ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

SAFETY ACTION PLAN

DRAFT

December 2025

ROCOG
ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

Acknowledgements

The Rochester-Olmsted Council of Governments (ROCOG) Safety Action Plan (SAP) is a product of a collaborative effort and commitment from ROCOG staff, the Steering Committee (SC), Technical Advisory Committee (TAC), and Policy Board. The Project team would also like to acknowledge stakeholders and community members within the region who participated and provided instrumental feedback to guide the SAP.

ROCOG Staff

- Karli McElroy, Project Manager
- Jarrett Hubbard, Plan Development Support
- Allison Sosa, Plan Development Support

Technical Advisory Committee (TAC)

- Abby Tricker, Olmsted County TZD Safe Roads Coalition
- Ben Johnson, Olmsted County
- Bill Angerman, City of Byron
- Dill Dombrovski, City of Rochester
- Jessica Schleck, MnDOT
- Captain JonTurk, City of Rochester Police Department
- Matt Lynch, Transportation for All Community Group
- Michael Schweyen, MnDOT District 6
- Michelle Ness, Olmsted County Sheriff's Department
- Nick Sandford, Olmsted County
- Sam Budzyna, City of Rochester
- Sandra Narh, City of Rochester

Steering Committee

- Al Roder, City of Byron
- Ben Johnson, Olmsted County
- Bill Schimmel, City of Stewartville
- Brian Mueller, Olmsted County
- Elizabeth Howard, City of Pine Island
- Fausto Cabral, MnDOT District 6
- Gary Pederson, City of Dover
- Greg Paulson, MnDOT
- Ia Xiong, City of Rochester
- Jason Baker, City of Oronoco
- Captain Jon Turk, City of Rochester Police Department
- Sheriff Kevin Torgerson, Olmsted County Sheriff's Department
- Kurt Wayne, MnDOT District 6
- Michele Peterson, City of Chatfield
- Nick Miller, City of Rochester
- Nick Sandford, Olmsted County
- Tamy Myers, City of Eyota
- Tyler Niemeyer, City of Rochester

Policy Board

- Al Roder, City of Byron Administrator
- Andy Friederich, Rochester City Council
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- Dave Iseminger, Mayor City of Dover
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- Dustin Morrow, Rochester Public Schools
- John Johnson, Township Representative
- Kim Norton, Mayor City of Rochester
- Laurel Podulke-Smith, Olmsted County Commissioner
- Mark Benscoter, Citizen Representative
- Michelle Rossman, Olmsted County Commissioner
- Nick Miller, Rochester City Council
- Patrick Keane, Rochester City Council
- Randy Reimer, Citizen Representative
- Sean Palmer, Rochester City Council

Letter from ROCOG

Dear Residents,

Safety on our roads is not just a transportation issue — it's a public health and community priority. Every trip in the Rochester-Olmsted region should begin and end safely, no matter your mode of travel or your age. Yet far too many lives have been forever changed by traffic crashes in our region.

Since 2019, 246 people in Rochester-Olmsted planning area have died or experienced life-altering injuries due to traffic crashes. Many of these incidents involved some of our most vulnerable road users: older adults, people walking or biking, and motorcyclists. These groups face disproportionate risks and deserve focused attention in our safety strategies.

That is why the **ROCOG Safety Action Plan** was developed — to take a proactive, data-informed approach to reducing serious and fatal crashes. This is the first regional plan of its kind for our area, and it outlines a clear roadmap to create safer streets for everyone.

The plan identifies key corridors where crashes are most severe — what we call the **High Injury Network** — and it prioritizes improvements where they will have the greatest impact. It also emphasizes the importance of equity, ensuring that all communities — regardless of income, age, ability, or how they travel — benefit from safer infrastructure and transportation policies.

Central to the plan is the **Safe System Approach**, which recognizes that while human error is inevitable, death or serious injury should not be. This approach builds safety into every part of the transportation system — from road design and vehicle technology to speed management and user behavior.

We know this work cannot be done in isolation. It requires collaboration across public health, transportation planning, law enforcement, education, advocacy, and policymaking. And it requires input and engagement from the people who use our roads every day — you.

At ROCOG, we believe that no loss of life is acceptable. The ROCOG Safety Action Plan is more than a document — it is a call to action. Together, we can shape a future where our transportation system works safely for everyone.

Sincerely,
Allison Sosa
Executive Director
Rochester-Olmsted Council of Governments (ROCOG)

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS (ROCOG) POLICY BOARD

RESOLUTION NO. [XXXX]

Resolution of Approval of Safe Street and Roads for All (SS4A) Safety Action Plan Goals

WHEREAS, the Rochester-Olmsted Council of Governments (ROCOG) is the federally designated Metropolitan Planning Organization (MPO) for the greater Rochester, Minnesota metropolitan area; and

WHEREAS, the Bipartisan Infrastructure Law established the Safe Streets and Roads for All (SS4A) discretionary grant program, providing $5 billion nationwide to support the U.S. Department of Transportation's National Roadway Safety Strategy and its goal of zero deaths and serious injuries; and

WHEREAS, Olmsted County, on behalf of ROCOG, applied for and was awarded SS4A funding from USDOT to prepare a Safety Action Plan; and

WHEREAS, ROCOG has developed its SS4A Safety Action Plan with input from the public, local governments, and partner agencies throughout the ROCOG planning area; and

WHEREAS, the SS4A Safety Action Plan outlines data-driven strategies, policies, and recommended projects to reduce serious and fatal crashes across all modes of travel; and

WHEREAS, the plan sets a safety vision aligned with the national goal of eliminating roadway deaths and serious injuries, and identifies an interim performance goal to guide progress;

NOW, THEREFORE, BE IT RESOLVED, that the ROCOG Policy Board hereby adopts the following safety goals as part of the SS4A Safety Action Plan:

- To eliminate all fatal and serious injury crashes by the year 2050; and
- To achieve a 50 percent reduction in fatal and serious injury crashes by the year 2035

BE IT FURTHER RESOLVED, that the ROCOG Policy Board directs ROCOG staff to support implementation of SS4A Safety Action Plan strategies into the region's transportation planning and programming, and to collaborate with all local jurisdictions, partners, and stakeholders to monitor progress toward these goals.

Adopted this 3rd day of December, 2025, by the ROCOG Policy Board.

Brian Mueller	Allison Sosa
ROCOG Policy Board Acting Chair	ROCOG Executive Director

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Acronyms & Glossary

ADA	Americans with Disabilities Act
BIL	Bipartisan Infrastructure Law
CA	Cultural Actions
CRSP	County Road Safety Plan
CSAH	County State Aid Highway
EMS	Emergency Medical Services
FHWA	U.S. Federal Highway Administration
HIN	High Injury Network
HSIP	Highway Safety Improvement Program
KABCO	Injury Severity Scale: K: Fatal Injury A: Suspected Serious Injury B: Suspected Minor Injury C: Possible Injury O: No Apparent Injury
LRIP	Local Road Improvement Program
MnDOT	Minnesota Department of Transportation
MPO	Metropolitan Planning Organization
RRFB	Rectangular Rapid Flashing Beacon
ROCOG	Rochester-Olmsted Council of Governments
SAP	Safety Action Plan for the Rochester-Olmsted area
SHSP	Strategic Highway Safety Plan
SS4A	Safe Streets and Roads for All
SRTS	Safe Routes to School
TAC	Technical Advisory Committee
USDOT	United States Department of Transportation
VRU	Vulnerable Road User

Chapter 1 Why a Safety Action Plan

National Context

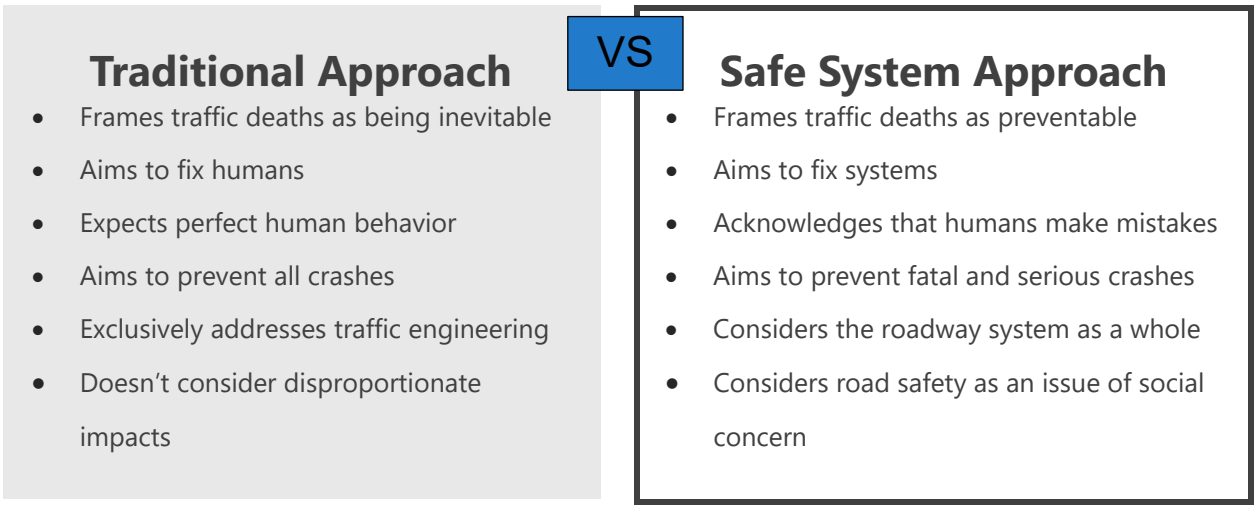
The Bipartisan Infrastructure Law (BIL) enacted by the U.S. Congress in 2021 established the Safe Streets and Roads for All (SS4A) Grant Program. The SS4A program provides discretionary grants to local, regional, and Tribal governments focused on the prevention of deaths and serious injuries on our local and regional roadway system. The SS4A program helps to implement the U.S. Department of Transportation's (USDOT) National Roadway Safety Strategy, which focuses on eliminating deaths and serious injuries across the nation's roadway system.

The Safety Action Plan (SAP) for the Rochester-Olmsted Council of Governments (ROCOG) planning area is the basic building block to guiding local and regional approaches through projects and strategies to address safety risks on the roadway system. The SAP uses analysis of historic crash information combined with roadway system user and community input to identify projects and strategies. The USDOT has adopted a Safe System Approach, which is a guiding paradigm in the development of the SAP.

The Approach to Traffic Safety

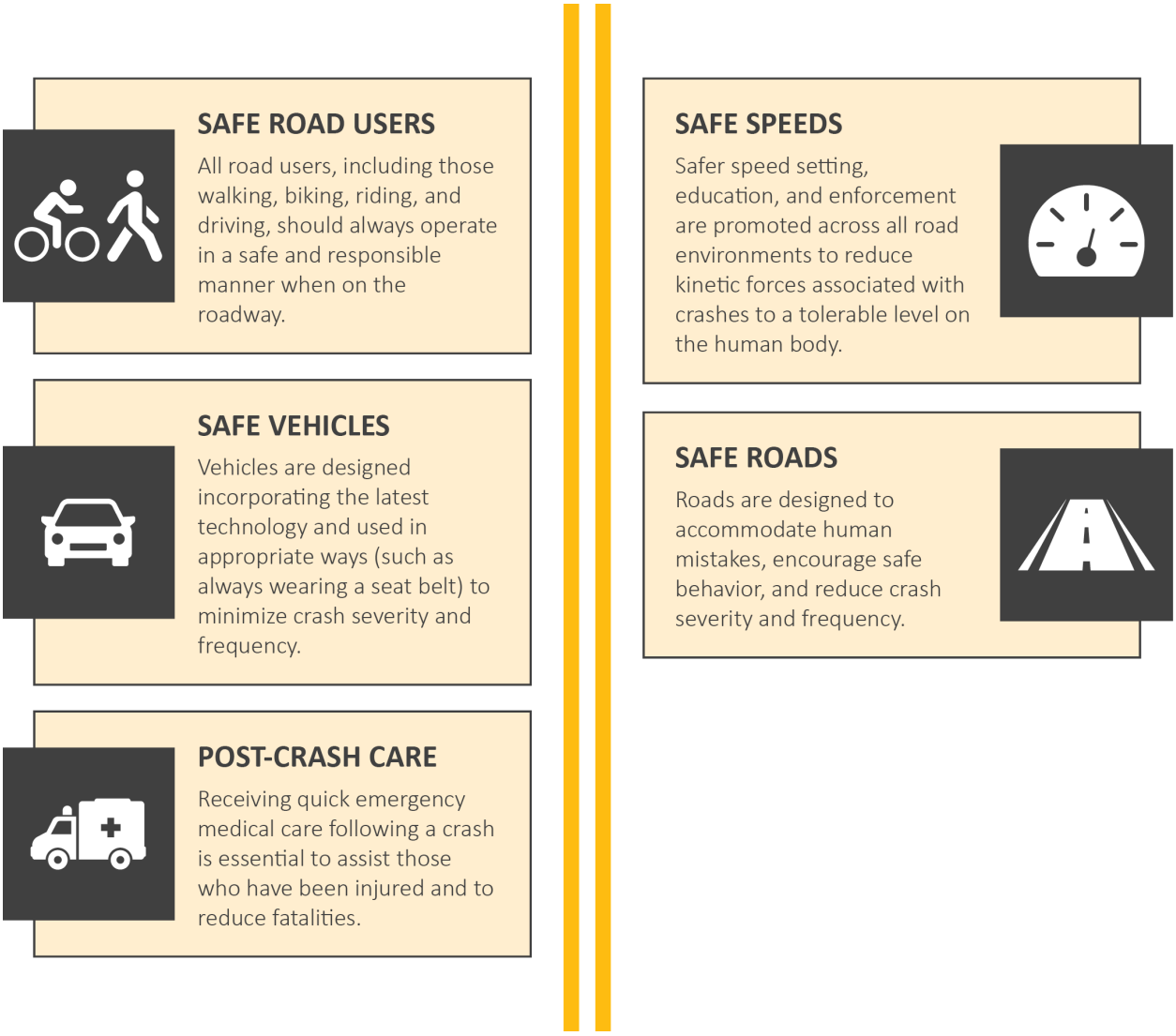
The Safe System Approach (SSA) is the foundational strategy for the Vision Zero movement and is proven to substantially reduce fatalities and serious injuries. USDOT has adopted the Safe System Approach to address contributing crash factors and promote layers of protection to prevent crashes and mitigate crash severity. This approach recognizes that humans make mistakes, humans are vulnerable, and redundant measures are needed to protect all road users.

Figure 1. Traditional Approach vs Safe System Approach



The Safe System Approach is guided by five core elements.

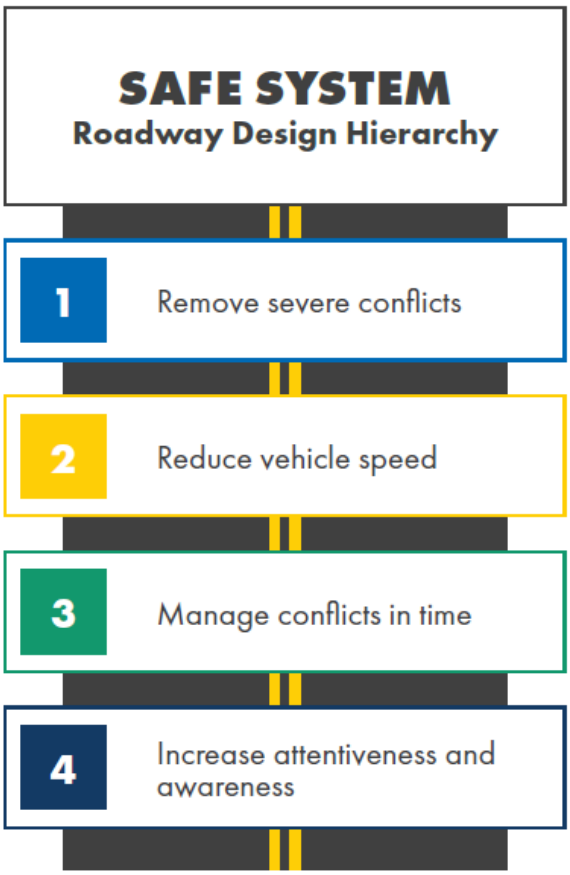
Figure 2. Core Elements of the Safe System Approach



To assist transportation agencies and practitioners in identifying and prioritizing countermeasures and strategies, the Federal Highway Administration (FHWA) developed the Safe System Roadway Design Hierarchy (SSRDH). The SSRDH is a tool that characterizes engineering and infrastructure-based countermeasures and strategies relative to their alignment with the SSA. The SSRDH includes four tiers increasing in alignment with the SSA. Tiers one through three focus on countermeasures and strategies related to removing roadway conflicts, managing speeds, and separating vulnerable road users to reduce the kinetic energy resulting from a crash. The fourth tier identifies countermeasures and strategies to improve road user awareness so proper action can take place.

Vulnerable Road Users

Figure 3. Safe System Hierarchy



Vulnerable road users are defined by the Federal Highway Administration (FHWA) as people walking, biking, or rolling. People within a motor vehicle or on a motorcycle are not included in this definition. Vulnerable road users are unprotected from motor vehicles and are therefore especially vulnerable to the devastating impact of a motor vehicle crash. According to the National Highway Traffic Safety Administration (NHTSA), vulnerable road users accounted for a growing share of all roadway fatalities in recent years.[1]

Between the years 2020 and 2021, pedestrian fatalities were estimated to have increased by 13 percent and bicyclist fatalities by five percent. **The U.S. Department of Transportation labels this increase in fatalities with respect to vulnerable road users as a crisis and calls for "substantial, comprehensive action to significantly reduce serious and fatal injuries on the Nation's roadways."** It must also be added that the conditions and areas with additional risk to vulnerable road users likewise should be included in this call for action.

Vulnerable Road User Crash Risk:

In the ROCOG planning area, 13% of vehicular crashes result in an injury (KAB), whereas more than 61% of crashes involving a bicyclist or pedestrian result in injury (KAB).

1 *https://www-fars.nhtsa.dot.gov/Main/index.aspx*

Motorcyclists

Motorcyclists are overrepresented in fatal traffic crashes – accounting for 6,335 fatalities (15 percent of all traffic fatalities) in 2023. Findings have shown that motorcyclists are 28 times more likely than passenger vehicle occupants to die in a crash and five times more likely to be injured. Motorcyclist-involved crashes in the ROCOG planning area reflect these national trends.

Motorcyclist Crash Risk:

42% of crashes in the ROCOG planning area involving at least one motorcyclist resulted in a fatality or serious injury. Of the 132 total motorcyclist-involved crashes, seven resulted in a fatality and 48 in a serious injury. Motorcyclists also accounted for 22% of all fatal and serious injury crashes (55 of the total 246).

Older Drivers

Older drivers are a demographic that is at higher risk on roadways. According to the NHTSA[2], in 2023 people aged 65 or older comprised 19 percent of all traffic fatalities in the nation. Additionally, the population of older drivers has increased by 28 percent in the past decade between 2014 and 2023. Older drivers have particularly been noted as an area of concern amongst policy makers and planning officials in the ROCOG planning area.

Older Drivers Crash Risk:

Of the 246 total fatal and serious injury crashes in the ROCOG planning area, older drivers contribute to 28% of crashes. This includes 11 fatalities and 42 serious injuries.

Unlicensed Drivers

Unlicensed drivers are another prevalent issue influencing roadway safety in the ROCOG planning area. According to the NHTSA's 2021 Traffic Safety Facts report[3], unlicensed drivers factored into almost 11,000 crashes nationwide. 31.8 percent of those unlicensed drivers had previous license suspensions or revocations, 17.2 percent had previous collisions, and 16.9 percent had previous speeding convictions. The key takeaways from the study were that unlicensed drivers were responsible for 18.4 percent of fatal motor vehicle crashes and these drivers tend to be repeat offenders.

Unlicensed Drivers Crash Risk:

In the ROCOG planning area, unlicensed drivers were involved in 6 fatal crashes and 50 serious injury crashes (56 total crashes) accounting for 23% of the total 246 fatal and serious injuries.

2 https://www.nhtsa.gov/older-drivers/keeping-our-older-drivers-safe-road

3 https://usclaims.com/educational-resources/non-licensed-drivers-responsible-for-20-percent-of-all-auto-accidents/#sources

Chapter 2 Multimodal Safety in the ROCOG Planning Area

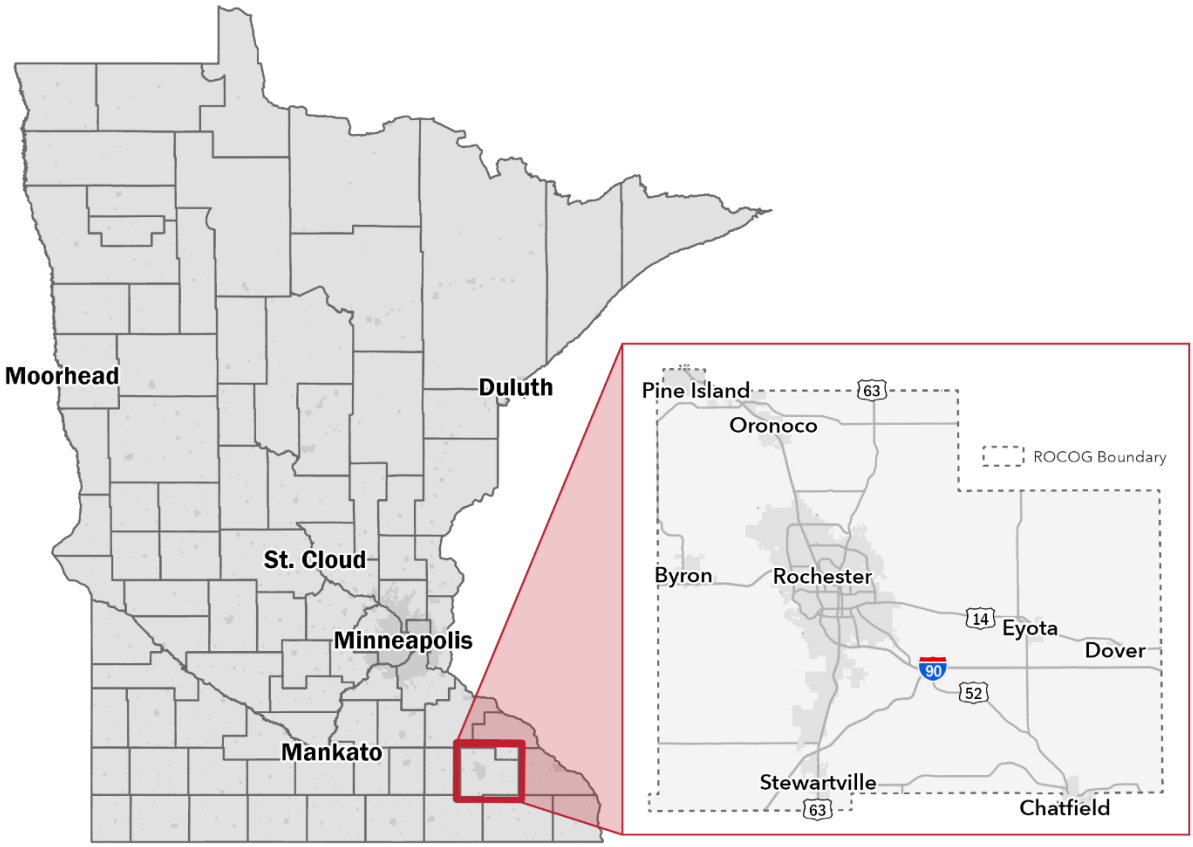
About ROCOG

ROCOG is the federally designated Metropolitan Planning Organization (MPO) for the Rochester-Olmsted Area. MPOs help facilitate implementing agencies (including municipal planning and engineering departments, county highway departments, and state departments of transportation) to prioritize their transportation investments in a coordinated way consistent with regional needs, as outlined in a metropolitan transportation plan. The mission of ROCOG is to harmonize the activities of federal, state, and local agencies, render technical assistance, and encourage public participation in the development of the area. ROCOG brings communities together to prioritize, coordinate, and fund transportation projects in the region, while supporting regional land use, environmental, and economic objectives.

Federal rules require the designation of MPOs in urbanized areas of 50,000 or more in population as a condition for spending Federal highway and transit funds. ROCOG serves an area that includes all of Olmsted County in addition to the City of Pine Island and the City of Chatfield which can be visualized in Figure 4. Rochester, seven additional cities, and 18 townships compose the region. Olmsted County has a population of approximately 156,000 residents, making it the 7th most populated county in the state. Pine Island and Chatfield have populations of approximately 3,500 and 2,800 respectively, giving the total region a population of approximately 162,100 residents.

