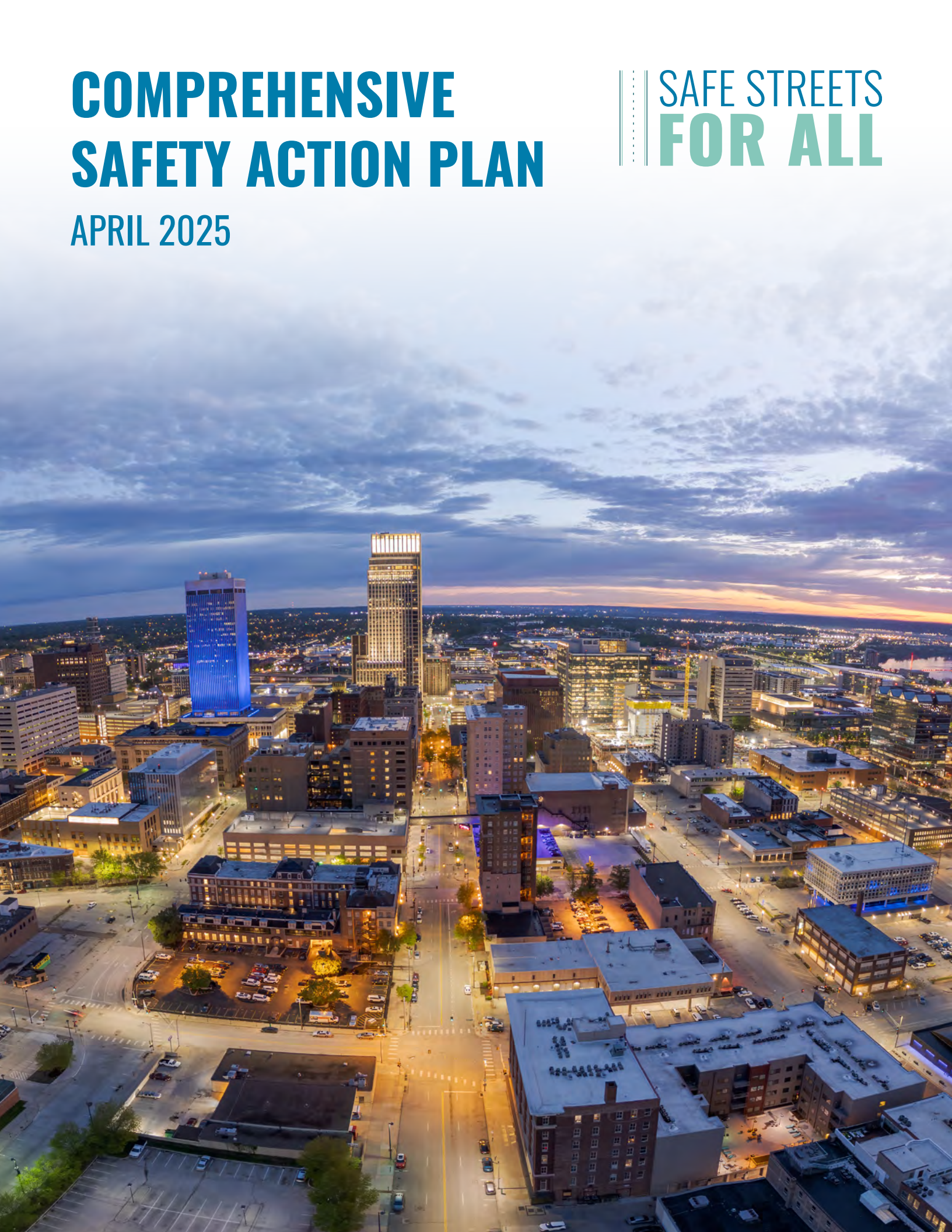


COMPREHENSIVE SAFETY ACTION PLAN

APRIL 2025

SAFE STREETS
FOR ALL





INTRODUCTION

Over the last five years, **268 people have died on roads within the plan study area while another 2,266 people have experienced life-altering injuries.** The Safe System Approach is a holistic and comprehensive approach to transportation safety that is grounded in the belief that deaths and serious injuries on our roadways are unacceptable. This Comprehensive Safety Action Plan outlines the path towards zero traffic fatalities and serious injuries by 2040, which will embody the principles of the Safe System Approach.

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PROJECT PARTNERS

Metropolitan Area Planning Agency (MAPA), two state Departments of Transportation, two counties and fifteen municipalities were involved in the planning process for this Comprehensive Safety Action Plan. We are grateful to our partners for taking the time to share their knowledge, experience, and ideas. MAPA will continue to work with these and other community partners to formally adopt this Comprehensive Safety Action Plan and to implement the safety projects outlined in the plan.

With the combined action and sustained intention of these partners, together we can achieve the goal of zero traffic fatalities and serious injuries in our region by 2040.

Iowa Department of Transportation

Nebraska Department of Transportation

Douglas County, NE

Sarpy County, NE

Bellevue, NE

Bennington, NE

Boys Town, NE

Carter Lake, IA

Council Bluffs, IA

Crescent, IA

Gretna, NE

La Vista, NE

McClelland, IA

Omaha, NE

Papillion, NE

Ralston, NE

Springfield, NE

Valley, NE

Waterloo, NE

Metropolitan Area Planning Agency

LETTER FROM MAPA’S EXECUTIVE DIRECTOR



I am incredibly excited to share MAPA’s Comprehensive Safety Action Plan with you. This document is the result of more than a year of analysis and intentional engagement with the community around the MAPA region. As trusted conveners and facilitators, MAPA is committed to enhancing transportation safety throughout the Greater Omaha-Council Bluffs area—recognizing that safe roadways, intersections, and transit systems are fundamental to preserving the quality of life that enables our communities to thrive and residents to live happier, healthier lives.

MAPA’s 2050 Long Range Transportation Plan includes people-centered goals to ensure that our transportation system supports the long-term growth and well-being of our region. Traffic safety sits at the center of many of these priorities, ensuring that lives are preserved through thoughtful, data-driven investment priorities for our infrastructure. From 2018 to 2022 alone, 268 people died in crashes on the roadways within our region and more than 2,200 more were seriously injured. The Safe Systems approach detailed within our plan is an investment in the quality of life of residents who would otherwise have their lives significantly impacted by the lasting effects of those injuries and deaths.

The outcomes of this planning process stretch beyond the projects and priorities within the document itself. We received overwhelming support from MAPA members who work as planners, engineers, law enforcement, and first responders who play important roles in shaping traffic safety at the local level. This effort also allowed us to test new approaches to gathering input and helped us forge new partnerships with community-based organizations that connected us with community members. We are tremendously grateful for the hours of time contributed by the numerous individuals, organizations and businesses that helped develop this plan.

The implementation of the priorities within this plan will take many years. With each dollar invested in the projects and strategies identified in MAPA’s CSAP, more than \$7 of benefits can be accrued. Our ability to realize our goals rests on our ability to maintain a long-term focus on the areas which are impacted most by fatal and serious crashes. Nearly ⅓ of all the fatal and serious injury crashes occur on just 2% of our region’s roadway miles.

Thank you for your interest in a vision of our region and thank you to the MAPA team for facilitating this important project.

Sincerely,

A handwritten signature in black ink, appearing to read "Mike Helgerson".

Mike Helgerson
Executive Director

LETTER FROM THE DIRECTOR OF THE NEBRASKA DEPARTMENT OF TRANSPORTATION



To the Communities of the MAPA Region,

The Nebraska Department of Transportation (NDOT) recognizes transportation safety is a shared responsibility and improving the safety of our roadways takes leadership at all levels of government. In alignment with our commitment toward implementation of the Safe System Approach, the NDOT expresses its support for the Metropolitan Area Planning Agency (MAPA) in the development of a regional Comprehensive Safety Action Plan (CSAP) and MAPA's goal of moving toward zero traffic fatalities in the region by 2040.

MAPA's CSAP represents a step towards enhancing the safety of all road users within the MAPA region. Its data-driven, strategic approach to identify higher-risk areas, prioritize the need for safety improvements, and implement effective solutions within available funding is consistent with the principles underpinning NDOT's statewide safety efforts, as outlined in our Strategic Highway Safety Plan (SHSP).

The SHSP emphasizes the importance of data-driven decision-making, stakeholder involvement, and a comprehensive framework for reducing fatal and serious injury crashes. NDOT recognizes the value of the CSAP in furthering the goals of the SHSP at the regional level. Lastly, we are encouraged by MAPA's dedication to community engagement in the drafting of the CSAP. As transportation practitioners have long recognized, enhanced safety on our roadways takes personal commitment alongside governmental education and intervention.

NDOT firmly believes that a unified and collaborative approach is necessary to achieve safety goals on Nebraska's integrated system of highways, roads, and streets. MAPA's Comprehensive Safety Action Plan represents a thoughtful planning approach and NDOT offers support in working to create a safer and more efficient transportation system for the MAPA region and Nebraska.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Vicki Kramer'.

Vicki Kramer
Director, Nebraska Department of Transportation

LETTER FROM THE DIRECTOR OF THE IOWA DEPARTMENT OF TRANSPORTATION



To the Communities of the Metropolitan Area Planning Agency Region:

The Iowa Department of Transportation (Iowa DOT) is pleased to continue its partnership with the Metropolitan Area Planning Agency (MAPA) and especially to support the regional Comprehensive Safety Action Plan (CSAP). This initiative provides a strategic framework for identifying high-risk areas, prioritizing safety improvements, and implementing data-driven solutions that enhance safety for all road users. Highway crashes and fatalities remain at unacceptable levels in Iowa and across the region, and we believe the CSAP will help us address this problem.

The CSAP builds on ongoing efforts to improve safety across the region, focusing on arterial roadways, signalized intersections, roadway lighting, pedestrian and bicyclist safety, motorcyclists, impairment and inattention, occupant protection, and speed management. Iowa DOT is committed to working with MAPA and local jurisdictions to ensure safety is prioritized in all projects which will advance CSAP outcomes, secure funding, and implement strategies.

As a key partner, Iowa DOT will provide guidance on best practices, data analysis, and new safety initiatives, with a focus on data sharing, project prioritization, and an effective toolbox of safety enhancements. The CSAP will help implement proven measures and seek the adoption of policy to reduce serious injuries and fatalities. Additionally, Iowa's focus on rural roadway safety and multimodal transportation options will ensure safety enhancements serve both urban and rural communities effectively. Strengthening interagency collaboration and fostering a data-driven approach will support long-term safety improvements, enhance mobility, and create a more resilient transportation network.

By incorporating stakeholder input and utilizing state and federal data, the CSAP addresses infrastructure design and driver behavior concerns. It also enhances partnerships with safety advocacy groups, local communities, and law enforcement, supporting all road users, particularly those at higher risk.

Iowa has shown that dedication to proven safety programs can reduce traffic fatalities and serious injuries. We are committed to expanding effective programs and implementing safety strategies to further reduce fatalities. Our partnerships with safety professionals in education, enforcement, engineering, and emergency response remain vital. This regional, collaborative plan includes a fifth E – everyone. Working together, we can change the traffic culture to ensure every traveler reaches their destination safely.

Sincerely,

A handwritten signature in black ink, appearing to read 'Scott Marler'.

Scott C. Marler
Director, Iowa Department of Transportation

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

MAPA's **Comprehensive Safety Action Plan** is the culmination of efforts throughout the region, drawing from the knowledge and experiences of individuals and groups interested in creating safe streets for everyone. Two committees were integral to the development of the plan: the Safety Committee and the Transportation Technical Advisory Committee (TTAC). The Safety Committee built trust among partners from different backgrounds on safety topics and supported consensus around recommendations and the final action plan. The TTAC guided the overall technical direction of the plan.

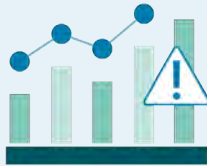
In addition to the Safety Committee and TTAC, this plan prioritized meeting with members of the community to garner important input on creating safer streets for everyone. Community engagement increases the visibility and understanding of local perspectives, needs, and concerns; this aids the development of effective, tailored countermeasures and, in turn, the plan's implementation and success.

This plan is a comprehensive, data-driven safety plan to reduce and eliminate fatal and serious injury crashes. It uses a systemic analysis—which identifies high-risk roadway features for targeted improvements—and a predictive analysis—which identifies locations with the greatest potential for improvement—to create a High Priority Network (HPN). The HPN prioritizes locations with high fatal and injury crash rates through a combination of need and risk and serves as the basis for identification of a set of candidate projects that suggest targeted safety countermeasures aimed at maximizing reductions in fatal and serious injury crashes across the network.

The goal of the MAPA Regional Comprehensive Safety Action Plan is to reduce and eliminate all traffic fatalities and serious injuries by 2040. The plan outlines the process of achieving this goal, providing a set of recommendations that address the following:



Leadership and Commitment recommends a framework for cross-jurisdictional collaboration and alignment of goals and priorities to make safety the utmost priority in all aspects of the region's transportation system.



Safe Systems provides examples of policies, strategies, or legislation that would provide systemwide safety benefits at the local, regional, and state levels.



Data Transparency and Accountability provides recommendations to enhance the quality of data collection, sharing, and monitoring and reporting to allow for data-informed decision-making.

The plan also provides a set of proposed Safety Metrics to track implementation progress across the region. By taking this first step, we will locate critical areas of safety concern and identify potential solutions that increase safety and reduce traffic fatalities and serious injuries.

WHAT IS MAPA?

Created in 1967, the Metropolitan Area Planning Agency (MAPA) is the designated Metropolitan Planning Organization (MPO) and the voluntary Council of Governments for the Omaha-Council Bluffs Region. An MPO is a federally mandated and funded transportation policy-making organization that is made up of representatives from local government and governmental transportation authorities. Its core functions include developing a long-range transportation plan and identifying projects to implement that vision. In addition to these core functions, MAPA's broader mission is to bring local governments together to address regional concerns. Overall, MAPA's purpose is to promote and preserve the quality of life for a more happy, healthy, and vibrant region. Find out more at www.mapacog.org.

MAPA's federal mandate is focused on the Omaha-Council Bluffs Transportation Management Area (TMA); this plan focuses on a subset of this area, including Douglas County and Sarpy County in Nebraska and the communities of Carter Lake, Council Bluffs, Crescent, and McClelland in Iowa. Pottawattamie County, which is a subset of MAPA's TMA, is developing their own Local Road Safety Plan for the rural sections of the TMA.

To get to zero, it will also take close coordination with Nebraska and Iowa Department of Transportations.

MAPA Study Region



GLOSSARY OF TERMS

TERM MEANING

AACN	Advanced Automatic Collision Notification
AASHTO	American Association of State Highway and Transportation Officials
ACN	Automatic Crash Notification
AE	Automated Enforcement
ASCE	American Society of Civil Engineers
BAC	Blood Alcohol Content
BCA	Benefit-to-Cost Analysis
BCR	Benefit-to-Cost Ratio
CEP	Community Engagement Plan
CIP	Capitol Improvement Program
DOT	Department of Transportation
DUI	Driving Under the Influence
EMS	EMS Emergency Medical Services
FHWA	Federal Highway Association
HIN	High Injury Network
HPMS	Highway Performance Monitoring System
HPN	High Priority Network
HSIP	Highway Safety Improvement Program
HRN	High Risk Network
ICE	Intersection Control Evaluation
IDOT	Iowa Department of Transportation
IIHS	Insurance Institute for Highway Safety
ISA	Intelligent Speed Assistance
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
KSI	Killed and Seriously Injured
LPI	Leading Pedestrian Interval
LRS	Linear Referencing System
LTAP	Local Technical Assistance Program
MAPA	Metropolitan Area Planning Agency

TERM MEANING

MIRE	Minimum Inventory of Roadway Elements
MOE	Measures of Effectiveness
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
MUT	Median U-Turns
NDOT	Nebraska Department of Transportation
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PCN	Positive Community Norms
PHB	Pedestrian Hybrid Beacons
PROWAG	Public Right-of-Way Accessibility Guidelines
RIRO	Right-in, Right-out
RRFB	Rectangular Rapid-Flashing Beacon
SHSP	Strategic Highway Safety Plan
SMP	Speed Management Plan
SRTS	Safe Routes to School
SS4A	Safe Streets and Roads for All
SSA	SSA Safe System Approach
STEP	Safe Transportation for Every Pedestrian
TIP	Transportation Improvement Program
TSP	Transit Signal Priority
TTAC	Transportation Technical Advisory Committee
VRU	Vulnerable Road Users





Safe Streets for All

01

SAFE SYSTEM APPROACH

The Safe System Approach is a comprehensive strategy for managing road safety that is closely aligned with Vision Zero principles. Developed by the Federal Highway Administration (FHWA), the goal of the Safe System Approach is to create a transportation system that is forgiving of human error and does not rely on individual road users to be perfect. Instead, the approach recognizes that people will make mistakes and that the transportation system must be designed to the extent possible to protect the road user from the consequences of those mistakes.

Vision Zero is a global traffic safety initiative that originated in Sweden in the late 1990s and is now endorsed by the U.S. Department of Transportation through their Safe Streets for All program and branded as the Safe System Approach (SSA). The core principle of the SSA is the belief that all traffic fatalities and serious injuries are preventable and that no loss of life is acceptable. The goal of the SSA is to create a transportation system that prioritizes safety above all else, using data-driven analyses to identify the root causes of traffic crashes and addressing them with comprehensive strategies rooted in a Safe System Approach.

TRADITIONAL APPROACH
Traffic deaths are INEVITABLE
PERFECT human behavior
Prevent COLLISIONS
INDIVIDUAL responsibility
Saving lives is EXPENSIVE

VS

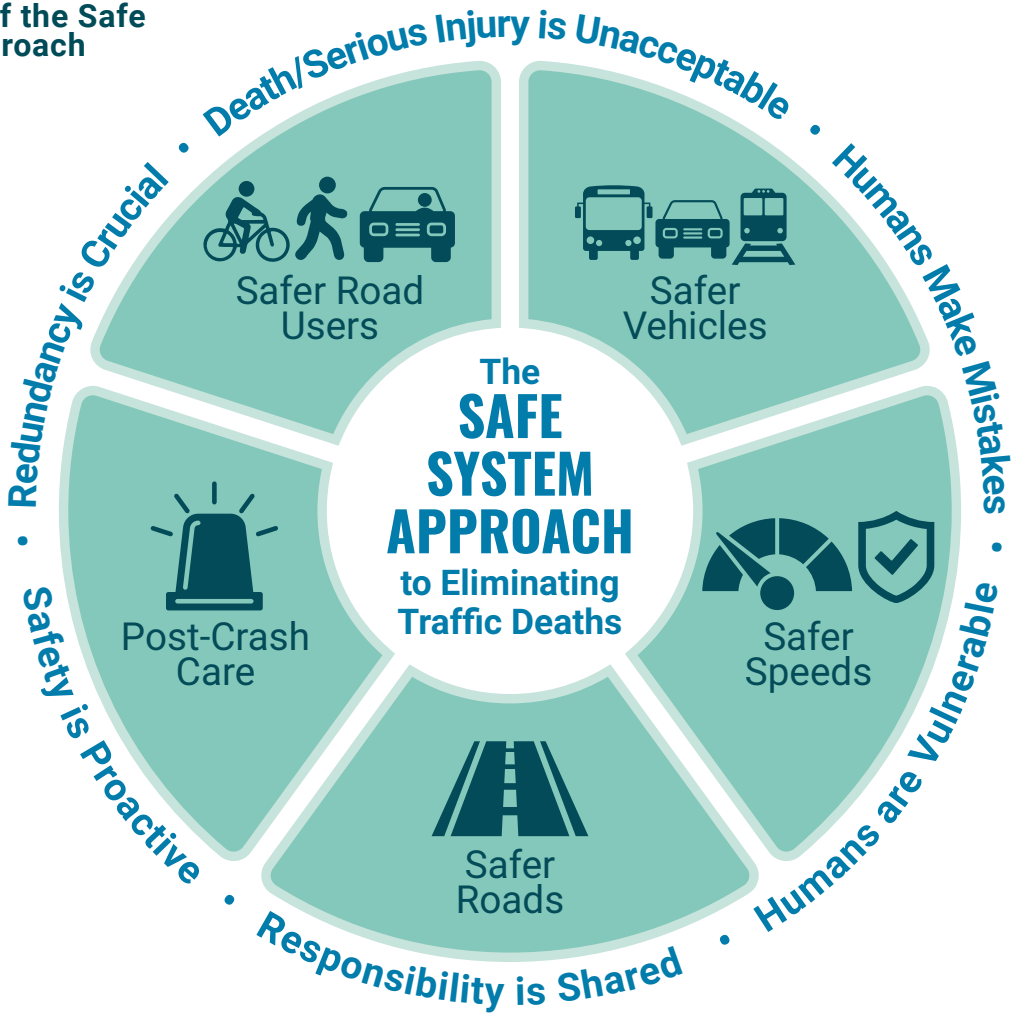
SAFE SYSTEM APPROACH
Traffic deaths are PREVENTABLE
Integrate HUMAN FAILING in approach
Prevent FATAL and SEVERE CRASHES
SYSTEMS approach
Saving lives is NOT EXPENSIVE

The Safe System Approach is based on six foundational principles*:

- ▶ **Deaths and serious injuries are unacceptable:** A Safe System Approach prioritizes the elimination of crashes that result in death and serious injuries.
- ▶ **Humans make mistakes:** People will inevitably make mistakes and decisions that can lead or contribute to crashes, but the transportation system can be designed and operated to accommodate certain types and levels of human mistakes and avoid death and serious injuries when a crash occurs.
- ▶ **Humans are vulnerable:** Human bodies have physical limits for tolerating crash forces before death or serious injury occurs; therefore, it is critical to design and operate a transportation system that is human-centric and accommodates physical human vulnerabilities.
- ▶ **Responsibility is shared:** All stakeholders—including government officials at all levels, industry members, non-profit/advocacy groups, researchers, and the public—are vital to preventing fatalities and serious injuries on our roadways.
- ▶ **Safety is proactive:** Proactive tools should be used to identify and address safety issues in the transportation system, rather than waiting for crashes to occur and reacting afterwards.
- ▶ **Redundancy is crucial:** Reducing risks requires that all parts of the transportation system be strengthened, so that if one part fails, the other parts still protect people.

