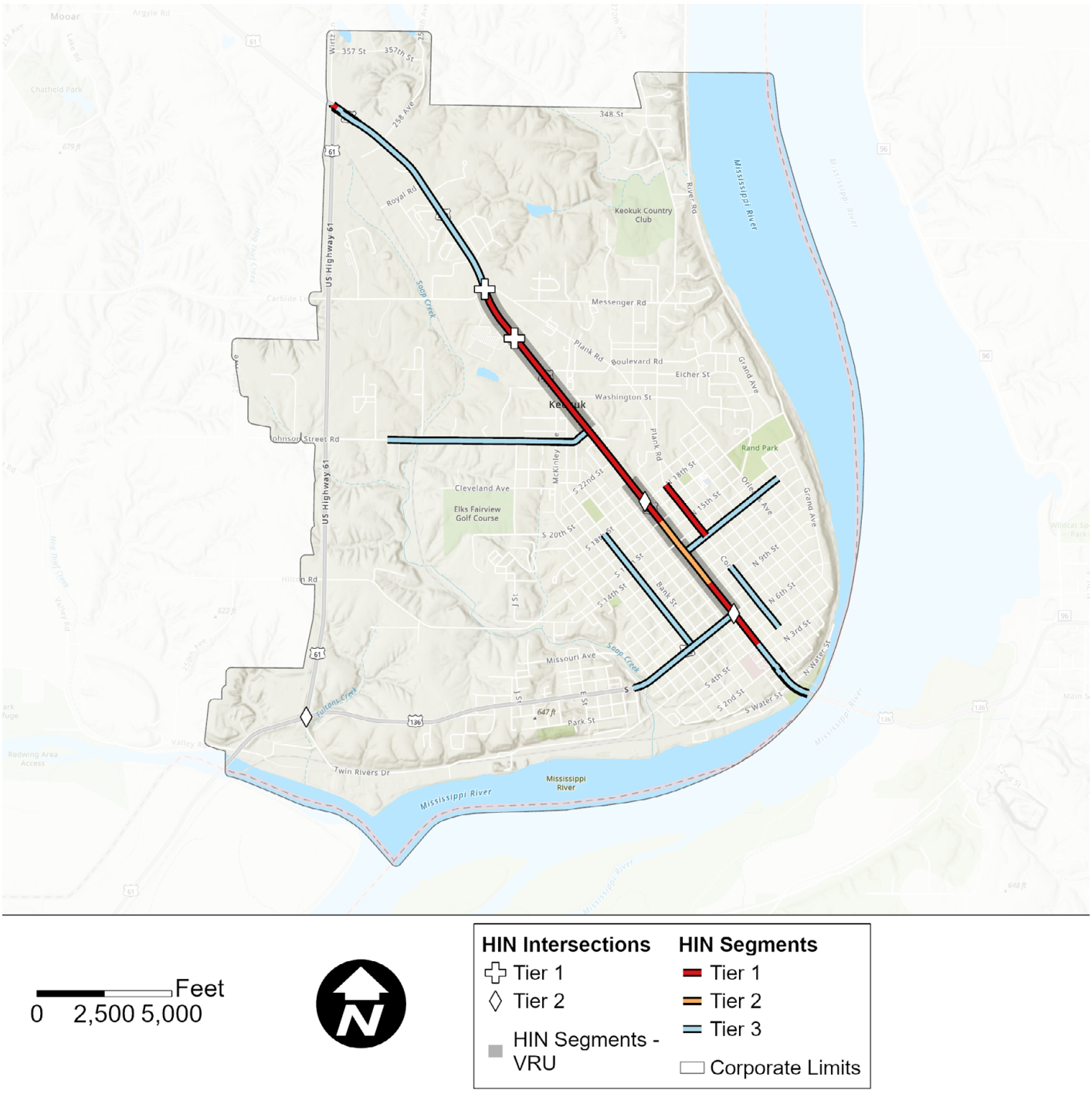


Figure 9: Keokuk HIN

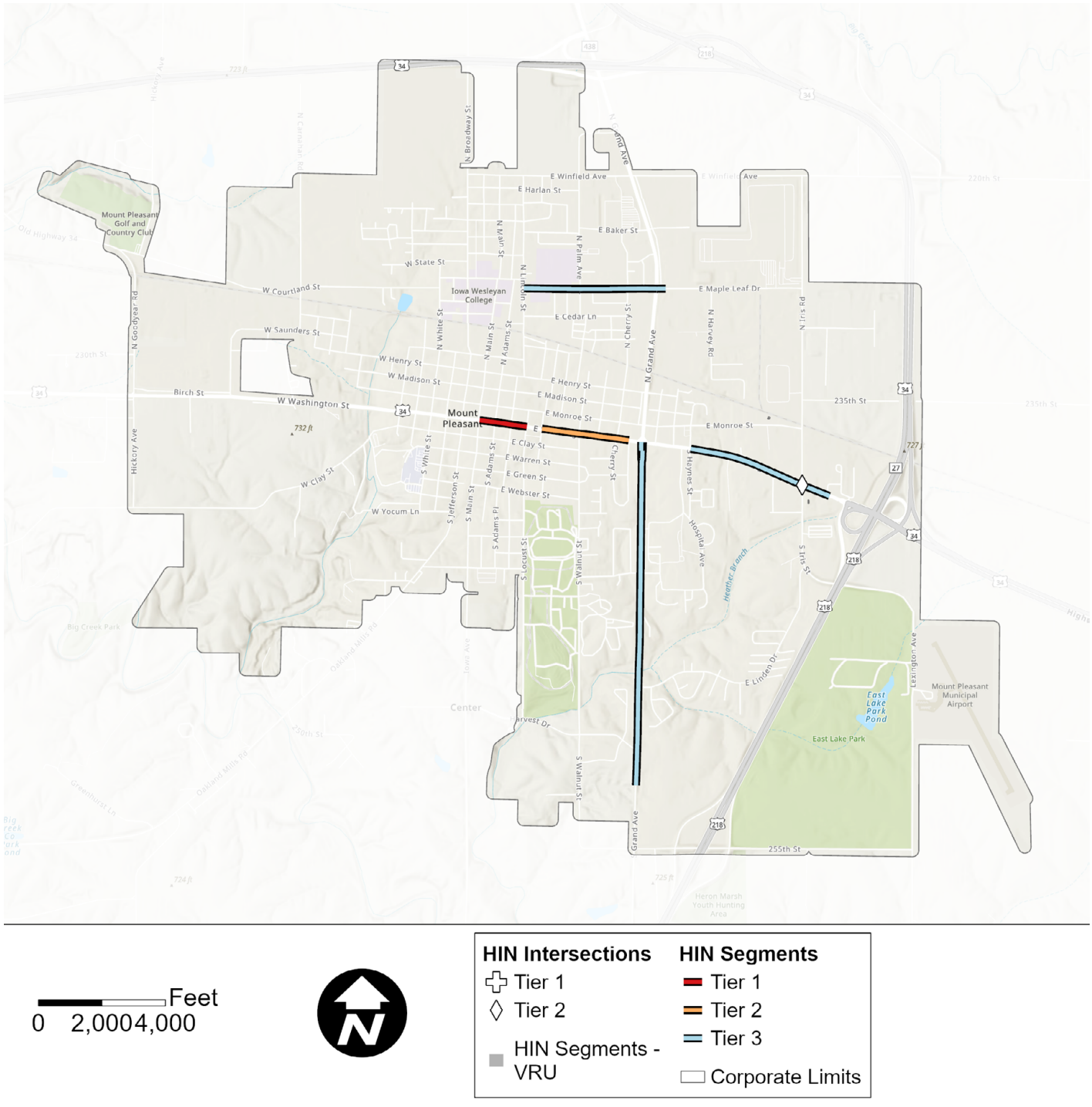