As the MPO, ROCOG is required to develop and maintain a long-range, multi-modal regional transportation plan every five years. It develops special plans and studies and collects data to help inform and drive implementation of the regional transportation plan and approves federal funding for transportation projects through the annual Transportation Improvement Program (TIP). While ROCOG provides regional coordination and approves use of Federal transportation funds within the metropolitan planning area, responsibility for the implementation of specific transportation projects lies with the Minnesota Department of Transportation (MnDOT), City of Rochester, City of Byron, City of Stewartville, and other local units of government.

Figure 4. ROCOG Map within Minnesota



How is ROCOG Governed?

ROCOG is governed by two committees:

The Policy Board is ROCOG's decision-making arm comprised of 16 voting members who represent the metropolitan planning area. The Policy Board consists of the Rochester City Council (3 members), City of Rochester Mayor (1 member), Olmsted County Board of Commissioners (3 members), Greater Olmsted Cities (3 members), Townships (2 members), Rochester School District (1 member), and the Community (2 members).

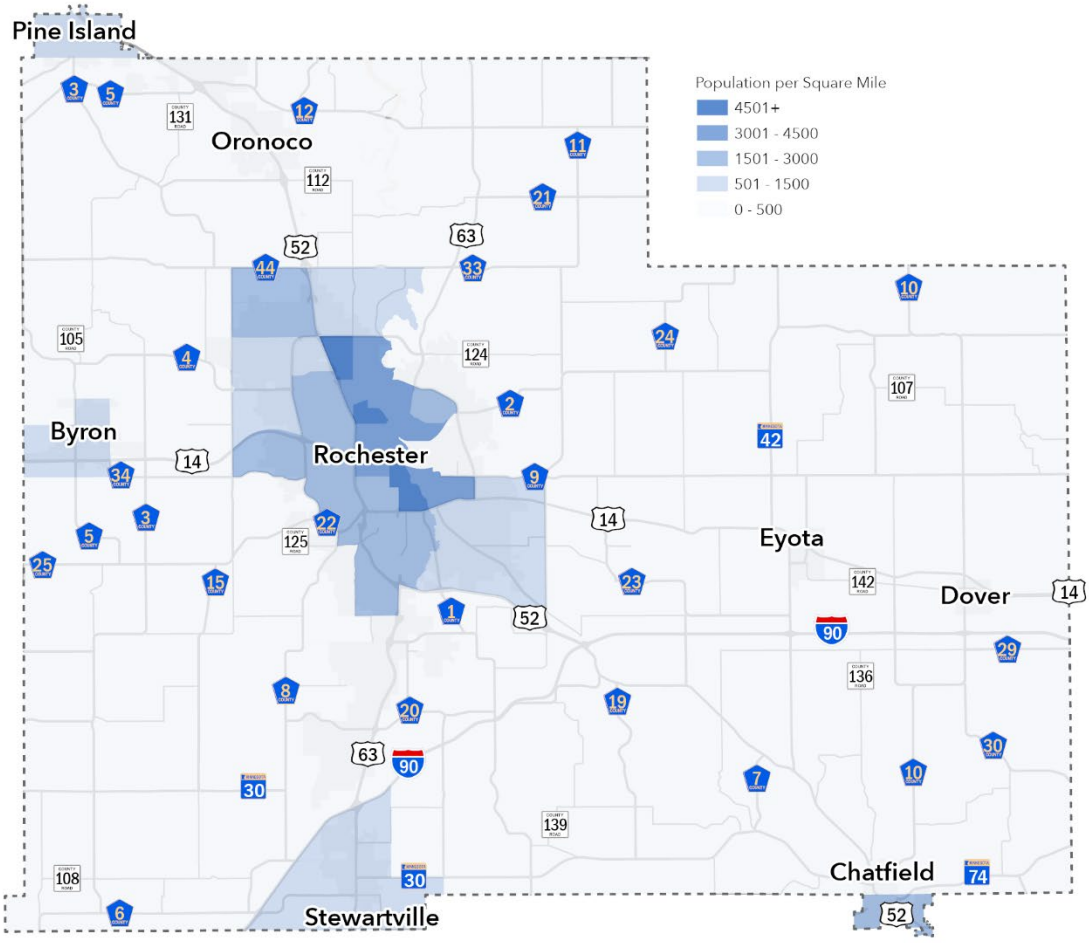
The Transportation Technical Advisory Committee (TTAC) advises the Policy Board on technical matters related to transportation planning in the region. The committee is made up of planning and engineering professionals from local jurisdictions, transit agencies, and representatives of MnDOT.

Why ROCOG Needs a Comprehensive Safety Action Plan

The loss of even one human life on a roadway is unacceptable. From 2019-2023, 37 people were killed in the ROCOG planning area, and 209 suffered serious injuries from roadway crashes. An additional 9,132 were involved in either minor injury, possible injury, or property damage-only crashes.

Olmsted County is projected to grow by 30 percent by the year 2050. The region grew at a rate of 8.5 percent between 2010 and 2020. Greater Olmsted cities made up the largest share of growth, nearly doubling in the 10-year period. The population is expected to continue growing, with Olmsted County's population projected to be 202,906 by 2050. The City of Rochester alone is projected to grow 32 percent to a population of 155,057 by 2050. Understanding population is critical to safety. Crashes tend to be concentrated in areas with the highest population density. Recognizing growth areas provides an opportunity to take a proactive approach and design safer roadways to accommodate for the increased activity. The current population in the ROCOG planning area is shown in Figure 5.

Figure 5. ROCOG Population per Square Mile



Source: ACS 2019-2023

Strong employment growth is the primary driver for Olmsted County's projected population growth. Destination Medical Center (DMC), Mayo Clinic's *Bold. Forward. Unbound.* initiative, Rochester Area Economic Development Investment, and the Community Economic Development Association are all key economic development efforts that support this growth.

In 2022, Olmsted County's workforce comprised 127,181 individuals. The leading employment sectors included healthcare and social assistance, retail, government and government enterprises, as well as accommodation and food services. In 2023, Olmsted County had a lower unemployment rate than the state of Minnesota, and its post-pandemic unemployment rate showed improvement compared to pre-pandemic levels. Although the number of residents actively seeking employment increased over the past year, it remains lower than in 2019. Additionally, Olmsted County ranked as the 5th largest economy among Minnesota's 87 counties and held the top spot in Greater Minnesota. To address the increasing transportation

demands and enhance safety, ROCOG aims to create safer communities through an analysis of crash data and identification of safety improvements for all modes of transportation. The increase in population, employment growth and increasing workforce opportunities means more commuters, which in turn increases exposure and the potential for more crashes.

Cities and counties within the region must collaborate with ROCOG and MnDOT to work toward the shared goal of improving safety for all roadway users and access to medical facilities when crashes do occur.

ROCOG also acknowledges that connectivity for all roadway users is imperative. With population growth expected over the next 30 years, the region's roadways will become burdened, affecting residents' quality of life. The region must continue to identify and fill gaps within the region's bicycle, pedestrian, and transit network to encourage healthy communities.

Vision and Goals

ROCOG desires transformative change in order to achieve its vision for the safety of its transportation infrastructure. This plan established a goal of zero traffic deaths and serious injuries on streets within the ROCOG planning area by 2050, with an interim goal of a 50 percent reduction in fatal and serious injuries by 2035, equating to an average reduction per year of 25 fatal and serious injury crashes. This goal was adopted by the ROCOG Policy Board on December 3, 2025.

Goal:

Zero traffic deaths and severe injuries in Rochester-Olmsted Planning Area by 2050

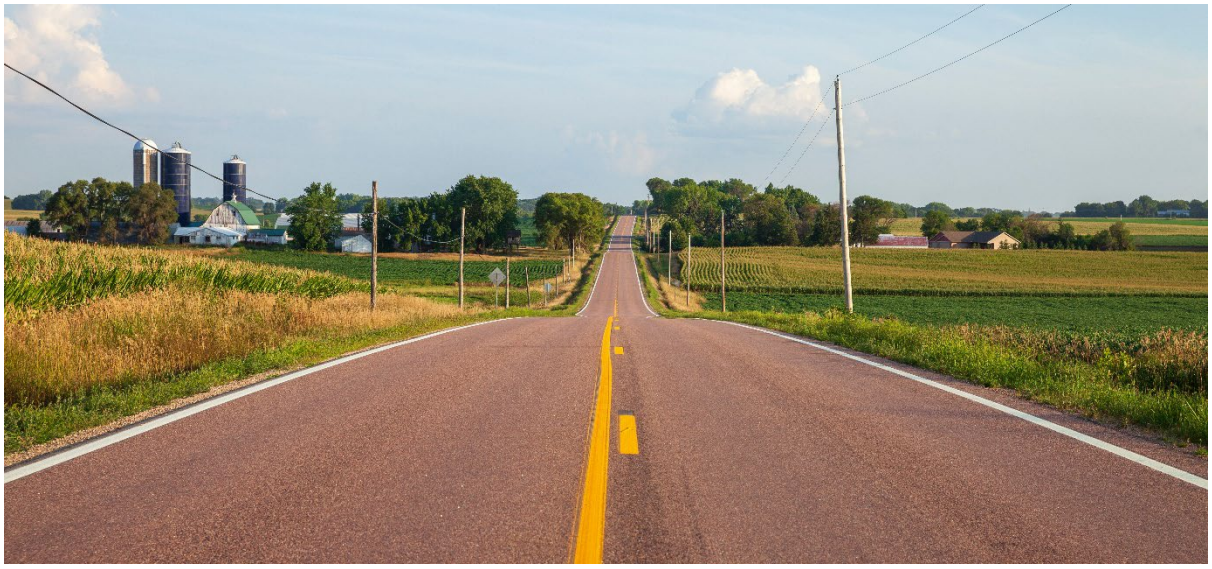
Eliminating fatalities and serious injuries requires the region's transportation leadership and staff to prioritize the issue, and to work closely with its transportation partners to do the same. Achieving the vision requires tremendous effort focused on physical engineering efforts and various non-engineering efforts, such as education, enforcement, and agency collaboration. ROCOG's goal will be measured on an annual basis starting in 2026, by the percent reduction in fatal and serious injury crashes.

Interim Goal:

50% reduction in fatal and serious injuries by 2035

Chapter 3 Current State of Practice

Several plans, policies, and programs address road safety at the national, state, and local levels. National policies and programs include Safe Routes to School (SRTS), Operation Lifesaver, and the Americans with Disabilities Act (ADA). These policies emphasize the need to accommodate all travel modes.



Plans Reviewed

Minnesota plans reviewed include:

- Minnesota Strategic Highway Safety Plan (2020)
- MnDOT Vulnerable Road User Safety Assessment (2023)
- MnDOT Best Practices for Pedestrian and Bicycle Safety (2021)
- Minnesota County Road Safety Plans
- MnDOT Complete Streets Policy (2025)

The reviewed plans of ROCOG and local partners include:

- ROCOG Long Range Transportation Plan (2020)
- ROCOG Environmental Justice Protocol (2016)
- Olmsted County Road Safety Plan (2021)
- City of Rochester 2040 Comprehensive Plan (2018)
- City of Rochester Active Transportation Plan (2022)
- Rochester Elementary Safe Routes Plan (2025)
- Rochester Public Transit Agency Safety Plan (2025)
- ROCOG Complete Streets Policy (2011)
- City of Rochester Complete Streets Policy (2009)
- City of Stewartville Complete Streets Policy (2010)

National practices and regulations reviewed include:

- Integrating the Safe System Approach with the Highway Safety Improvement Program
- FHWA Complete Streets Policy of 2025
- Americans with Disabilities Act of 1990

Best Practices

The review also compiled and documented best practices in safety action planning based on federal guidance and other plans. How these techniques are incorporated into this plan are documented in Table 1.

Table 1. Best Practices in Safety Action Planning

Best Practice	Incorporated in ROCOG SAP?
Defining target date for achieving zero or a significant reduction in roadway fatalities and serious injuries	Yes
Prioritizing locations for investments that improve safety for vulnerable road users to guide future funding	Yes
Transportation safety planning and policy is driven by robust data-driven processes to identify crash trends. Identifying characteristic crash profiles that contribute to the region's High Injury Network or other areas with high concentrations of crashes, especially severe injury and fatal crashes	Yes
Aligning with the USDOT National Roadway Safety Strategy and other Vision Zero and Safe Systems Approach	Yes
Conducting engagement with stakeholders and community members to inform safety strategies and prioritization of projects	Yes
Finding cost effective solutions to improving existing infrastructure	Yes

See Appendix A for additional information on local, regional, and state safety plans and policies guiding the ROCOG planning area.

Chapter 4 Engaging ROCOG Planning Area Communities

Stakeholder and public engagement are critical in ensuring the applicability and implementation of the safety strategies included in this plan. Community outreach was an important part of this plan and ensuring that decisions impacting the community adequately represent key concerns. Throughout both phases of engagement, a total of 700+ people were engaged through pop-up events, 45+ people were engaged through focus groups, and 500+ people were engaged online. A full engagement summary can be found in Appendix B.

Phase I - Summer 2025 Engagement

The project team conducted various engagement activities from July to October of 2025, including:

- Focus Group
  - Township Supervisors – August 25, 2025
- Pop-up Events
  - Byron Good Neighbor Days – July 19, 2025
  - Eyota Days – July 19, 2025
  - Rochester Safe City Nights – July 22, 2025
  - National Night Out in Oronoco – August 5, 2025
  - Rochester Safe City Nights – August 12, 2025
- Interactive Map (online) – April 28 to October 10, 2025

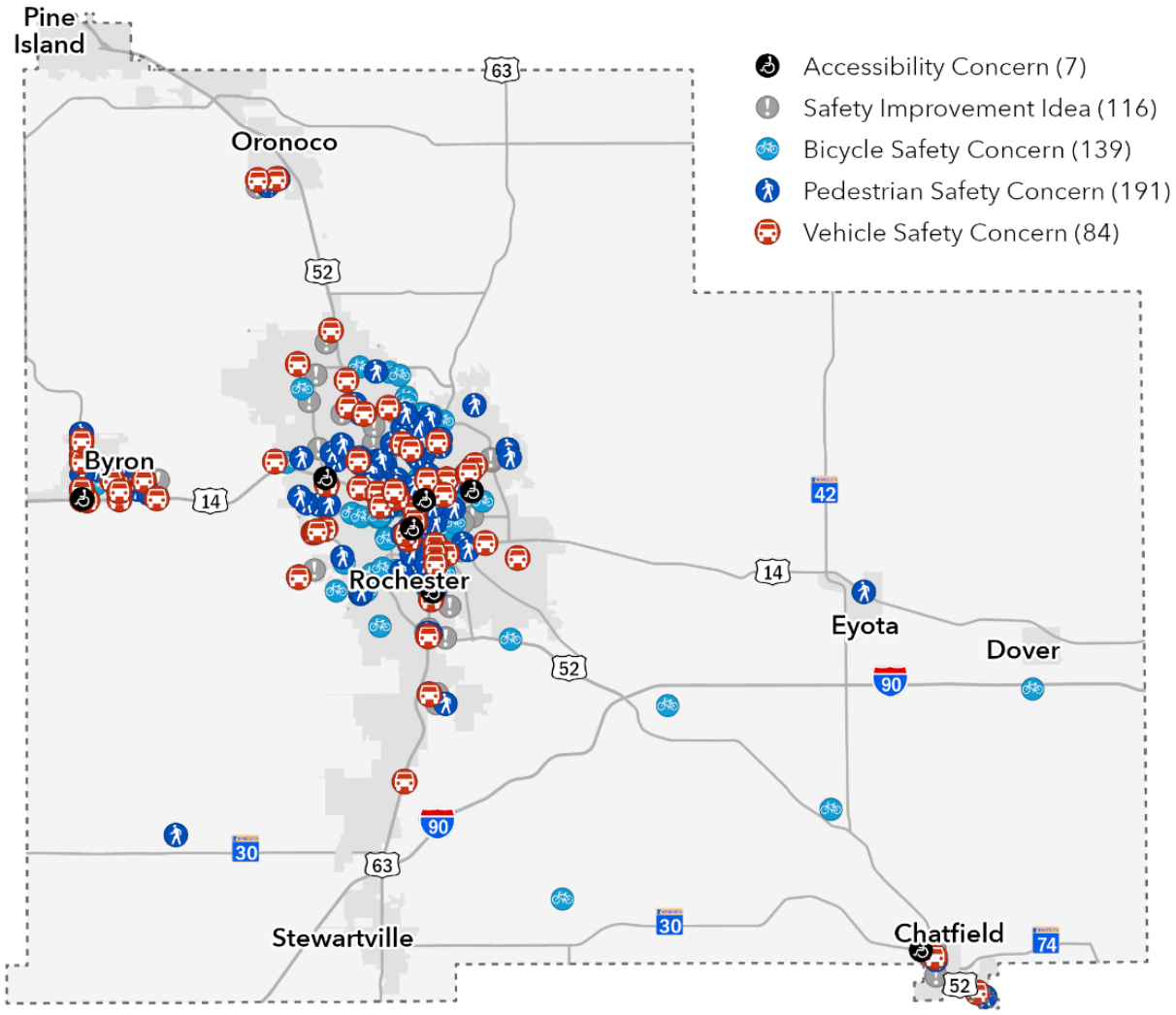
The public shared ideas on their transportation experience, with a focus on better understanding the multimodal transportation experience and safety concerns. The team also sought to raise awareness on the general work of ROCOG and safety action plans.

In addition to the in-person events, ROCOG invited the public to provide feedback through an interactive map of the existing transportation system in the ROCOG planning area, as shown in Figure 6. Participants were able to add pins to indicate the location of their comments as well as choose from one of the following categories safety categories:

- Accessibility Concern
- Safety Improvement Idea
- Bicycle Safety Concern
- Pedestrian Safety Concern
- Vehicle Safety Concern

The map was available for comment from April through October 2025 and received over 530 unique comments.

Figure 6. Interactive Map Results



Source: ROCOG Interactive Map

The feedback received during Phase 1 helped to identify unsafe locations including specific intersections and roadways within the ROCOG Planning area. The feedback also helped to identify many different themes by geography, safety concern, and mode of travel.

Phase II – Fall 2025 Engagement

The second round of engagement occurred in September and October 2025 and focused on sharing what the project team had learned thus far as well as testing ideas with the community. The engagement activities included:

- Pop-up Events
  - October 8 – Chatfield Community Center for the Arts
  - October 8 – Stewartville Fire Department Prevention Event
- Focus Groups
  - September 23 – Bicycle, Pedestrian, and Accessibility Advocates
  - September 26 – Emergency Responders
  - October 1 – Rochester-Olmsted Youth Council
  - October 6 – Older Adults (125 Live Senior)

Key outcomes of the safety analysis, demographic analysis, and list of potential transportation safety countermeasures were shared, along with the identified regional safety goals. Feedback received during Phase II shaped the strategies that were included in the final Safety Action Plan.

What was heard

As a result of the robust public outreach and stakeholder engagement, the following key themes were gathered. These key themes assisted in informing recommended countermeasures as a part of this Safety Action Plan. The following list shows recurrent themes heard throughout the engagement in each community.

Key Concerns

- Pedestrian & Cyclist Safety
  - Lack of sidewalks
  - Unsafe crossings
  - Narrow shoulders
  - ADA accessibility issues
- Traffic Behavior & Speeding
  - Speeding in residential areas
  - Drivers ignoring stop signs
  - Distracted/inattentive driving
- Transit & School Safety
  - Bus maneuverability issues
  - School-related intersection safety
- Connectivity & Growth
  - County Road 7 bisecting Eyota
  - Desire for trail connections
  - Need for infrastructure to support growth
- Infrastructure Conditions
  - Poor sidewalk conditions
  - Lighting issues
  - Bridge shaking
- Child Safety
  - Car seat awareness
  - High-speed traffic on neighborhood streets where children actively play

Chapter 5 Data Analysis

In this section we highlight the findings of each of the analyses completed as a part of the Safety Action Plan. They include the following:

Table 2. Data Analyses

Analysis	Purpose
Demographic Analysis	Determines areas of persistent poverty (also called underserved communities) to help prioritize locations for future safety improvements
Historical Crash Evaluation and HIN	Identifies and summarizes where crashes occurred within the ROCOG planning area
Systemic Analysis	Focuses on prioritizing locations that are most at risk of crashes, resulting in the region's crash profiles

Demographic Analysis

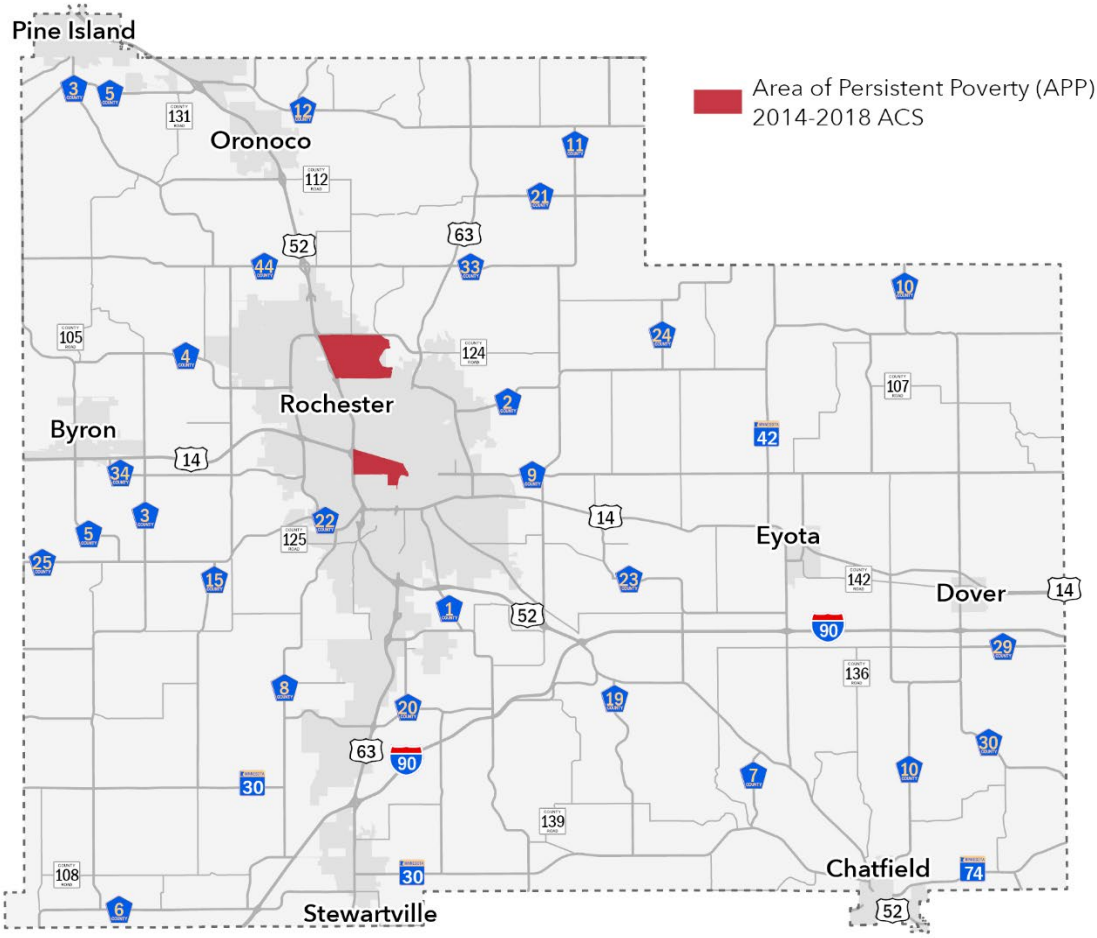
It is well known that transportation can have economic benefits, particularly to families and children. This plan performed spatial analysis to deepen the understanding of the demographic composition of the ROCOG planning area, resulting in the identification of areas of persistent poverty (APP). Also called underserved communities by the USDOT, areas of persistent poverty are defined as census tracts which have a poverty rate of at least 20 percent as measured by the 2014-2018 five-year data series available from the American Community Survey. This data series timeframe was used to be consistent with SS4A Notice of Funding Opportunity (NOFO) definitions of underserved communities. Transportation safety improvements can positively impact access to education opportunities, jobs, and quality of life.

As part of the Metropolitan Transportation Plan (MTP) 2050, ROCOG has set forth a guiding principle to "provide a transportation system that serves all residents and visitors." Between 2010 and 2020, the ROCOG planning area saw increased racial diversity and significant economic disparities. The proportion of White residents decreased, while Black, Asian, and multiracial populations grew. Poverty rates vary widely, with some areas exceeding 21 percent, highlighting the need for transportation investments benefiting all residents. Figure 7 highlights the areas of persistent poverty within the ROCOG planning area. The darker shades of red represent areas where levels of poverty are higher.