**Source: U.S. Department of Transportation*

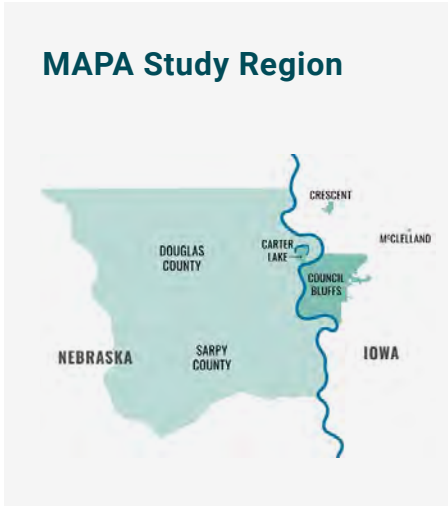
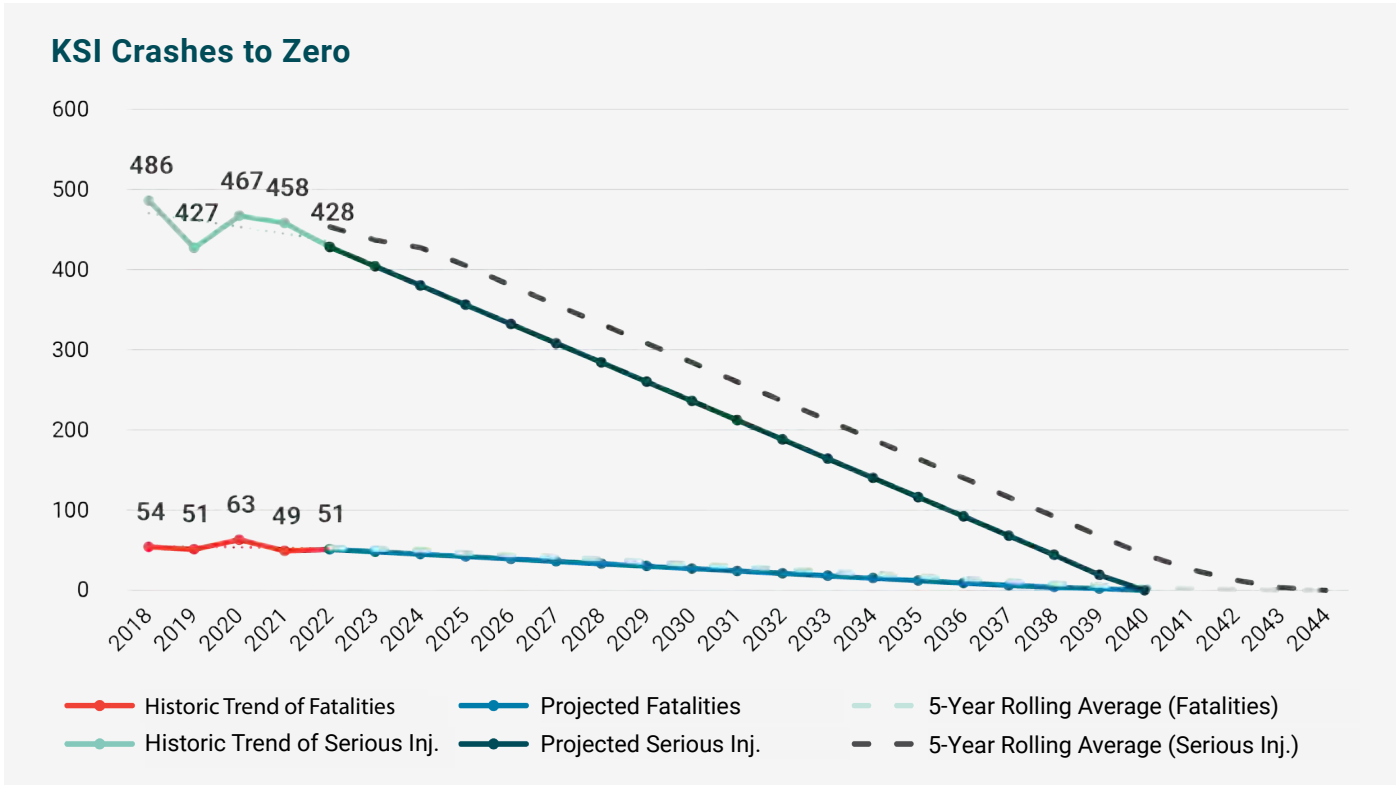
Principles of the Safe System Approach



ZERO TO 2040

Nationwide, traffic deaths are increasing at an alarming rate, particularly in disadvantaged and under represented communities. From 2017 to 2021, MAPA's region has experienced a higher rate of non-motorist fatalities than either Nebraska's or Iowa's average, with a disproportionately high impact on disadvantaged communities. Disadvantaged communities make up 22% of the region's population and experience 33% of the total traffic fatalities and 47% of the pedestrian fatalities on all roads. By taking this first step through the creation of this Comprehensive Safety Action Plan, we will locate critical areas of safety concern and identify potential solutions that increase safety and make progress in our goal:

The goal of the Safe Streets for All MAPA Safety Plan is to eliminate all fatal and serious injury (KSI) crashes by 2040.



Most jurisdictions within Nebraska have lower rates of people being killed or seriously injured and crashes than the state as a whole; however, Valley, Gretna, and Waterloo are overrepresented in this regard due to the proportionally high number of KSI crashes compared to their low populations. Douglas County and Sarpy County have lower rates than the state, but there is still significant room for improvement.

Iowa has nearly half the rates of people being killed and seriously injured in crashes as Nebraska, with Council Bluffs and Carter Lake being below their state's rate. Like other small cities in the region, Crescent has a higher fatality and serious injury rate than the state due to low populations and high killed and seriously injured (KSI) crashes. McClelland and Boys Town has achieved the goal of zero deaths or serious injuries on its roadways but can benefit from the Safe System Approach to maintain this trend.

Crash Fatalities and Serious Injuries

Source: Nebraska DOT, Iowa DOT

Jurisdiction	Persons Killed and Seriously Injured Per 100,000
Valley, NE	59.6
Gretna, NE	50.7
Waterloo, NE	42.8
Nebraska	40.8
Omaha, NE	35.6
Douglas County, NE	33.8
Crescent, IA	31.8
Springfield, NE	26.5
Iowa	25.5
Sarpy County, NE	23.7
Council Bluffs, IA	21.9
Papillion, NE	21.4
Ralston, NE	20.1
Bellevue, NE	19.8
La Vista, NE	17.9
Carter Lake, IA	10.5
Bennington, NE	9.9
Boys Town, NE	0.0
McClelland, IA	0.0

MEASURES OF EFFECTIVENESS

To reach our goal of zero fatalities and serious injuries by 2040, we must track our progress and adjust our course as necessary. Measures of Effectiveness (MOE) are metrics we can use to measure how we're doing and hold ourselves accountable.

MOE utilizes data-driven, evidence-based decision-making to make targeted improvements; we want to make the most meaningful impact with limited resources, relying on known, proven countermeasures. These measures need to demonstrate the impact of these improvements to garner continued support and resource allocation for transportation safety. MOE should be defined based on the identified gaps within the transportation network leading to fatal and serious injury crashes.



GOALS AND OUTCOMES

The MAPA SS4A Project will develop a regional Comprehensive Safety Action Plan.

Our priorities are:

- 1 Enhancing safety
- 2 Increasing accessibility
- 3 Ensuring the well-being of all community members

These priorities rely on continuous monitoring of key safety indicators, regardless of ability or mode of transportation. These key safety indicators (described in later chapters) are detailed measures, such as injury frequency and severity, near miss frequency rates, and crash type rates, that allow us to keep an eye on our progress in achieving our 2040 goal.

CIP PRIORITIZATION BASED ON SAFETY

To accomplish zero by 2040, safety-oriented practices need to be redundant within our system; one such way is to have the jurisdictions within the MAPA region to develop their Capital Improvement Programs (CIP) to prioritize projects based on safety. As CIPs are updated annually, the progress to zero fatalities and serious injuries within each jurisdiction can be recorded and used to make informed decisions regarding future projects.

LEVERAGING OUTSIDE FUNDING

This Comprehensive Safety Action Plan also aligns with and builds upon several state, regional, and local plans, such as the City of Omaha Vision Zero Action Plan, Nebraska and Iowa Strategic Highway Safety Plans (SHSP), Nebraska and Iowa Vulnerable Road User Safety Assessments, MAPA PM1 Safety Performance Measures, and the MAPA Regional Safety Report (2015-2019). The projects and strategies in this plan will require funding to be allocated, much of which may come from non-City funds. The MAPA Comprehensive Safety Action Plan project team reviewed and compiled a list of available programs for funding transportation safety, whether those are infrastructure projects or educational/ enforcement initiatives.

Community Engagement



02



Community engagement is the cornerstone of the Comprehensive Safety Action Plan, its implementation, and its long-term success within the region.

Ultimately, this planning effort wanted to provide meaningful interactions and build a positive community of support for safety-focused solutions; MAPA wanted to work directly with residents, businesses, community partners, and stakeholders to best understand current perceptions and expectations revolving around transportation safety. As the MAPA SS4A region includes fifteen communities within three counties across Nebraska and Iowa, a Community Engagement Plan (CEP) was developed to identify, outline, and describe outreach and engagement strategies, the different audiences the plan wanted to engage, and messages key to the heart of the plan. Several types of meetings and events were utilized to gather information, knowledge, and experience from individuals from a wide variety of backgrounds and are identified within the CEP.

Appendix A includes a dedicated section detailing our comprehensive community engagement efforts.

COMMUNITY ENGAGEMENT PLAN (CEP)

The CEP outlines how MAPA and the project team conducted community engagement efforts on the Safe Streets and Roads for All (SS4A) project. This plan defined how the community engagement team would inform, consult, involve, collaborate, and empower the public throughout the project, detailing communication goals, key messages, audiences, specific outreach tools, and engagement strategies. The plan also included expected timing for sharing project information with key audiences, including under-served communities as defined in USDOT's Equitable Transportation Community Explorer.

To help share public outreach and engagement strategies, a Co-Creation Workshop was held on Wednesday, April 22, 2024, collaboratively crafting the project's community engagement approach with direct input from MAPA's network of community partners and advocacy groups.

The desired outcomes from the workshop were:

- 1 Educate** and inform workshop participants while facilitating active contributions to the engagement strategy.
- 2 Establish** a clear, equitable framework for community engagement.
- 3 Incorporate** public feedback into engagement tactics ensuring community perspectives directly shape the CSAP.
- 4 Produce** a Community Engagement Plan that integrates community partner feedback and results in a strategy that aligns with community needs.



Two main types of engagement were outlined in the CEP:



In-person Community Engagement

In-person engagement events included committee meetings (Safety Committee and TTAC), leadership commitment and goal setting meetings, engagement booths, focus groups, one-on-one meetings, community presentations.



Digital Engagement

Digital engagement occurred through the SS4A webpage, social media platforms, an online survey, and a self-guided online meeting. More information regarding engagement, in-person or online, are described within the remaining chapter.

EQUITY ENGAGEMENT WORKPLAN

One key component of the CEP is the Equity Engagement Workplan, which identified disadvantaged communities through collaboration with diverse local representatives and utilizing criteria from the USDOT's Disadvantaged Communities Index, Justice 40, and the Social Vulnerability Index. Fifty percent of engagement efforts within the MAPA region were focused on prioritizing engagement within disadvantaged communities, as they are disproportionately affected by traffic and pedestrian fatalities (making up 21% of the region's population but experiencing 33% of total traffic fatalities and 44% of total pedestrian fatalities on all roads).



LEADERSHIP COMMITMENT & GOAL SETTING

Safety is a principle that needs to be present throughout all parts of the transportation system. Leadership commitment and goal setting meetings were hosted with representatives from seventeen jurisdictions across Nebraska and Iowa to define the goals of the CSAP, describe how the project team would work collaboratively to develop tailored safety actions that meet the needs of their communities, and provide draft resolution content for their governing bodies to begin the process to procure formal resolutions. Two rounds of meetings occurred, the first in Fall/Winter 2024 and the second in Spring 2025, to accomplish these items.

SAFE STREETS
FOR ALL

METROPOLITAN AREA PLANNING AGENCY

MEMORANDUM OF UNDERSTANDING

A Memorandum of Understanding (MOU) by [NAME OF CITY/JURISDICTION] regarding the Metropolitan Area Planning Agency (MAPA) Comprehensive Safety Action Plan (CSAP) and the commitment to jurisdiction-level actions to reduce traffic fatalities and serious injuries to zero by the year 2040.

One death on our streets is one too many; between 2018 and 2022, there were 268 traffic fatalities and 2,266 serious injuries in the MAPA region. This MOU aims to inform communities within the MAPA region of resources available to them through the development of the CSAP and ensure commitment by [NAME OF CITY/JURISDICTION] to the priorities of the CSAP.

The CSAP is a comprehensive, data-driven document that states the aforementioned overarching goal for the region, informs about the U.S. DOT's Safe System Approach, emphasizes the current state of safety through regional trends, safety focus areas, and the High Priority Network, and provides a Vision Zero Toolbox, prioritized safety projects, recommendations, and safety metrics that communities can measure their progress in achieving zero traffic fatalities and serious injuries by 2040.

Through the Safe System Approach and the Comprehensive Safety Action Plan, communities within the MAPA region can create safer streets and roads for all; for this reason, this MOU states that:

[NAME OF CITY/JURISDICTION] should adopt the Safe System Approach as a comprehensive and holistic approach to eliminating traffic fatalities and severe injuries and should use the Safe System Approach when evaluating projects, conducting traffic studies, and implementing transportation improvements.

[NAME OF CITY/JURISDICTION] should acknowledge and incorporate the CSAP into their approach, plans, design, construction, enforcement, and support of regional safety efforts. Additionally, recommendations and goals from the CSAP should be incorporated, where applicable, into comprehensive and master plans.

[NAME OF CITY/JURISDICTION] should coordinate with MAPA and the [NAME OF STATE] Department of Transportation to share relevant transportation and safety data.

[NAME OF CITY/JURISDICTION] should use the High Priority Network tool ([MAPA SS4A App](#)) in assessing safety concerns.

[NAME OF CITY/JURISDICTION] should utilize the Vision Zero Toolbox, which is contained within the CSAP, to quickly implement vetted infrastructure, behavioral, and enforcement countermeasures to create safer roads for all users.

[NAME OF CITY/JURISDICTION] should work to align funding and prioritize projects identified in the CSAP to address systemic safety concerns, such as within their Capital Improvements Program.

[NAME OF CITY/JURISDICTION] should work to adopt and implement applicable recommendations defined within the CSAP.

This Memorandum of Understanding shall take effect immediately upon its adoption.

Signed: _____ Date: _____

Printed: _____

MAPA

SS4A PLANNING STRUCTURE

The TTAC and the Safety Committee were two groups composed of transportation professionals, advocacy groups, and various community stakeholders. These two groups were essential to developing this Regional Comprehensive Safety Action Plan.

TRANSPORTATION TECHNICAL ADVISORY COMMITTEE

The Transportation Technical Advisory Committee (TTAC) advises and provides technical guidance to the MAPA Board of Directors about a variety of transportation matters; the TTAC is comprised of city and county engineers, planners, and public works representatives, as well as planners and engineers from the State of Nebraska and the State of Iowa. The project team attended eight meetings between April 2024 and February 2025 to present and garner feedback from the TTAC on the visioning of the plan, public engagement, results of the comprehensive data analysis, potential policy and process changes, project prioritization, and the draft plan itself.

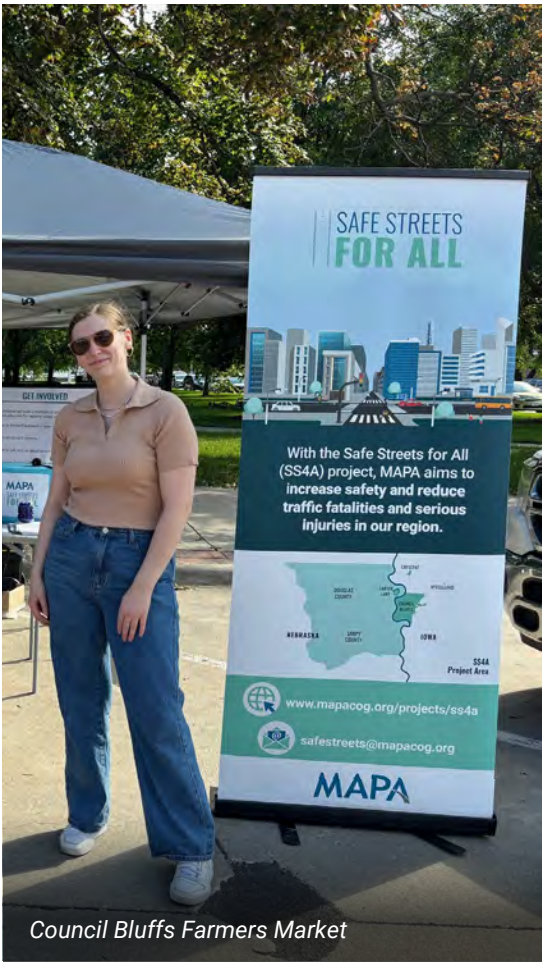
TTAC Organizations:

- ▮ Iowa Department of Transportation
- ▮ Nebraska Department of Transportation
- ▮ FHWA Nebraska
- ▮ Omaha Airport Authority
- ▮ City of Bellevue
- ▮ City of Council Bluffs
- ▮ City of Gretna
- ▮ City of La Vista
- ▮ City of Omaha
- ▮ City of Papillion
- ▮ City of Ralston
- ▮ Cass County
- ▮ Sarpy County
- ▮ Metro Transit
- ▮ Papio-MO River NRD

SAFETY COMMITTEE

The SS4A Safety Committee was put together to build trust among partners from different backgrounds on safety topics and support consensus around recommendations and final action plan. The SS4A Safety Committee is made up of the previously existing MAPA Safety Committee, MAPA staff, trusted community action groups, community stakeholders, and safety advocates. The project team attended six meetings between May 2024 and April 2025.

The Safety Committee worked alongside the TTAC to give input on key safety issues and strategies, validate safety data and outreach findings, and support the CSAP development. Additionally, the Safety Committee provided oversight of the CSAP development, implementation, and monitoring.



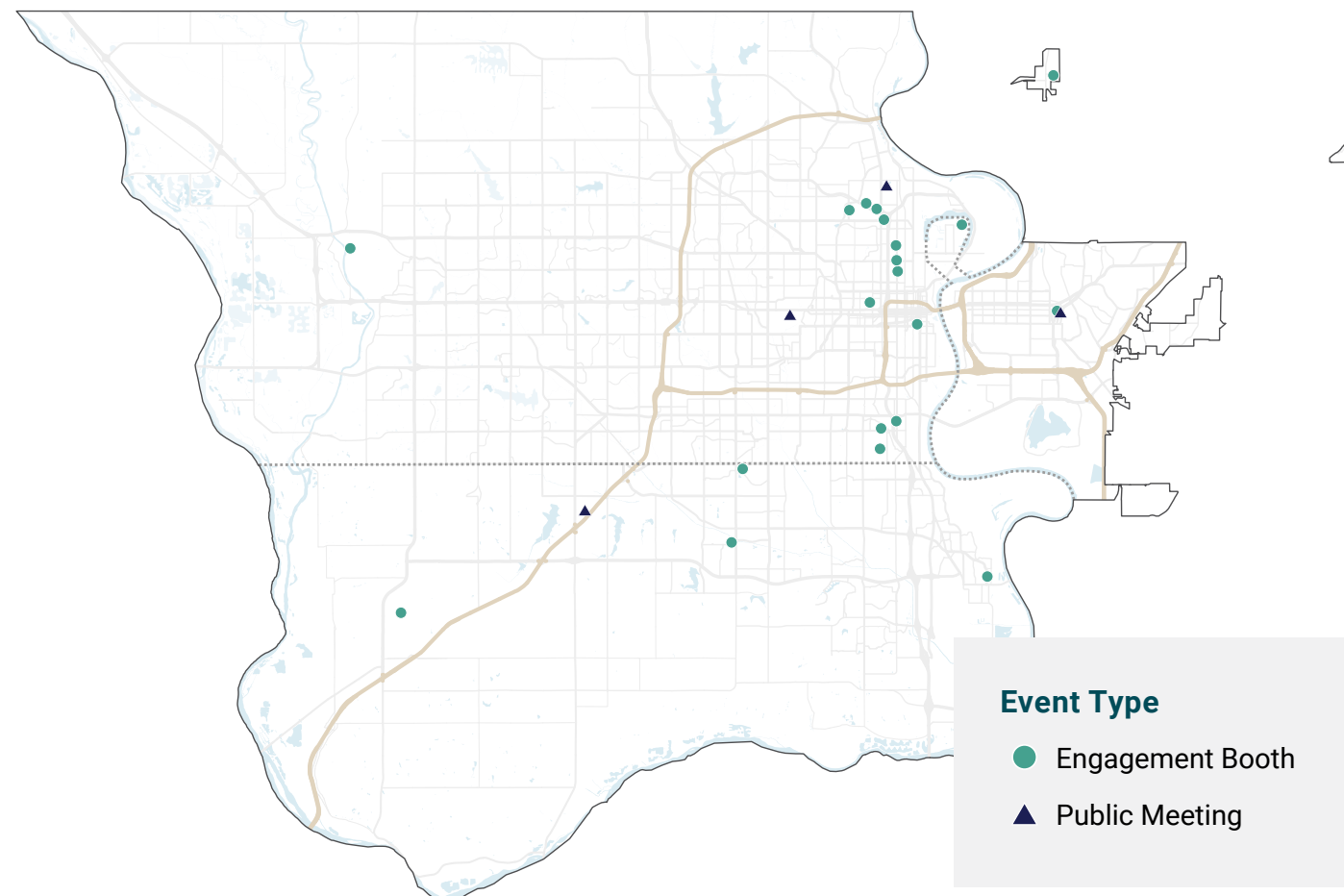
COMMUNITY OUTREACH OVERVIEW

Let's Talk, La Vista!

From pop-up events at local festivals, Faires, and markets to more formal meetings in traditional settings, community outreach happened across the entire MAPA region. We had 61 events ranging in size, location, and targeted demographics across the MAPA CSAP project area, including engagement booths, focus groups, public meetings, one-on-one meetings, and community presentations.

Type of Engagement	# of Meetings
Engagement Booths	20
Focus Groups	8
Public Meetings	4
One-on-One Meetings	21
Community Presentations	6

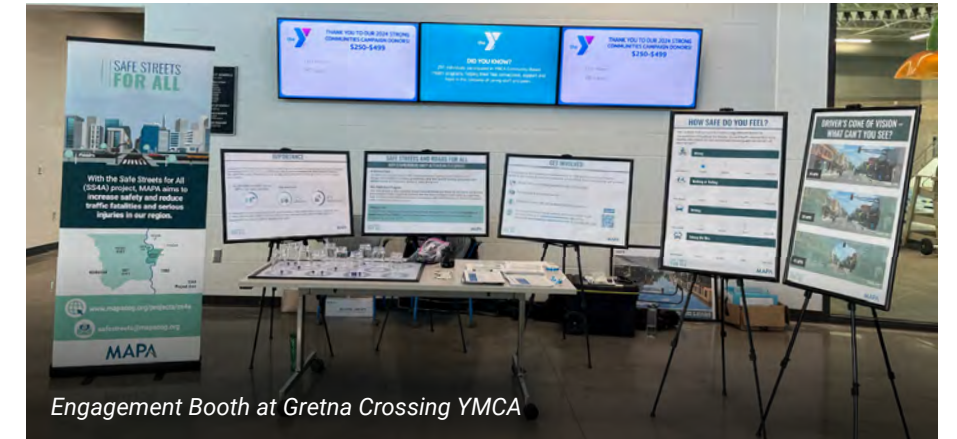
ENGAGEMENT BOOTH AND PUBLIC MEETING LOCATIONS



ENGAGEMENT BOOTHS

Pop-up events provided great opportunities to engage with the community by meeting them in places where they already planned to be, leveraging existing venues and events like farmers markets, festivals, and pancake feeds. Twenty pop-up events were held between July 2024 and March 2025, with more than 1,160 number of attendees. These kinds of events allowed for everyone's voice to be heard, as we all play a part in creating safe streets.