Figure 10: Mount Pleasant HIN

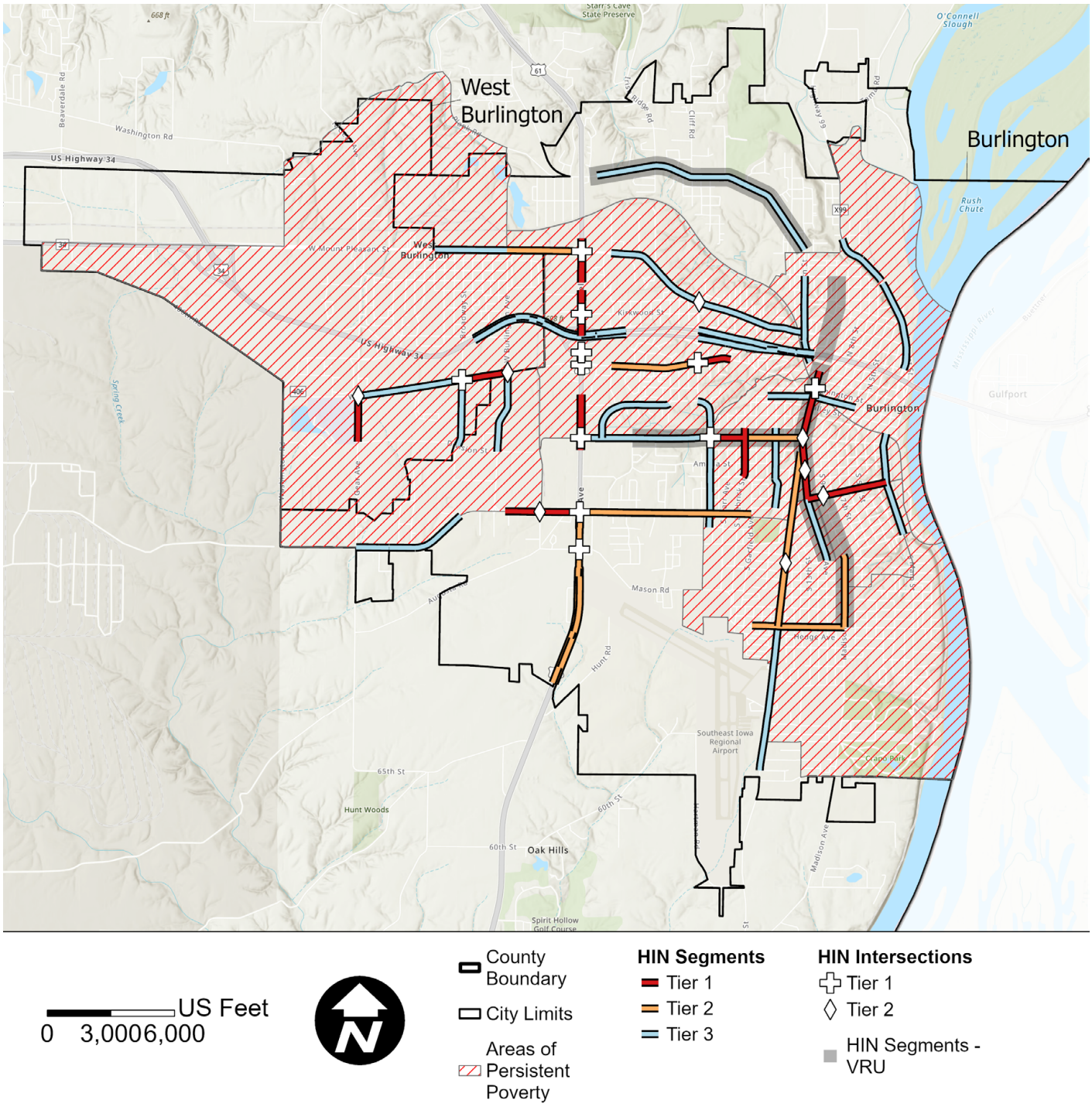