2.6% of the population within the ROCOG planning area resides in an area of persistent poverty

Source data: 2014 – 2018 American Community Survey

Figure 7. Areas of Persistent Poverty



Source: U.S. Census Bureau, American Community Survey 5-Year Estimates (2014–2018)

Safety Analysis

Historical Crash Evaluation

The historical crash evaluation examined past traffic crashes, breaking them down by the type of road user involved (e.g., drivers, pedestrians, or bicyclists), the type of road, and who is responsible for the road. The analysis in the crash summary may be used by ROCOG to help prioritize roadway safety investments in the future. The most recent five-years of data (2019-2023) was obtained through MnDOT. Crashes are summarized by "KA" indicating fatal and serious injury crashes and "BCO," which includes non-serious injuries and property damage only. The KABCO injury scale includes the designations shown in Table 3. Additional details on the historical crash evaluation are provided in Appendix C.

Severe injuries include both fatal and serious injuries (KA). Severe injuries are characterized by significant physical damage or trauma, and they require careful documentation to accurately reflect their severity in crash data. Examples of suspected serious or incapacitating injuries include severe lacerations, broken extremities, internal injuries, significant burns, and instances of unconsciousness or paralysis.[4] A fatal crash involves one or more individuals' deaths because of the crash.

Table 3. KABCO Injury Scale

Severe (more injurious)	Non-Severe (less injurious)
K – fatal injury A – incapacitating injury (serious injury)	B – non-incapacitating injury C – possible injury O – property damage only

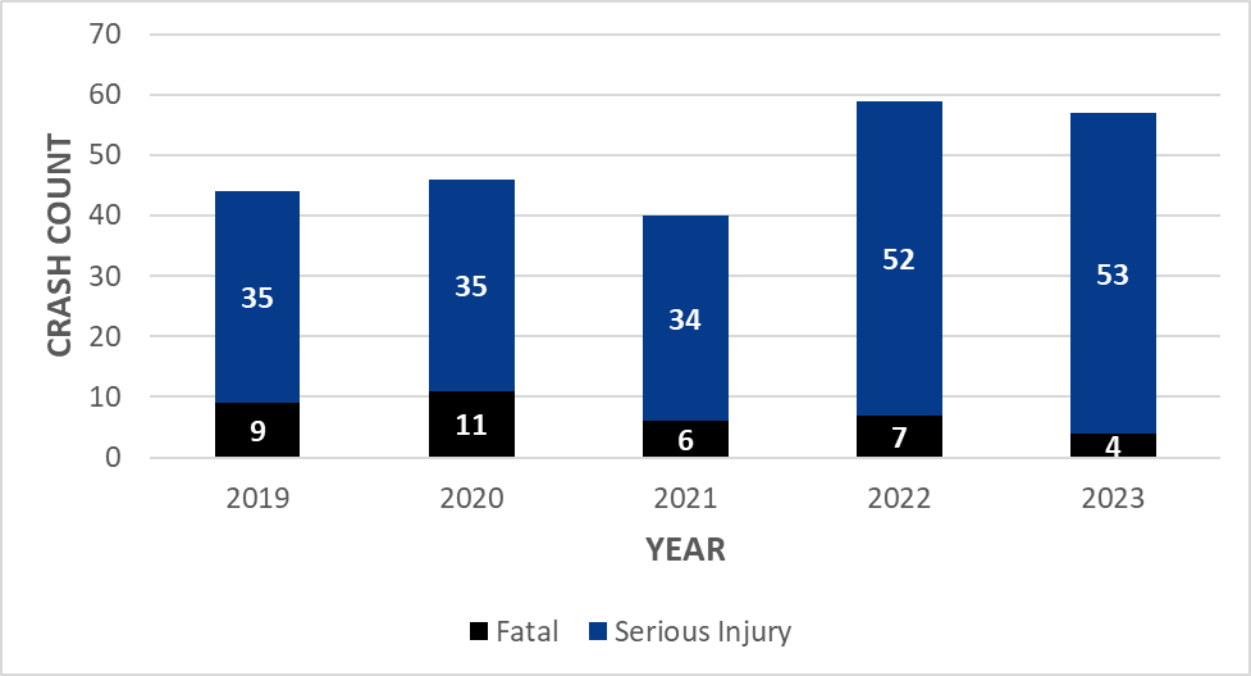
Summary of All Roads in the ROCOG Planning Area

A total of 9,378 crashes occurred in the ROCOG planning area between 2019 and 2023. Of those crashes, 246 (or 2.6 percent) resulted in a fatal or serious injury (see Figure 8). This equates to an average of 50 fatal or serious injury crashes on average per year in the last five-year period.

An analysis of these crashes was completed to identify crash trends among five modes: automobiles, heavy automobiles (including semi-trucks), pedestrians, bicycles, and motorcycles. These details are provided in Appendix C. The last five years of crash data shows that people on motorcycles, bicycles, and on foot are disproportionately impacted in terms of crash severity (Figure 9). Finally, Figure 10 shows a map of fatal and serious injury crashes occurring between 2019 and 2023.

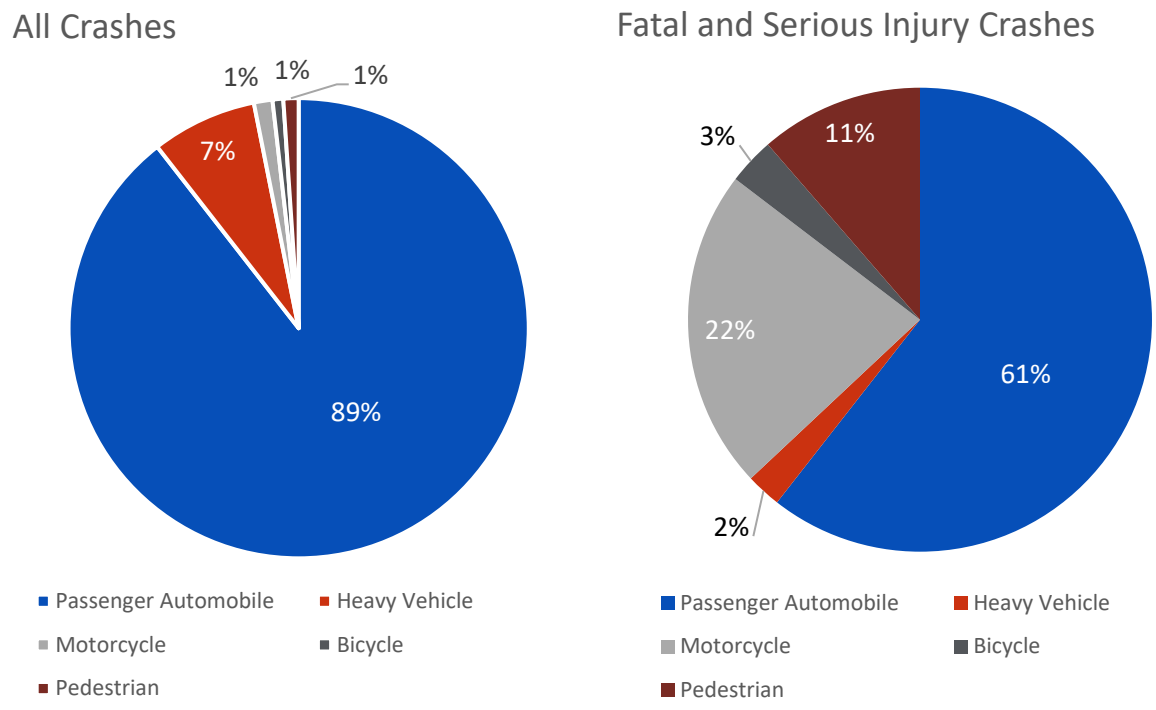
4 https://highways.dot.gov/media/20141

Figure 8. Five-Year Crash History (2019-2023)



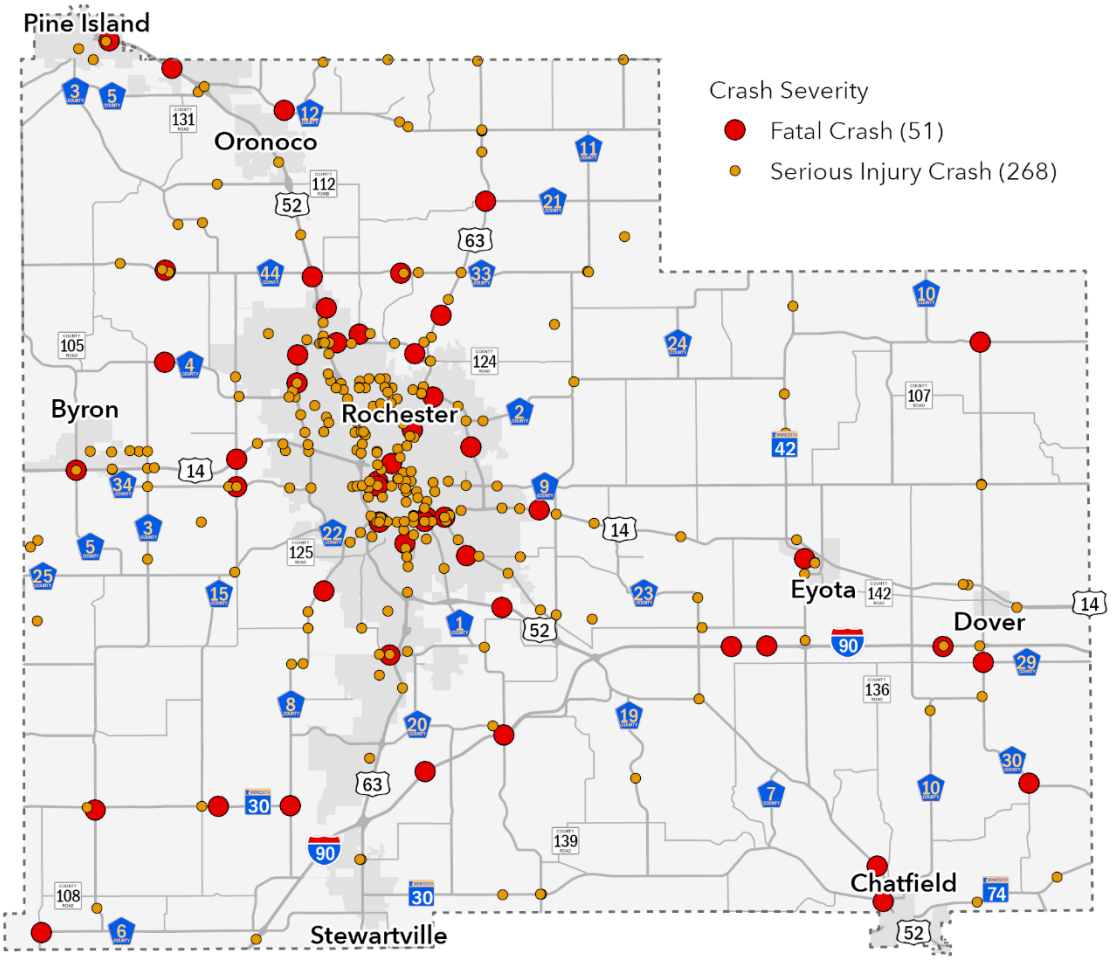
Source: MnDOT crash data (2019–2023)

Figure 9. All Crashes vs. Fatal and Serious Crashes by Mode of Transportation (2019-2023)



Source: MnDOT crash data (2019–2023)

Figure 10. Fatal and Serious Injury Crashes (2019-2023)



Source: MnDOT crash data (2019–2023)

High Injury Network (HIN)

As a part of the Historical Crash Evaluation, a High Injury Network (HIN) was developed. The HIN included all roadways within the ROCOG planning area except for freeways and limited-access highways on the nonmotorized networks because pedestrians and bicyclists are prohibited on those facility types. The elimination of these roads is standard practice due to their operational differences (higher speeds, higher volumes, and access control) as well as ineligibility for SS4A funds. Additionally, these roads are not owned and operated by local agencies and the focus of the Safety Action Plan is to identify a list of priority locations for local agencies to focus on. As Table 4 shows, most of the HIN is owned by either the County or cities. While most of the ROCOG network is composed of township and city roadways.

HIN Fast Facts

- 6.4% of the roadways in the ROCOG planning area are on the all-mode HIN (139 miles)
- The all-mode HIN accounts for 57.7% of all fatal and serious injury crashes
- Only 2.4% of roadways are in the ROCOG planning area are within underserved communities but 11.1% of the HIN is in underserved communities

The results of the HIN analysis are shown in Figure 11. Additional details can be found in Appendix D.

What is a High Injury Network?

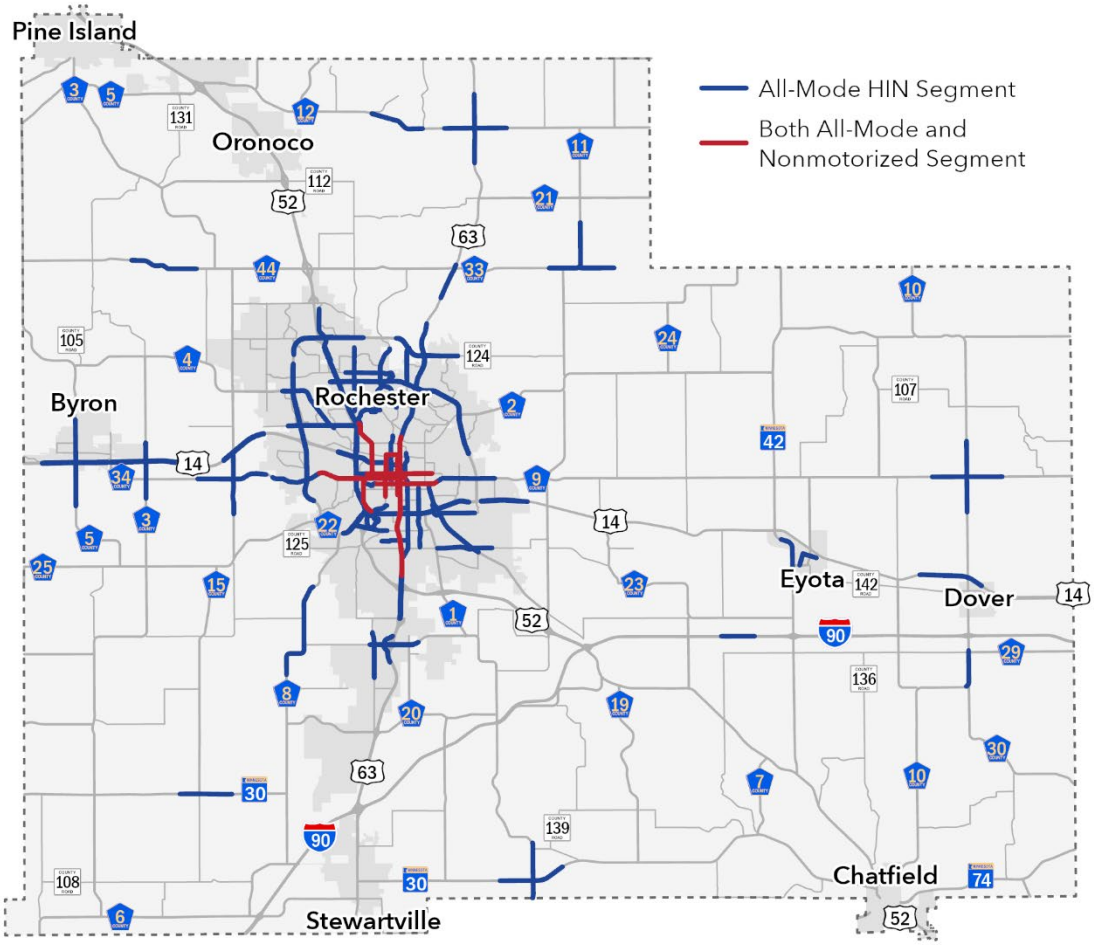
The High Injury Network (HIN) identifies streets or locations where a high number of severe crash concentrations have occurred along a corridor-level segment for the most recent five-year period (2019-2023). The HIN represents a prioritized subset of the overall regional transportation network in the ROCOG planning area, focusing on streets with the highest prevalence of severe crashes.

Table 4. Distribution of Jurisdictions on High Injury Network

Jurisdiction	Percentage on HIN	Percent of the ROCOG Network
US Roads	18.8%	5.8%
State Roads	3.0%	2.5%
County Roads	34.7%	24.4%
Municipal Roads	39.0%	30.9%
Township Roads	1.4%	30.4%
Private Roads	0.9%	4.4%

Source: MnDOT crash data (2019–2023)

Figure 11. High Injury Network (2019-2023)



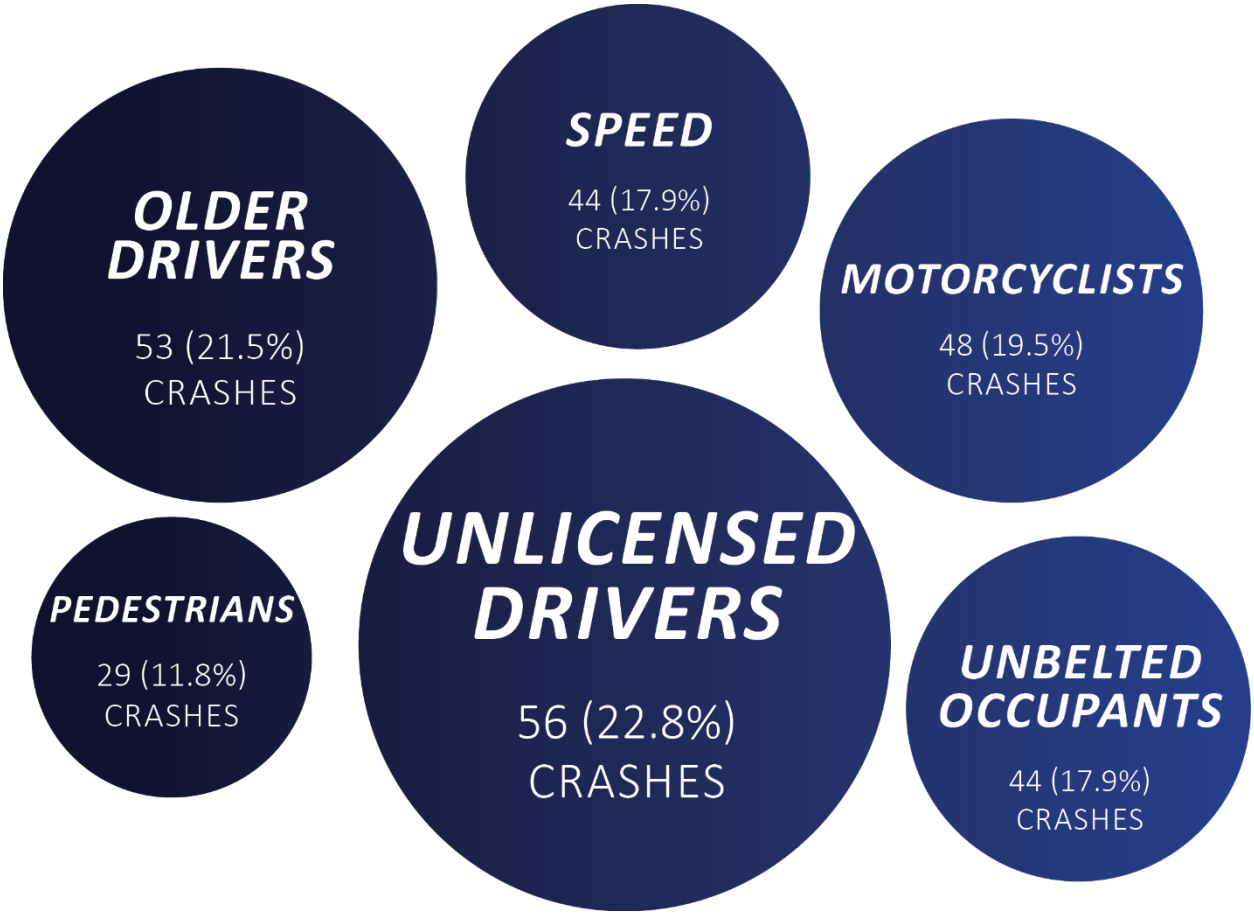
Source: MnDOT crash data (2019–2023)

Focus Areas

Minnesota's Strategic Highway Safety Plan (SHSP) identified a set of focus areas for the State. Focus areas are key contributing factors to crashes that are prioritized based on statewide and regional crash data analysis. These emphasis areas reflect the most common causes of serious injuries and fatalities on Minnesota roadways and guide targeted safety strategies. Figure 12 highlights the most relevant behavioral focus areas to the ROCOG planning area based on safety analysis and engagement feedback. All top focus areas, apart from speed, are higher than statewide averages for the percentage of fatal and serious injury crashes documented in the five-year period. Takeaways are noted below:

- ROCOG Unlicensed Drivers (23% of KA) **>** Minnesota Unlicensed Drivers (20% of KA)
- ROCOG Older Drivers (22% of KA) **>** Minnesota Older Drivers (18% of KA)
- ROCOG Motorcyclists (20% of KA) **>** Minnesota Motorcyclists (17% of KA)
- ROCOG Unbelted Occupants (18% of KA) **>** Minnesota Unbelted Occupants (15% of KA)
- ROCOG Pedestrians (11.8% of KA) **>** Minnesota Pedestrians (11.7% of KA)
- ROCOG Speed (18% of KA) **<** Minnesota Speed (23% of KA)

Figure 12. ROCOG Top Behavioral-Related Focus Areas



Source: MnDOT crash data (2019–2023)

Systemic Analysis

A systemic analysis looks for patterns that might lead to serious crashes in the future. Instead of just studying where crashes have already happened, it helps identify types of roads that may be at higher risk. By targeting these high-risk locations with future projects, communities can make a bigger impact in reducing severe and fatal crashes.

For each segment and intersection, the **risk** of serious crashes was calculated based on various roadway characterists.

The systemic analysis process involved grouping intersections and roadway segments based on shared characteristics such as rural or urban setting, traffic volume, speed, and roadway classification. These groups were then evaluated to identify which had the highest rates of severe crashes, both across all travel modes and specifically for pedestrians and bicyclists. The overall goal of the analysis was to pinpoint roadway locations with the greatest risk for severe crashes. For ROCOG, this process led to the development of typical crash profiles for common roadway and intersection types.

Crash Profiles

Crash profiles highlight the types of roads or intersections where serious crashes happen most frequently. These areas make up a small section of the overall network but have a big impact on transportation safety. By focusing on these locations, agencies can get the most out of their efforts and funding by making improvements where they're most needed.

Crash profiles were created by identifying the top ten types of roads and intersections in both urban and rural areas with the highest rates of serious crashes. These rates were based on how many severe crashes happened between 2019 and 2023. Each crash rate was then compared to the average for rural or urban areas to show which types stand out. Segment crash profiles are shown in Figure 13 and intersection crash profiles are shown in Figure 14. For additional details on the systematic analysis see Appendix E.

Systemic Analysis Fast Facts

Segments:

- High risk segments make up 5% of the total roadway system.
- 22% of the total severe (KA) crashes occurred on these high-risk segments.
- Roadways with the most risk for severe crashes are two-lane rural roadways.

Intersections:

- High risk intersections make up 3% of the total system intersections.
- 80% of all severe (KA) crashes occur at these high-risk intersections.
- Urban signalized intersections have the most risk for severe crashes.