Participants in the pop-up engagement booths had the opportunity to have a conversation about safety and the role that they play in it through several different activities; a marble jar activity, a sticker board, and a "cone of vision" exercise, as well as the opportunity to fill out



a survey. The marble jar activity had jars representing different safety issues; participants would place their marbles in the jars associated with safety issues they would like addressed. The sticker board asked participants to use stickers to describe how safe they feel using different types of transportation (driving, riding

the bus, walking, and biking), making along the scale from very unsafe to very safe. The "cone of vision" exercise, using different sheets of paper, simulated what participants vision is like when driving 25, 35, and 45 miles per hour, allowing them to experience how their field of view becomes more limited the faster they drive.

POP-UP EVENT LOCATIONS*

- | | |
|---|--|
| 07/27/2024: Carter Lake Days | 09/28/2024: Gretna Crossing YMCA Atrium |
| 08/03/2024: NOMAFEST | 10/12/2024: Let's Talk, La Vista! |
| 08/15/2024: Papillion Farmers Market | 11/09/2024: Cradle to Career Summit |
| 08/22/2024: Council Bluffs Farmers Market | 12/02/2024: Washington Library |
| 08/24/2024: Nebraska Renaissance Faire | 12/03/2024: One Omaha Holiday Party |
| 08/31/2024: Crescent Farmers Market | 12/05/2024: South Omaha Neighborhood Alliance Holiday Party |
| 09/07/2024: Bellevue Farmers Market | 12/07/2024: Christmas in the Village |
| 09/14/2024: Fiestas Patrias | 01/12/2025: Mt. Moriah Church |
| 09/21/2024: Railroad Days | 01/12/2025: Downtown Omaha Library |
| 09/27/2024: Gifford Park Neighborhood Market | 01/25/2025: State of North Omaha |

*List is non-comprehensive, see Appendix A for full details on engagement locations.

FOCUS GROUPS

Focus group meetings allow for more targeted conversations regarding specific geographic areas or safety topics, involving different community groups, business owners, and representatives to gather vital insights into safety concerns within specific communities.

09/25/2024
Valley Block Talk

11/22/2024
Work Zones

12/02/2024
Road Maintenance and Construction

12/04/2024
Traffic Incident Management and Traffic Enforcement

12/05/2024
Vulnerable Populations

12/11/2024
EMS and Fire Departments

12/13/2024
Emergency Rooms and Trauma Centers

02/06/2025
Schools

PUBLIC MEETINGS

The project team hosted four public meetings throughout the project area during the draft plan stage, alongside a self-guided online meeting option for convenience and accessibility. These public meetings introduced MAPA, gave context to the project and its importance to the region, and provided progress to date in developing the plan (i.e., public engagement efforts, data analysis results, etc.). The public meetings hosted activities for children and adults alike, engaging with traffic safety concepts; the highlight of these events were the scroll maps, which allowed attendees to mark which countermeasures and recommendations resonated with them best.

ONE-ON-ONE MEETINGS

Our team utilized twenty one-on-one interviews or conversations to have in-depth discussions about a specific geographic area or safety concern with various organizations or individuals.

2/18/2025
Public Meeting at UNO Community Engagement Center

2/20/2025
Public Meeting at Miller Park Pavilion

2/25/2025
Public Meeting at Council Bluffs Library

2/27/2027
Public Meeting at Meadows Community Center

Let's Talk, La Vista!



ONLINE ENGAGEMENT

The Safe Streets team developed a webpage, <https://mapacog.org/projects/ss4a/>, that allowed the public to find updated information about the project, and to participate in an online survey. The survey allowed the public provide comments, answer poll questions, and pinpoint specific locations with roadway safety concerns. The feedback was used to help influence MAPA’s SS4A efforts. The project team received a total of 519 comments from online engagement opportunities.

Community Survey

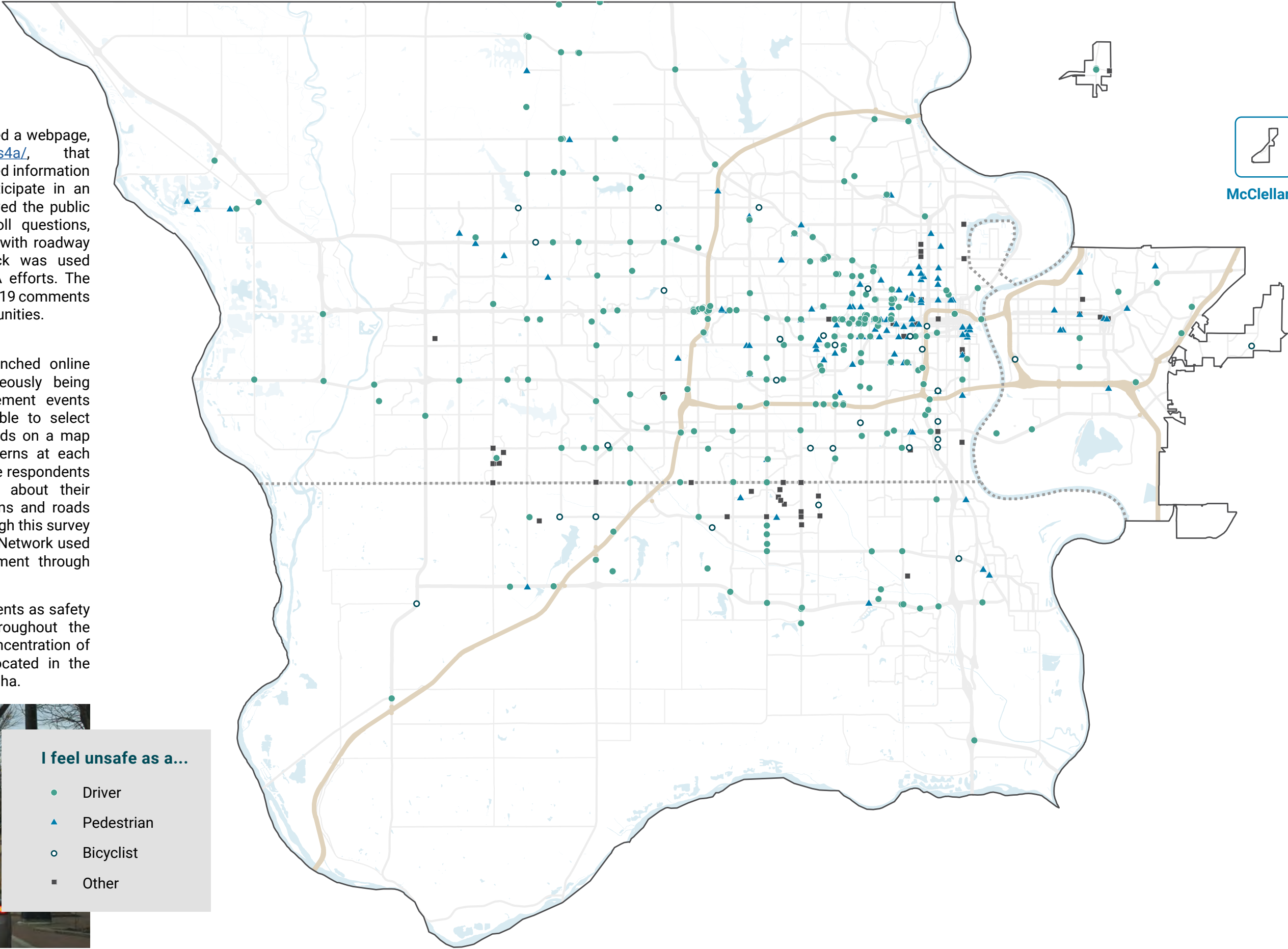
A Community Survey was launched online in July 2024, while simultaneously being offered at community engagement events in-person. Participants were able to select multiple intersection points/roads on a map and indicate their safety concerns at each point; this survey allowed for the respondents to create multiple responses about their safety concerns for intersections and roads around the MAPA region. Although this survey remains open, the High Priority Network used feedback from online engagement through early October 2024.

Locations identified by respondents as safety concerns were distributed throughout the study area, with the highest concentration of community safety concerns located in the midtown area of the City of Omaha.



I feel unsafe as a...

- Driver
- ▲ Pedestrian
- Bicyclist
- Other



KEY THEMES

The following were common themes in the input provided during engagement booths, public open houses, one-on-one engagement, and community surveys.

From Engagement Booths

Participants in engagement booths expressed concerns about speeding vehicles, reckless/careless driving, and cars failing to yield. Bike lane concerns weren't prioritized, but approximately a third of participants felt either unsafe or very unsafe while biking.

From Public Meetings

A countermeasures "dotmocracy" activity prioritized infrastructure improvements like stop-control modifications, roundabouts, and roadway reconfigurations. Pedestrian and cyclist safety was emphasized with protected bike lanes and raised crossings, while behavioral measures such as speed limits and automated enforcement were also favored.

From One-on-One Engagement

MAPA held highly detailed one-on-one meetings with area organizations, enforcement agencies and neighborhood groups to discuss specific needs, including safety countermeasures, technology, and/or data needs.

From the Community Input Survey

Regarding how people choose to move in the MAPA region:

- ▶ Speeding was the most common concern across all respondent groups (drivers, pedestrians, and cyclists)
- ▶ Drivers were most concerned with speeding, red light running, and distracted driving
- ▶ Pedestrians were most concerned with speeding, crosswalks, and distracted driving
- ▶ Bicyclist were most concerned with bike protection, speeding, distracted driving, and crosswalks

Regarding the geometry of the transportation network:

- ▶ Speeding and redlight running were the top two concerns at intersections, followed by the design of the intersection, distracted driving, and "other."
- ▶ Speeding was the top safety concern for midblock roadway segments, followed by concerns about roadway design and "other."

The most common themes in "other" responses included concerns about:

- ▶ Driver behavior like speeding, aggressive driving, stop-sign running, and failure to yield to pedestrians at crosswalks and at intersections.
- ▶ Surface condition of roads, traffic congestion, and roads/intersections with poorly marked lanes or confusing signage.
- ▶ A lack of crosswalks and sidewalks.
- ▶ Poor visibility at intersestions.





State of Safety

03

THE “STATE OF SAFETY” CHAPTER ANALYZES REGIONAL SAFETY TRENDS AND PATTERNS AND PROVIDES AN EXPLORATION OF SAFETY FOCUS AREAS IDENTIFIED THROUGH CRASH DATA ANALYSES AND THE PUBLIC ENGAGEMENT PROCESS.

The safety focus areas are pivotal in addressing the region’s safety challenges and have been categorized into five broader focus groups.

We begin by presenting an overview of MAPA regional trends, setting the stage for a detailed discussion on each focus area’s relationship with fatal and serious injury crashes. A standard metric in the focus areas is the representation ratio, or likelihood of a fatal or serious injury crash occurring, which addresses the over- or under-representation of various factors in the data. This helps show what characteristics in each focus area cause or contribute to severe crashes.

Much of the previous data influenced the High Priority Network’s (HPN) creation. The HPN is a critical component in the region’s safety improvement strategy, composed of the High Injury Network (HIN), the High Risk Network (HRN), and data from the Community Survey Map. The HIN identifies road segments with a high concentration of severe crashes, allowing for targeted interventions in areas most needing safety enhancements. The HRN highlights infrastructure that poses significant risks to road users, focusing on systemic improvements to mitigate potential hazards. The Community Survey Map integrates public input with technical analysis, ensuring that community concerns and lived experiences inform safety priorities. Together, these elements create a comprehensive framework for identifying and addressing regional safety issues.



OUR GOAL IS TO PROVIDE A THOROUGH UNDERSTANDING OF THE REGION’S SAFETY LANDSCAPE, HIGHLIGHTING KEY ISSUES AND OPPORTUNITIES FOR IMPROVEMENT.

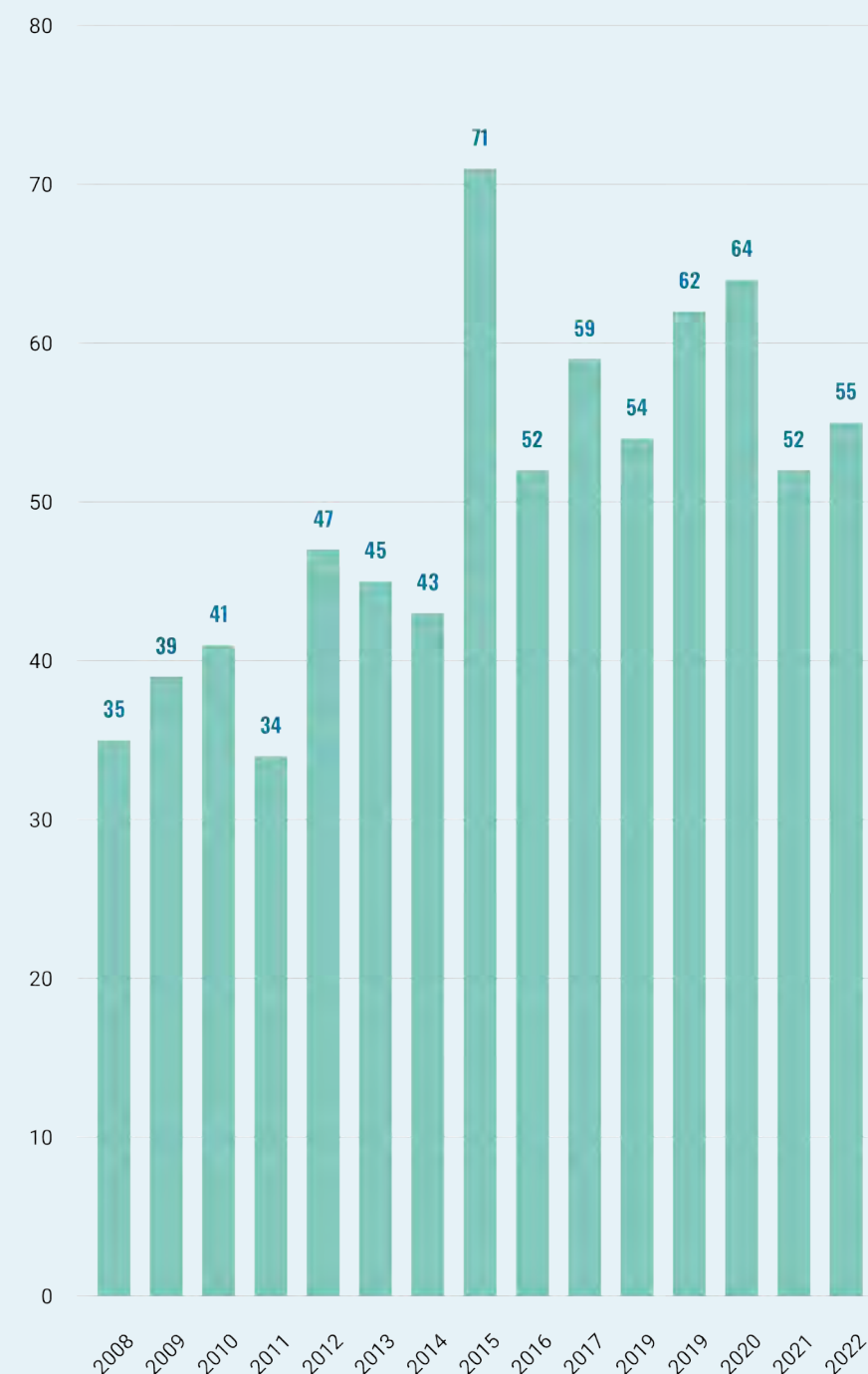
By the end of this chapter, you will have a clearer picture of the issues that require strategic measures needed to enhance safety and reduce fatal and serious injury crashes across the region.

Note: Unless otherwise noted, the data presented in this chapter was derived from the 2018-2022 crash data (provided by Nebraska DOT and Iowa DOT) for the CSAP study area.

All references to “the MAPA region” or “the region” refer to the CSAP study area, which includes Douglas and Sarpy Counties in Nebraska, as well as the cities of Council Bluffs, Carter Lake, Crescent, and McLelland in Iowa.

MAPA REGIONAL TRENDS

In examining the MAPA regional trends, fatal crashes have slowly been increasing over the last 15 years.



Total Crash Fatalities, 2008-2022 (MAPA CSAP Study Area)

Source: NHTSA Fatality Analysis Reporting System (FARS)

2018-2022 FATAL AND SERIOUS INJURY CRASHES

The MAPA region encompasses more than 5,400 miles of roadway and 28,000 intersections; in the last five years alone, 2,160 fatal and serious injury crashes have occurred, a portion of the 23,259 fatal and injury crashes that resulted in a fatality or an injury. The data analysis for the Safety Action Plan focuses only on Killed and Seriously Injured (KSI) crashes. KSI crashes are by far the most impactful and life-altering type of crashes.

By mapping crashes through multiple methods (described in more detail in the following sections), we can identify how to make the most impactful change as timely as possible with limited resources.

Year	KSI Crashes	All Fatal/Injury Crashes*
2018	460	5,756
2019	404	5,280
2020	442	4,179
2021	429	4,050
2022	425	3,994
Total	2,160	23,259

*Excludes Property Damage Only (PDO) crashes.



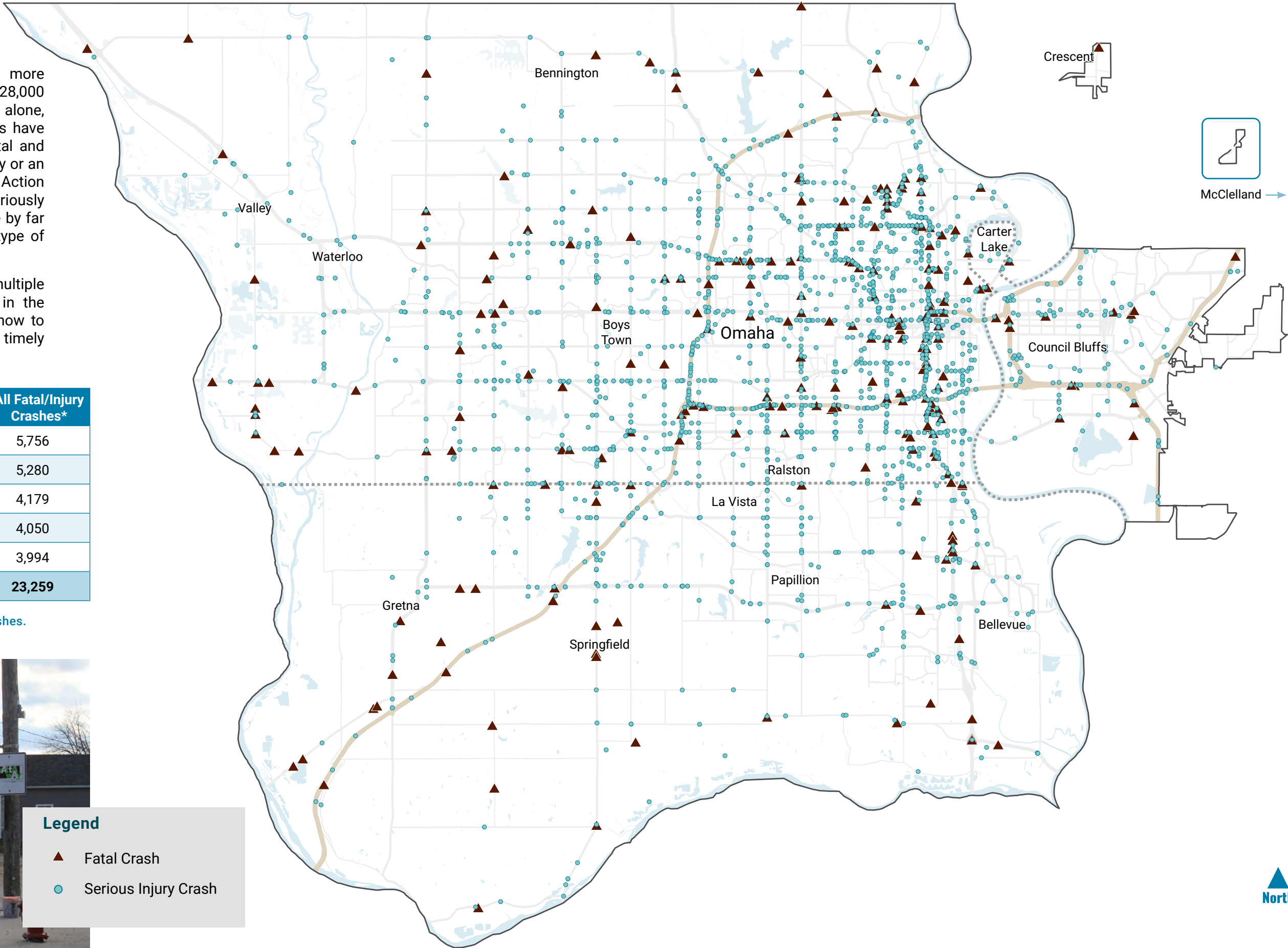
Legend

▲

Fatal Crash

●

Serious Injury Crash



SAFETY FOCUS AREAS

Through the crash data analysis and the CSAP engagement process, fourteen Focus Areas were identified that emerged as key issues or opportunities to address the region's safety challenges. These focus areas were grouped into a set of five broader Focus Groups.

The following section discusses each of these focus areas, their relationship with KSI crashes, and their over- or under-representation in the data.

Focus Group	Focus Areas
 High-Risk Infrastructure	Arterial Roadways
	Signalized Intersections
	Rural Roads and Highways
	Roadway Lighting
 Safety Zones	Maintenance and Work Zones
	School and Pedestrian Zones
 Vulnerable Road Users	Pedestrians & Bicyclists
	Motorcyclists
	Young and Male Drivers
 Contributing Crash Factors	Impairment & Inattention
	Occupant Protection
	Speed
 Safe System	Safer Vehicles
	Post-crash Care

HIGH-RISK INFRASTRUCTURE

The physical characteristics of roadways can influence the likelihood and severity of crashes. Arterials, signalized intersections, and a lack of roadway lighting are all infrastructure factors that correlate with an increased prevalence of fatal and serious injury crashes. While rural roads and highways have a lower KSI crash rate than urban streets, they are included as a focus area due to the unique crash characteristics of those crashes and of the solutions put into place.