Figure 11: Burlington / West Burlington HIN and Underserved Community Overlay

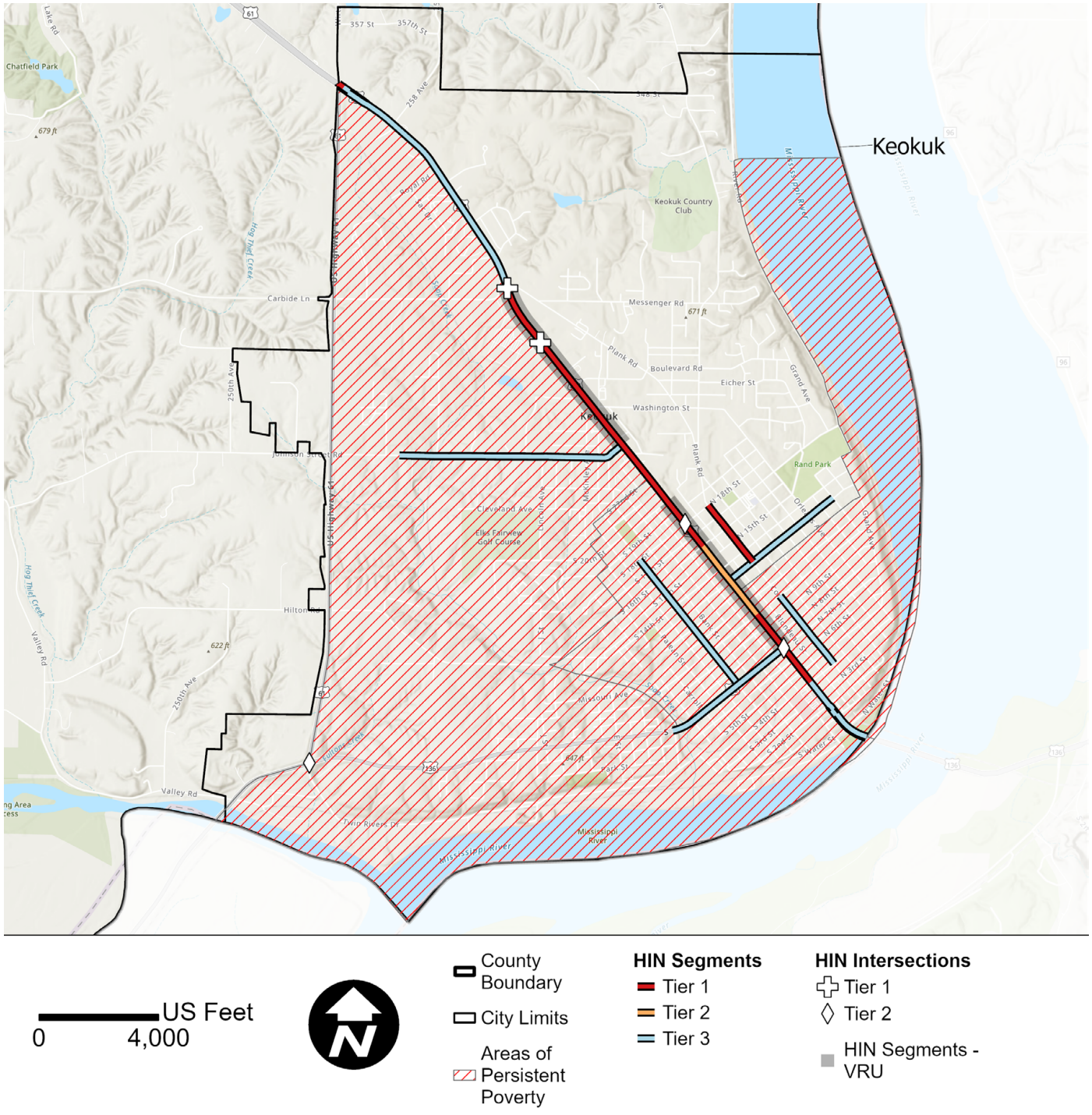


Figure 12: Keokuk HIN and Underserved Community Overlay