Figure 13. Segment Crash Profiles (2019-2023)

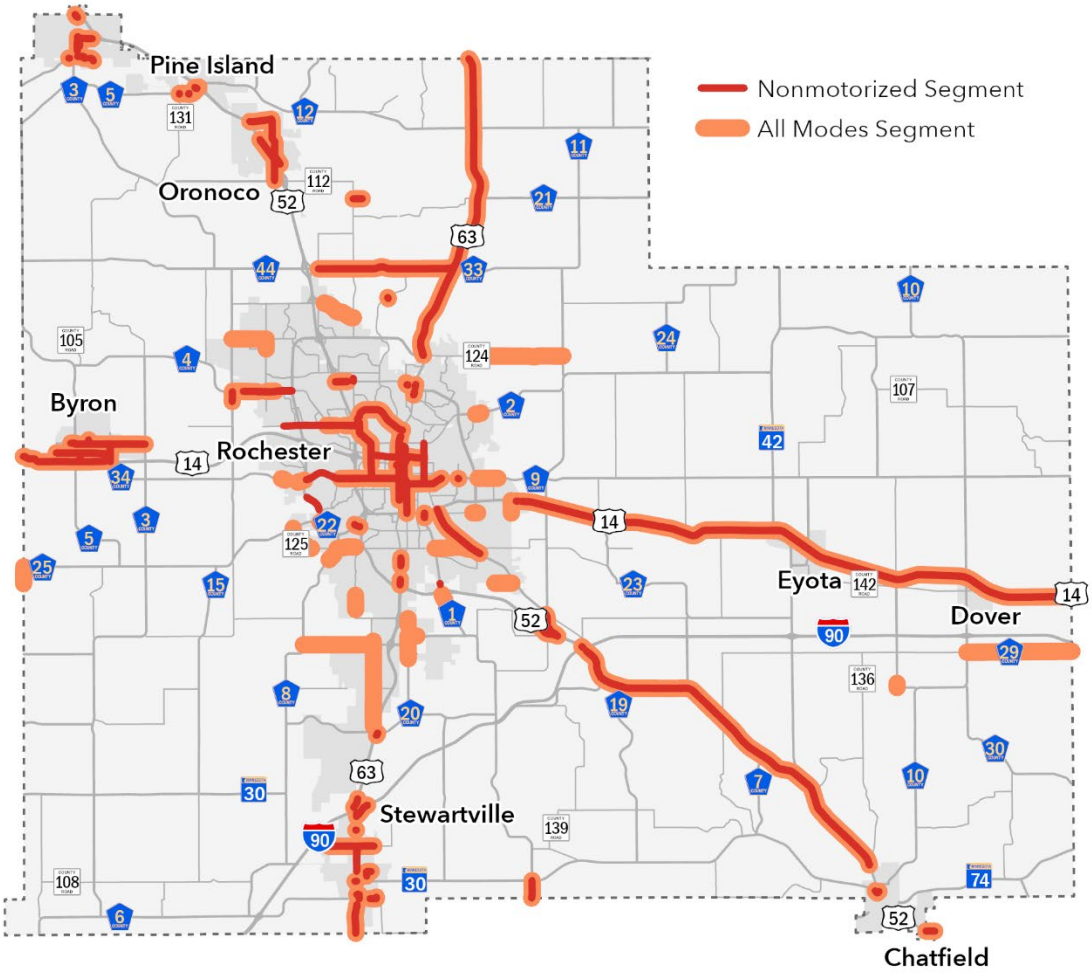
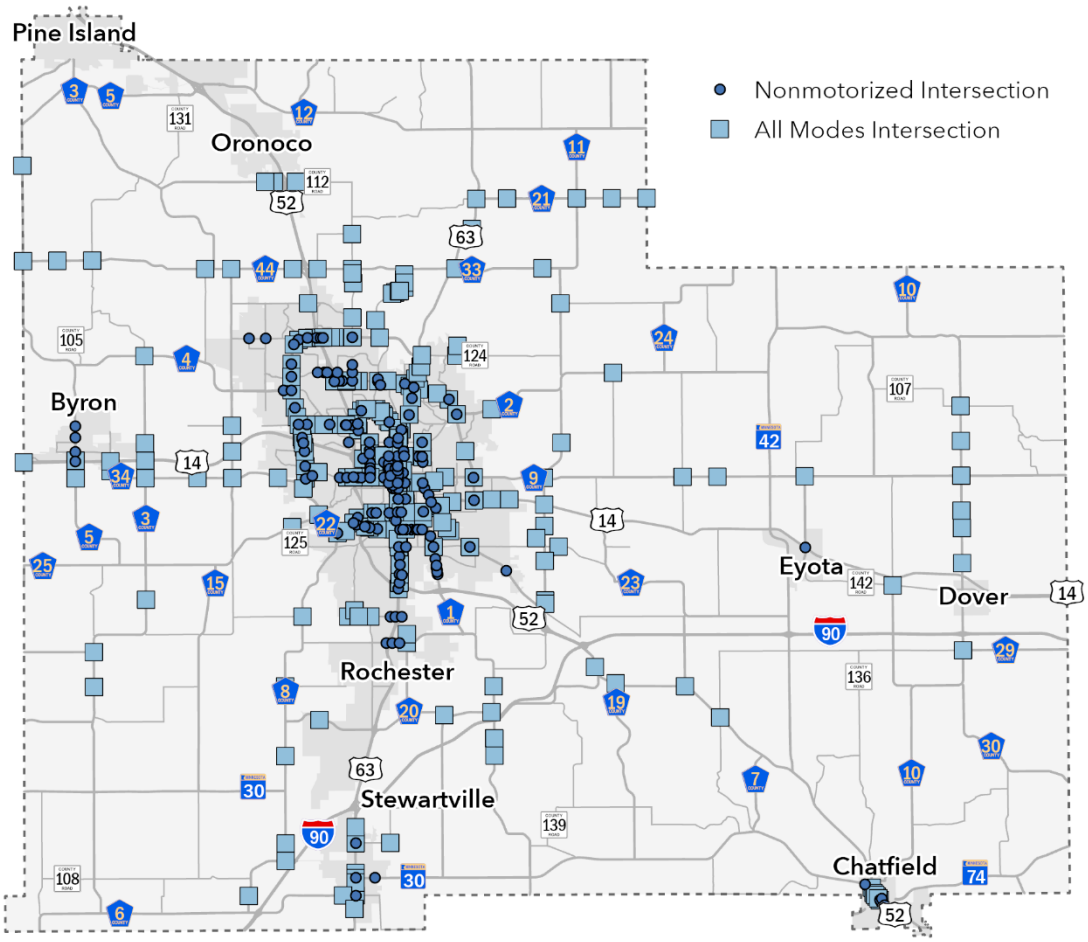


Figure 14. Intersection Crash Profiles (2019-2023)



Chapter 6 Safety Strategies & Toolkit

Safety countermeasures, or solutions, were identified to improve safety in high-risk or key concern areas in the ROCOG planning area. The countermeasures include data-driven and proven safety strategies from FHWA Proven Safety Countermeasures[5], FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations[6], and the Crash Modification Factor Clearinghouse[7]. The countermeasures discussed in the following pages include both engineering strategies and non-engineering strategies.

Engineering Design Strategies

A set of engineering priority strategies have been identified by location type: urban and rural. These priority strategies were chosen based on the crash profiles, engagement feedback, and unique set of issues facing the ROCOG planning area. An abbreviated list of strategies is described in more detail below. An expanded list is shown in Table 5 and Table 6. The list indicates which tiers in the Safe Systems Hierarchy, shown in Figure 3, the strategy meets. The effectiveness considers various roadway contexts and crash severity. The following ranges were utilized: Low (0-29 percent) - Moderate (30-59 percent) - High (59 percent and above). See Appendix F for the complete toolkit of strategies.

Priority Engineering Design Strategies

SIDEWALKS

Sidewalks, and paved pathways alongside roads for pedestrian use improve accessibility, connect neighborhoods, and enhance safety by reducing exposure to moving vehicles. Sidewalks can include features such as curbs, drainage systems, and accessibility standards. Based on these factors, the cost of constructing sidewalks is approximately $80,000 per mile. Sidewalks are highly effective in reducing pedestrian crashes, with studies showing a 40 percent decrease in such incidents when sidewalks are installed. By keeping pedestrians off the roadway, they help minimize conflicts with vehicles, making streets safer for everyone.

BUFFER BETWEEN OPPOSING LANES (MEDIAN BARRIERS)

Median barriers are physical barriers placed in the center of a roadway to separate opposing lanes of traffic, preventing vehicles from crossing into oncoming lanes. They are commonly used on roads to reduce head-on collisions.

Median barriers can be made of concrete and include plants and trees, metal guardrails, or cables, designed to absorb impact. The cost of installing median barriers ranges from $25,000

5 https://highways.dot.gov/safety/proven-safety-countermeasures

6 https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/STEP-guide-improving-ped-safety.pdf

7 https://cmfclearinghouse.fhwa.dot.gov/

to $150,000 per mile. Cost can vary based on materials, design and roadway conditions. Median barriers are highly effective in preventing crashes, with studies showing a 44 – 56 percent reduction in crashes. Their ability to stop vehicles from crossing into oncoming traffic makes them an effective roadway safety measure.

ROUNDABOUTS

Roundabouts are circular intersections where traffic flow is slowed and serious conflict points (locations where two vehicles could potentially crash into each other) are reduced. Traffic has a one-way flow with yield signs at entry points. Roundabouts perform well when it comes to safety; roundabouts in Minnesota have an over 80 percent reduction in fatal and serious injury crashes. In urban settings, vehicles entering the roundabout slow speeds to about 15-20 mph, allowing for efficient movement of traffic with cost around $2,500,000 per intersection.

ENHANCED EDGE LINES (6” AND 8”)

Enhanced edge lines are road markings that are made wider to improve visibility and safety. They help drivers clearly see the edge of the road, especially in low-light or poor weather conditions. They reduce the risk of lane departure crashes, especially around curves. The estimated cost per mile is low ($7,000) making them an effective countermeasure on large stretches of rural road. Minimal maintenance is required and edge lines can provide long-term safety benefits for drivers. Studies show that the conversion to enhanced edge lines can lower crashes by 14 percent.

Table 5. Urban Safety Countermeasures

Urban Safety Countermeasures				Safe System Hierarchy Tiers			
Type of Environment	Description	Estimated Implementation Cost	Estimated Effectiveness*	Remove Severe Conflicts	Reduce Vehicle Speeds	Manage Conflicts in Time	Increase Attentiveness & Awareness
Intersection	**Roundabout / Mini Roundabout**	High ($1,800,000 to $2,400,000)	High	X	X		
Intersection	**Dedicated Left / Right Turn Lanes**	High ($250,000)	Low / Moderate	X			
Intersection	**Signal Backplates with Retroreflective Borders**	Low ($4,000)	Low				X
Intersection	**Flashing Yellow Arrow at Existing Signal**	Moderate ($50,000 to $100,000)	Moderate			X	
Intersection	**Lighting**	Moderate	Low				X
Intersection	**No Right Turn on Red**	High ($100,000)	Not available	X			
Intersection	**Removed Sightline Obstructions**	Not available	Moderate	X			
Intersection	**Retroreflective Strips on Stop Sign Posts**	Low ($2,500)	Not available				X
Intersection	**Advanced "Yield Here to Pedestrians" Sign and Stop Bar**	Low ($300 per sign)	Low				X
Segment	**Corridor Access Management**	High ($360,000 per mile)	Low/Moderate	X	X		
Segment	**Road Diet (Lane Reconfiguration)**	Moderate / High (25,000 to $100,000)	Low / Moderate	X	X		
Segment	**Bicycle Lanes / Boulevard**	Low ($1,000 to 11,000 per mile)	Moderate	X			
Segment	**Median Barriers**	Moderate ($25,000 to $50,000)	Moderate	X			
Segment	**Variable Speed Limits**	Low	Moderate		X		
Segment	**Dynamic Speed Feedback Sign**	Moderate ($30,000 per location)	Low		X		
Segment	**Appropriate Speeds**	Low	Moderate		X		
Segment	**Reduced Lane Widths**	Low ($2,000 to $25,000)	High		X		
Pedestrian	**Rectangular Rapid Flashing Beacons**	Low ($15,000)	Moderate /High				X
Pedestrian	**Curb Extension**	Moderate / High ($50,000 to $100,000)	Moderate				X
Pedestrian	**Pedestrian Refuge Islands**	Low / Moderate ($2,140 to $41,170 per mile)	Low	X	X		
Pedestrian	**Sidewalks**	Moderate ($80,0000 per mile)	Moderate	X			
Pedestrian	**Pedestrian Countdown Timers**	Low ($12,000)	Low	X		X	
Pedestrian	**In-Street Pedestrian Crossing Sign**	Low ($240 per sign)	Not available				X
Pedestrian	**Pedestrian Hybrid Beacons**	High ($100,000 to $170,000)	High	X		X	
Pedestrian	**Parking Restriction on Crosswalk Approach**	Low ($15,000)	Low				X

Table 6. Rural Safety Countermeasures

Rural Safety Countermeasures				Safe System Hierarchy Tiers			
Type of Environment	Description	Estimated Implementation Cost	Estimated Effectiveness*	Remove Severe Conflicts	Reduce Vehicle Speeds	Manage Conflicts in Time	Increase Attentiveness & Awareness
Intersection	**Restricted Crossing U-Turn**	High ($750,000 per intersection)	Moderate / High	X			
Intersection	**Roundabout**	High ($1,800,000 to $2,500,000)	High	X	X		
Intersection	**High Friction Surface Treatment (Hfst)**	High ($28 per SY)	Moderate	X	X		
Intersection	**All-Way Stop / Yield**	Low	High			X	
Intersection	**Removed Skew / Realigned Intersections**	High	Moderate	X			
Intersection	**Bypass Lanes**	Moderate	Low	X			
Intersection	**Left/Right turn lane**	Moderate	Moderate	X			
Intersection	**LED Stop Signs**	$6,000	Moderate				X
Intersection/ Curve	**Streetlights**	Low ($4,800 per streetlight)	Moderate				X
Segment	**Safety Edge / Shoulder Paving**	High ($75,000)	Moderate	X			
Segment	**Centerline Rumble Strip**	Low ($3,000)	Moderate				X
Segment	**Enhanced Edgeline (6" and 8")**	Low ($2,500)	Low				X
Segments/ Curves	**Clear Zone Maintenance / Enhancements**	Moderate ($100,000)	Moderate / High	X			
Segment	**Ditch / Embarkments / Side Slope Improvements**	Not available	Not available	X			
Segment	**Shoulder / Edge Line Rumble Strip**	Low ($3,000 to $7,000 per mile)	Moderate				X
Segment	**Upgraded Signs / Oversized Regulatory Signs**	Low ($3,000 per mile)	Moderate				X
Curves	**Dynamic Curve Signing**	Low / Moderate ($20,000 to $40,000)	Moderate				X
Curves	**Chevrons**	Low ($3,000)	Low				X
Curve/ Intersection	**Reconstruct TT intersection to a single T**	High ($400,000)	Moderate	X			
Curves	**High Friction Surface Treatment (HFST)**	High ($36 per SY)	Moderate	X	X		
Curves	**Paved Shoulders**	Low ($75,000 per mile)	Moderate	X			
Curve/ Intersection	**Upgraded Signs / Oversized Regulatory Signs**	Low	Moderate				X
	Review signs and markings	$0	Not available				X
Curves	**Curve Warning Sign**	Low ($2,000)	Moderate		X		X
Curves	**Speed Advisory Signs**	Low ($2,000)	Low		X		X
Curves	**6" or 8" Pavement Markings**	Not available	Not available				X

Non-Engineering Design Strategies

Not all approaches to improving roadway safety in the ROCOG planning area include physical improvements or changes to the system. A key theme for non-engineering roadway safety countermeasures is the continued commitment by ROCOG and its partners to a comprehensive, proactive approach to improving roadway safety. These solutions are vital components of a comprehensive safety strategy. These measures focus on policy, education, enforcement, and community engagement, aiming to foster a culture of safety and awareness among all road users.

Priority Non-Engineering Design Strategies

Speed Management

Speed management programs provide a framework on how to create a safe environment for all road users across a specific road network. A speed management program aims to address factors that influence speeding. This includes user behavior, roadway design, land use, traffic behavior and law enforcement. Along with identifying issues, countermeasures are to be identified that are effective in management speeds. The outcome of developing the plan is to evaluate the effectiveness of the solutions and thus reduce speeding-related fatalities and injuries as well as increasing the safety experience for all road users.

Road Safety Audit

A Road Safety Audit estimates and reports road safety issues as well as identifying specific improvements for all road users. A team independent from the project conducts the audit. Road safety audits may specifically focus on vehicles, pedestrians, motorcycles or a specific combination of users. Road user capabilities and limitations are essential for a road safety audit. These audits can be utilized at any stage in the project development process. Road safety audits can be used for projects ranging from minor to major in size.

Safe Routes Studies

Safe Routes to School has been a longstanding program that uses a variety of education, engineering and enforcement strategies that help make routes safer for children to walk and bicycle to school and encouragement strategies to entice more children to walk and bike. Various Safe Routes to School plans have identified improving walking and biking access to schools as a priority.

Based on public input and analysis of crash data, a Safe Routes to School study is highlighted as a potential countermeasure to consider in this Plan that will improve walking and biking access near schools. However, additional infrastructure improvements and other strategies may be necessary to improve walking and biking access to schools and parks. Allocating additional funding at the local level to supplement programming and infrastructure development is a possible strategy for ROCOG and its partners to pursue.

Motorcycle Awareness Campaigns

A series of motorcycle awareness campaigns are aimed at both motorcyclists and other road users. These campaigns focus on educating motorcyclists about safe riding practices, such as wearing helmets and protective gear, maintaining a safe speed, and using defensive driving techniques. Additionally, the campaigns educate drivers of other vehicles about the importance of being vigilant for motorcycles, understanding their vulnerability on the road, and providing them with sufficient space.

Additional Non-Engineering Design Strategies

Corridor Studies

A corridor study is a planning project that characterizes and evaluates roadway conditions, whether existing or for the future. The goal of the study is to provide recommendations for infrastructure projects that address concerns highlighted by the study. Once the corridor study is adopted, implementation can begin which can lead to funding for the project, additional studies and/or policy updates.

Lighting Management

Lighting management programs create a plan to strategically place lighting infrastructure for the benefit of all road users. Lighting management plans particularly emphasize resolving pedestrian safety issues as this vulnerable user group is at significant risk during the night. Once implemented, lighting infrastructure will provide a visual environment that is safe for road users during hours of darkness. Lighting management plans may also consider and investigate using new lighting technology to enhance the safety of the network.

Pedestrian Education/Visibility

The visibility of pedestrians can be affected by obstructed views, lighting conditions, and parked vehicles. The safety issues that arise from this can be resolved with pedestrian education campaigns that engage the community in the planning process to make the transportation network more visible and safer to all road users. Brochures, news articles, social media announcements and videos, and poster materials can be developed to educate road users about pedestrian safety to improve user experience.

HIN Corridor Enhanced Enforcement

The HIN developed through this Plan's in-depth analysis of crash data provides an opportunity to focus not only on engineering countermeasures, but also non-engineering countermeasures, such as focused law enforcement and traffic monitoring efforts.

Community-Based Safety Workshops

Community-based safety workshops bring together residents, local businesses, and community organizations to discuss transportation safety concerns and solutions. These workshops include hands-on activities such as bicycle safety checks, pedestrian safety drills, and interactive demonstrations on safe driving practices.

Collaborative Safety Partnerships

Through partnerships with local businesses, schools, non-profits, and healthcare providers, promote a culture of safety across the community. Collaborative efforts include hosting safety awareness days, creating public service announcements, and offering transportation safety training sessions tailored to specific groups such as young drivers and senior citizens.

Improving Traffic Records and Coordination

The coding and classification of crash data can also be assessed and improved by making training programs available for law enforcement to report on bicycle and pedestrian crashes as well as racial demographics. This can also include the expansion of data attributes to identify more information about the given crash. Near miss incidents are another major gap in our understanding of roadside safety. Near miss reporting can improve the understanding of how the circumstances of a crash can arise. Continued coordination is also necessary with law enforcement, emergency medical services, and hospital records.

Distracted Driving Programs

Distracted driving programs can further reduce crashes by raising awareness, enforcing laws, and promoting safe driving habits. Programs can include advocating for laws that prohibit texting, handheld phone use, and other distractions. Additionally, distracted driving campaigns educate drivers through schools, workplaces, and other community spaces to promote safe driving habits with the help of guest speakers (such as law enforcement) and educational materials that discourage engaging with distractions while driving.

Alcohol Impaired Driving Campaigns

Drunk driving campaigns are designed to reduce accidents and fatal crashes by raising public awareness of the dangers of impaired driving. These programs can utilize public service announcements, social media outlets, and local communities to educate people about the risks of driving under the influence of alcohol and drugs. These campaigns advocate for stricter laws, including sobriety testing and higher penalties on impaired driving. Campaigns should work alongside law enforcement agencies to increase awareness and enforce impaired driving laws, especially around holidays.

Youth Driver Safety Programs

The high crash rates among young drivers are due to factors such as inexperience, risk-taking behaviors, and peer influence. Campaigns focus on changing the local environment to prevent alcohol misuse through social norms, incorporating counseling and prevention programs. These initiatives can bring together schools, health departments, and law enforcement to prevent future crashes involving young drivers. These youth programs are also to be directed to adults, where programs have been designed to penalize parents providing alcohol to the youth.

Demonstration Projects

Demonstration projects use materials such as plastic bollards and paint to temporarily make a change to a roadway, to show what future changes may look like to public agencies, partners, and the public. They are designed for the short-term, and the cost of a demonstration project is significantly less than a final infrastructure project. Demonstration projects are useful as stakeholders can evaluate the project before making any permanent infrastructure changes. These projects also inspire action, help gather data and increase public engagement. See NACTO Quick Builds for Better Streets: A Project Delivery Model for U.S. Cities for more information on best practices for a quick-build approach.

TRAFFIC CALMING DEMONSTRATION

Traffic calming demonstration projects may include using temporary materials to create a median island, traffic circle, or a parklet to reduce or slow traffic in the short-term. The goal of the demonstration may also aim to increase the safety of active transportation methods. To evaluate the effectiveness, surveys, interviews, and counts may also be recorded during the process.

BIKE LANES/ TRAIL DEMONSTRATION

Using temporary materials, bike lanes can be added by creating a buffer to prevent cars from utilizing the given demo project's location. Materials may include paint, tape, bike lane-related signs, or flexible posts for separated bike lanes. Existing lanes for automobiles can also be reduced to make space for a bike lane demonstration project. Bike lane demos are generally low-cost.

MIDBLOCK CROSSWALK INSTALLATION DEMONSTRATION

Midblock crosswalks can be demonstrated using spray paint. The crosswalk markings may be applied to a project location where pedestrian traffic is anticipated and encouraged. The goal of the project is to see if the crosswalk will reduce potential conflicts between motorists and pedestrians. The effectiveness of a midblock crosswalk demo can be evaluated by driver stop/yield compliance, interviews, and surveys.

Chapter 7 Implementation & Road to Zero

Putting the Toolkit into Action

The engineering countermeasures and non-engineering safety strategies detailed in the previous chapter include a wide range of potential recommendations, specifically addressing corridors and intersections on the HIN and those identified by the public through community engagement.

Prioritized Locations

To develop a list of prioritized locations for the ROCOG planning area, the analysis results from the HIN, systemic analysis, and public engagement were leveraged. Priority corridors were identified by plotting each of the following analysis layers to determine where the corridors with the most significant overlap existed:

- **The HIN** – all-modes HIN, nonmotorized-only/VRU-only HIN
- **The crash profiles** – all-modes crash profile segments, VRU-only crash profile segments, all-modes crash profile intersections, VRU-only crash profile intersections
- **The public engagement comment points**

As a result of this overlay exercise, the Plan identified three priority tiers for the region:

- **Tier 1** – HIN + Crash Profile + High Concentration Public Comment Points
- **Tier 2** – HIN + Crash Profile **OR** HIN + High Concentration Public Comment Points **OR** Crash Profile + High Concentration Public Comment Points
- **Tier 3** – High Concentration Public Comment Points

The priority corridors (Tier 1 – Tier 3) are shown in Figure 15 and Figure 16 while the individual corridors are listed in Table 7, Table 8, Table 9, Table 10, and Table 11. Cities within the ROCOG planning area should review the prioritized locations and identify potential opportunities for incorporating programmed projects listed in their capital improvement plans. An interactive version of the prioritized location map is available here https://arcg.is/1m8nLD1.