SAFETY ZONES

The Safety Zones focus group looks at the safety concerns of an area, as opposed to High-Risk Infrastructure, which are exact locations; this focus group is dedicated to addressing critical areas in traffic safety, emphasizing two primary focus areas: (1) Maintenance and Work Zones and (2) School and Pedestrian Zones. The group aims to enhance the protection of construction workers, road maintenance personnel, and pedestrians, particularly around schools and work zones. By analyzing crash data and identifying trends, the focus group seeks to implement strategies that minimize risks and improve safety in these vulnerable areas.

VULNERABLE ROAD USERS

The Vulnerable Road Users focus group looks into the people that are most affected, namely (1) Pedestrians and Bicyclists, (2) Motorcyclists, and (3) Young and Male Drivers. The first two, pedestrians/bicyclists and motorcyclists, are vulnerable to traffic itself and, therefore, are much more likely to be involved in a crash and for that crash to be severe. Young and male drivers, on the other hand, have a “self-imposed” vulnerability to more frequent crashes and severity due to lack of experience (young), aggressive driving behavior (male), and risk-taking (both).

CONTRIBUTING CRASH FACTORS

Contributing Crash Factors look at the underlying features and corroborating circumstances that lead to KSI crashes. These include (1) Impairment and Inattention, (2) Occupant Protection, and (3) Speed.

SAFE SYSTEMS

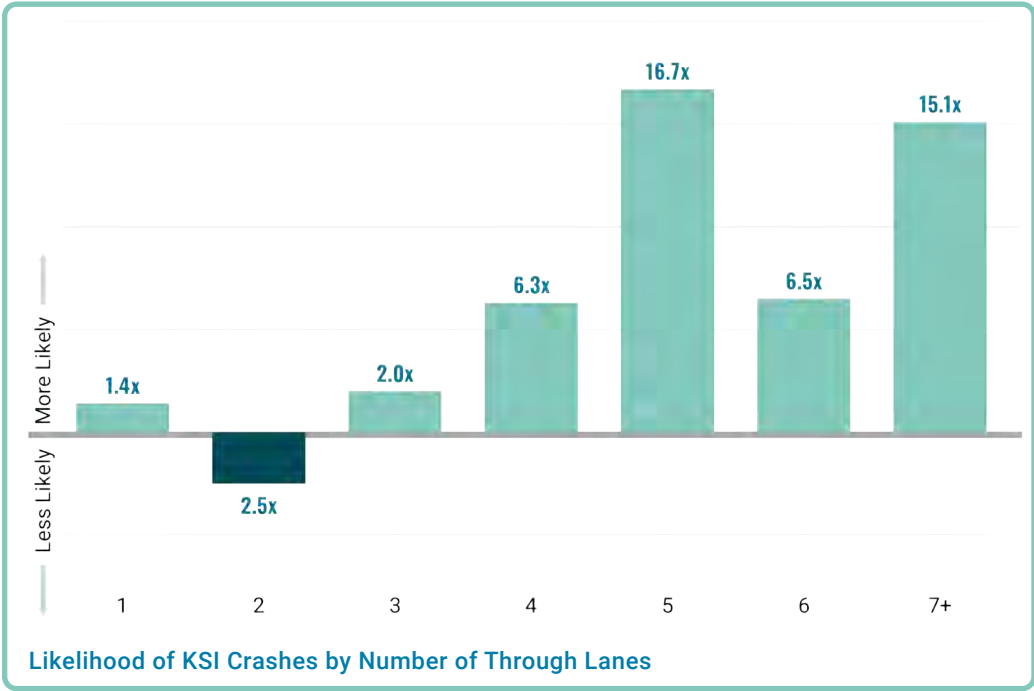
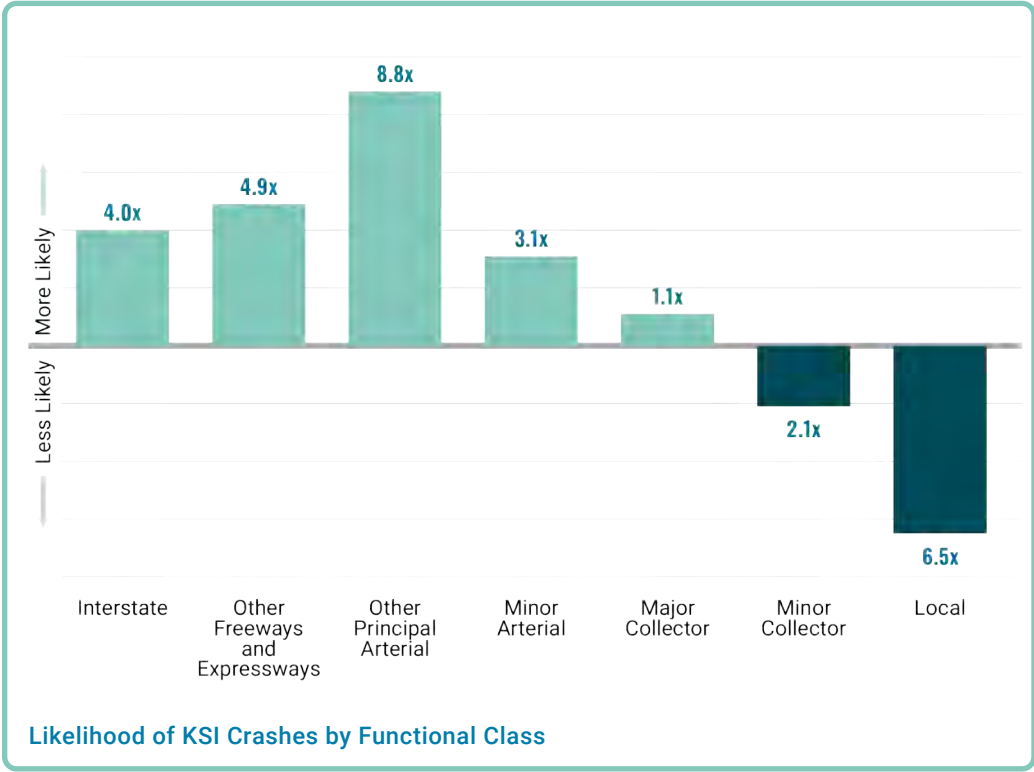
The last focus group is Safe Systems, which includes (1) Safe Vehicles and (2) Post-crash Care. The other Safe Systems (Roads, Users, and Speeds) were imbedded in the other focus categories/areas. Additionally, both Safer Vehicles and Post-crash Care, require systemic coordination at high-levels to measure data and implement countermeasures.





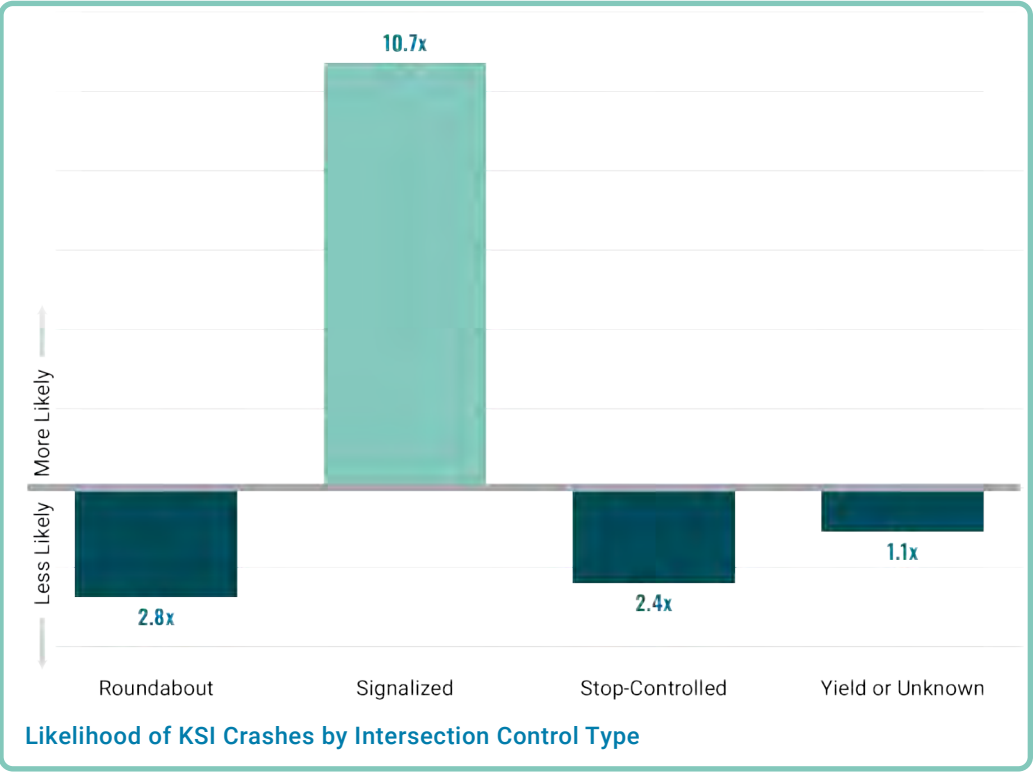
ARTERIAL ROADWAYS

As roadways get busier (i.e., the roadway volume increases) and get wider (i.e., the number of lanes increase), the risk of being involved in a KSI crash generally increases. Principal arterial roadways are the most overrepresented, when accounting for their share of total roadway network mileage. Interstates, other freeways and expressways, and minor arterials also show significant overrepresentation in the KSI crash data.



SIGNALIZED INTERSECTIONS

Signalized intersections, as compared to other intersection control types, are more than ten times more likely to have a KSI crash occur. In contrast, the data indicates that roundabouts are nearly three times less likely to have a KSI crash occur than average for all intersections.



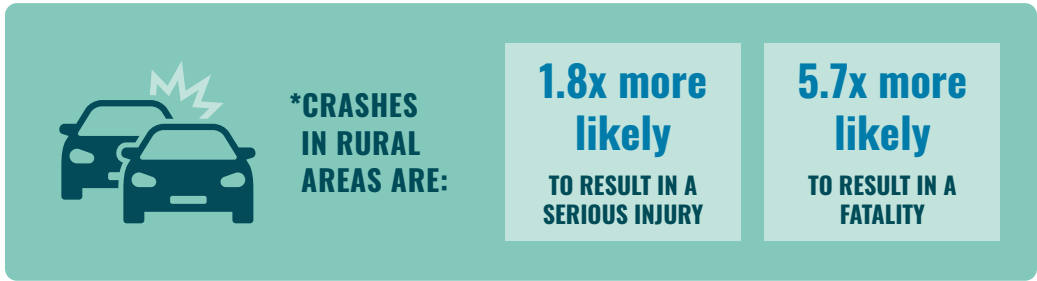
Control Type	# of Intersections	% of Intersections	# KSI Crashes	% of KSI Crashes
Roundabout	125	0.4%	2	0.2%
Signalized	1,557	5.5%	734	59.3%
Stop-Controlled	25,723	91.4%	472	38.2%
Yield or Unknown	727	2.6%	29	2.3%
Total	28,132	100.0%	1,237	100.0%



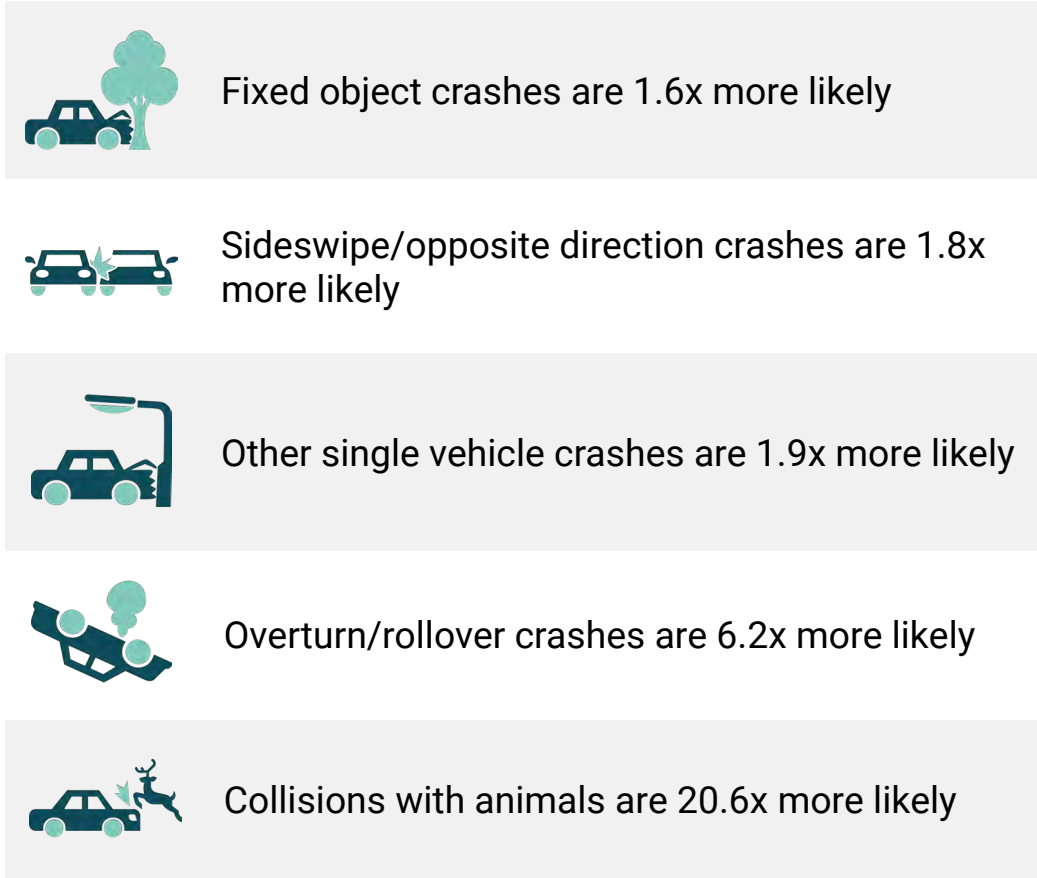


RURAL ROADS AND HIGHWAYS

While urban areas in the region are more represented in terms of the number of KSI crashes, crashes that occur on rural roads and highways are nearly twice as likely to result in a serious injury and are nearly six times more likely to result in a fatality.



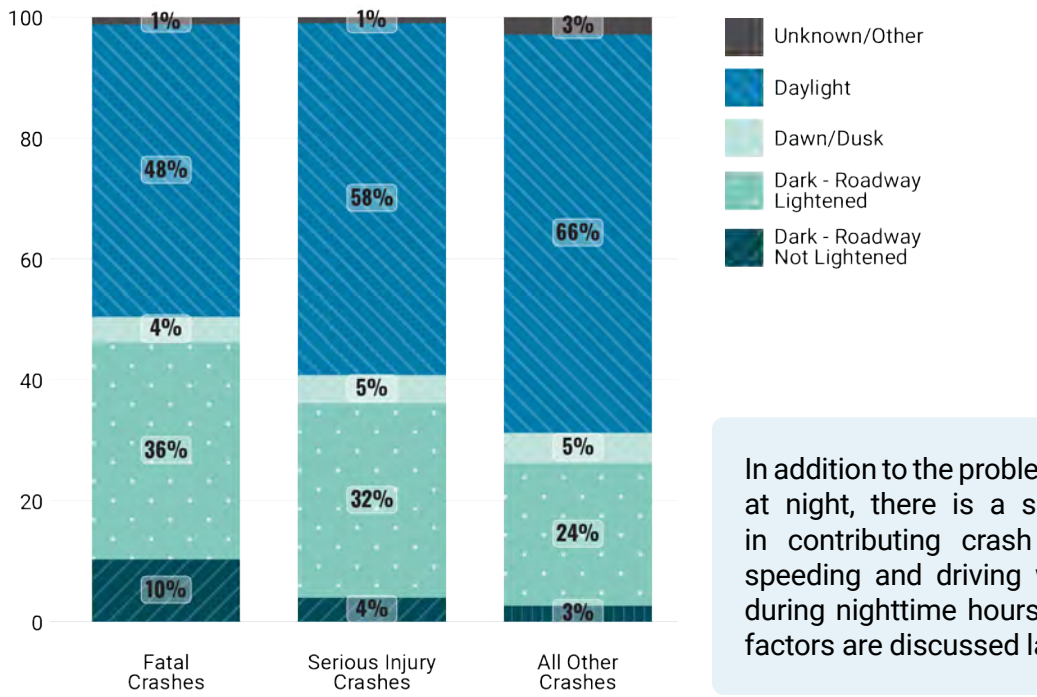
***Certain crash types are significantly more represented in rural areas, compared to urban areas:**



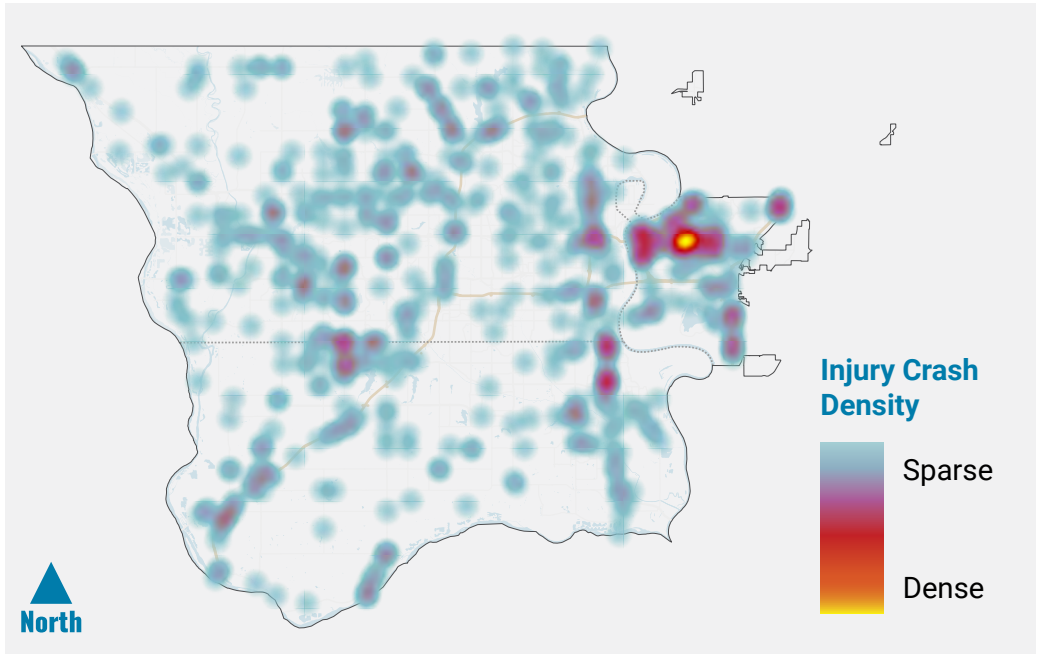
**Compared to crashes in urban areas, using the 2020 Census defined urban area boundary.*

ROADWAY LIGHTING

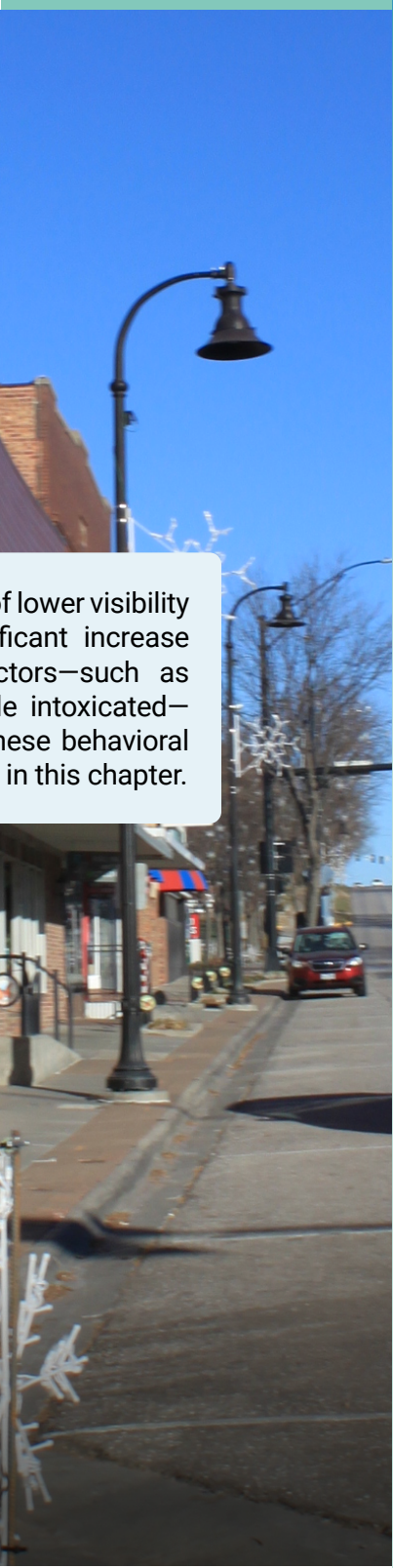
KSI crashes disproportionately occur in dark or nighttime conditions, when compared to all crashes. Nearly half of fatal crashes occurred in dark conditions, with about one in five of these nighttime crashes also being reported as occurring where roadway lighting was not present. Injury crashes that occurred in dark, unlit conditions are distributed throughout the region, but higher concentrations and clusters of these crashes can be found in certain areas, most notably within Council Bluffs, along portions of US-75, and in suburban areas along arterials that have not been reconstructed as urban sections.