Figure 15. Priority Corridors

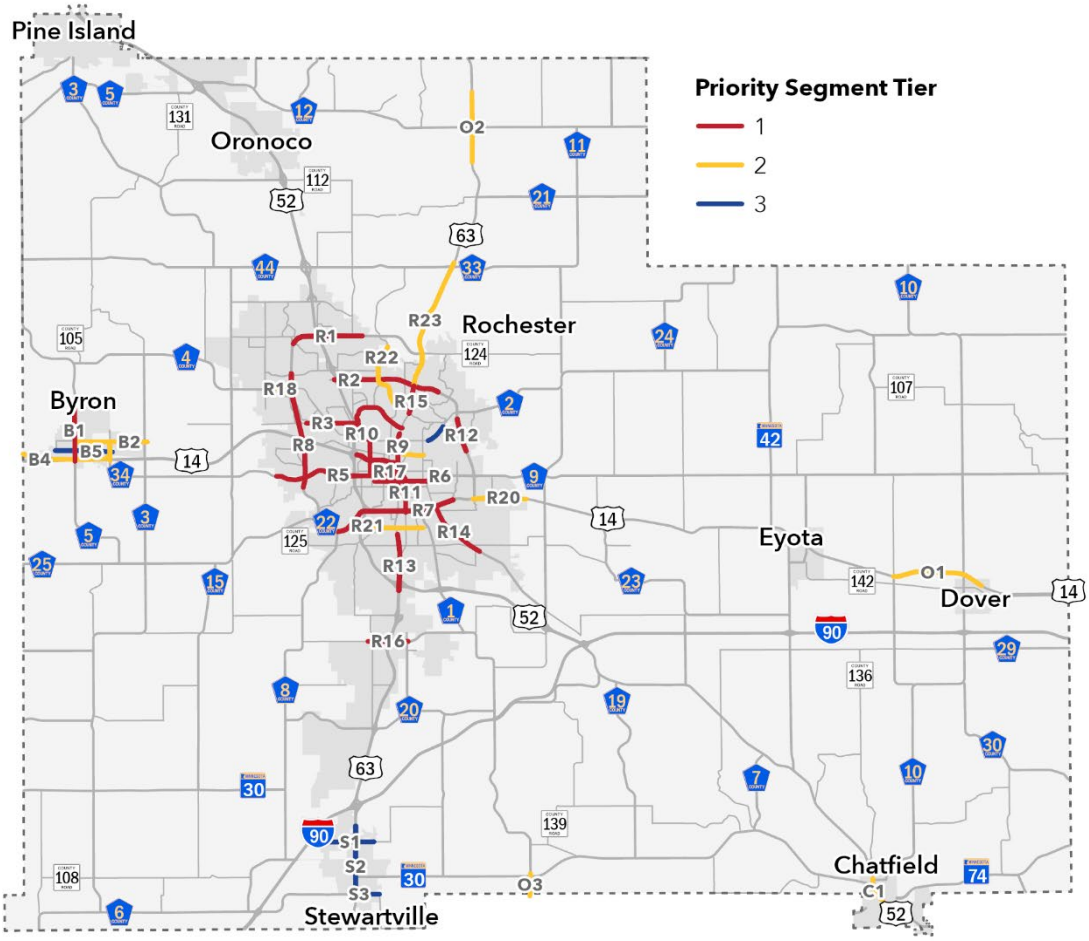


Figure 16. Priority Corridors - Rochester Inset

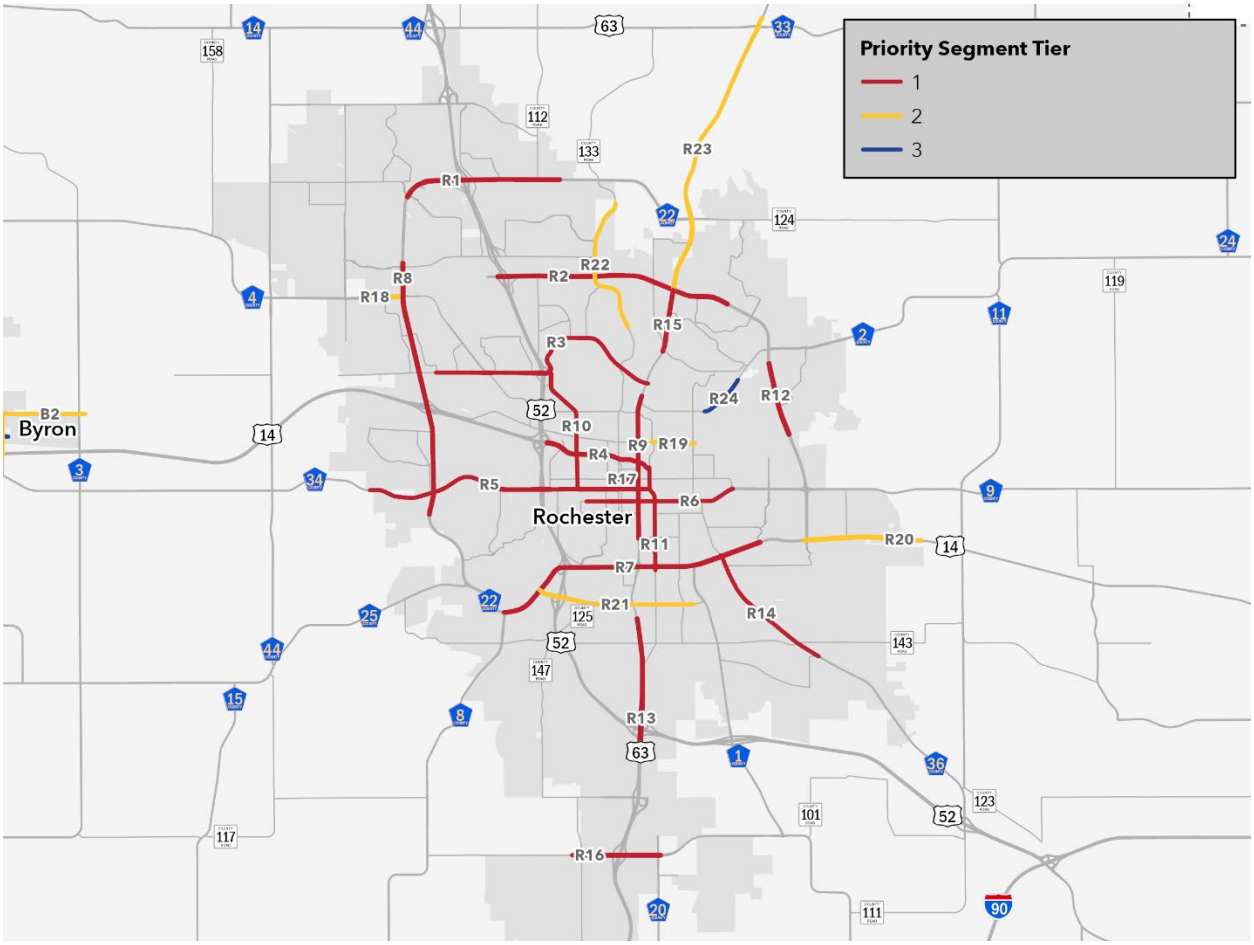


Table 7. Priority Corridors - Rochester

#	Corridor Priority Tier	Corridor Name	Start Road	End Road	Length (Miles)	Jurisdiction	HIN	Crash Profile	Engagement Points	Timeframe
R1	1	CSAH 22 (55th St NW)	55th St NW / Members Pkwy NW	E of Kings Run Dr NW	4.13	CSAH 22	✓	✓	✓	Illustrative
R2	1	37th St NW	Hwy 52	Reserve Ave NE	6.10	MSAS 212 / CSAH 22	✓	✓	✓	Illustrative
R3	1	19th St NW / Elton Hills Dr NW	Scott Rd NW	Broadway Ave N	4.14	MSAS 122	✓	✓	✓	Illustrative
R4	1	Civic Center Dr NW	Hwy 52 / Hwy 14	W Silver Lake Road	2.82	MSAS 122	✓	✓	✓	Medium
R5	1	CSAH 34 (Country Club Rd) / 2nd St	45th Ave NW	Civic Center Dr SE / 3rd Ave SE	5.01	CSAH 34 / MSAS 106	✓	✓	✓	Short
R6	1	4th St SW / SE	9th Ave SW	19th Ave SE	2.34	MSAS 119	✓	✓	✓	Illustrative
R7	1	Hwy 14 / CSAH 22 (12th St SW / Salem Rd SW)	Bamber Valley Rd SW	College Dr SE / Tee Time Rd SE	7.24	Hwy 14 / CSAH 22	✓	✓	✓	Illustrative
R8	1	CSAH 22 (W Circle Dr NW)	Badger Hills Dr NW / 41st St NW	Berkshire Rd SW / Fairway Ridge Ln SW	6.62	CSAH 22	✓	✓	✓	Illustrative
R9	1	Broadway Ave S	16th St NE	9th St SE	3.71	MSAS 201	✓	✓	✓	Short
R10	1	Assisi Dr NW/11th Ave NW	Elton Hills Dr NW	2nd St SW	1.92	MSAS 113	✓	✓	✓	Illustrative
R11	1	3rd Ave SE	Civic Center Dr NE / 2nd St NE	12th St SE	1.35	MSAS 109	✓	✓	✓	Short
R12	1	CSAH 22 (E Circle Dr NE)	S of Wheelock Dr NE	S of Silver Creek Rd NE	1.93	CSAH 22	✓	✓	✓	Illustrative
R13	1	Broadway Ave S	N of 18th St SE	Hwy 52	3.24	MSAS 201	✓	✓	✓	Illustrative
R14	1	CSAH 36 (Marion Rd SE)	Hwy 14	30th Ave SE	1.87	CSAH 36	✓	✓	✓	Illustrative
R15	1	CSAH 33 (Broadway Ave N)	CSAH 22 (37st St NE)	Northern Heights Dr NE	1.62	CSAH 33	✓	✓	✓	Illustrative
R16	1	48th St SW	Tee Ct SW	St Bridge Rd SE	2.31	CSAH 20 / MSAS 155	✓	✓	✓	Illustrative
R17	1	W Center Street	4th Ave SW	1st Ave SW	0.18	MSAS 105	✓	✓	✓	Illustrative
R18	2	CSAH 4 (Valleyhigh Rd NW)	Kenosha Dr NW	SB Circle Dr NW	0.78	CSAH 4	✓	✓		Illustrative
R19	2	7th St NE	W Silver Lake Dr NE	E Silver Lake Dr NE	0.57	MSAS 104		✓	✓	Illustrative
R20	2	Hwy 14	30th Ave SE / Towneclub Pkwy SE	E of 40th Ave SE	2.78	Hwy 14	✓	✓		Illustrative
R21	2	16th St SW	Salem Rd SW	9th Ave SE	2.64	MSAS 210		✓	✓	Illustrative
R22	2	W River Pkwy NW/W River Rd NW	City Boundary / N of Essex Pkwy NW	Zumbro Dr NW	1.91	MSAS 101		✓	✓	Illustrative
R23	2	Hwy 63 (Broadway Ave N)	N of 75th St NE/Hwy 63	CSAH 22 (37st St NE)	5.46	Hwy 63	✓	✓	✓	Illustrative
R24	3	Viola Rd NE	14th Ave NE	Parkwood Hills Dr NE	0.61	MSAS 213			✓	Illustrative

Table 8. Priority Corridors – Byron

#	Corridor Priority Tier	Corridor Name	Start Road	End Road	Length (Miles)	Jurisdiction	HIN	Crash Profile	Engagement Points	Timeframe
B1	1	CSAH 5 (2nd Ave NE)	20th Street NW	Hwy 14	1.27	CSAH 5	✓	✓	✓	Illustrative
B2	2	7th St NW / NE	2nd Ave NW	County Rd 3 NW	2.30	MSAS 107		✓	✓	Illustrative
B3	2	10th Ave NE	7th St NE	Hwy 14	1.06	MSAS 105		✓	✓	Illustrative
B4	2	Voll Dr NW / Frontage Rd NE	19th Ave NW	10th Ave NE	2.61	MSAS 101		✓	✓	Illustrative
B5	3	4th St NW / NE	9th Ave NW	10th Ave NE	1.64	M 71		✓	✓	Illustrative

Table 9. Priority Corridors – Stewartville

#	Corridor Priority Tier	Corridor Name	Start Road	End Road	Length (Miles)	Jurisdiction	HIN	Crash Profile	Engagement Points	Timeframe
S1	3	20th St NW / 20th St NE	11th Ave NW	City Boundary / E of Clubhouse Dr NE	1.38	M 51		✓		Illustrative
S2	3	Hwy 63 (Main St N)	Schumann Drive NW	6th St SW	3.00	Hwy 63		✓		Illustrative
S3	3	CR 106 (6th St SE)	Hwy 63	CR 106	0.68	CR 106		✓		Illustrative

Table 10. Priority Corridors – Chatfield

#	Corridor Priority Tier	Corridor Name	Start Road	End Road	Length (Miles)	Jurisdiction	HIN	Crash Profile	Engagement Points	Timeframe
C1	2	Hwy 52 (Main St NE)	Union St NE	8th St	1.00	Hwy 52		✓	✓	Illustrative

Table 11. Priority Corridors – Olmsted County

#	Corridor Priority Tier	Corridor Name	Start Road	End Road	Length (Miles)	Jurisdiction	HIN	Crash Profile	Engagement Points	Timeframe
O1	2	Hwy 14	County Rd 32 SE	.62 Miles East of County Rd 10 SE	2.64	US 14	✓	✓		Illustrative
O2	2	Hwy 63	125th St NE	105th St NE	2.01	US 63	✓	✓		Illustrative
O3	2	CSAH 1 (County RD 1 SE)	Hwy 30	County Boundary	0.65	CSAH 1	✓	✓		Illustrative

Prioritized Implementation Actions

As it seeks to improve safety, ROCOG, through this document, has identified several actions related more generally to roadway infrastructure, behavior, and policy and programs. ROCOG encourages its implementing agencies to commit to prioritizing these actions as part of a regional comprehensive plan to improve safety.

Roadway Infrastructure Actions

- Design the roadside to include protection systems (such as cable median, crash cushions and guiderail end treatments) or manage roadside vegetation, trees and other fixed objects and consider alterations to steep ditch slopes to minimize the severity of crashes
- Consider "No Turn on Red" restrictions at identified high crash locations
- Proactively implement safety conversions (for example 4-to-3 lane safety conversions) or other safety treatments to address high injury 4-lane undivided streets
- Implement pedestrian and bicycle safety strategies near schools, libraries, and other potential high-pedestrian VRU traffic areas
- Implement low-cost quick-build spot and systemic safety improvements while seeking to strategically upgrade to more long-term improvements

Behavioral Actions

- Expand enforcement of school zone laws
- Support high-visibility enforcement campaigns that specifically target speeding, unrestrained occupants, distracted driving, and substance impaired driving
- Continue to evaluate and implement speed management techniques related to roadway design, roadway surface, traffic control, community education, and speed enforcement

Growing Safety Culture within ROCOG

Foundational change has already begun within the ROCOG planning area. Through the process of creating this plan, ROCOG engaged communities to identify opportunities to address transportation safety and change the safety culture. The cultural actions (CA) listed below will support the region's vision to achieve zero traffic deaths and serious injury crashes on streets within ROCOG by 2050. Further, they will serve as the groundwork for the implementation of countermeasures identified through this Safety Action Plan's prioritization process.

Table 12. ROCOG Cultural Actions (CA)

#	Action	Timeline
A.1	ROCOG's Policy Board adopts this SAP and commits to the Safety Vision and Goal	Q4 2025
A.2	Share the SAP analysis including GIS data to all local governments within the ROCOG planning area for analysis and identification of countermeasures to implement	Q1 2026
A.3	Continue to engage local partners to monitor progress on the SAP	Continuous

#	Action	Timeline
A.4	ROCOG will assist local agencies to apply for funding to address roadway safety priorities including an application for the Safe Streets and Roads for All grant program	Annually
A.5	Incorporate the HIN, crash profiles, and project recommendations into long range transportation planning	Continuous
A.6	Continue to update datasets and evaluate crash data for future plan updates	Continuous
A.7	Monitor progress on an annual basis toward safety goals convening an annual meeting with local partners to review crash statistics and project implementation	Annually
A.8	Present annually to the ROCOG Policy Board on the status of SAP actions and project implementation	Annually

Potential Funding Strategies

A variety of funding sources can be used to address safety issues. These funds can be used to reconstruct roadways, install pedestrian and bicycle facilities, implement education and enforcement strategies, and complete other transportation-related projects that improve safety. Coordination with city, county, and state agencies will be important to harness their available funding. In addition, several competitive grant programs could also be utilized. Below is an overview of potential state and federal grant opportunities anticipated to be available in 2026 and beyond.

Highway Safety Improvement Program (HSIP)

The Federal Highway Administration (FHWA) administers the Highway Safety Improvement Program (HSIP), which provides funding to projects designed to improve travel safety. Per FHWA guidance, HSIP funding "requires a data- driven, strategic approach to improving highway safety on all public roads with a focus on performance." The HSIP program provides funding for roadway construction or reconstruction projects designed to decrease the frequency and/or severity of all types of crashes including vehicles, pedestrians, bicycles, and other non-motorized vehicles. Funding can only be used for construction costs. The program runs on a biennial basis with the next opportunity in 2025. Federal funds provide 90 percent with a 10 percent match from the local agency or the State of Minnesota.

Safe Streets for All (SS4A)

USDOT's Safe Streets and Roads for All (SS4A) is intended to fund more than $1 billion each year through FY 2026 for regional, local, and tribal initiatives which significantly reduce or eliminate roadway fatalities and serious injuries. With the completion of this Safety Action Plan, ROCOG and its stakeholders are eligible to apply for implementation and supplemental or demonstration activity funding.

Transportation Alternatives Program (TAP)

The MnDOT Transportation Program (TAP) provides funds for county, city, township, and tribal governments for pedestrian and bicycle crossing improvements, off-street bicycle and pedestrian facilities, on-road bicycle facilities, and traffic control and safety devices. The program requires a 20 percent match. Example projects include Safe Routes to School plans, crossing signal plans and infrastructure, trail or shared use path feasibility studies, trail resurfacing, new trails/paths/bike lanes/sidewalks, and wayfinding or visibility upgrades such as pavement markings.

Local Road Improvement Program (LRIP)

Administered by MnDOT, the LRIP program provides competitive grants to assist local agencies for constructing, reconstructing, or reconditioning regionally significant local roads, roads that are impacted by trunk highway projects, or roads that improve rural safety. LRIP has no match requirement. Example safety projects include roundabouts, reduced conflict intersections, and construction of sidewalks and trails.

Evaluation and Tracking

ROCOG will develop an annual report to evaluate progress toward this plan's vision and safety goal. The yearly reporting will be posted on ROCOG's website and will include the status of project implementation and the most recent crash statistics. ROCOG will convene a meeting with local partners and relevant departments annually to review the report.

Specific performance measures will include:

- Number of fatal and serious injury crashes by mode and location
- Number of safety engineering projects implemented by strategy, location and investment amount
- Number of non-engineering countermeasures implemented by type of strategy, location (if applicable), and investment amount

From the date of adoption, ROCOG may choose to revise the goals, countermeasures, or actions of this Safety Action Plan. ROCOG may also choose to update the Safety Action Plan after periodic review with our agencies to ensure the data evaluation is up to date and reflects the evolving policies, programs, and projects within the region.

A Shared Responsibility

To reach its goal of reducing fatalities and serious injuries to zero by 2050, it will take a concerted effort by everyone – staff and elected officials, residents and local employers, individuals and organizations. Improving safety on our roadways will improve the quality of life for people who live, work and visit the ROCOG planning area. **Every life matters.**

Appendix A. Policy Review

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

SAFETY ACTION PLAN

Safety Action Plan

Appendix A - Practice in Review

October 20, 2025

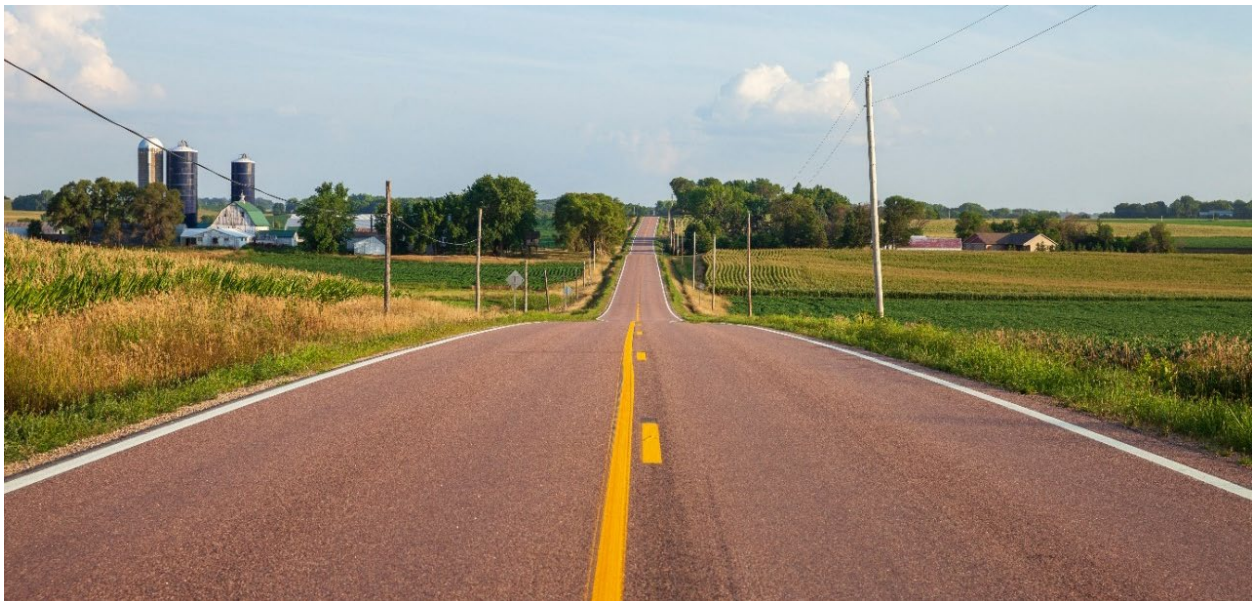
Introduction

The State of Practice Review examines the current transportation safety planning practices employed by Rochester-Olmsted Council of Governments (ROCOG), Olmsted County, the City of Rochester, other cities within the ROCOG planning area, and relevant State policies. It also explores best practices from national sources, reviewing essential guidance and resource documents that focus on planning and designing safe infrastructure with consideration of vulnerable road users.

Executive Summary – Key Takeaways

Best practices in transportation safety planning employed by Cities and other agencies include:

- Defining target date for achieving zero and an interim goal for a significant reduction in roadway fatalities and serious injuries
- Prioritizing locations for investments that improve safety for all roadway users to guide future funding
- Identifying crash trends that are driven by transportation safety planning and policy
- Identifying characteristic crash profiles that contribute to the region's High Injury Network or other areas with high concentrations of crashes, especially severe injury and fatal crashes
- Aligning with the USDOT National Roadway Safety Strategy and other Vision Zero and Safe Systems Approach initiatives
- Conducting engagement with stakeholders and community members to help inform priority locations and safety strategies
- Finding cost effective solutions to improving existing infrastructure



Literature Review

Rochester-Olmsted Council of Governments' Safety Activities

ROCOG Long Range Transportation Plan (2020)

The ROCOG Long Range Transportation Plan (LRTP) represents the region's 25-year vision for a multimodal transportation system, developed in accordance with federal guidelines and anticipated future growth. ROCOG is currently in the process of updating this plan for the horizon year 2050 to reflect evolving regional needs, community input, and new safety priorities. The LRTP "finds a balance between prioritizing the maintenance of the existing system and promoting reliability and system resiliency" and sets forth a series of long-range planning goals that address the future transportation network. The document is organized into three sections, which are as follows:

1) Description of the ROCOG planning area
2) The LRTP's guiding information that was used to inform preparation of the plan
3) The LRTP Long Range Plan (recommendations and methods to Improve the transportation network)

The LRTP addresses safety in both the guiding information and long range plan sections. In the guiding information section, the safety chapter takes a hierarchical approach to reviewing plans, highlighting the interconnection and integration of plans from the federal level down to the county level. The LRTP summarizes each governmental plan and identifies safety-related projects and policies that impact the ROCOG planning area. These include The Minnesota Department of Transportation (MnDOT), Minnesota Strategic Highway Safety Plan (SHSP), Minnesota Toward Zero Deaths (TZD), and Olmsted County Road Safety Plan (CRSP). Finally, ROCOG responds to the strategies identified within the governmental plans and lists the strategic directions necessary to align with the policies including engineering, education and enforcement as three key components of safety.

The long range plan section outlines recommendations and strategies to improve the transportation network. Safety is integrated throughout several chapters of the plan, including those on active transportation, the Streets and Highway Plan, and the Transportation Systems Management and Operations (TSMO). For instance, the TSMO is a set of integrated strategies to improve safety and mobility along multimodal and intermodal systems, while reducing congestion and delays through alternatives to roadway expansion. This chapter of the LRTP summarizes relevant Federal Highway Administration (FHWA) and MnDOT policies and aligns them with current ROCOG Long Range Transportation Goals. Intelligent Transportation Systems (ITS) are a TSMO tool that monitors traffic conditions and adjusts operations in real-time. These aid in the reduction of crashes and alerts drivers of potential hazards.

The LRTP's final chapter provides implementation recommendations, which include safety and are as follows:

Safety Implementation Recommendations:

- "ROCOG and its partner jurisdictions will continue to collaborate with local law enforcement, public health agencies and others on travel safety education and outreach activities as part of Southeast Minnesota Towards Zero Death.
- ROCOG's partner road agencies will continue to coordinate with law enforcement agencies on targeted enforcement campaigns and initiatives.
- ROCOG and its partner road authorities will continue to monitor crash data on a routine basis to identify potential improvement needs that can be advanced into local capital improvement programs and state/federal grant funding.
- ROCOG and its partner road agencies will coordinate safety investments and improvements across jurisdictional boundaries."