Proportion of Crashes by Lighting Condition



Heatmap of All Injury Crashes Reported as Occurring in Dark, Unlit Conditions

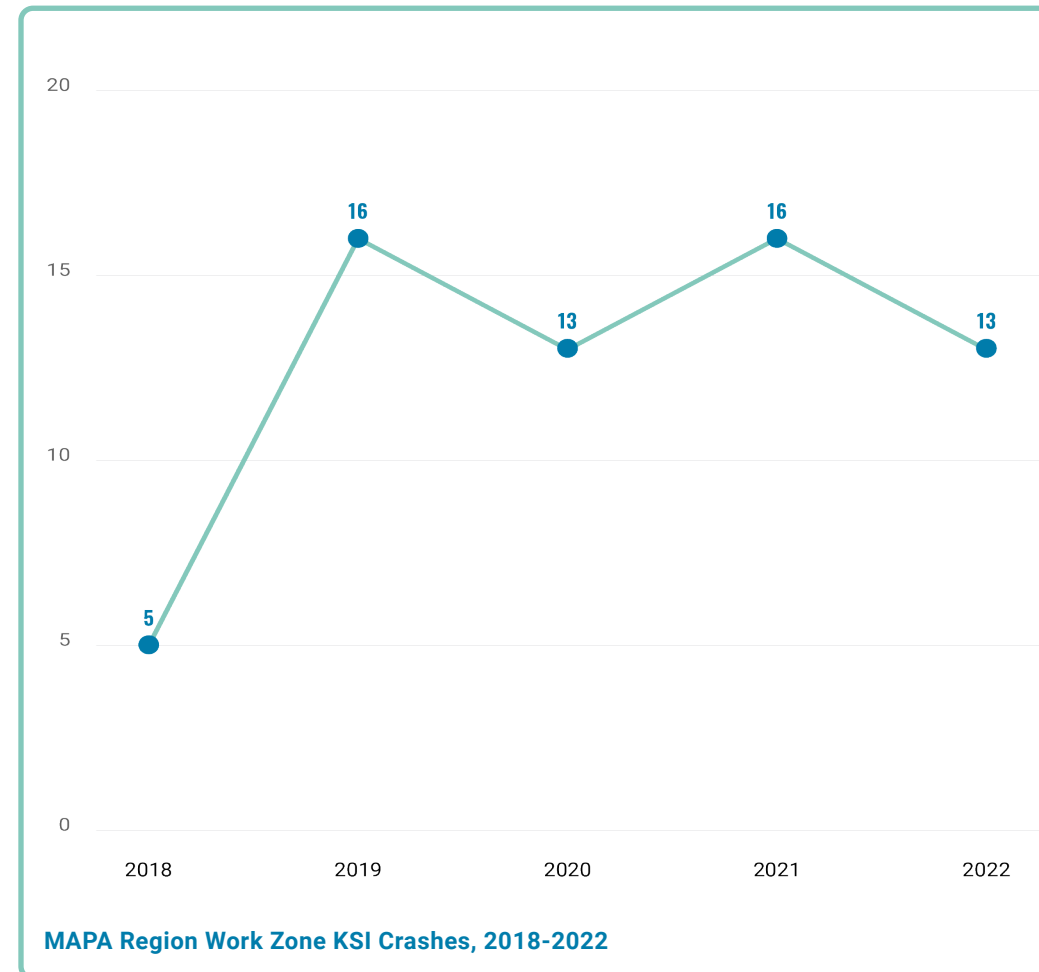


In addition to the problem of lower visibility at night, there is a significant increase in contributing crash factors—such as speeding and driving while intoxicated—during nighttime hours. These behavioral factors are discussed later in this chapter.

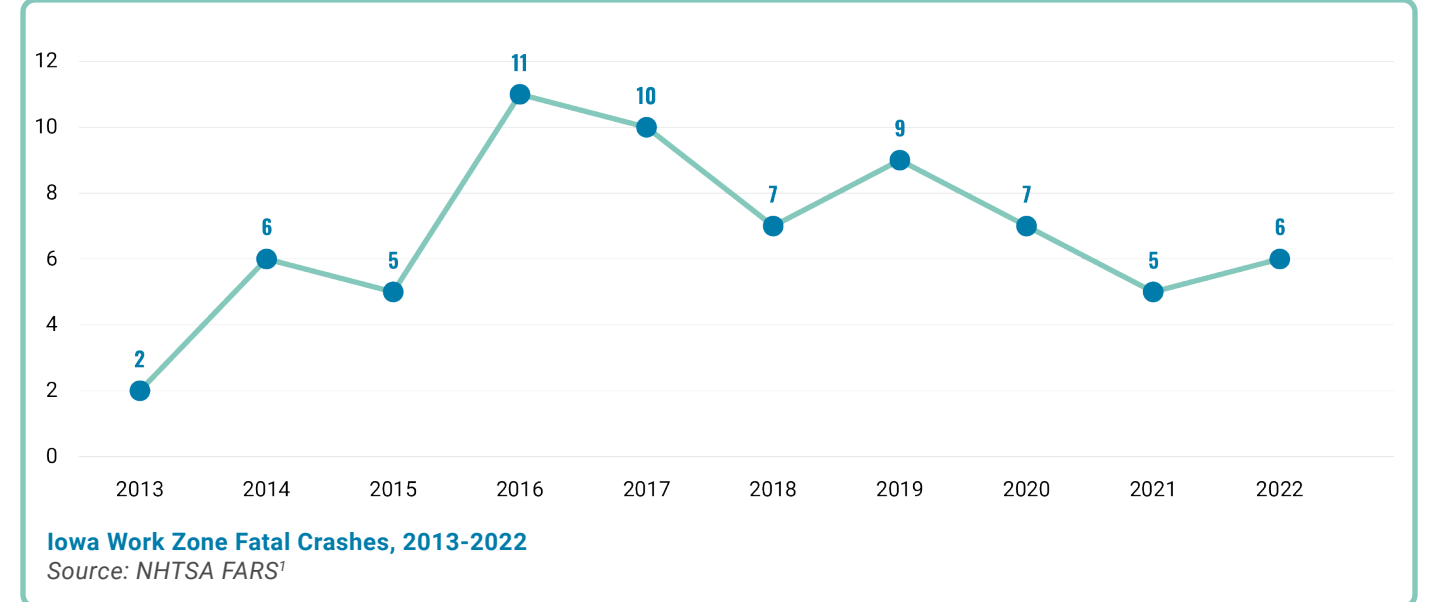


MAINTENANCE AND WORK ZONES

Approximately 3% of the fatal and serious injury crashes in the region from 2018-2022 were noted as work zone-related. Construction workers and road maintenance personnel are highly vulnerable in work zones, where traffic is often moving in close proximity. The workers being injured and killed are the ones who voluntarily put their lives at risk to maintain our roadways.



Statewide 2013-2022 crash data shows an average of 6.8 fatal work zone related crashes per year in Iowa and 7.4 per year in Nebraska, with Iowa data showing a slight upward trend and Nebraska showing a slight downward trend over these ten years.



NATIONALLY, THERE HAS BEEN A CLEAR UPWARD TREND IN WORK ZONE RELATED FATALITIES, WITH AN INCREASE FROM

593 Fatalities
IN 2013

TO

891 Fatalities
IN 2022

Source: NHTSA FARS, GES, and CRSS²

¹ <https://workzonesafety.org/work-zone-data/work-zone-fatal-crashes-and-fatalities/>

² <https://workzonesafety.org/work-zone-data/work-zone-traffic-crash-trends-and-statistics/>



SCHOOLS AND PEDESTRIAN ZONES

Schools and Pedestrian Zones are critical areas of focus for enhancing traffic safety, particularly for the most vulnerable road users, such as children and pedestrians. These zones are characterized by their high potential for conflicts between pedestrians and motor vehicles, necessitating targeted strategies to mitigate risks and ensure the safety of those on foot and during peak hours of pickup and drop off.



CRASHES IN THE REGION THAT OCCURRED WITHIN 1,000 FEET OF SCHOOLS WERE

2.4x more likely TO HAVE INVOLVED A CHILD PEDESTRIAN

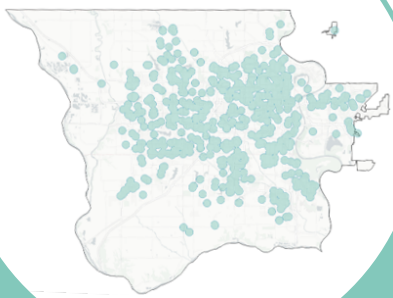
Additionally, it is known that the perceived safety of urban areas and school zones leads to higher rates of walking and biking. Maintaining the highest safety standards in these locations is essential to creating and maintaining vibrant communities.



IN THE REGION, CHILDREN MAKE UP:

9% of all fatally or seriously injured vehicle occupants

19% of all fatally or seriously injured pedestrians and bicyclists



24% OF THE REGION IS WITHIN A HALF MILE OF A SCHOOL.

IN THESE SCHOOL AREAS:



60% of fatal or serious injury crashes involving children occur in school areas.



44% of fatal or serious injury crashes involving child vehicle occupants occur in school areas.

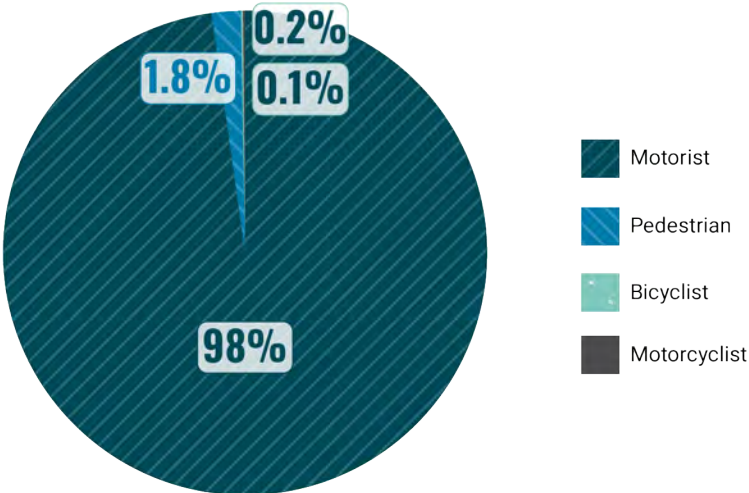


76% of fatal or serious injury crashes involving child pedestrians and bicyclists occur in school areas.

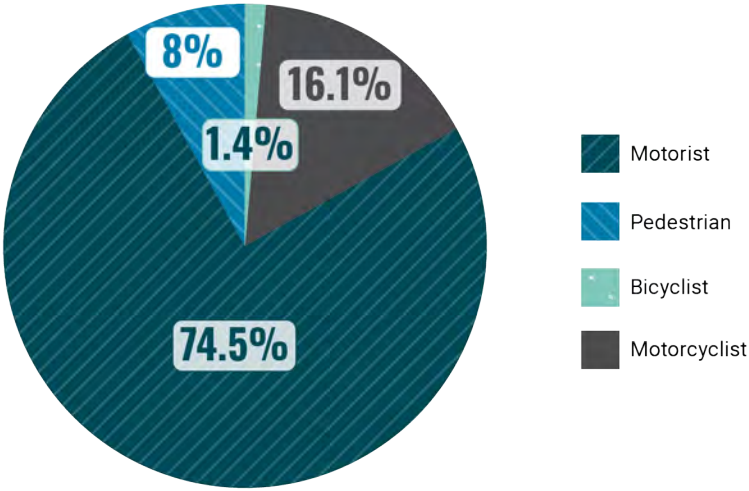
PEDESTRIANS AND BICYCLISTS

After decreasing for three decades and reaching a historic low in 2009, pedestrian, bicyclist, and other nonmotorist fatalities in the United States have risen dramatically. Between 2013 and 2022, nonmotorist fatalities have increased by 56.5%. Nonmotorist fatalities have increased at nearly double the rate of total traffic fatalities, which increased by 29.2% over the same period.

Within the MAPA region, pedestrians and bicyclists' KSI crashes are also increasing. In addition to this, pedestrians and bicyclists are overrepresented in these crashes; although they make up 2% of the region's total commuting populating, they are involved in more than 9% of KSI crashes. One out of seven fatal crashes involve a pedestrian.



Commute Mode Share
Source: 2022 American Community Survey 5-Year Estimates, aggregated for all jurisdictions in the CSAP study area



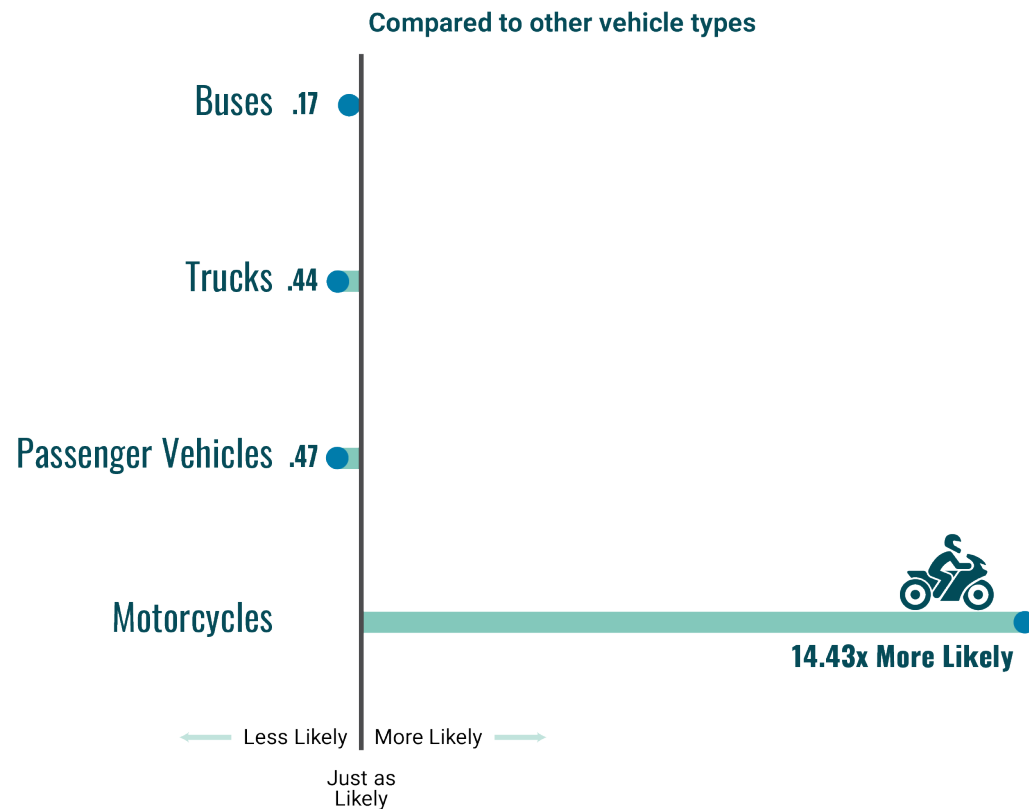
KSI Crashes by Mode





MOTORCYCLISTS

Motorcyclists are the most overrepresented group involved in KSI crashes based on how residents of the MAPA CSAP area choose to travel. They are involved in nearly 16% of all KSI crashes, yet they only account for 0.1% of the commuting population.³ When involved in a crash, motorcyclists are over 14x more likely to be fatally or seriously injured than occupants of other vehicle types.



Risk Ratio of Vehicle Occupants that are Fatally and Seriously Injured, by Vehicle Type

One contributing factor to this overrepresentation could be lower rates of helmet and safety gear usage by motorcyclists. Currently, both Iowa and Nebraska do not require all riders to wear a helmet by law.



**MOTORCYCLE
HELMET USAGE
IS ESTIMATED TO**

**REDUCE THE RISK
OF DEATH BY
42%**

**REDUCE THE RISK
OF HEAD INJURY BY
61%**



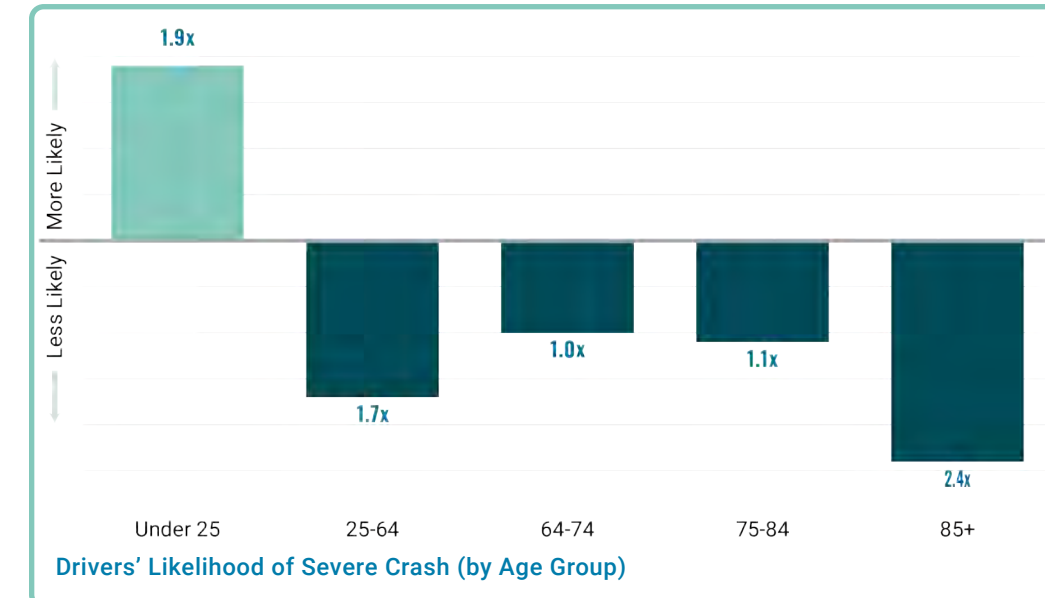
Find out more about motorcyclists through the [Safe Streets and Roads for All: Motorcycles One-Pager](#)⁴

³ Motorcyclists' share of all (including non-commute) trips would likely be significantly larger than 0.1%, but this data is unavailable.

⁴ https://mapacog.org/wp-content/uploads/2024/11/SS4A-One-Pagers_MOTORCYCLE_2024.11.26.pdf

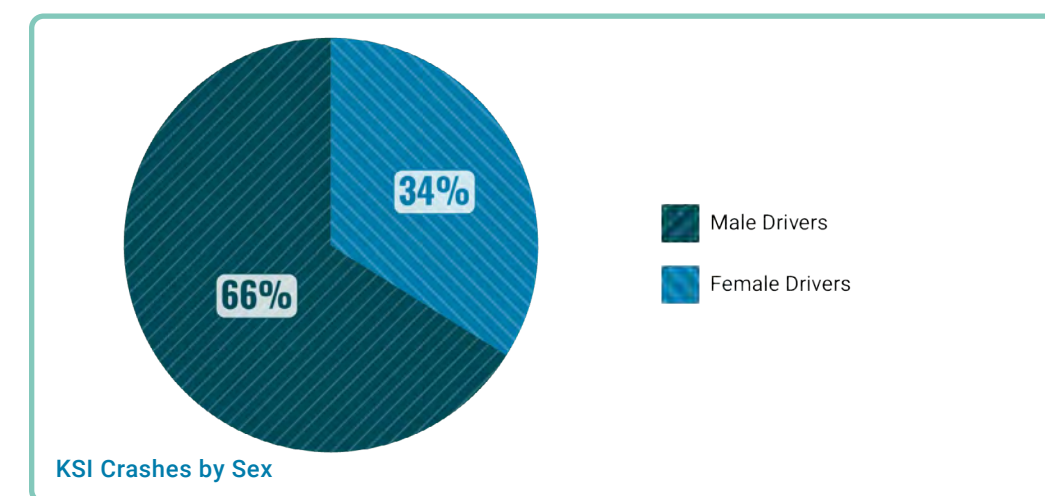
YOUNG AND MALE DRIVERS

Drivers under the age of 25 are the most overrepresented in KSI crashes by age group relative to their share of the overall population in the study area.



Regarding crash trends by sex, male drivers are involved in more crashes than female drivers; nearly two-thirds of drivers involved in KSI Crashes are male.

Young (under 25) male drivers in particular are much more likely to engage in risky behaviors. They are nearly three times more likely to be involved in a KSI crash than the average person. Data shows that males on average drive more vehicle miles than females and are more likely to participate in risky driving behaviors, including driving under the influence of alcohol, lack of seat belt use, and driving aggressively. Male drivers of all ages are about twice as likely to be involved in a KSI crash as female drivers.



Find out more about young drivers through the [Safe Streets and Roads for All: Young Drivers One-Pager](#)⁵

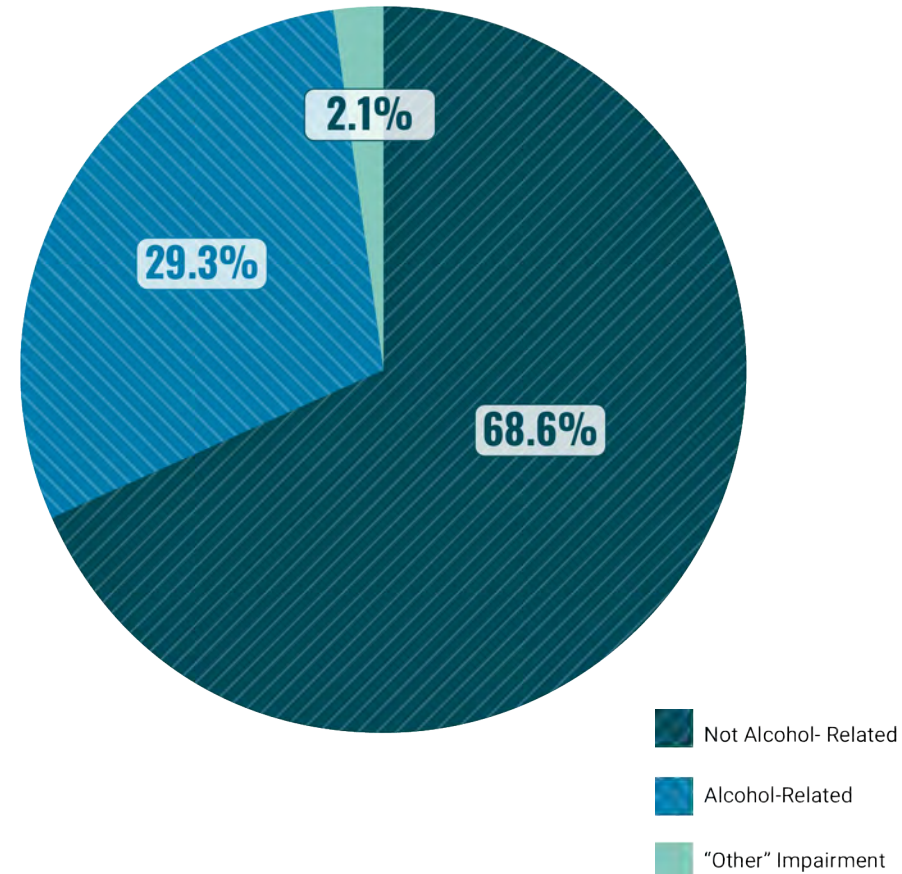
⁵ https://mapacog.org/wp-content/uploads/2024/11/SS4A-One-Pagers_YOUNG_2024.11.26.pdf





IMPAIRMENT AND INATTENTION

Impairment, the use of alcohol or drugs while traveling, was noted as a factor in approximately 31% of fatal crashes and 19% of serious injury crashes. Focusing on alcohol-related crashes only, approximately 29% of fatal crashes and 17% of serious injury crashes were noted as having at least one party involved test above the statutory limit for blood alcohol content.



Fatal Crashes by Alcohol Impairment

Another two percent of these fatal and serious injury crashes were noted as some "Other" form of being under the influence, including drugs, medications, or alcohol less than the statutory limit.



Driving while distracted is another behavior that may be considered reckless or negligent, as drivers keep their attention away from their environment and other road users. Distracted driving was reported as a factor in 4% of all crashes.

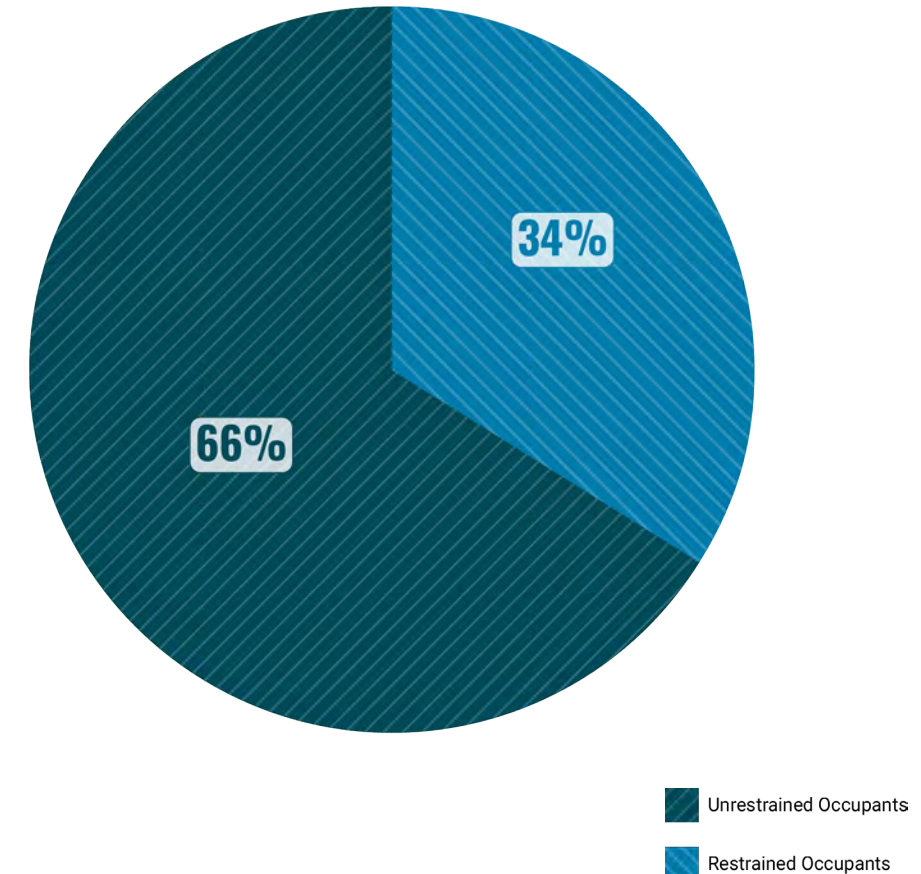


Find out more about impaired driving through the [Safe Streets and Roads for All: Impaired Driving One-Pager](#)⁶

⁶ https://mapacog.org/wp-content/uploads/2024/11/SS4A-One-Pagers_IMPAIR_2024.11.26.pdf

OCCUPANT PROTECTION

Studies indicate that seatbelts reduce crash fatalities and serious injuries by about half.⁷ Nearly two thirds of all 2018-2022 KSI crashes in the region involved at least one occupant not wearing a seatbelt, and 80% of fatal crashes involved at least one occupant not wearing a seatbelt.



KSI Crashes by Seatbelt Usage

While the data available for this analysis does not indicate whether the unbelted occupant(s) account for the fatality or serious injury, studies have shown that unbelted occupants contribute to increased injury and fatality risk for belted occupants in the same vehicle.⁸



⁷ <https://www.cdc.gov/seat-belts/facts/index.html>
⁸ <https://pmc.ncbi.nlm.nih.gov/articles/PMC1730165/>



SPEED

Speed is a key factor in traffic fatalities and serious injuries and it is often the deciding factor that separates these from minor injury or property damage crashes. Approximately 77% of KSI crashes in the region occurred on roads with a posted speed limit of 35 mph or higher. National studies have shown that the likelihood of a fatality increases exponentially with vehicle speed, approximately doubling for every 10 mph increase.

SPEED IS A PARTICULARLY INFLUENTIAL FACTOR IN CRASHES FOR SEVERAL REASONS:



HIGHER SPEED MEANS MORE
more forceful collisions



AT HIGHER SPEEDS, DRIVERS HAVE A
narrower field of vision



AS SPEED INCREASES, DRIVERS HAVE
less time to react



HIGHER SPEEDS ALSO EXTEND
BRAKING DISTANCES, MEANING
**drivers may not be
able to stop in time**

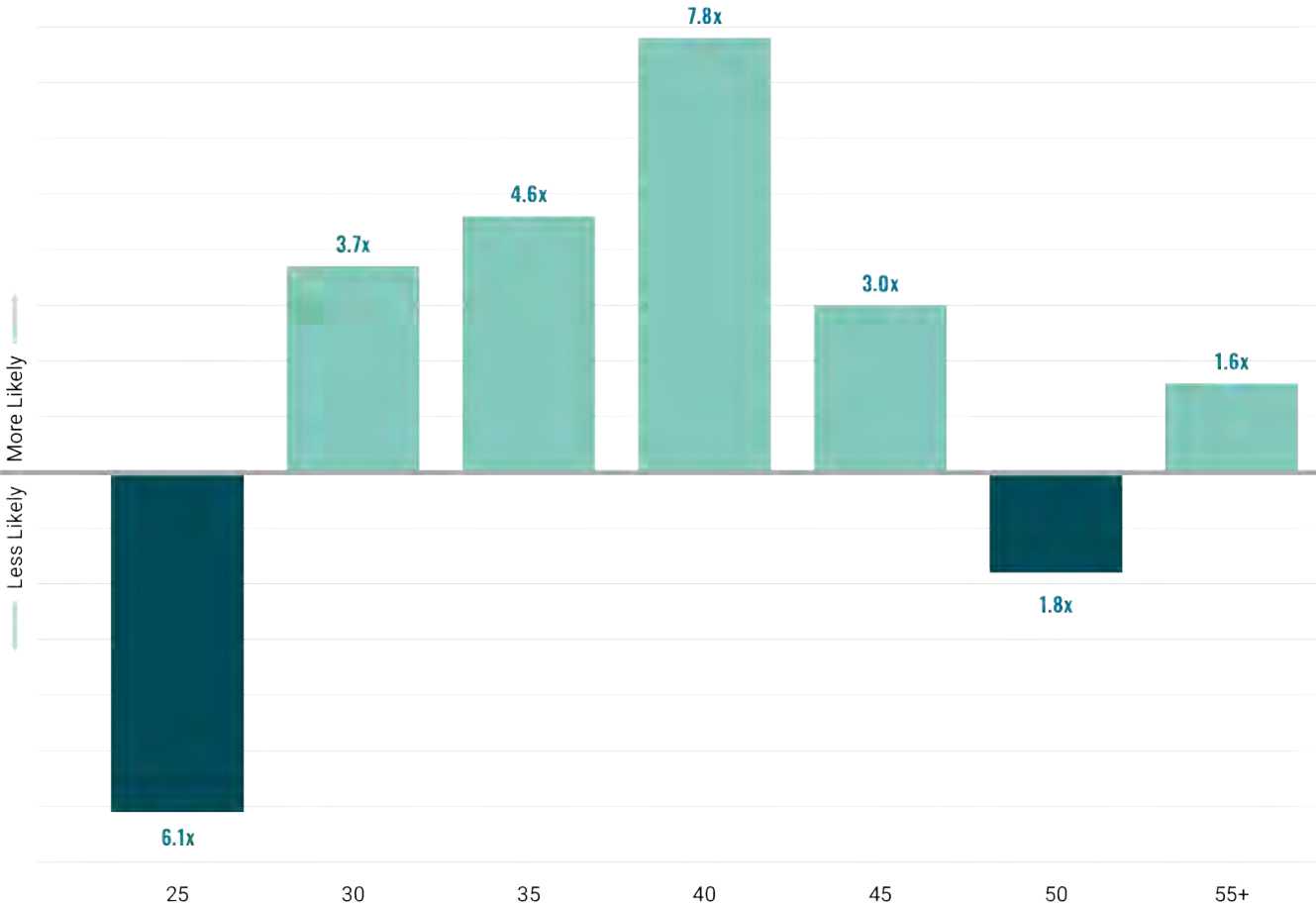
In the MAPA CSAP study area, as in other areas, roads with higher speed limits are associated with a greater likelihood of injury crashes or fatalities. However, for roadways with a posted speed limit above 40 mph, the trend dips before increasing slightly again.

This is primarily due to most roadway facilities with higher speeds having increased safety infrastructure such as medians, separated pedestrian/bicycle paths, access management, and improved shoulders.



IT IS THE MISMATCH OF HIGHER SPEEDS ON LOCAL ROADS THAT
CONTRIBUTES TO INJURIES AND FATALITIES.

Speeding-related driver behaviors (where drivers were noted as having “exceeded authorized speed limit” or were “driving too fast for conditions”) were a contributing factor in approximately 8% of all KSI crashes.



Likelihood of Fatal or Severe Injury Crash (by Posted Speed Limit)

*CRASHES WHERE DRIVERS WERE NOTED TO BE
SPEEDING OR DRIVING TOO FAST FOR CONDITIONS ARE:

6.5x
MORE LIKELY TO RESULT
IN A FATALITY

3.0x
MORE LIKELY TO RESULT
IN A SERIOUS INJURY

*When compared to crashes where speeding-related driver behaviors were not noted as contributing factors.



SAFER VEHICLES

Safer Vehicles refers to the improvement/inclusion of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both vehicle occupants and non-occupants. Two considerations of this could be the design of the vehicle body itself (shape and size) and the systems it uses internally.

Although larger vehicles (e.g., pickups and SUVs) tend to provide more protection for their occupants in a crash, they are significantly more likely to result in fatalities or serious injuries to other vehicle occupants and particularly to pedestrians.

**BETWEEN 2013 AND 2016,
CAR OCCUPANTS WERE⁹**

28% more likely
TO DIE IN COLLISIONS WITH SUVs THAN WITH CARS

PICKUPS WERE

2.5x times as likely
TO KILL THE DRIVER OF A CAR THEY CRASHED INTO THAN A
CAR COLLIDING WITH ANOTHER CAR

Over the past several decades, several vehicle systems have emerged and can be found in a variety of different vehicle makes and models, including automatic emergency braking, lane departure warnings, intelligent speed assistance (ISA), and automatic crash notification (ACN). These introduced features have impacted crashes, including:

- ▶ In the European Union (who is fitting all new cars, vans, buses, and heavy good vehicles with ISAs), ISA is estimated to eventually cut road deaths by 20% across the European Union.¹⁰
- ▶ ACN is estimated (with the full implementation of advanced ACN and the availability of universal cellular coverage) to reduce fatalities from vehicle crashes by 1.6% to 3.3% per year.¹¹
- ▶ Automatic emergency braking reduced rear-end crashes by 50% and reduced rear-end crashes that caused injuries by 5%.¹²
- ▶ Lane departure warning systems have reduced all relevant crashes by 11% and all relevant injury crashes by 21%.¹³

⁹ [IIHS | Vehicle Size and Weight](https://www.iihs.org/news/detail/front-crash-prevention-slashes-police-reported-rear-end-crashes)
¹⁰ <https://www.iihs.org/news/detail/front-crash-prevention-slashes-police-reported-rear-end-crashes>
¹¹ <https://www.itskrs.its.dot.gov/2017-b01175>
¹² [NHTSA | Intelligent Speed Assistance](https://www.itskrs.its.dot.gov/2017-b01175)
¹³ [ITE | Advanced Automatic Collision Notification \(AACN\)](https://www.itskrs.its.dot.gov/2017-b01175)
¹⁴ http://mapacog.org/wp-content/uploads/2025/02/SS4A-One-Pagers_EMERGENCY_2025.02.12.pdf

POST-CRASH CARE

After a crash, timely intervention by emergency first responders can make a significant difference in survival and recovery. These responders play a vital role in quickly assessing and stabilizing injuries and ensuring safe transport to medical facilities where further care is provided.



THE NEED

285
FATALITIES
(2018 - 2022 FARS DATA)

51%
OF CRASHES REQUESTED
EMERGENCY TRANSPORT TO A
MEDICAL FACILITY

45%
OF THOSE TRANSPORTED
PASSED AWAY WITHIN THE
FIRST HOUR OF THE CRASH

THE RESPONSE

ON AVERAGE, EMS ARRIVED ON THE SCENE WITHIN
7 MINUTES
OF A CRASH



Find out more about Post Crash Care: Emergency Services through the [Safe Streets and Roads for All: Post Crash Care One-Pager](#)¹⁴



SAFETY COVERAGE MAP

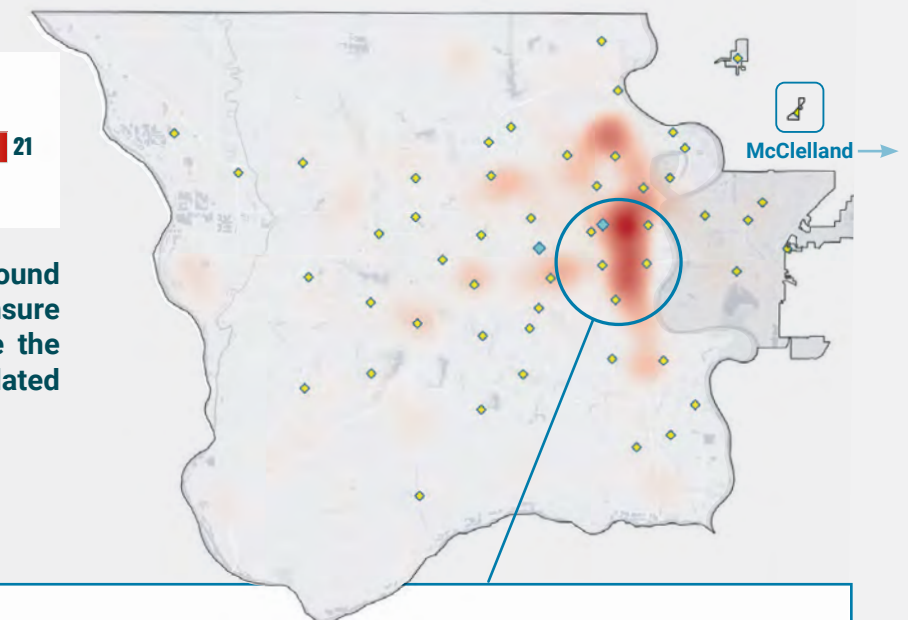
Emergency Facilities

- ◆ Fire Station
- ◆ Level 1 Trauma Hospital

Fatalities

0 21

Fatality hotspots are concentrated around emergency facilities. It is important to ensure these nearby emergency facilities have the resources needed to handle crash-related incidents effectively.



Highlighted Emergency Facilities:

- The Nebraska Medical Center
- CHI Health Creighton University Medical Center
- Omaha Fire Department Station 1
- Omaha Fire Department Station 3
- Omaha Fire Department Station 31
- Omaha Fire and Rescue Station 33
- Omaha Fire and Rescue Station 34

HIGH PRIORITY NETWORK

The High Priority Network (HPN) is a tool that identified priority roads and intersections for project implementation through a combination of crash history, potential risk, and community concern; it combines a hotspot analysis of high fatal and serious injury crash rates, a risk analysis of roadway characteristics, and the results of a survey of safety conditions in the MAPA region.

Three tools contributed to the High Priority Network, answering three key questions:

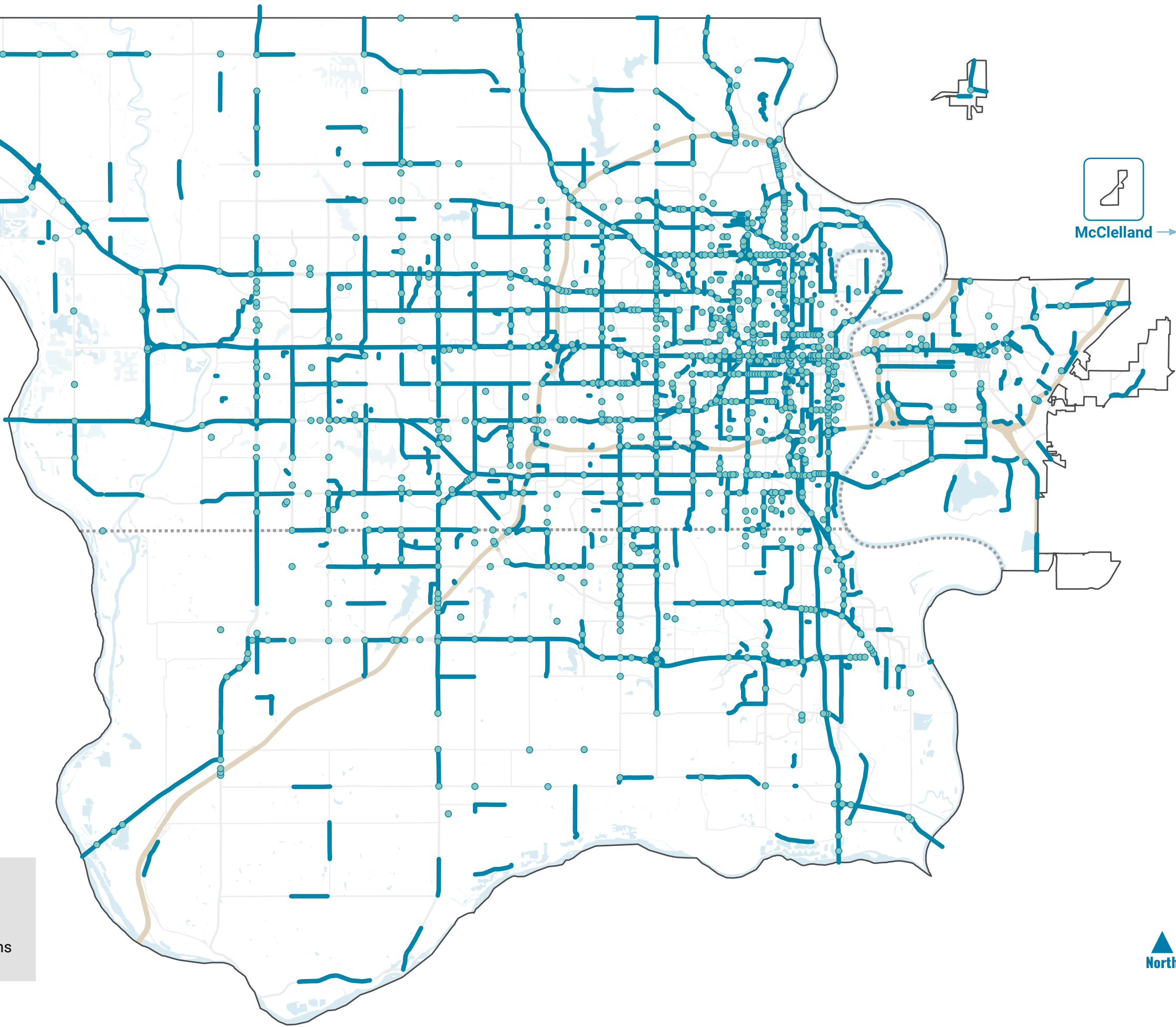
- 1 **High Injury Network:**
Where have there been crashes?
- 2 **High Risk Network:**
Where will there be crashes?
- 3 **Community Survey:**
What safety concerns does the community have?

If a part of the transportation network was identified on the High Injury Network, the High Risk Network, or the community survey, it became a part of the HPN.



Legend

- Segments
- Intersections

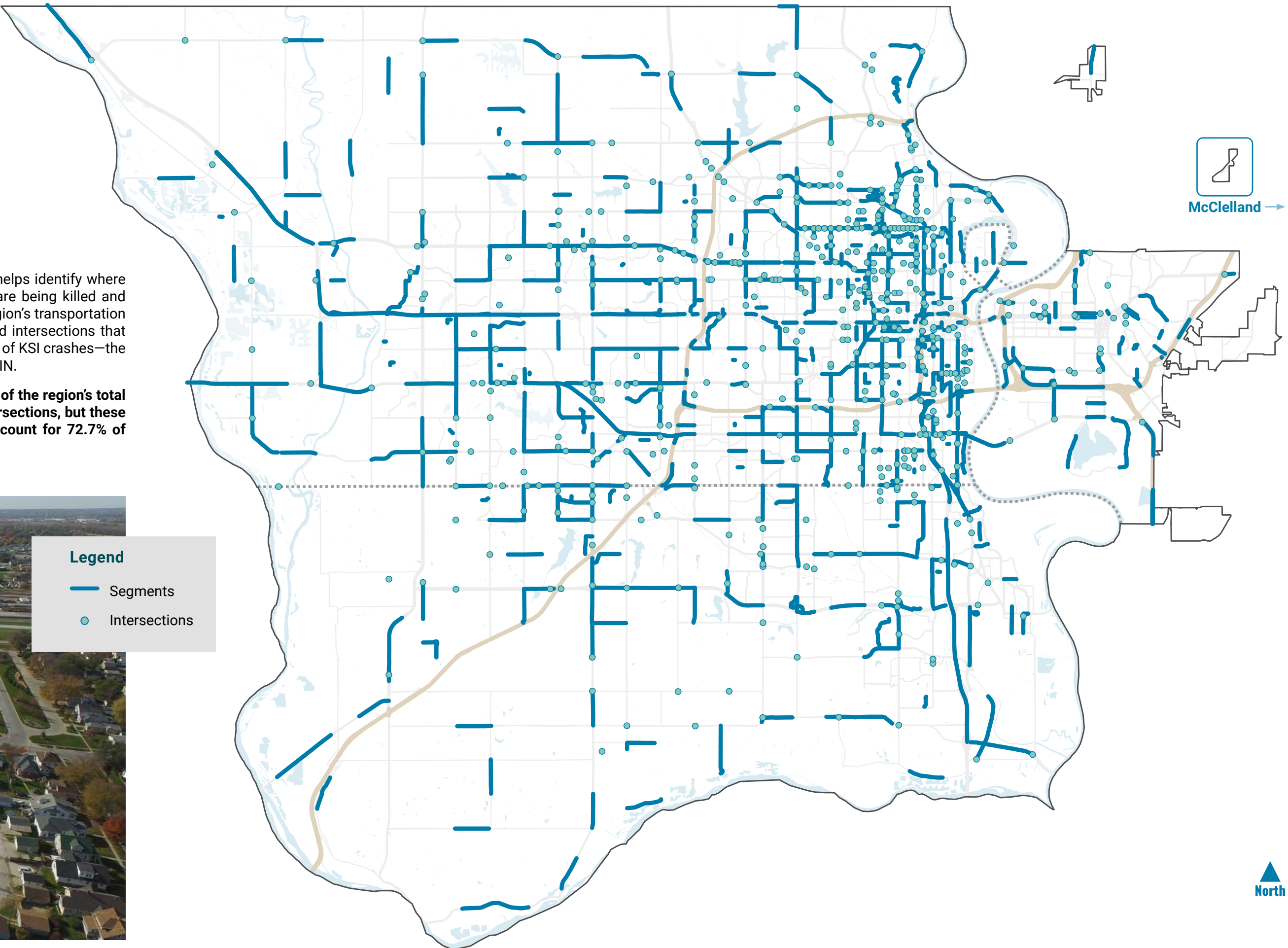
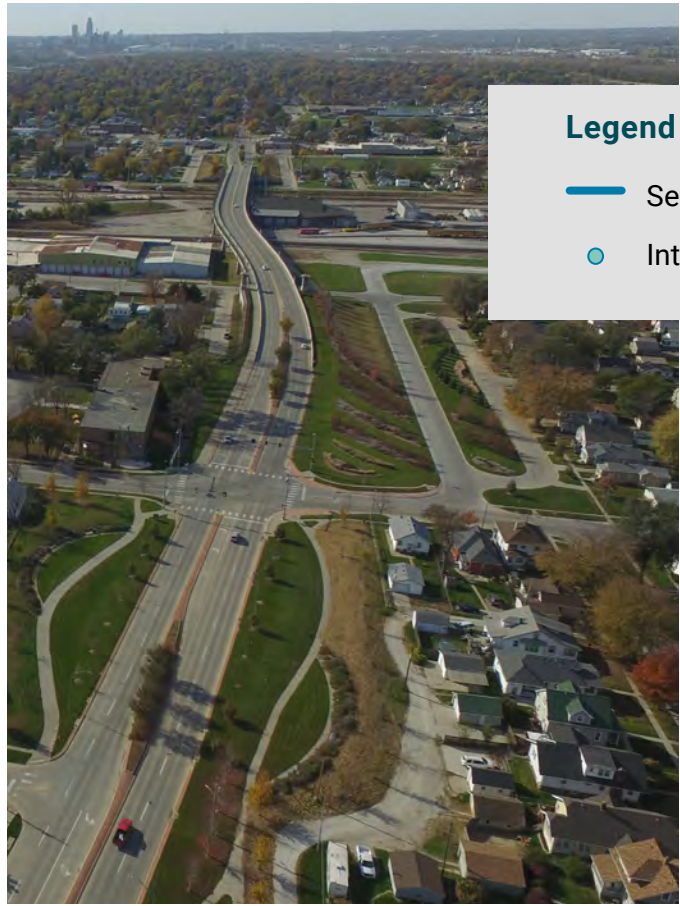


1

HIGH INJURY NETWORK

The High Injury Network (HIN) helps identify where the highest number of people are being killed and seriously injured (KSI) on the region's transportation system. Roadway segments and intersections that have the highest concentrations of KSI crashes—the top two percent—make up the HIN.