Other Agencies' Safety Activities

MnDOT Strategic Highway Safety Plan (2025)

The MnDOT SHSP is a policy plan within the Minnesota TZD program that aims to provide a framework for strategies involving enforcement, education, engineering, and emergency medical services and trauma systems. The SHSP is guided by data and stakeholder outreach, including analysis of crash trends. Based on this information, safety focus areas are identified and grouped into four categories according to their priority or connection to other focus areas. primary, rising concern, connected, and support solutions. Primary focus areas include intersections, lane departures, impairment, and unbelted occupants. Strategies and specific actions are then developed to assist traffic safety partners in implementing the plan.

The SHSP is updated every five years to reflect crash trends and emerging safety strategies. Stakeholder and public engagement input is vital in informing strategies; stakeholder input is collected through conferences, workshops, and steering committee meetings.

MnDOT Best Practices for Pedestrian and Bicycle Safety (2021)

In January 2021, MnDOT approved the Best Practices for Pedestrian and Bicycle Safety, which provides design guidelines to enhance safety for pedestrians and cyclists on Minnesota roads. These guidelines operate in tandem with other federal and state documentation. The roadway treatments are classified as proven, tried, or experimental. The proven treatments are widely used and have been deemed effective under specific conditions after being reviewed by FWHA. The tried methods have been implemented at intersections or linear facilities but have not been fully evaluated. Finally, experimental treatments have been tested in controlled environments or as a pilot project and are not included in the MnMUTCD or an FHWA Interim Approval.

The document is divided into two sections: Intersections and Linear Facilities. The intersections are divided into three subcategories: Controlled Intersection Elements, General Intersection

Elements, and Uncontrolled Intersections. Each category and subcategory provide an overview of the design and purpose of the safety roadway treatments, as well as where to implement these treatments and countermeasures and the projected project cost.

MnDOT Vulnerable Road User Safety Assessment (2023)

MnDOT's Vulnerable Road User Safety Assessment (VRUSA) is a comprehensive evaluation that focuses on enhancing safety for vulnerable road users. This assessment is mandated by the Bipartisan Infrastructure Law (BIL) and was required to be completed by November 15, 2023. The primary goal is to identify high-risk areas and implement strategies to reduce injuries and fatalities among these road users.

The document identifies high-risk areas using the High Injury Network (HIN), predictive crash tools, and state crash statistics defined below. It then implements safety strategies, including infrastructure improvements and community-focused measures to reduce injuries and fatalities for pedestrians, bicyclists, and other non-motorists.

MnDOT's VRUSA is crucial because fatalities among the most vulnerable road users in the United States are increasing at a greater rate than overall traffic fatalities. The FHWA has encouraged states to prioritize vulnerable road user safety in all federal highway investments and appropriate projects.

High-Injury Network Analysis Report:

Identifies locations with high rates of injuries involving vulnerable road users

Descriptive and Predictive Bicycle Safety Analysis Report:

Offers bicycle safety data and forecasts with key findings and recommendations

State Crash Statistics:

Broken down by various factors such as location, severity, roadway type, class, demographics involved, conditions, and more

Olmsted County Road Safety Plan (CRSP) (2021)

After completing the 2016 CRSP update, Olmsted County updated the plan again in 2021. The main objective of the revised plan is to reduce fatalities and serious injuries on local roadways by identifying projects that are eligible for HSIP funding. This plan is consistent with Minnesota's SHSP and supports the state's TZD program. The TZD program has set a goal to achieve zero fatalities, fewer than 300 traffic fatalities, and 850 serious injuries by 2020. The updated CRSP also identifies potential opportunities for collaboration at the regional level with TZD local steering committees to collaborate and strengthen local road safety.

The Olmsted County CRSP employed a data-driven approach to identify areas that required safety investment. The analysis involved a review of crash data that spanned five years. The crashes were categorized into 20 focus areas, and the data was compared with that of the state, southeast Minnesota, and metro Minneapolis. The County's focus areas were consistent with lane departures, intersections, and non-motorized vehicles. The analysis also used a statewide crash tree to identify the roadways where crashes occurred, whether on urban or rural roads, along with the roadway segment and intersection-related crashes. This helped to visualize and compare the severe and total crashes between Olmsted County and the state. The analysis showed that 55 percent of all crashes occurred on rural roads.

The County took a proactive approach to evaluate safety on the roads, identifying risk factors to prioritize areas for improvements. Risk factors were categorized into segments, intersections, and curves that had a set of criteria to determine the severity of crashes. Projects were selected based on their locational risk factors, such as speed limit, alignment skew, and signaling, and were given priority over other projects. Finally, the document provides a list of potential HSIP funded projects as well as the type of countermeasure to reduce fatal or serious crashes.

City of Rochester 2040 Comprehensive Plan (2018)

The City of Rochester 2040 Comprehensive Plan sets out a vision with guiding principles, policies, and actions for the city's future. This plan proactively identifies current issues, stays ahead of trends, and provides an opportunity to consider the future implications of today's decisions to ensure community growth. Key priorities include improving transit services to provide more travel options and lower costs, designing urban areas to enhance livability and business success, and expanding infrastructure to support current and future growth.

Much like the ROCOG LRTP, the City of Rochester 2040 Comprehensive Plan looks to enhance public safety services to ensure quick response times to crashes. It also looks to design safer urban environments with better lighting, pedestrian friendly pathways, and clearly marked crosswalks. The plan focuses on maintaining and expanding infrastructure to support safe travel, such as well-maintained roads and effective traffic management systems. Additionally, by planning the built environment with health and safety in mind, the plan aims to create safer streets and reduce the risk of pedestrian- and bicyclist-involved crashes.

City of Rochester Active Transportation Plan (2022)

The City of Rochester Active Transportation Plan aims to enhance walking and biking as primary modes of transportation. This update to the 2012 Rochester Area Bicycle Master Plan addresses changes in population, land use, and transportation options. The plan's vision is to provide equitable freedom of movement, making walking and bicycling safe, convenient, and enjoyable. To achieve this vision, the plan outlines goals focused on:

- Health
- Equity
- Safety
- Connectivity

- Resiliency
- Economic prosperity

These goals guide investments in infrastructure to create comfortable spaces for walking and biking, connect people to everyday destinations, and promote community well-being. By prioritizing active transportation, the City of Rochester can improve public health, address social inequities, enhance safety, and ensure the city can adapt to future changes and challenges. Overall, the Active Transportation Plan represents a comprehensive effort to foster a healthier, more inclusive, and sustainable community.

Rochester Elementary Safe Routes to Schools Plan (2025)

The Rochester Elementary Safe Routes to Schools (SRTS) plan builds off the 2022 SRTS plan completed for Willow Creek, John Adams, Kellogg, and Dakota Middle schools. The following were identified as priority SRTS initiatives under the plan:

- Reduce lanes, improve crossings, and install off-street bike facilities along N Broadway Ave.
- Reduce lanes and install crossing enhancements at the intersections of 18th Ave NW with 37th St NW and 41st St NW and at the intersection of County Rd 1 SE with 20th St SE.
- Temporarily close 31st St NW between 18th Ave NW and 15th Ave NW during school arrival and dismissal times to create a safe, pedestrian-friendly zone.
- Convert the existing sidewalk to a shared use path from Willow Creek Middle to the intersection of County Rd 1 Se with 20th St SE.
- Dedicate funding to bike fleet maintenance to enable in-school bike education and field trips.
- Establish drop-off points near each school to encourage students to walk and reduce congestion.

The focus of the Rochester 2025 plan is to promote walking and biking, as fewer than 20 percent of K-8 students now use the modes to get to school. The goal is to have 40 percent of K-8 students walking or biking to school by 2035. The plan's priorities include:

- Updating the city's school speed zone policy to install a speed zone at every school.
- Integrating community art opportunities into SRTS for traffic calming and community engagement.
- Prioritizing school entrance daylighting and crosswalk marking in the city's public works schedule.
- Exploring additional ideas such as winter maintenance, park connections, and Rochester Public Works SRTS funding.

The plan recommends various infrastructure enhancements to support safer, more accessible routes to schools. It also identifies key issues and prioritizes recommendations for each elementary school in the area, helping guide future projects.

Rochester Public Transit Agency Safety Plan (2025)

The Rochester Public Transit Agency Safety Plan (PTASP) ensures the safety and security of Rochester's public transportation system, in compliance with the Federal Transit Administration's (FTA) Public Transportation Safety Program. The plan incorporates Safety Management System (SMS) principles to create a comprehensive approach to managing and improving transportation safety.

The safety principles are as follows that address both transportation safety and passenger security:

- Safety Management Policy: Establishes the agency's commitment to safety and outlines responsibilities of management and employees.
- Safety Risk Management: Identifies, assesses, and mitigates safety risks by regularly analyzing hazards and implementing measures to reduce them.
- Safety Assurance: Monitors and evaluates safety performance continuously, including regular safety audits, inspections, and performance reviews.
- Safety Promotion: Focuses on training and communication to foster a safety culture, including safety training programs for employees and public awareness campaigns.
- Safety Performance Targets: Sets specific, measurable goals for improving safety performance, such as reducing the number of crashes or incidents.
- Emergency Preparedness and Response: Outlines procedures for responding to emergencies, ensuring the transit system can handle unexpected events safely and efficiently.

Minnesota Speed Limits, Zones; Radar Statute (2024)

Minnesota Statute 169.14[1] establishes statutory speed limits on various types of roadways under ideal conditions. These limits include 10 mph in alleys, 30 mph on streets in urban districts, 55 mph on other roads, 65 mph on expressways and urban interstate highways, and 70 mph on rural interstate highways. Speed limits not covered by the statutory limits are determined by the Commissioner of Transportation based on an engineering and traffic investigation. This investigation considers factors such as test drive results, road type and condition, location and type of access points, crash history, traffic volume, sight distances, and travel speed samples. A key component of this investigation is the 85th percentile speed, which is the speed at or below which 85 percent of vehicles travel on a given roadway. This measure helps ensure that speed limits are set in accordance with the natural driving behavior of the majority of drivers.

The statute also allows for special speed zones, such as school zones, where lower speed limits can be set to ensure the safety of children. Additionally, cities have the authority to set speed limits on certain city streets after conducting an internal traffic study. Under the statute

[1] https://www.revisor.mn.gov/statutes/cite/169.14

driving in excess of 100 miles per hour results in a six-month license revocation. Furthermore, driving 20 miles per hour or more over the speed limit incurs an additional surcharge equal to the amount of the fine imposed for the speed violation, but not less than $252.

National Best Practices

Integrating the Safe System Approach with the Highway Safety Improvement Program

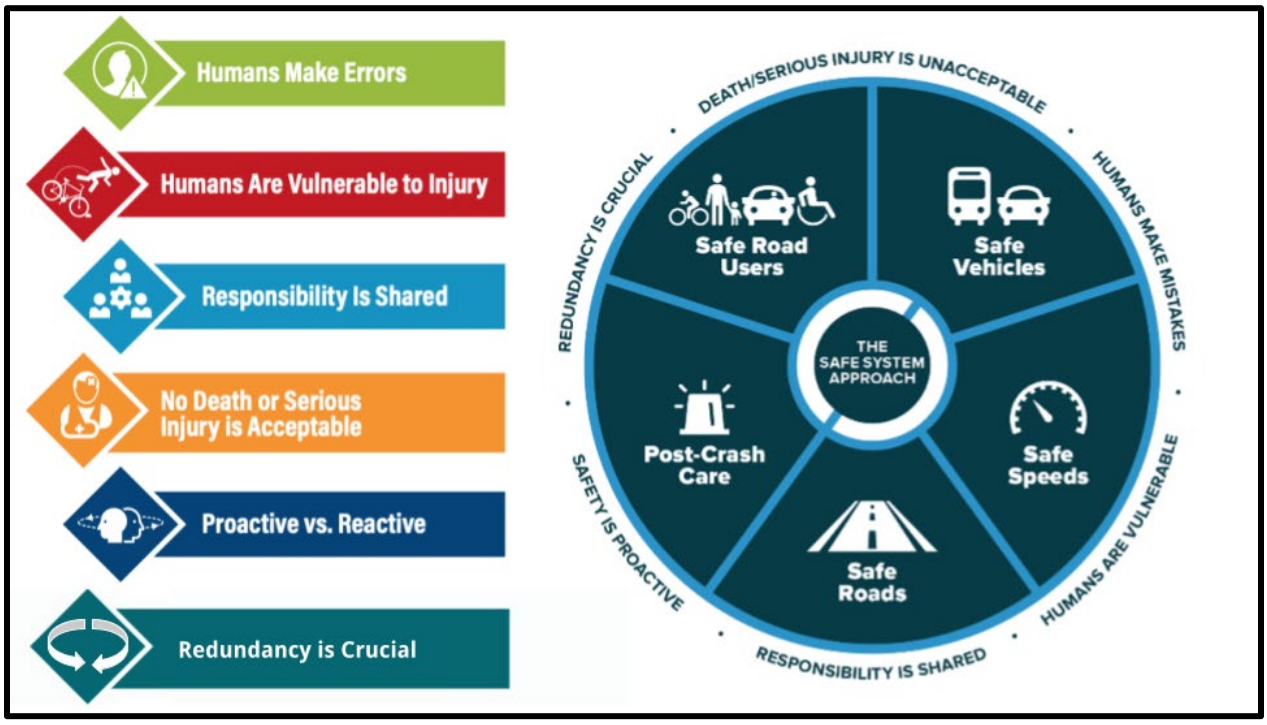
The Safe System Approach is a global strategy that aims to minimize the risk of serious human injury in the event of road accidents. The approach was developed as part of the Vision Zero initiative and recognizes that human error is inherent in using roadways. Therefore, the responsibility for ensuring traffic safety lies with the agencies that build and maintain transportation systems. The ultimate object is to eliminate all fatal and serious injuries by designing roadways that minimize the impact on the human body. The document outlines the six core Safe System principles, including:

- Death or serious injury is unacceptable
- Humans make mistakes
- Humans are vulnerable
- Responsibility is shared
- Safety is proactive
- Redundancy is crucial

The document also lists the five elements of a Safe System that, when implemented, can make public roads safer. These include:

- Ensuring that road users comply with traffic rules and are not under the influence of drugs or alcohol.
- Improving roadway design through measures such as clear zones, roundabouts, and functional class delegation.
- Setting appropriate speed limits to reduce the risk of accidents and mitigate their impact.
- Encouraging the use of safer vehicles with active safety features and technology that can interact with the transportation system.
- Ensuring timely emergency services and effective crash reporting practices.

FHWA's Highway Safety Improvement Program (HSIP) is a program that seeks to reduce fatalities and serious injuries on public roads. The document compares the current HSIP foundational elements to the Safe System Approach principles and identifies areas of overlap. It also outlines potential opportunities for integrating the Safe System Approach principles and elements into Strategic Highway Safety Plans and State HSIPs for better traffic safety outcomes. The Safe System Approach will also be incorporated in SS4A Action Plans.



FHWA Complete Streets Policy of 2025

This national Complete Streets ACT is a comprehensive policy framework designed to ensure that transportation infrastructure is safe, accessible, and convenient for all users, including pedestrians, cyclists, motorists, and transit riders. It emphasizes a multi-modal approach to roadway design, which considers the needs of people of all ages and abilities. The Complete Streets Policy is a FHWA recommendation but is not federally mandated. The policy has various resources that can be utilized by transportation professionals to ingrate safety for all users into planning and analysis. By understanding how streets fit within a multimodal network, professionals can identify infrastructure needs to better serve the community.

Key components of the policy include:

- Commitment and Vision: Establishing a clear intent to create a connected network that serves all users
- Equity: Prioritizing underinvested and underserved communities
- Applicability: Applying the policy to all projects and phases, including new projects, retrofits, reconstructions, maintenance, and operations
- Design Guidance: Using the latest and best design criteria and guidelines
- Land-Use Planning: Considering the broader context of each project and the community's current and future needs
- Performance Measurement: Establishing specific metrics to track progress and report to the public
- Implementation Plan: Outlining specific steps for implementing the policy to ensure it has a measurable impact

MnDOT and many agencies within the ROCOG planning area have each adopted their own Complete Streets policies in accordance with these national recommendations that emphasize a multi-modal approach, addressing the needs of all users in urban, suburban, and rural contexts. These policies integrate features like sidewalks, bike lanes, ADA-compliant ramps, traffic calming measures, and improved street lighting to enhance safety and accessibility for people of all ages and abilities.

The Americans with Disabilities Act of 1990

The Americans with Disabilities Act (ADA), enacted in 1990, is a landmark civil rights law that prohibits the discrimination against individuals with disabilities in all areas of public life, including employment, public accommodations, transportation, state and local government services, and telecommunications. It ensures equal access and mandates reasonable accommodation and modifications to policies and facilities to avoid discrimination.

Safety is a key component of the ADA, particularly in Title II, which mandate the removal of architectural barriers and the implementation of accessible design features transportation infrastructure. These include curb ramps, tactile warning surfaces, accessible pedestrian signals, and other modifications to ensure safe navigation for individuals with disabilities. These measures enhance the safety of transportation systems, making them more accessible and secure for everyone.

Olmsted County and many agencies within the ROCOG planning area have adopted plans that align with the Americans with Disabilities Act by ensuring transportation facilities are accessible and safe for individuals with disabilities. These plans include upgrading curb ramps, sidewalks, and pedestrian facilities to meet ADA standards, enhancing safety and accessibility for all users.

Appendix B. Engagement Summary

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

SAFETY ACTION PLAN

Safety Action Plan

Appendix B - Public Engagement Summary

October 20, 2025

Introduction

The Rochester-Olmsted Council of Governments (ROCOG) initiated the Safety Action Plan (SAP) with the goal of developing a regional strategy to eliminate roadway fatalities and serious injuries for all users across its planning area. The public engagement process aided in documenting areas of concern, developing concepts to address deficiencies, and preparing a detailed Action Plan to design, fund and implement improvements. The goal of community outreach was to learn community priorities, document 'near misses', and highlight areas of concern across the entire transportation system.

The results of engagement helped inform a systemic analysis and the identification of prioritized locations for communities across the ROCOG planning area. Potential strategies will promote a safe and accessible system for all users, including those who walk, bike, drive, or use public transit. By prioritizing direct public input, local knowledge has helped to inform each phase of SAP development.

The engagement process was designed to collect detailed, location-specific data that would have been impossible to gather through crash records alone. More than 750 people were engaged in-person at seven pop-up events across the ROCOG planning area, including Byron, Chatfield, Stewartville, Eyota, Oronoco, and Rochester. Youth and families were actively engaged via tactile activities at each event. Additionally, a project website featured an interactive comment map that encouraged residents to pinpoint specific areas of concern. This online input opportunity was highly effective and yielded more than 530 unique transportation safety concerns and suggestions.

A critical focus of community engagement was the identification of locations where residents perceived a high risk, often indicating locations where near misses occurred that had not yet resulted in a formal crash report. This insightful anecdotal evidence augmented the systemic analysis, helping to identify design deficiencies and locations of perceived concern.

After engaging the community broadly via in-person and virtual input opportunities, ROCOG hosted four targeted focus group discussions with key stakeholders:

- Bicycle, pedestrian and accessibility advocates
- Emergency responders
- Older adults (125 Live – One Hour, One Topic)
- Rochester-Olmsted Youth Council

These sessions provided more in-depth discussion to understand not just where problems exist, but what engineering and non-engineering safety strategies would be most effective and impactful across diverse user groups. The combined qualitative and quantitative data—gathered through in-person activities, the online map, and focus groups—was a key component of developing this Safety Action Plan for communities in the ROCOG planning area. What was learned from the community directly informs the documentation of areas of concern and the development of concepts that adhere to the Safe System approach, ensuring the final action plan is a well-rounded, community-driven, and effective blueprint for safety improvements.

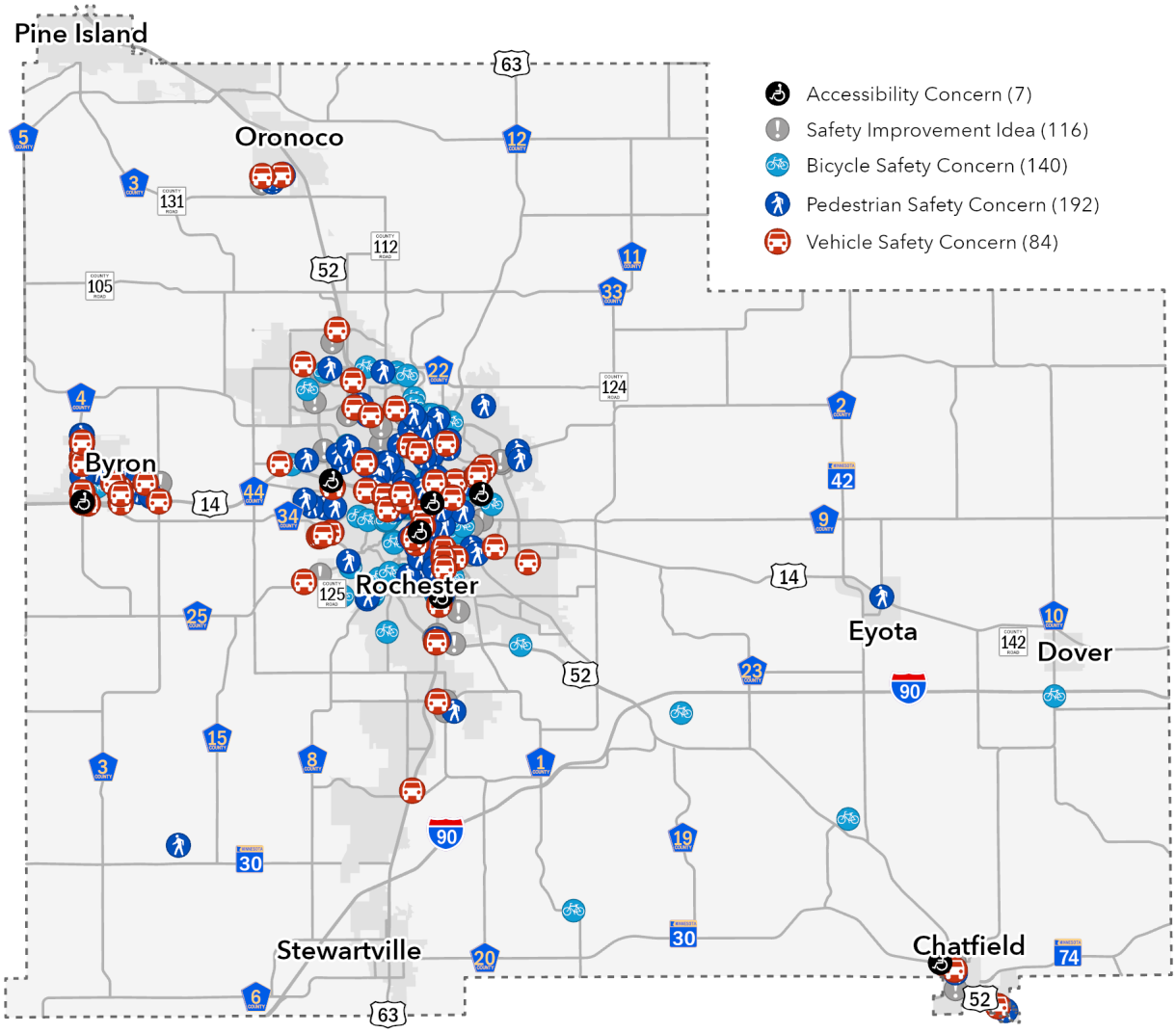
Online Comment Map

The online comment was publicly available from April 28 to October 10, 2025. Over the five-and-a-half month period the website amassed 539 unique points identifying locations of concern by the community. The points were distributed across five categories:

1) Accessibility Concern
2) Safety Improvement Idea
3) Bicycle Safety Concern
4) Pedestrian Safety Concern
5) Vehicle Safety Concern

The results are visualized below in Figure 1 and a comment log of all online comment map input is included at the end of this document.

Figure 1. Online Comment Map



Key Takeaways from the Online Comment Map

To learn more about these safety concerns and where they are happening, see the public comment tables at the end of the appendix.

Vehicle Safety Concerns

- **Intersection safety**: Poor control and risky left turns contribute to confusion and crashes.
- **Speeding and driver behavior**: Excessive speeds and failure to follow traffic rules.
- **Visibility issues**: Hills, curves, vegetation, and glare reduce sightlines and reaction time.
- **School zone safety**: High foot traffic and chaotic conditions near schools lead to frequent near misses.
- **Rural roadway hazards**: Narrow shoulders, faded markings, and lack of turn lanes create unsafe conditions.
- **Crash-prone areas**: Specific locations repeatedly cited for collisions and near misses.
    - The area near the Kwik Trip (Byron)
    - 10th Ave NE and 4th St NE (Byron)
    - S Broadway and Hwy 52 (Rochester)
    - Hwy 63 (Rochester)
    - Civic Center Dr (Rochester)
    - Viola Rd (Rochester)

Accessibility Concerns

- **Missing or inadequate curb ramps**: Prevents safe transitions between street and sidewalk.
- **Obstructed or poorly placed pedestrian signals**: Limits accessibility and usability.
- **Sidewalk gaps or ledges**: Creates barriers for wheelchair users and others with mobility aids.
- **Lack of pedestrian infrastructure**: No sidewalks or separation from traffic.
- **Unsafe design and visibility**: Forces users into traffic due to poor sight lines or layout.