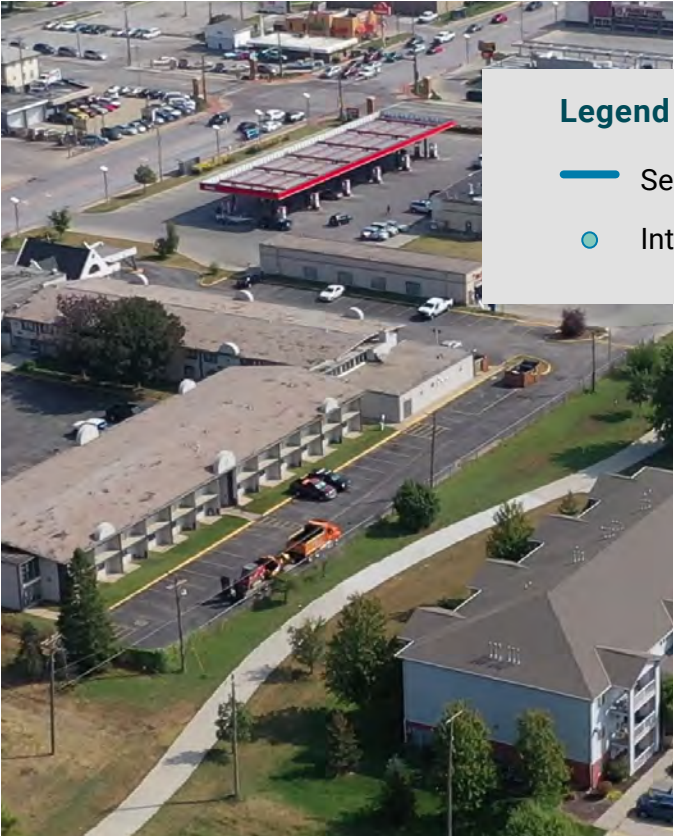
The HIN accounts for just 7.0% of the region's total roadway miles and 2.0% of intersections, but these segments and intersections account for 72.7% of all KSI crashes.



HIGH RISK NETWORK

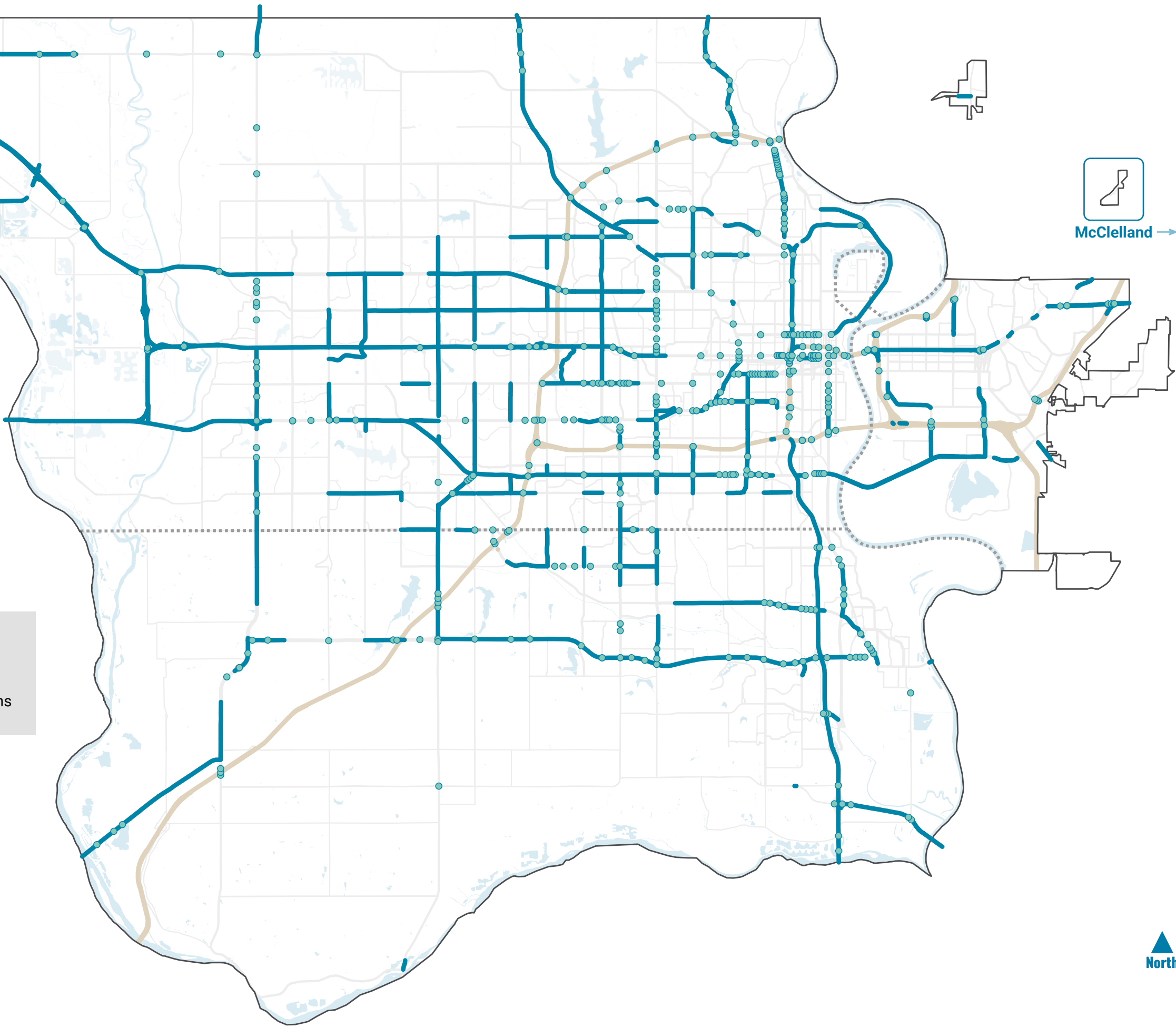
The High Risk Network (HRN) helps identify where potential fatal and serious injury crashes may occur, as fatal and serious injury crashes are a small share of total vehicle interactions and near misses never get reported.

The goal is to highlight parts of the transportation system with roadway features (e.g., number of lanes) and driver behaviors (e.g., speeding) that may increase the likelihood of a KSI crash on the network; the top two percent of the roadway system flagged is the HRN. The HRN accounts for 5.2% of the region's total roadway miles and 1.7% of total intersections. These segments and intersections account for 24.5% of all KSI crashes.



Legend

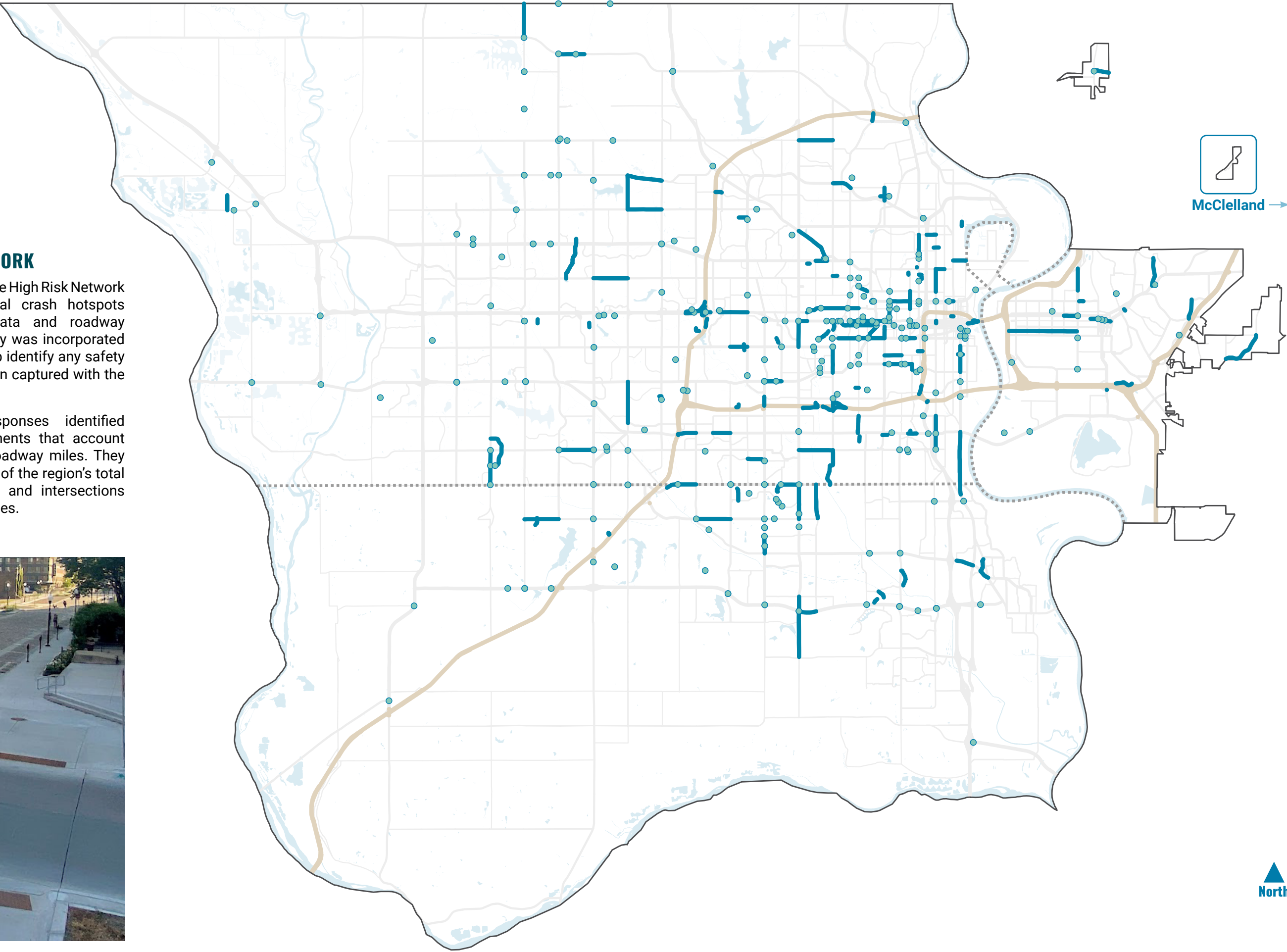
- Segments
- Intersections



COMMUNITY SURVEY NETWORK

As the High Injury Network and the High Risk Network identify historical and potential crash hotspots considering existing crash data and roadway attributes, the community survey was incorporated into the High Priority tool to help identify any safety concerns that may not have been captured with the other tools.

The Community Survey responses identified concerns along roadway segments that account for 1.2% of the region's total roadway miles. They also identified concerns at 0.9% of the region's total intersections. These segments and intersections account for 7.8% of all KSI crashes.





Vision Zero Toolbox

04

COUNTERMEASURES THAT WORK

The Vision Zero Toolbox is a resource compiling useful information regarding transportation countermeasures with known safety benefits.

The toolbox features five major categories of countermeasures, including:

- Segment Countermeasures
- Intersection Countermeasures
- Safety Countermeasures for Pedestrians and Bicyclists
- Rural and Highway Countermeasures
- Behavioral Countermeasures

These countermeasures are included to help make the transportation network safer and more accessible for all road users, regardless of ability, age, or preferred travel method. The toolbox can be utilized in conversations around safety, especially in reaching a shared understanding about creating a safer roadway system for all. As communities across the MAPA region come in all different shapes and sizes, it's important to include a variety of countermeasures within the toolbox so that each community can handpick countermeasures and tailor them to improve connectivity and safety.

AUDIENCE

This toolbox is simple, straightforward, and easily understandable. Although the primary audience is transportation professionals and safety advocates in roles where they have an impact on what projects are implemented within their community (such as members of Planning or Public Works departments, MAPA, etc.), this toolbox was designed to ensure that anyone could pick it up and understand what these countermeasures are, their benefits, and where they are applicable to be used.

APPLICATION

The Vision Zero Toolbox aims to provide a variety of countermeasures that are targeted for different contexts. These countermeasures can be used independently or in conjunction with each other, giving communities flexibility in choosing countermeasures best suited to their needs and existing conditions.

KEY CONSIDERATIONS

Each countermeasure includes the following; a helpful legend is included on the right-hand portion of the toolbox for convenience.

Name:	Description:
The title of each countermeasure	1-2 sentences describing the countermeasure.

Applicable Crash Types:

The crash profile relationship with crash types shown on police reports. For the first four sections, these are identified symbolically; for behavioral countermeasures, these are identified by key words.

 Lane Departure: Fixed Object, Head-on, Overturn, Sideswipe, Parked Vehicle, Single Vehicle	 Rear-end	 Bike/Ped: Bicyclists /Pedestrians
	 Angle: Left Turn, Right Angle	Other: Animal, Train, Other

Crash Reduction Factor:

The potential reduction of crashes due to the implementation of a countermeasure for all crash severities and types, with exceptions for roadway lighting, cable median barrier, and all pedestrian and bicycle safety-related countermeasures.

Quick-Build Capable:

A symbolic indication of whether a countermeasure is quick-build capable or not, dependent on factors like right of way, cost, and time to implement. **Criteria include:**

1. Little to no impact of right-of-way or roadway geometry
2. Cost of quick-build version is less than 50% of the capital cost
3. Can be completed in less than a year, from concept to completion

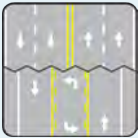
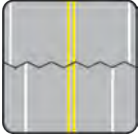
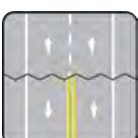
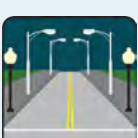
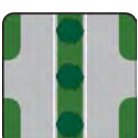
Cost:

The relative cost for the countermeasure.			
\$ <\$10k	\$\$ \$10k - \$100k	\$\$\$ \$100k - \$1M	\$\$\$\$ \$1M +

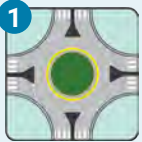
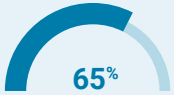
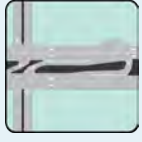
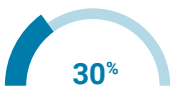
Traffic Considerations:

Traffic considerations are factors (such as roadway geometry, traffic volume, number of lanes, and more) that help users decide if a countermeasure may be a good fit for a potential area or project; as behavioral countermeasures are not dependent on the existing geometry of the roadway network, General Considerations (such as crash history) are the factors considered.

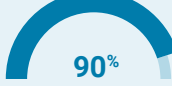
SEGMENTS COUNTERMEASURES

	Description	Applicable Crash Types	Crash Reduction Factor	Quick Build Capable	Cost	Traffic Considerations
 Roadway Reconfiguration	Roadway reconfigurations reduce the number of lanes, cutting conflict points, crossing distances, and vehicle speeds.	   	 30%		\$\$-\$\$\$	4-to-2 thru lanes: <18,000 ADT 6-to-4 thru lanes: <36,000 ADT
 Lane Narrowing	Lane narrowing shrinks roadway width while keeping lane count, slowing traffic, shortening pedestrian crossings, and adding bike/pedestrian areas.	   	 25%		\$\$	Avoid on Truck Routes
 Landscaped Buffers / On-Street Parking	Landscaped buffers, on-street parking, and street trees implemented in conjunction or separately can slow traffic and improves safety.	   	-		\$\$\$	Evaluate Line of Sight at Intersections
 One-way to Two-way Street Conversions	Converting one-way to two-way streets calms traffic, increases connectivity, and creates safer streets for all users.	   	 30%		\$\$\$	Evaluate Signal Modifications, Access, and Turn-lanes
 Horizontal Traffic Calming	Horizontal traffic calming techniques, such as road narrowing, chicane installation, and roundabouts, slows traffic and improves safety.	   	 30%		\$	<20,000 ADT
 Vertical Traffic Calming	Vertical traffic calming techniques, such as speed humps, raised crosswalks/intersections, and traffic circles, slows traffic and improves safety.	   	 30%		\$\$	<10,000 ADT Ensure Compliant with EMS Vehicles
 Roadway Lighting	Street lighting improves visibility, especially at intersections, crosswalks, and other high-traffic areas, reducing crashes and enhancing pedestrian safety.	   	 20%		\$\$	-
 Raised Medians and Access Management	Medians separate traffic, reducing head-on collisions and providing safe havens for pedestrians. Limiting driveways improves access management and reduces traffic conflicts.	   	 40%		\$\$\$\$	>12,000 ADT

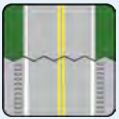
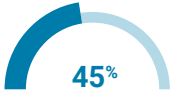
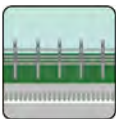
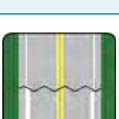
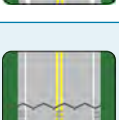
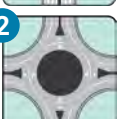
INTERSECTIONS COUNTERMEASURES

	Description	Applicable Crash Types	Crash Reduction Factor	Quick Build Capable	Cost	Traffic Considerations
 Single-lane Roundabouts	1. Single-lane roundabouts reduce traffic speed, eliminate dangerous angle crashes, and shorten crossing distances for pedestrians. 2. Multi-lane roundabouts handle more traffic but have more conflicts than single-lane roundabouts. Turbo roundabouts add dividers to improve safety. 3. Mini-roundabouts are smaller, single-lane versions of traditional roundabouts with traversable centers for larger vehicles without requiring additional ROW.		 65%		\$\$-\$\$\$\$	<30,000 EADT
 Multi-lane Roundabouts					\$\$\$\$	<45,000 EADT
 Mini-Roundabouts					\$\$-\$\$\$	<20,000 EADT
 All-way Stop Control Conversion	All-way stop control converts either two-stops or unwarranted signals to four-way stops, reducing wait times and making intersections more predictable.		 50%		\$	<12,000 ADT (each approach) <=2 thru-lanes (each approach)
 Reduced Conflict Intersections	• Reduced left-turn conflict intersections redesign left turns to reduce crashes and improve safety. Common types include RCUTS and MUTs. • Right-in, right-out (RIRO) and three quarter intersections simplify traffic flow by restricting side-street movements, forcing right turns, and reducing crossing paths.		 35%		\$\$\$\$	Prior Condition Stop-Controlled
 Systemic Traffic Signal Modifications	Traffic signal modifications improve safety and efficiency through both hardware and software upgrades, such as: • Hardware: Signal Light Upgrades, Retroreflective Backplates, Ped. Countdowns, and Stop-bar/Crosswalk Striping • Software: Updated Timings, Leading Pedestrian Intervals, and Intelligent Transportation Systems (ITS) Implementation.		 15%		\$\$	-
 Intersection Daylighting and Curb Extensions	• Intersection daylighting improves visibility by restricting parking near intersections using pavement markings and flexible posts. • Curb extensions and bulb-outs shorten crossing distances, improve visibility, and increase pedestrian comfort at intersections.		 30%		\$\$	Avoid at High Truck-Volume Intersections
 Left-turn Hardening	Left-turn Hardening reduces vehicle turning speed and increases vehicle yielding to pedestrians by guiding vehicles to take wider turns.		 30%		\$\$	Avoid at High Truck-Volume Intersections

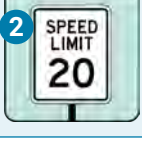
SAFETY COUNTERMEASURES FOR PEDESTRIANS & BICYCLISTS

	Description	Applicable Crash Types	Crash Reduction Factor	Quick Build Capable	Cost	Traffic Considerations
	Rectangular Rapid-Flashing Beacon RRFBs use flashing lights to improve safety at unsignalized crosswalks, especially crossings of two lanes or less and under 40 mph.	   	 45%		\$\$	See FHWA STEP Guide, Table 1
	Pedestrian Hybrid Beacon PHBs use flashing lights to improve driver yielding to pedestrians at unsignalized crossings, especially on higher-speed roadways.	   	 55%		\$\$\$	See FHWA STEP Guide, Table 1
	Systemic Crossing Modifications Systemic crossing modifications improve pedestrian safety and accessibility across busy streets with marked crosswalks, lighting, refuge islands, and clear signage.	   	 30%	✓	\$\$	See FHWA STEP Guide, Table 1
	Raised Crossing Raised crossings improve pedestrian safety and accessibility by slowing traffic and providing a level crossing surface.	   	 30%		\$\$	See FHWA STEP Guide, Table 1
	Sidewalks Sidewalks improve pedestrian and cyclist safety by providing designated spaces separate from traffic, including ADA-compliant features.	   	 90% Where Sidewalks are Missing		\$\$-\$\$\$	-
	Bicycle Lanes Bicycle lanes make cycling safer and more comfortable by separating cyclists from traffic and pedestrian facilities using paint or physical barriers.	   	 45%	✓	\$\$	<6,000 ADT and <35 MPH
	Protected Bicycle Lanes / Cycle Tracks Protected bike lanes separate cyclists from traffic with physical barriers, significantly reducing collisions and improving safety.	   	 55%	✓	\$\$\$	6,000 - 20,000 ADT and <45 MPH Evaluation Exclusive Turn-lanes and Protected Turn Signal Phasing
	Shared-use Paths Shared-use paths (off-street trails) improve safety and accessibility for active transportation and recreation by separating users from traffic.	   	 25%		\$\$-\$\$\$	>20,000 or >45 MPH
	Safe Routes to School Safe Routes to School encourages walking and biking to school, educates students, and supports projects that create safe, active routes.	   	 35%		\$\$-\$\$\$	-