Safety Improvement Ideas

- **Intersection control**: Need for roundabouts, stop signs, and signals to improve safety and visibility.
- **Speed management**: Requests to lower speed limits and add calming features like speed tables and signage.
- **Pedestrian access**: Gaps in sidewalks, crossings, and transitions hinder safe and accessible movement.
- **Trail connectivity**: Desire for practical trail links to destinations and formalization of informal paths.
- **Lighting and visibility**: Add lighting and remove obstructed sight lines improve safety for all modes.
- **Design priorities**: Infrastructure often favors cars over people; better wayfinding and layouts are needed.
- **Parking safety**: Improve parking practices to enhance visibility and access.
- **Wildlife conflicts**: Requests for signage to reduce animal-vehicle collisions.

Bicycle Safety Concerns

- **Connectivity gaps**: Incomplete bike lanes and trail links force unsafe detours and transitions.
- **Hazardous conditions**: High-speed traffic, poor visibility, and unsafe crossings endanger non-drivers.
- **Trail and road maintenance**: Cracked pavement, debris, and outdated infrastructure create safety risks.
- **Vehicle conflicts**: Cars blocking bike lanes and unsafe driving behaviors disrupt bike travel.
- **Signage and visibility**: Inadequate markings and poorly placed signals confuse users and reduce safety.
- **Youth safety**: Kids face dangerous routes to schools and parks due to missing infrastructure.
- **Bike amenities**: Limited and poorly located bike parking lacks supporting infrastructure.
- **Network planning**: Need for a cohesive, citywide bike system with regional connections and protected lanes.

Pedestrian Safety Concerns

- **Unsafe crossings**: Lack of marked crosswalks, signals, and driver compliance creates dangerous conditions.
- **Speed and traffic volume**: High speeds and heavy traffic near schools and parks make walking unsafe.
- **School zone safety**: Students face risky crossings due to missing infrastructure and fast-moving vehicles.
- **Visibility issues**: Hills, curves, vegetation, and poor design reduce driver awareness and reaction time.
- **Infrastructure needs**: Requests for pedestrian-focused upgrades like signals, bridges, and better signage.

Pop-Up Events

The project team hosted a series of pop-up events to engage the community where people were already gathering. The approach focused on leveraging existing community events, enabling the team to engage residents in their own community spaces; often setting up a booth alongside other vendors or staff. A list of the pop-up events is provided below:

- Byron Good Neighbor Days – July 19, 2025
- Eyota Days – July 19, 2025
- Rochester Safe City Nights – July 22, 2025
- Oronoco's National Night Out – August 5, 2025
- Rochester Safe City Nights – August 12, 2025
- Chatfield Public Library – October 8, 2025
- Stewartville Fire Safety and Prevention Open House – October 8, 2025

More than 750 people were engaged in-person at seven pop-up events across the ROCOG planning area, including Byron, Chatfield, Stewartville, Eyota, Oronoco, and Rochester. Youth and families were actively engaged via a tactile activity; the prompt and results are summarized below.

Prompt: Using 5 marbles, what would you prioritize to improve transportation safety in Olmsted County?

There are 7 categories, so you can't prioritize everything. You can use your marbles however you'd like – spread them out, or add them all to your top priority:

- **Intersection Safety (for people who walk or bike) -** Includes crosswalks, stop lights, lighting enhancements, pedestrian islands, and curb ramps that make crossings safer.
- **Intersection Safety (for people who drive) -** Adding turn lanes, recommending improvements at uncontrolled intersections, stop lights, roundabouts, or J-turns.
- **Fill Sidewalk and Trail Gaps -** Connect missing links to make walking and biking routes continuous. This could also include improvements to trail lighting.
- **Slower Vehicle Speeds -** Traffic calming, speed limits, pavement markings, and street design to reduce crash risk.
- **Highway Pavement and Safety Improvements -** Adding shoulders, maintaining and improving ditches, lighting, pavement preservation, signage.
- **Accessibility Improvements -** Fixing curb ramps, uneven sidewalks, improving transit availability and access, and addressing other barriers for people with disabilities.
- **Education and Enforcement -** Programs that encourage safe behaviors for all road users, strategies for addressing inattentive driving, law enforcement coordination.

Table 1: Pop-up engagement prioritization activity results

Categories	Byron	Eyota	Rochester (July 22)	Oronoco	Rochester (Aug 12)	Chatfield	Stewartville	Total	Percent of Responses
Intersection Safety (for people who walk or bike)	33	2	115	37	111	9	67	374	19.4%
Education and Enforcement	20	1	101	29	105	6	41	303	15.7%
Accessibility Improvements	20	9	82	31	112	8	37	299	15.5%
Fill Sidewalk and Trail Gaps	22	13	76	29	85	5	39	269	14.0%
Highway Pavement and Safety Improvements	20	1	53	27	90	4	40	235	12.2%
Slower Vehicle Speeds	12	5	71	24	78	3	33	226	11.7%
Intersection Safety (for people who drive)	14	4	68	20	67	5	41	219	11.3%
Total	**141**	**35**	**566**	**197**	**648**	**40**	**298**	**1,925**	**100.0%**

A summary of each pop-up engagement event is available on request from ROCOG staff.

Focus Groups

ROCOG hosted five targeted focus group discussions with key stakeholders:

- Bicycle, pedestrian and accessibility advocates - September 23, 2025
- Emergency responders – September 26, 2025
- Rochester-Olmsted Youth Council – October 1
- Older adults – October 6 & October 8

Key Takeaways

Focus Group Themes - <u>Engineering & Infrastructure</u>

- High-Risk Roadways and Intersections - Highways 14, 52, and 63 and several local roads are high-speed corridors with safety concerns for drivers and pedestrians which are listed in the key themes.
- People who walk, bike or roll face danger from missing trail links, confusing lane markings, distracted driving and lack of physical protection.
- Roundabouts received mixed reviews. While generally supported, pedestrians and bicyclists expressed concerns about drivers not yielding, and others noted design issues such as flat centers or obstructing foliage.
- Drivers often fail to see cyclists, and pedestrians also risk injury by crossing the street mid-block.

Focus Group Themes - <u>Driver Behavior & Educational Opportunities</u>

- Education Gap - There is a widespread lack of knowledge on modern road designs, particularly roundabouts and bike lane markings, among older drivers and long-time residents. Youth and emergency responders note that young drivers may learn the rules, but their parents do not.
- Distracted driving is a shared problem across all ages, and many drivers would prefer additional enforcement.
- School zones were consistently noted as an area of importance for improving transportation safety.
- Safety concerns exist regarding the presence of uncontrolled micro-mobility devices, including e-bikes, scooters, golf carts, and ATVs, on roads and sidewalks.
- Visible police presence is necessary to ensure drivers comply with posted speed limits.

A summary of each focus group discussion is available on request from ROCOG staff.

The following themes were identified via conversations with residents across all in-person engagement events

Pedestrian & Cyclist Safety

- Lack of sidewalks
- Unsafe crossings
- Narrow shoulders
- ADA accessibility issues

Traffic Behavior & Speeding

- Speeding in residential areas
- Drivers ignoring stop signs
- Distracted/inattentive driving
- Confusing road layouts
- Need for driver education (youth and older drivers)

Transit & School Safety

- Safe crossings at schools
- Parking lot safety concerns
- School-related intersection safety

Connectivity & Growth

- Desire for trail connections
- Need for infrastructure to support growth and encourage safe driving

Infrastructure Conditions

- Poor sidewalk conditions
- Lighting Issues

Child Safety

- Car seat awareness
- Children playing in streets
- Bicycle safety and education

Comment Log

Comment #	Comment	Category
1	On the south side of this corner, there is a big ledge to get to the sidewalk. It requires you to go up someone's driveway	Accessibility Concerns
2	Critically unsafe. No ADA-accessible curbs on the south side and sight lines are extremely poor due to 1st Avenue Flats parking. This design flaw compels every road user (walkers, bikers, drivers, and those with mobility aids) to enter traffic unsafely.	Accessibility Concerns
3	One of the WALK buttons on the east side of the road is a foot off of the sidewalk and behind a bunch of tall grass. Even if the grass were cleared, the gap between the button and the sidewalk needs to be narrowed	Accessibility Concerns
4	No sidewalks or separation from car traffic to navigate west-east or east-west.	Accessibility Concerns
5	Since the gate is always closed here, all that's left is an area with a large ledge so get wheelchairs up it is very hard to do	Accessibility Concerns
6	It would be really great if there was a way to safely bike from the taco bell/walmart/starbucks area all the way to the movie theater/south target area without having to go all the way around to Mayowood or Gamehaven.	Bicycle Concerns
7	The bike trail here where cracks were sealed has made for a really rough bike trail. All the tar filled cracks have sunken in and it's painful and really bumpy	Bicycle Concerns
8	There is a very large edge on the drive to get from the street bike lane to the bike path that goes under the bridge. You really have to prepare to hit it at a 45-90 angle safely	Bicycle Concerns
9	The bike lane ends abruptly here (because of the hill obviously) so it'd be great if there was some other option without rejoining traffic	Bicycle Concerns
10	Extend the bike lane out on E Center St further East from Mayo Civic Center	Bicycle Concerns
11	Crossing N Broadway to go between the multiuse paths on either side is dangerous. I've been almost hit numerous times, mostly from drivers not properly executing right turn on red, or turning anyway when someone is in the crosswalk.	Bicycle Concerns
12	I was nearly killed here in 2022. There is no shoulder with a deep ditch. I was passed by a speeding gravel dump truck when there was oncoming traffic. I had to dive into the ditch to save my life.	Bicycle Concerns
13	This is a tight blind turn. The ideal solution is to reroute the trail from 16th Ave along the creek. An interim solution might be a mirror to see around the turn.	Bicycle Concerns
14	This crossing can be dangerous because of the 4 lanes of traffic. This should be reduced to two lanes.	Bicycle Concerns
15	County 10 has a nice paved shoulder for most of its length but inexplicably loses shoulder pavement at the very point it is needed most near the I90 intersection. Please pave the shoulder the whole way.	Bicycle Concerns

Comment #	Comment	Category
16	There is no direct way to get from the Center Street bike lane to the Zumbro River multiuse path unless cyclists ride the wrong way on this one-way. Make it Two Way for bikes.	Bicycle Concerns
17	The safest way for bikes to get around this area is on the low volume streets, but 17th Ave is one way. Make it two way for bikes.	Bicycle Concerns
18	This is one of the better routes to get to/from downtown to the multiuse paths on the Zumbro River to the East. But it is one way. Make it two way for bikes.	Bicycle Concerns
19	This is another case where a Multiuse Path intersects with a street with a bike lane, but there is grass and a high curb between. Add a ramp/curb-cut to connect the two,	Bicycle Concerns
20	Everywhere. Drivers drive too fast. Why can't we implement a policy, much like the Twin Cities of 20MPH, unless otherwise posted.	Bicycle Concerns
21	Bike lane ends	Bicycle Concerns
22	Bike lane ends	Bicycle Concerns
23	Elton Hills Drive, between HWY 52 and N Broadway, is horrible for cars, bikers, and pedestrians. There should be a bike lane to allow more room on the sidewalks for walkers and runners.	Bicycle Concerns
24	heading towards silver lake, wonder about making bike lanes more visible	Bicycle Concerns
25	Motorists creep across the trail and block trail crossings. Add stop signs or stop lines?	Bicycle Concerns
26	Cars are often parked in the dedicated bike lanes causing a biker to have to swerve into the street	Bicycle Concerns
27	Cars are often parked in the dedicated bike lanes causing a biker to have to swerve into the street	Bicycle Concerns
28	Cars do pass bikers and can't see cars that might be on the otherside of the hill	Bicycle Concerns
29	The crossing is very difficult on the south side. Very narrow short sidewalk next to a ditch. This is so badly designed.	Bicycle Concerns
30	The bridge sidewalk should be twice as wide so bicycles can pass each other without one worrying about falling into the roadway. Very dangerous, especially for kids.	Bicycle Concerns
31	Bike Lane disappears as you approach 7th.	Bicycle Concerns
32	A curb cut so bikes could get off of trail and into apartments would be useful.	Bicycle Concerns
33	Curb cuts here so bikes can go from neighborhood to trail without having to travel on narrow sidewalk	Bicycle Concerns

Comment #	Comment	Category
34	Bumpy trail means bikes more likely to use road, creating friction. City doesn't have plan for maintaining trails it seems.	Bicycle Concerns
35	Feels safer to go against traffic when crossing bridge. Can see if oncoming cars taking a right vs not being able to see them and risking getting hit.	Bicycle Concerns
36	Very long, exposed crossing for a bicycle.	Bicycle Concerns
37	Trail connection to road takes an odd angle, bikes get nasty bump on curb unless slowing way down.	Bicycle Concerns
38	Trail ends and crossing is dangerous. Should have connection all the way to existing trail at 18th Ave.	Bicycle Concerns
39	Incomplete bike lane. Two blocks away from connecting Center Street to existing bike lanes.	Bicycle Concerns
40	Bike lane on west side gets very narrow.	Bicycle Concerns
41	Bicycle paint is faded and drivers seems to be aggressive towards bicyclists here	Bicycle Concerns
42	this track crossing is poorly paved - really hazardous to cross for bikes or mopeds	Bicycle Concerns
43	this is the only bike parking around and this area experiencing lots of lifting on bicycles so it feels unsafe to park here	Bicycle Concerns
44	When crossing roads, it helps to have a smooth connection between path and road. This one is very sharp and causes a bad bump if you have any speed.	Bicycle Concerns
45	path crosses tracks and is poorly paved.	Bicycle Concerns
46	No trail crossing at this intersection. Vehicles traveling to fast for safe crossing	Bicycle Concerns
47	Kids on electric scooters go flying through this intersection without looking for cross traffic.	Bicycle Concerns
48	A lots of kids crossing for school	Bicycle Concerns
49	No safe bicycle or pedestrian crossing on Hwy. 14 in the Byron area	Bicycle Concerns
50	wide trail turns into narrow sidewalk and then is gone completely. Horrible trail gap for kids especially. Blocks access to beach.	Bicycle Concerns
51	Blind corner.	Bicycle Concerns
52	blind corner	Bicycle Concerns
53	having a trail on the east side of Valleyhigh would allow people to bike out of Nachreiner Park neighborhood and onto Douglas Trail.	Bicycle Concerns
54	Difficult for students to get to bike path	Bicycle Concerns

Comment #	Comment	Category
55	Crossing to ballfields and playgrounds	Bicycle Concerns
56	Very difficult to see cars when entering roundabout from any direction. Burn needs to come down so drivers going north to south can see bikers and pedestrians. Speed limits also need to be decreased from 45/55 mph to 30 mph because we are within city limi	Bicycle Concerns
57	Bike Lane disappears, unclear markings at intersection.	Bicycle Concerns
58	If bike wants to get onto 7th, no obvious curb cut to use.	Bicycle Concerns
59	path goes right to very sharp high curb cut, very difficult for rider to transition between path and road.	Bicycle Concerns
60	Sign post right on edge of trail and a danger to those coming from Broadway Crossing.	Bicycle Concerns
61	Bikes going from trail to 3rd Ave can't enter road with any speed. This means crossings take longer and are more dangerous. Add a curb cut.	Bicycle Concerns
62	Very sharp curb where street transitions to path. Smooth it out. Rochester's lack of flexibility with curbs is embarrassing. Get a grinder and problem solved in 10 minutes. Just do it!	Bicycle Concerns
63	Crossing out for a while? Why? Don't have to make it great. Just put some paving stones in and have a flimsy foot bridge for when the water's high right after rain.	Bicycle Concerns
64	Trail switches sides. A curb cut would allow riders to transition easier, with less traffic conflict.	Bicycle Concerns
65	Sharp 3" drop as bridge transitions to path. Get a grinder out there, 15 minutes work and fixed!	Bicycle Concerns
66	Sharp turn from road bike lane to trail. Make it easier for bikes with speed to enter trail from road.	Bicycle Concerns
67	the trail has a sharp curb so you have to stop, but then traffic is encouraged to move quickly due to very wide road and pavement curve. It highly encourages right on red without a stop or a look to the right.	Bicycle Concerns
68	sharp blind corner under railroad. Ad sign at very least saying slow down and stay to right. Both ways!	Bicycle Concerns
69	Gate here is always closed, going around on bike, very sharp curb cut. A little bit of asphalt could smooth out easily.	Bicycle Concerns
70	Condition of trail discourages use, increases likelihood a person will choose to drive.	Bicycle Concerns
71	Curb cut connections between bike lanes and trail allow bikers to bypass walkers if they judge traffic levels on road to be safe.	Bicycle Concerns

Comment #	Comment	Category
72	Students crossing here for school activities and the speed limit is 55mph. Lower speed/ put in a crosswalk	Bicycle Concerns
73	Kids need a crosswalk to get to high school for camps in the summer. Also probably needed during the school year as well. Crossing this road would lead to a bike path.	Bicycle Concerns
74	Due to construction on SE corner having fabric over the fencing, cannot see cars at this intersection. This is a problem coming from both South and East.	Bicycle Concerns
75	Blind corner and virtually always has rocks and other debris. Have had several near falls due to debris. People walk down from rail bridge and knock rocks onto path. Need some sort of barrier along edge to keep it out.	Bicycle Concerns
76	bike path along creek has a mostly blind corner here. Also, rocks under this bridge are climbed on and smaller ones fall on to path.	Bicycle Concerns
77	Turns immediately from bike path to sidewalk with no real way for bikes to get onto street. Bikes forced to either go through grass or continue on sidewalk. Many pedestrians on this stretch and side walk is narrow.	Bicycle Concerns
78	Several holes were cut in this block of street and the replacement is not level with old street. Very large bumps.	Bicycle Concerns
79	This is right outside a designated bike parking space for mayo employees and no bike lane.	Bicycle Concerns
80	This is right outside a designated bike parking space for mayo employees and no bike lane.	Bicycle Concerns
81	This stretch of road is only north bound bike lane for several blocks. The south bound lanes are closed a street over. Make it a two way cycle track to allow both north and south transit.	Bicycle Concerns
82	This stretch of road is only north bound bike lane for several blocks. The south bound lanes are closed a street over. Make it a two way cycle track to allow both north and south transit.	Bicycle Concerns
83	This stretch of road is only north bound bike lane for several blocks. The south bound lanes are closed a street over. Make it a two way cycle track to allow both north and south transit.	Bicycle Concerns
84	Cars often parked in bike lane.	Bicycle Concerns
85	Delivery trucks often parked in bike lane.	Bicycle Concerns
86	The bike lane just disappears.	Bicycle Concerns
87	Coming from North, bike lane just disappears. Apparently, I'm supposed to teleport the next several blocks until it comes back.	Bicycle Concerns

Comment #	Comment	Category
88	Can confirm have had multiple near misses here, especially on NE corner. People take rights on red and the left turners try to beat the bikes and just go. traffic also backs up over crosswalk and make it inaccessible.	Bicycle Concerns
89	This section was "closed" for a week before any work was started earlier this summer. No reason the construction signs couldn't have been off to the side until actually starting.	Bicycle Concerns
90	This stretch of bike path is not only not on this map, but also does not have lights making it dangerous to navigate in the dark.	Bicycle Concerns
91	Bike lane on east side has a giant tree/bush growing from boulevard and it covers virtually whole bike lane, making it unusable for this stretch from top of hill to Elton hills.	Bicycle Concerns
92	This is approximately where there is a bike path crossing 9th (not on map on west side). Cars move too fast and don't stop for peds.	Bicycle Concerns
93	This stretch of bike path on the east side is in horrible condition, extremely bumpy. Seems it hasn't been maintained since placed in the 1980s.	Bicycle Concerns
94	This whole section is pretty rough, but there is an area where there is a huge hole in the path where almost 1/2 is just missing. This has been here for years. Is there no plan to upkeep these paths like we do roads?	Bicycle Concerns
95	I need a safe place to lock my bike when using the library. It does't feel safe to leave here.	Bicycle Concerns
96	bridge has been out for > 1 year, forcing people to cross at dangerous intersections instead.	Bicycle Concerns
97	Maybe a mirror to help with blind corner? Have seen collisions.	Bicycle Concerns
98	This entire section crossing over the frontage roads on both sides and 52 is a nightmare. There are so many little intersections and people park over crosswalks waiting for their light. It is slightly better to go on the side against traffic on sidewalk.	Bicycle Concerns
99	Whole bridge is a death trap on bike. Need to go on sidewalks just to not die.	Bicycle Concerns
100	The crossing signals are often ignored by vehichles. The north one is hidden by a tree and the south one cannot be seen with sunlight glare.	Bicycle Concerns
101	Need better biking path or protected bike lane along 16th street - Drivers are horrible at noticing and yielding to people walk/biking while crossing intersections. Drivers don't see me before entering the intersection and i have been almost hit many time	Bicycle Concerns
102	Need better biking path or protected bike lane along 16th street - I bike frequently from neighborhoods east of Broadway Ave (near Mayo High) to the shopping centers by Apache Mall and am almost hit VERY OFTEN at residential intersections	Bicycle Concerns

Comment #	Comment	Category
103	There are no bike lanes or sidewalks. Bikes will drive in the road and it's just too fast and heavy traffic to be safe.	Bicycle Concerns
104	Bike lane continuation is difficult to naviage from 3rd Avenue onto W River Pkwy. Cars are impatient at intersction, and will pass bicycles over double-yellow lines.	Bicycle Concerns
105	Often difficult to cross here during commuting times	Bicycle Concerns
106	Bike lanes on 19th St NW feel like a joke since traffic moves faster than speed limit and cars are parked on the side.	Bicycle Concerns
107	Inadequate signage/lane marking for motorists needing to merge into L lane when W bound. Leaves motorists making abrupt lane change ACROSS bike lane. Bike lane should remain to the far Right.	Bicycle Concerns
108	Paved drainage ditch resembles a bike path. It needs to be either redesigned, or marked as a hazard.	Bicycle Concerns
109	Multi-use trail is extended here on the east side of Cascade Creek but has a very dangerous connection to 10th St NW with constricted access, pitched sidewalk sections and need to use private drives for curbcuts.	Bicycle Concerns
110	Bridge crossing for both Peds and cyclists is far to narrow on both north/south sides. Needs to be widened like done on 7th St NW bridge.	Bicycle Concerns
111	Blind corner needs better marking/warning for both Peds and cyclists.	Bicycle Concerns
112	Traffic coming off Weatherhill Rd SW are often carrying excessive speed due to downhill descent and frequently roll through the stop sign and into the crossing shoulder. Needs a STOP LINE added and ideally rumble strips.	Bicycle Concerns
113	Activation of the cross walk lights does not allow users to SEE or HEAR that the signal is active. Curb cut is not ADA compliant.	Bicycle Concerns
114	Blind corner needs better warnings and lane markings.	Bicycle Concerns
115	Constricted and poorly designed connection to street using blind corner, narrow sidewalk and private drives for curb cuts.	Bicycle Concerns
116	Sidewalk alongside of the restrooms is used as the defacto route to the preferred/safer route through the park. Needs to be widened and re-designed.	Bicycle Concerns
117	Exit to 7th St. NW off the bridge is not adequately marked as a hazard for incoming Ped/cyclists.	Bicycle Concerns
118	bike path very rough	Bicycle Concerns
119	bike path very rough	Bicycle Concerns
120	Would love to see options for biking to/from Chatfield into Rochester. US 52 is NOT safe with how people drive.	Bicycle Concerns