RURAL & HIGHWAY COUNTERMEASURES

	Description	Applicable Crash Types	Crash Reduction Factor	Quick Build Capable	Cost	Traffic Considerations
 Systemic Stop-control Modifications	Systemic stop-control modifications improve intersection visibility with advanced warning signs, retroreflective panels, enlarged signs, rumble strips, and cross-traffic warning signs.		 40%	✓	\$\$	History of Stop-sign Running or Nighttime Crashes
 Safety Edge	Safety Edges provide a smooth transition between paved roadway and shoulders, preventing tire damage and vehicle loss of control while increasing pavement durability.		 50%		\$\$\$	Curb-less/Guardrail-less Roadways
 Shoulder Installation/Widening	Installing or widening shoulders provides space for disabled vehicles, maintenance, and other safety activities. Safety edges can be installed on new or widened existing shoulders.		 25%		\$\$\$	Most Effective When ADTs >1,000
 Turn-lane Additions	Adding auxiliary lanes separates turning traffic, reducing crashes while improving visibility.		 45%		\$\$\$	Visibility Concerns History of Left-turn Related of Rear-end Crashes
 Pavement Friction Management	Pavement Friction Management measures, monitors, and maintains pavement friction to improve safety, especially at intersections, crosswalks, and crash-prone locations.		 55%		\$\$\$\$	More Effective on Curves
 Cable Median Barrier	Cable Median Barriers protect against fixed roadside hazards, reducing fatal and serious crashes.		 40%		\$\$\$	History of Median Crossover or Head-on Crashes
 Curve Delineation Modifications	Enhanced Curve Delineation uses reflective chevrons and advance warning signs to significantly reduce curve crashes, especially at night and in rural areas.		 30%	✓	\$\$	Existing Sideslope and Distance to Roadside Features History of Roadway Departure or Nighttime Crashes
 Wider Edge Lines	Wider edge lines improve visibility, reducing roadway departure crashes, especially on rural two-lane highways. Adding center and edge lines where they are missing further improves safety.		 15%	✓	\$\$	Presence of Curves History of Single-Vehicle or Nighttime Crashes
 Rumble Strips	Rumble strips alert drivers to lane departure, reducing head-on and run-off-the-road crashes.		 15%		\$\$	History of Lane Departure Crashes Consider Potential Noise Concerns
1  2  Single-lane Roundabouts Multi-lane Roundabouts	1. Single-lane roundabouts reduce conflict points, speed, and angle crashes, improving safety for all road users. 2. Multi-lane roundabouts handle more traffic but have more conflicts than single-lane roundabouts. Turbo roundabouts add dividers to improve safety.		 50%	✓	\$\$\$\$	<30,000 EADT <45,000 EADT

BEHAVIORAL COUNTERMEASURES

	Description	Applicable Crash Types	Crash Reduction Factor	Quick Build Capable	Cost	General Considerations
 Automated Enforcement	Automated enforcement uses cameras to detect and document traffic violations like red light running and speeding, notifying vehicle owners by mail. Currently legal in Iowa but not Nebraska.	Speeding	 50%		\$\$\$	Data-driven Location Selection
 Speed Feedback Signs	Speed feedback signs display approaching drivers' speeds to make them aware of their current speed, with flashing numbers indicating speeding.	Speeding	 5%	✓	\$	-
 Speed Limit Reduction	- Speed limit reductions, based on context and activity level, reduce crashes by lowering speeds and increasing sign frequency. - Slow zones designate lower speeds (15 - 20 mph) in areas with vulnerable populations, like parks, school zones, and neighborhoods	Speeding	 30%	✓	\$\$\$	<5,000 ADT
 Slow Zone		All				
 High-Visibility Saturation Patrols	Saturation patrols deter drunk driving by increasing the perceived risk of arrest in high-risk areas. These programs should be regular and highly publicized.	Impaired	-		-	See NHTSA Countermeasures That Work: High-Visibility Saturation Patrols
 Publicized Sobriety Checkpoints	Sobriety checkpoints deter drunk driving by visibly removing impaired drivers from the road.	Impaired	-		\$-\$\$\$	See NHTSA Countermeasures That Work: Publicized Sobriety Checkpoints
 Increased Traffic Safety Enforcement Efforts	Traffic enforcement focuses on behaviors like drunk driving, speeding, distracted driving, and seatbelt use. Specialized patrols and checkpoints target impaired drivers, especially at night.	Impaired	-		-	See NHTSA Countermeasures That Work
 Sober Ride Home Programs	Alternative transportation programs reduce drunk driving by providing options like rideshare services, nonprofit safe rides, and public transportation.	Impaired	-		\$\$	See NHTSA Countermeasures That Work: Alternative Transportation
 Mass Media Campaigns	Mass media campaigns use radio, TV, and social media to promote safety and tailor messages to make maximum impact.	Impaired	-		\$\$\$	See NHTSA Countermeasures That Work: Mass Media Campaigns

COUNTERMEASURE SPOTLIGHTS

As the MAPA region encompasses a variety of communities big and small, rural and urban, different communities need tailored countermeasures and strategies to improve safety within their jurisdictions. Five countermeasures from within the Vision Zero toolbox are especially noteworthy and are featured here as countermeasure spotlights:



- ▶ Roundabouts
- ▶ Lane Reconfiguration
- ▶ Red Light Running and Speed Cameras
- ▶ Systemic Signal Modifications
- ▶ Traffic Calming

EACH COUNTERMEASURE SPOTLIGHT TAKES A DEEPER DIVE INTO THE COUNTERMEASURE, PROVIDING SAFETY JUSTIFICATIONS, COMMON CONCERNS AND SOLUTIONS, AND LISTS SEVERAL BEST PRACTICE REFERENCES.

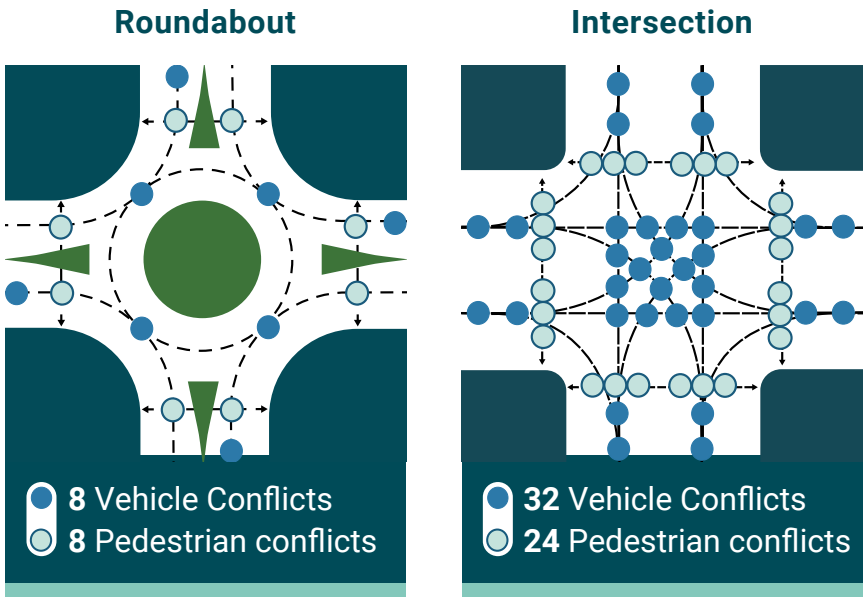
ROUNDBABOUTS

Roundabouts are circular intersections designed to promote a continuous flow of traffic. Unlike traditional intersections, roundabouts do not use traffic signals. Instead, vehicles enter the roundabout and yield to traffic already circulating. This design reduces the likelihood of severe collisions, with vehicles moving counterclockwise in right-hand traffic countries and clockwise in left-hand traffic countries. Roundabouts are known for their safety and efficiency in managing traffic volumes.



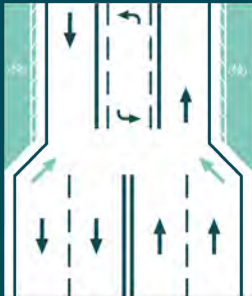
Safety Justification

Roundabouts have been proven to enhance road safety significantly. Studies indicate that roundabouts reduce the occurrence of fatal and severe injury crashes by up to 90% compared to traditional intersections (FHWA, 2021). The primary safety benefit comes from the reduced speed of vehicles, as the circular design requires motorists to slow down. Moreover, eliminating traffic signals means fewer points of conflict, such as head-on or high-speed right-angle collisions. The continuous movement also reduces rear-end collisions commonly associated with traffic light intersections (IIHS, 2020).



Common Concern	Solutions
Confusion: Drivers unfamiliar with roundabouts may find them confusing, leading to potential hesitation or incorrect navigation.	Driver confusion can be addressed through public education campaigns and clear, intuitive signage that guides drivers through the roundabout.
Pedestrian Safety: There are concerns about pedestrian safety, especially for those with disabilities, who must cross multiple lanes of moving traffic.	Implementing pedestrian crossings with clear markings and actuated crossing lights at multi-lane crossings to ensure safe passage.
Large Vehicles: Concerns regarding the maneuverability of trucks and emergency vehicles within the roundabout's tight curves.	Roundabouts are designed with truck aprons that allow sufficient space to accommodate larger vehicles, and some middle islands are built to be mountable.
Cyclist Safety: Cyclists may feel vulnerable navigating roundabouts alongside motor vehicles, mainly if dedicated cycling lanes are not provided.	Incorporating dedicated cycling paths or lanes that separate cyclists from motor traffic and following the latest guidance from FHWA and AASHTO.
Construction Costs: The initial cost of constructing a roundabout can be higher than installing traffic signals, leading to budgetary concerns.	Highlighting the long-term benefits and cost savings associated with reduced crash rates, improved traffic flow, and no cost of traffic signal maintenance.

- BEST PRACTICE & REFERENCES:**
- [Roundabouts: An Informational Guide \(FHWA\)](#)
 - [Guidelines for the Planning and Design of Roundabouts \(mssDOT\)](#)
 - [Guide for Roundabouts \(NCHRP\)](#)

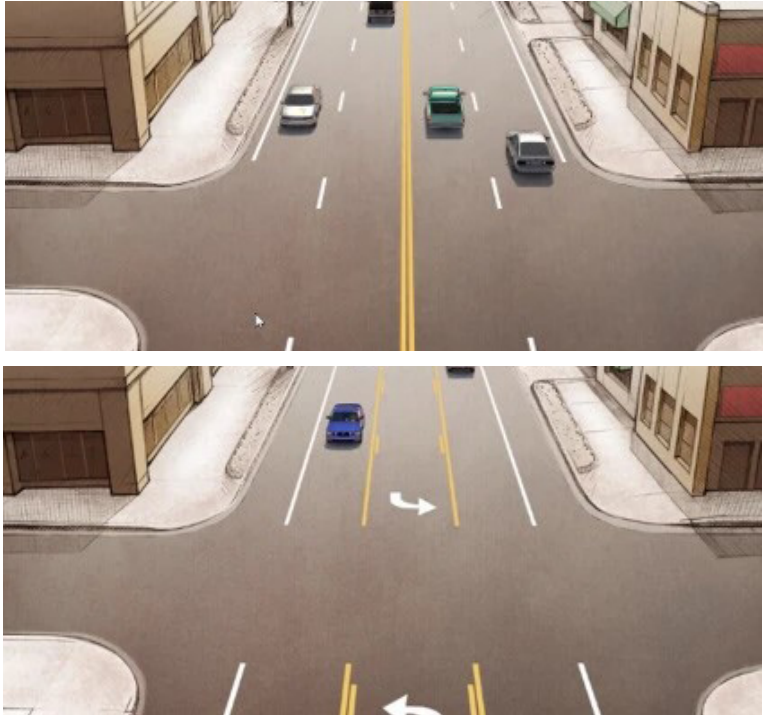


LANE RECONFIGURATION

Lane Reconfiguration, commonly known as a Road Diet, involves reducing the number of travel lanes and reassigning that space for other purposes, such as bike lanes, pedestrian pathways, or parking. This approach aims to improve road safety, enhance mobility, and create more livable streetscapes.

Safety Justification

Research indicates that road diets can significantly enhance road safety by reducing speeds and minimizing the number of lanes pedestrians must cross. According to the FHWA, implementing a road diet can reduce overall crashes by an average of 19-47% (FHWA, 2021). This is achieved through a combination of lower vehicular speeds, improved visibility, and less lane changing, which lowers the chances of side-swipe and rear-end collisions. Additionally, converting a 4-lane roadway to a 3-lane adds a two-way center-turn lane that removes turning vehicles from the traffic flow and allows EMS to bypass congestion.



Iowa DOT



BEST PRACTICE & REFERENCES:

[Road Diet Informational Guide \(FHWA\)](#)

[4- to 3-lane Conversion \(Iowa DOT\)](#)

[Urban Street Design Guide \(NACTO\)](#)

Common Concern	Solutions
Traffic Congestion: Concerns that removing travel lanes will lead to increased congestion and longer travel times.	Studies show that road diets often have minimal impact on traffic flow, especially on roads with lower volumes. Implementing traffic signal timing adjustments and adding turn lanes can help maintain efficient traffic movement.
Emergency Response: Fears that lane reductions will impede emergency vehicle access and response times.	Road diets can include designated lanes or shoulder spaces for emergency vehicles. Additionally, improved traffic flow and reduced incidents can actually enhance response times.
Business Impact: Local business owners may worry about reduced customer access and visibility.	Road diets can create a more inviting environment for pedestrians and cyclists, potentially increasing foot traffic and business activity. Clear signage and adequate parking solutions can mitigate negative impacts.
Pedestrian Safety: Concerns about pedestrian safety, particularly in areas where crossing distances are increased.	Incorporating pedestrian refuge islands, enhanced crosswalks, and signalized crossings can provide safe and easy passage for pedestrians.

RED-LIGHT RUNNING AND SPEED SAFETY CAMERAS

Red-light running and speed safety cameras are increasingly being used as tools to promote road safety and improve compliance with traffic laws. These automated enforcement systems capture images or videos of vehicles committing traffic violations, such as running red lights or exceeding speed limits, and issue citations to the registered owners.

Safety Justification

Research has shown that red-light running and speed safety cameras can significantly reduce the incidence of dangerous driving behaviors and associated crashes. According to the Insurance Institute for Highway Safety (IIHS), red-light cameras can reduce fatal red-light running crashes by up to 21%. Speed safety cameras have been found to lower the likelihood of crashes by reducing speeds and deterring aggressive driving. These cameras contribute to an overall safer driving environment by encouraging motorists to adhere to traffic laws.



<https://www.villageofworth.com/180/Photo-Enforcement>

Common Concern	Solutions
Privacy Issues: Concerns about the invasion of privacy due to constant surveillance.	Enforcement agencies ensure that cameras are only used to capture and process images of traffic violations. Clear policies and regular audits can help maintain public trust and protect privacy rights.
Revenue Generation: Perceptions that cameras are used primarily to generate revenue rather than enhance safety.	Transparency in the use of funds and clear communication about the safety benefits can address these concerns. Revenue generated can be reinvested in road safety initiatives and infrastructure improvements.
Accuracy of Citations: Fears that automated systems may incorrectly issue citations.	Robust verification processes and opportunities for drivers to contest citations can ensure accuracy and fairness. Regular maintenance and calibration of equipment are also essential.
Driver Behavior: Concerns that cameras may cause drivers to abruptly stop or slow down, leading to rear-end collisions.	Proper placement and signage can alert drivers to the presence of cameras, encouraging consistent compliance without sudden maneuvers. Studies indicate that overall crash rates tend to decrease with the implementation of safety cameras.



BEST PRACTICE & REFERENCES:

[Automated Enforcement in a New Era \(GHSA\)](#)

[Automated Enforcement Program Checklist \(IIHS\)](#)

[System Analysis of Automated Speed Enforcement Implementation \(NHTSA\)](#)



SYSTEMIC SIGNAL MODIFICATIONS

Traffic signal modifications improve safety and efficiency through both hardware and software upgrades, such as:

Hardware	Signal Light Upgrades	Signal light upgrades is the improvement of a signalized intersection through one or multiple upgrades, such as using LED lights in the signal head for better visibility and energy efficiency, having a signal head per lane of traffic, or switching from a pole light to a mast-arm light.
	Retroreflective Backplates	Retroreflective backplates improve the visibility of the illuminate face of the signal by framing the signal with a 1- to 3-inch yellow retroreflective border; this signal modification improves visibility and conspicuity during daytime and nighttime conditions.
	Pedestrian Countdowns	Pedestrian Countdowns are signal heads that have a countdown timer module. These signal modifications clearly indicate to pedestrians how much time left before the crossing phase ends, allowing them to know when to start crossing and when to wait to cross.
	Stop-bar / Crosswalk Striping	Stop-bar and crosswalk striping improve visibility of crossing locations at intersections, indicating clearly where vehicles should stop and the space for pedestrians and bicyclists to cross.
Software	Updated Signal Timings	Updating signal timings are the adjustment of green light duration and cycle length, yellow signal light duration, or changes in traffic timing to better reflect existing traffic conditions.
	Leading Pedestrian Intervals	Leading pedestrian intervals (LPI) give pedestrians 3-7 seconds of crossing time before vehicles are given a green light; LPIs increase pedestrian visibility, increase the yielding behavior of motorists, and can provide additional time to cross.
	ITS Implementation	Intelligent Transportation System (ITS) Implementation refers to the use of technology to improve safety and efficiency through multiple measures, such as adaptive traffic control, advance detection, and coordinated signal systems.



BEST PRACTICE & REFERENCES:

[Proven Safety Countermeasures \(FHWA\)](#)

[STEP Studio \(FHWA\)](#)

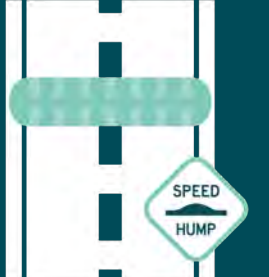
Safety Justification

The implementation of traffic signal modifications can provide improvements in adherence to traffic signal cycles, yielding behavior to pedestrians and bicyclists crossing, red-light-running, and crashes at signalized intersections. Several of these hardware and software upgrades are proven safety countermeasures by the FHWA, such as:

- ▶ Retroreflective backplates see a 15% reduction in total crashes at intersections
- ▶ Yellow change intervals see a 36-50% reduction in red-light running and 8-14% reduction in total crashes
- ▶ LPIs see a 13% reduction in pedestrian-vehicle crashes at intersections

TRAFFIC CALMING

Traffic calming is a set of countermeasures that encourage safer vehicle speeds by changing the built environment around the transportation network. These countermeasures consist of lane narrowing, horizontal features, vertical features, roadside features, and other features that changes the perception of the roadway to improve safety, mobility, and comfort. Traffic calming countermeasures can be implemented individually or combined with other countermeasures.



Horizontal	Lane Narrowing	Lane narrowing is the reduction of the width of the roadway without adjusting the number of lanes; the reclaimed space can be used for on-street parking, pedestrian or bicycle facilities, or greenery. Narrow lanes encourage slower speeds and shortens crossing distances for pedestrians.
	Chicane Installation	A chicane installation creates an S-shaped curve in the road using curb extensions, edge islands, or alternating on-street parking. The change in the orientation in the roadway encourages slower speeds.
	Curb Extensions / Bulb-outs	Curb extensions and bulb-outs can be implemented at mid-block crossings or at intersections to narrow crossing distances for pedestrians while encouraging safer speeds for motorists. Curb extensions can also narrow corner radii, which slows turning speeds and improves yield behavior.

Vertical	Speed Humps / Speed Cushions	Speed humps are raised sections in a roadway that can be tailored to a street and match the target speed; speed cushions—speed humps with cutouts to the street level—allow emergency vehicles to pass through without having to reduce speeds.
	Raised Crosswalks / Raised Intersections	Raised crossings are flush with the sidewalk, encouraging motorists to yield to pedestrians in the crosswalk and reinforcing slower speeds. Raised crossings allow pedestrians to cross at the same height as the sidewalk, improving accessibility. Raised crosswalks can be implemented at mid-block locations or as a raised intersection.
	Raised Medians / Refuge Islands	Medians separate opposing traffic, reducing the number of head-on, cross-median crashes. Raised medians—medians built higher than the road level—offer pedestrians and bicyclists refuges mid-crossing, limit motor vehicle turns, and mitigate head-on collisions.

Safety Justification

According to the FHWA, “implementation of traffic calming measures can reduce traffic speed, reduce motor-vehicle collisions, and improve safety for pedestrians and cyclists. These measures can also increase pedestrian and bicycling activity.”¹⁵ Many traffic calming measures are proven safety countermeasures by the FHWA and have measurable reductions in all types of injury crashes.



15 <https://web.archive.org/web/20250204233102/https://www.transportation.gov/mission/health/Traffic-Calming-to-Slow-Vehicle-Speeds>



BEST PRACTICE & REFERENCES:

[Speed Reduction Mechanisms \(NACTO\)](#)

[Vertical Speed Elements \(NACTO\)](#)

[Traffic Calming ePrimer \(FHWA\)](#)

SYSTEMIC COUNTERMEASURES MAP

This map highlights potential opportunities for selected types of safety countermeasures, based on existing roadway characteristics data. These opportunities correspond to Safety Metrics found on the last page of Chapter 6 in this plan.

Existing Undivided Roadway Reconfiguration Opportunities

This identifies undivided (no median present) multi-lane roadways that may be candidates for roadway reconfigurations. It includes 4-lane undivided segments that have estimated annual average daily traffic volumes below 18,000 vehicles per day.

It also includes the undivided section of Dodge Street, which may be a candidate for installation of a median replacing the center lane.

Shoulder Installation Opportunities

This identifies rural roadway sections that currently lack paved shoulders. Shoulder candidates that have annual average daily traffic exceeding 1,000 vehicles per day may be especially good candidates for shoulder installation. NDOT's Highway Safety Improvement Program will fund installation of two-foot shoulders and Safety EdgeSM as part of mill and overlay projects along rural roadways with greater than 1,000 AADT.

Signalized Intersection Modification Opportunities

These locations identify all intersections that had over three or more KSI crashes during the 2018-2022 study period. All of these are signalized intersections where implementation of safety countermeasures could have an especially high impact. These countermeasures could range from signal modifications to reconstruction to an alternative intersection type, such as a roundabout or a reduced-left turn conflict intersection.

Curve Delineation Modification Opportunities

This identifies curves that were identified as candidates for curve delineation modifications (adding reflective chevrons and advance warning signs) through the project identification process for this CSAP (see Chapter 5 for more information).

Traffic Calming Priority Areas

These neighborhoods (Census Block Groups) have relatively high densities of injury crashes (over 0.5 per mile) along streets that could be candidates for traffic calming (local and collector streets with posted speed limits of 35 mph or less).