Comment #	Comment	Category
121	This intersection always takes two light cycles to cross on the sidewalk, which causes some to not wait for the signal.	Bicycle Concerns
122	Crossing from the path on the east of W circle drive to the west side is very dangerous	Bicycle Concerns
123	Bike lane dead ends shortly before the bridge, without safely allowing cyclists to merge onto the sidewalk. Although, I believe this is banned to be resolved when the road is restricted for LINK	Bicycle Concerns
124	19th street (or another E-W) county road needs to accommodate bicyclists better, because currently it is really hard to go between Rochester and Byron safely without a car. The best option would be a new trail like the Douglas trail going west here.	Bicycle Concerns
125	Bike down center or first, no good way to cross highway without backtracking. 2nd is a disaster to try and cross east to west	Bicycle Concerns
126	The main north-south track should not be the main patient in-out for mayo. Too many drivers without a sense of where they are going. Almost been hit many times despite having a dedicated lane.	Bicycle Concerns
127	Trail ends and there is no good way to get down Salem road to commute to mall or to tj max,	Bicycle Concerns
128	cars turning from the off ramp to westbound 2nd Street fail to yield to pedestrians and cyclists	Bicycle Concerns
129	The bike lanes on 11th is useless if it doesn't have an extended north south corridor. It is only through the neighborhood.	Bicycle Concerns
130	Bike lane ends and you must cut through grass or next to bathroom.	Bicycle Concerns
131	Very difficult to commute here, and shopping is here	Bicycle Concerns
132	Crosswalk buttons too close to road. Do not feel safe pushing button and waiting while cars and large trucks zoom past often speeding (even if they weren't speeding, the cars are still traveling very fast)	Bicycle Concerns
133	Bike infrastructure along 16th Street is inadequate. Traffic is too heavy on the four-lane right of way and a sidewalk along 16th Street is too narrow for bikes and pedestrians. Turning drivers are not cued to be alert for pedestrian and cyclists.	Bicycle Concerns
134	Bike access into Greenview offices, homes is difficult across four lanes of traffic	Bicycle Concerns
135	New wave of park & walkers here (no permits for parking) and makes visibility challenging - no bike lane along 7th, people act like it's a 4-way. dangerous.	Bicycle Concerns
136	Cyclists bike down this one way often / because it feels safer than the adjacent roads. ?	Bicycle Concerns

Comment #	Comment	Category
137	When turning left from 7th onto Broadway (in either direction), the lack of a dedicated left turn signal makes bikes stranded in the middle of the intersection. A protected bike intersection could eliminate any safety issues like this.	Bicycle Concerns
138	The abrupt ending of the beautiful bike path makes travel further into downtown feel treacherous.	Bicycle Concerns
139	Dedicated & separated safe bike lane on 4th St would help reduce bike safety concerns and connect with near by trails.	Bicycle Concerns
140	With such narrow shoulders, biking feels really dangerous here	Bicycle Concerns
141	See other comments. Unsafe for bikes as well as pedestrians due to uphill curve, sun angle at times of year, and increased number of homes/traffic	Bicycle Concerns
142	There's not really a great way easily get from shops north of here to the shops south of here - and there's been some folks walking under the bridge.	Pedestrian Concerns
143	There's not a lot of room for people to walk to the city park here - the shoulders are so narrow and seems to frequently have people walking	Pedestrian Concerns
144	Need controlled crossing on 15th Ave SE.	Pedestrian Concerns
145	crossing this is always a little scary because there is no pedestrian light for this on ramp so traffic doesn't always wait even if the ped light is on for the rest of the intersection	Pedestrian Concerns
146	Crosswalk is needed.	Pedestrian Concerns
147	Speed and accessibility concern	Pedestrian Concerns
148	Pedestrian Crossing Needed. Unsafe grade and this is the access to the Mill Creek Park area used by school sporting teams as well as community access to the walking paths.	Pedestrian Concerns
149	MNDoT's plan to reconstruct this intersection is more dangerous (than it already is) for pedestrians crossing.	Pedestrian Concerns
150	This intersection is very dangerous to cross. Last week I was nearly hit by a driver executing a right tuen on red when I had the walk light. The sequence of light changes actually contributes to the issue.	Pedestrian Concerns
151	This is a particularly tricky intersection for those using the multiuse path when car traffic is busy.	Pedestrian Concerns
152	with new businesses across the street, would be great to have a walking cross area here across broadway safely	Pedestrian Concerns
153	Way too much high speed and loud cars on 6th ST SW. Pedestrians and dog walkers feel intimidated.	Pedestrian Concerns
154	Pedestrian "beg button" northbound disappeared within the past week	Pedestrian Concerns

Comment #	Comment	Category
155	People look to the left to turn right and do not stop which makes it unsafe to cross when using the trail	Pedestrian Concerns
156	It’s no wonder kids don’t walk to school when the vast majority would need to cross at least 4 lanes to get to school - right next to school!	Pedestrian Concerns
157	Pedestrian crossing at West Circle Drive(Ry 22) at Berkshire Rd SW	Pedestrian Concerns
158	Little kids are often crossing 6th to go the park from the neighborhood, and cars are speeding down 6th avenue despite a "Stop for pedestrians" crosswalk	Pedestrian Concerns
159	Cars are flying down this hill and it is very unsafe for pedestrians to cross which is concerning because it is is a route to a daycare and required if you are using a sidewalk to go uphill on 6st sw	Pedestrian Concerns
160	There's a crossing here, but when crossing from the West, the curve makes it hard to see if cars coming from the north. Also, cars coming from the north can't see you until you're out in the roadway.	Pedestrian Concerns
161	Unfinished pathway. This will get worse with Chick Fil A coming in nearby.	Pedestrian Concerns
162	Need a pedestrian safety light somewhere between 14th and Hoover. Ninth is not the place as there is too much traffic coming off or going onto that road.	Pedestrian Concerns
163	There's a pedestrian crossing sign but cars ignore. Need more infrastructure on 9th to slow down cars to speed limit.	Pedestrian Concerns
164	Sidewalk not connected to neighborhood sidewalk that runs to south.	Pedestrian Concerns
165	Not having a sidewalk to connect 25th Ave to Valleyhigh Dr was an extremely poor decision	Pedestrian Concerns
166	trail abruptly ends, no crossing set up	Pedestrian Concerns
167	Crossing Elton Hills is dangerous! Too wide, too fast, no infrastructure. Neighborhoods are almost cut off from one another.	Pedestrian Concerns
168	Cars do not slow down here. Very dangerous crossing.	Pedestrian Concerns
169	The beg button takes way too long to respond. In fact I think it only adds time, it doesn't speed it up. Thus more people tempted to cross without light rather than waiting.	Pedestrian Concerns
170	Trail is on east side of W Circle Dr SW. I walk a lot, but I cannot safely cross from Berkshire Rd SW to get to the trail system. W Circle Dr traffic is too fast and I cannot see traffic approaching from the south due to the curve.	Pedestrian Concerns
171	Several sidewalk gaps here despite apartments, a gymnastics academy, and a nearby trail.	Pedestrian Concerns
172	Trails on one side, history center on the other, and a four lane highway where traffic goes 50mph in between. Need a crossing signal.	Pedestrian Concerns

Comment #	Comment	Category
173	sidewalk disappears here	Pedestrian Concerns
174	turn lanes for getting on or off Elton Hills seem to be twice as wide as necessary. Makes pedestrian crossing seem risky.	Pedestrian Concerns
175	odd shape intersection is made harder to cross by everything being so wide and rounded. More difficult for pedestrians to cross.	Pedestrian Concerns
176	There's half mile gap here between pedestrian crossings	Pedestrian Concerns
177	this is a common crossing point that could use a pedestrian light to get to the trail on the north side of viola	Pedestrian Concerns
178	From a pedestrian standpoint, this whole area seems designed to get one run over.	Pedestrian Concerns
179	This road would be safer to cross if two lanes. Not really the traffic present to need four lanes.	Pedestrian Concerns
180	Consider slower speed limit and pedestrian crossing blinking lights	Pedestrian Concerns
181	Slower traffic currently set to 40 have crossing lights for pedestrians	Pedestrian Concerns
182	This intersection is horrible for walkers, bikers, drivers, etc. way too busy for the set up that is here currently. I drive out of my way to avoid this disaster of an intersection	Pedestrian Concerns
183	Hard to cross-busy	Pedestrian Concerns
184	Needs 4 way stop when 4th connects out to County Rd 3 to slow traffic by the park. Many kids cross at this intersection for sporting events and cars fly through the "crosswalk"	Pedestrian Concerns
185	Formal crosswalk for park access. Many kids cross the road at this intersection and there is no stop signs on 4th that is now connected out to County Rd 3	Pedestrian Concerns
186	Unsafe to cross	Pedestrian Concerns
187	Unsafe to cross	Pedestrian Concerns
188	Traffic to fast for safe pedestrian crossing	Pedestrian Concerns
189	No trail crossing here	Pedestrian Concerns
190	No trail on East side of County Road 5	Pedestrian Concerns
191	Not safe to cross street	Pedestrian Concerns
192	bus passengers standing is street waiting for bus	Pedestrian Concerns

Comment #	Comment	Category
193	Traffic moves way too fast at this intersection and is often more concerned in trying to cross than looking for pedestrians. A round about might help with traffic congestion and pedestrian safety.	Pedestrian Concerns
194	People from the church parking lot aren't crossing in the crosswalk. This is dangerous because the hill prevents drivers from seeing them in enough time to stop	Pedestrian Concerns
195	Poor signage . Small / minimal warning lights	Pedestrian Concerns
196	School cross for a lot of kids . Also lots of car accidents	Pedestrian Concerns
197	The speed of traffic with the pedestrian traffic over one of the busiest streets. No stop sign, cars hitting the medians, the crossing lights that no one pays attention to. This intersection is a disaster.	Pedestrian Concerns
198	Add crosswalk warning lights for county 5. There is a significant amount of pedestrian and bike traffic that crosses county 5 using 9th St.	Pedestrian Concerns
199	Cars fly by this intersection that’s a busy pedestrian intersection	Pedestrian Concerns
200	I’ve almost gotten hit here multiple times, even with the flashing pedestrian crossing is on.	Pedestrian Concerns
201	Crosswalk to ballfields	Pedestrian Concerns
202	Crosswalk	Pedestrian Concerns
203	Add speed hump	Pedestrian Concerns
204	Add speed hump	Pedestrian Concerns
205	It is difficult to safely cross the road to get to the sidewalk across the road. There is a hill when looking south making it difficult to cross, especially with the speed limit.	Pedestrian Concerns
206	How are high school students supposed to cross the county road when this is deemed an unsafe crossing?	Pedestrian Concerns
207	Very awkward intersection. When is it supposed to be safe for pedestrians if one direction doesn't have to stop?	Pedestrian Concerns
208	Streets that run parallel to main drives are often safer/less noisy for pedestrians and bikes. But ONLY if streets or at least sidewalks go through. Should have been a sidewalk connecting to 26th Ave here.	Pedestrian Concerns
209	No crosswalk here and no sidewalk on the other side of the road.	Pedestrian Concerns
210	Busy intersection with kids trying to get to school.	Pedestrian Concerns
211	No cross walk for kids to get to school	Pedestrian Concerns
212	Crosswalk needed	Pedestrian Concerns

Comment #	Comment	Category
213	Connect sidewalk from Somerby to Hwy5. Significant amount of pedestrians including children going to and from middle and high schools.	Pedestrian Concerns
214	Difficult for students to cross the county road safely to get access to the walking path	Pedestrian Concerns
215	Difficult for people to cross the road to get to the walking path (students.)	Pedestrian Concerns
216	Trail connection but no crosswalk, cars speed way too fast. Near-misses for kids crossing to go to high school or middle school.	Pedestrian Concerns
217	No crosswalk yet trail connection at this intersection. Kids crossing this daily to get to high school or middle school. Extremely busy before school and after school so kids end up sprinting to get across. Difficult to judge speed of cars	Pedestrian Concerns
218	Crosswalk needed and sidewalk needed on 9th St	Pedestrian Concerns
219	With the development of neighborhoods in this area, this crossing is highly used. There are no crosswalk markings to cross County 5, and there are no pedestrian crossing signs to alert drivers. Pedestrian activated blinking crosswalk signs should be added	Pedestrian Concerns
220	Super busy before and after school, mini roundabout needed	Pedestrian Concerns
221	Crossing to walk to the middle school/high school. Also vehicle traffic during morning and after school times.	Pedestrian Concerns
222	Many pedestrians cross to ballfields and playground	Pedestrian Concerns
223	Slight hill and cars drive too fast for pedestrians	Pedestrian Concerns
224	Crossing for walking path on 55mph road	Pedestrian Concerns
225	Cars drive too fast on 9th	Pedestrian Concerns
226	No safe way for pedestrians to cross	Pedestrian Concerns
227	extremely busy before/after school	Pedestrian Concerns
228	not well market for crossing busy road. need flashing light	Pedestrian Concerns
229	very busy/high speed crossing area. need flashing light at minimum. lower speed limit north of high school to 45 mph, build tunnel under Co road 5 for pedestrian crossing	Pedestrian Concerns
230	very busy/high speed crossing point for pedestrians. need flashing lights, lower speed limit to 45 mph north of HS, build tunnel under Co Road 5 for pedestrian crossing	Pedestrian Concerns
231	This is an unsafe intersection for pedestrians. I have witnessed multiple cars run the stop sign on Valleyhigh Dr. NW. Vehicles without the stop sign are often unaware of pedestrians trying to cross the intersection.	Pedestrian Concerns

Comment #	Comment	Category
232	This location needs a crosswalk	Pedestrian Concerns
233	Kids cross here all the time, could use a crosswalk with blinking lights, or an overpass	Pedestrian Concerns
234	Needs to have crosswalk or round about put in.	Pedestrian Concerns
235	Needs a crosswalk here with a signal.	Pedestrian Concerns
236	Very busy intersection with high school in one direction and middle school the other, many children need to cross. Also a higher speed limit (40) making it even more dangerous. I have witnessed many close calls here.	Pedestrian Concerns
237	Kids cannot safely cross here to get to the walking path/bike path to get to the high school.	Pedestrian Concerns
238	need cross walk lines. This is between where Mayo employees park and work. Have had several near misses from vehicles not stopping or even accelerating towards pedestrians. yes, it is Mayo, but it is a high use intersection..	Pedestrian Concerns
239	Have nearly been hit with a right on red multiple times at this intersection by both NE and SE corners. Would recommend making it no right on red. And having a longer leading pedestrian light as this is a high pedestrian use intersection.	Pedestrian Concerns
240	These pavers were nearly impossible to transit while on crutches. Kept catching on the letters; had several near trips.	Pedestrian Concerns
241	This stretch of path has no lighting.	Pedestrian Concerns
242	These are timed bus stops on a day/evening/weekend bus route yet, no pedestrian crossing at this intersection. And at least the north one doesn't even have a curb cut for mobility facing Elton Hills.	Pedestrian Concerns
243	Cars drive way, way to fast on this road. Need traffic calming measures and left turn lanes.	Pedestrian Concerns
244	seems trail crossing sign may be covered by trees as cars often don't stop.	Pedestrian Concerns
245	cars don't stop for pedestrian crossing. signs appear covered by trees. also curb cut on east side is in horrible condition.	Pedestrian Concerns
246	Cars going way too fast, speed limit is supposed to be ~35, but many seem to be drag racing.	Pedestrian Concerns
247	Have witnessed someone run a red light in front of a cop car and nothing was done.	Pedestrian Concerns
248	strangely shaped intersection making it difficult to see pedestrians. Also a very wide lanes north/south.	Pedestrian Concerns
249	Drivers run this 4 way stop frequently	Pedestrian Concerns

Comment #	Comment	Category
250	Lots of foot traffic /kids for school	Pedestrian Concerns
251	Lots of kids and bike traffic	Pedestrian Concerns
252	There are no sidewalks here. People will walk in the street. Especially with Groome Shuttle here there needs to be more pedestrian access.	Pedestrian Concerns
253	More people walking under 52, an easy access is becoming urgent	Pedestrian Concerns
254	The City of Eyota is split by Hwy 14, pedestirians from the Summerfield area of eyota to the rest of the city have to cross an active highway - this is not safe, a pedestrian bridge would allow kids from that neighborhood to walk to school safely	Pedestrian Concerns
255	Cars FLY down this road, and even though there is a large and obvious crosswalk sign with flags, it feels very unsafe.	Pedestrian Concerns
256	This is only a 2-way stop sign and that has been an issue at times, when people think its a 4 way.	Pedestrian Concerns
257	There is no stop sign for vehicles traveling N/S on 7th Ave, and cars really get going fast between the stop sign on 7th/9th and the stop sign on 7th /11th. Cars really fly down this stretch of road.	Pedestrian Concerns
258	Pedestrians dont always notice that there is no stop sign here- this is dangerous for both cars and walkers.	Pedestrian Concerns
259	Downtown is walkable south of this point and the residential neighborhood area is walkable north of this point, but crossing Civic Center Dr. is risking your life and is a strong deterrent for people in those neighborhoods who would like to walk downtown.	Pedestrian Concerns
260	This street/sidewalk connects to the bike path and lacks street lights to make it feel safe to use in the evening.	Pedestrian Concerns
261	This is a dangerous intersection for pedestrians as it's very wide. CArs turning right or left often don't watch for pedestrians.	Pedestrian Concerns
262	The sidewalk next to Subway is connected with no barrier to their parking lot. Also, the transit stop a this location has been struck be vehicles numerous times by vehicle. So much that RPT has put a concrete barrier next to the bus stop.	Pedestrian Concerns
263	Car eastbound on 4 St SW. Pedestrian southbound on 2 Ave SW. Driver cannot see pedestrian until almost to intersection because of high plants in center of 4 St SW.	Pedestrian Concerns
264	There’s a pedestrian crosswalk near here, but since it’s so busy and not lighted/signaled/noticeable, it’s very hard for vehicles to see you	Pedestrian Concerns
265	A sidewalk begins around here, but doesn’t connect to much	Pedestrian Concerns

Comment #	Comment	Category
266	Trail that runs behind here/into IBM is not maintained	Pedestrian Concerns
267	Need flashing pedestrian crosswalk from bear creek development to bike trail	Pedestrian Concerns
268	Critically unsafe for pedestrians. Southbound traffic on this road crests a hill with severely limited sight lines, causing cars to appear suddenly. Pedestrians attempting to cross face extreme collision risk, as experienced in near-misses.	Pedestrian Concerns
269	Confusing crossings, narrow and misaligned lanes, and a hazardous median create extreme collision risk. Negligent design requires urgent overhaul.	Pedestrian Concerns
270	Eastbound crosswalk indicator at this location is invisible to users when there is sun glare. Pedestrians cannot confirm their crossing signal, creating hesitation, confusion, and a serious collision risk.	Pedestrian Concerns
271	Right-on-red turns and left-turning vehicles consistently disregard crosswalk right-of-way, forcing pedestrians to yield or face collision. Extreme danger. Urgent signal/enforcement review needed.	Pedestrian Concerns
272	Critically narrow, dangerous, and infrastructural anti-human. This bridge offers no protection from the road, sacrificing pedestrian/cyclist safety for motorist convenience. Extreme hazard. Urgent redesign for human dignity.	Pedestrian Concerns
273	Critically unsafe. Prioritizes cars over human safety. Offset crosswalk means turning vehicles don't yield and assume right-of-way. Multi-directional approaches create confusion, hesitation, and extreme collision risk.	Pedestrian Concerns
274	There should be a stoplight here	Pedestrian Concerns
275	Bridge crossing for both Peds and cyclists is far to narrow on both north/south sides. Needs to be widened like done on 7th St NW bridge.	Pedestrian Concerns
276	Blind corner needs better marking/warning for both Peds and cyclists.	Pedestrian Concerns
277	Activation of the cross walk lights does not allow users to SEE or HEAR that the signal is active. Curb cut is not ADA compliant.	Pedestrian Concerns
278	Blind corner needs better warnings and lane markings.	Pedestrian Concerns
279	Constricted and poorly designed connection to street using blind corner, narrow sidewalk and private drives for curb cuts.	Pedestrian Concerns
280	Sidewalk alongside of the restrooms is used as the defacto route to the preferred/safer route through the park. Needs to be widened and re-designed.	Pedestrian Concerns
281	Exit to 7th St. NW off the bridge is not adequately marked as a hazard for incoming Ped/cyclists.	Pedestrian Concerns
282	This intersection NEEDS to prioritize pedestrians, bicyclists, etc. Please prioritize people here first, not cars.	Pedestrian Concerns
283	Cars do not stop at stop sign and almost always run through where walkers/bikers would cross. Have almost been hit numerous times. Drivers	Pedestrian Concerns

Comment #	Comment	Category
	speed through to use 9th ave nw to get to 37th st nw to bypass light on W riverparkway and 37 st.	
284	despite paved path on East side of Broadway, adjacent to Fairgrounds, it's a challenge to walk/bike from East to West to get to Walgreens/Crossroads Shops and link to trail next to HyVee	Pedestrian Concerns
285	Buttons for crosswalk too close to the road. Do not feel safe walking that close to zooming cars and large trucks	Pedestrian Concerns
286	No sidewalks. Especially difficult to walk along this street (either side) during winter.	Pedestrian Concerns
287	No sidewalks. There is a grassy area to walk on off the road, but that is unnavigable in the winter.	Pedestrian Concerns
288	Very fast traffic , definitely need lower speed and stop light. No one stop for pedestrian lights	Pedestrian Concerns
289	Please do something so many times people just won't stop for pedestrians	Pedestrian Concerns
290	No cross walk where road is narrowed and where there is heavy pedestrian foot traffic	Pedestrian Concerns
291	No cross walk where road is narrowed and where there is heavy pedestrian foot traffic	Pedestrian Concerns
292	No cross walk where road is narrowed and where there is heavy pedestrian foot traffic	Pedestrian Concerns
293	Better signs for foot traffic	Pedestrian Concerns
294	People driving way too fast, have almost been hit several times.	Pedestrian Concerns
295	This street is the only street to access more than 100 homes. There are lots of young families that live on this street and no sidewalks. Cars race through and it is very unsafe. My family has been in a lot of close calls with cars.	Pedestrian Concerns
296	The speed limit is too fast for walking traffic	Pedestrian Concerns
297	No where to walk other then the road	Pedestrian Concerns
298	No walk way	Pedestrian Concerns
299	We have no sidewalks in Oronoco. This creates a safety concern especially for children walking to their school bus stops. Also, all ages need a place to walk along our narrow streets safely.	Pedestrian Concerns
300	Cars drive too fast on Zumbro Hills with many young kids living on both sides of the road	Pedestrian Concerns
301	Many cars turn on 14 Ave to skip the lights at 11th Ave and zoom up and down this street which has kids playing	Pedestrian Concerns

Comment #	Comment	Category
302	This is a huge safety problem for cars, bikes, and pedestrians. You cannot see going up or down this hill at certain times of the day due to sun, and it's not wide enough for bikes or pedestrians. Very concerning.	Pedestrian Concerns
303	Very dangerous curve. Do not feel safe letting my kids bike or walk near here. Sun is at bad angle at times of year for drivers. No space to walk and an uphill curve.	Pedestrian Concerns
304	The sun hitting this spot causing vehicles to not be able to see the road, and people are often walking, running, or biking on it. Very dangerous!	Pedestrian Concerns
305	Crossing on this intersection's east side is unsafe with right-turn drivers having difficulty seeing pedestrians approach it. My brother and I have both been hit at this unsafe intersection.	Pedestrian Concerns
306	Sidewalk very inconsistent on this portion of Broadway between 16th St and the interstate. People are forced to frequently walk in the street next to 45mph traffic.	Pedestrian Concerns
307	It be great if there was a tunnel or overpass for pedestrians, bike, and slow mopeds/scooters to get from south broadway to 40th street etc	Safe Improvement Ideas
308	It would be great if there was a connection from the bike trail to this county road here over the ditch to avoid walking/riding north or south on saint bridgets rd	Safe Improvement Ideas
309	add pedestrian crossing lights	Safe Improvement Ideas
310	remove curb to get on road bike lane from this path intersection	Safe Improvement Ideas
311	roundabout	Safe Improvement Ideas
312	roundabout	Safe Improvement Ideas
313	Sidewalk installation for connectivity from Lonestone to Hillside	Safe Improvement Ideas
314	Sidewalk installation from Enterprise Drive to Prospect Drive	Safe Improvement Ideas
315	Connect existing sidewalk with trail system in park	Safe Improvement Ideas
316	Improved crosswalk with lights	Safe Improvement Ideas
317	Roundabout	Safe Improvement Ideas

Comment #	Comment	Category
318	Goes from trail to sidewalk and back to trail. Not wide enough if encounter oncoming trail user.	Safe Improvement Ideas
319	add trail to Cub right here!	Safe Improvement Ideas
320	Add more curb cuts to connect trail to bike lane on West Silver Lake.	Safe Improvement Ideas
321	Add curb cuts so bikes can go from 15th Ave to Elton Hills Dr.	Safe Improvement Ideas
322	Put in pavement as there is a clear goat path/desire path already present here.	Safe Improvement Ideas
323	A paved path on the Utility ROW would allow more bikes and pedestrians to walk along Cascade without having to go to Broadway.	Safe Improvement Ideas
324	A pedestrian bridge and trail up to East River Road would be wonderful!	Safe Improvement Ideas
325	roundabout - this would help traffic go where they need to go and slow everyone down	Safe Improvement Ideas
326	suggested stop sign	Safe Improvement Ideas
327	suggested 4 way stop for the park/sports complex. Cars fly through the "crosswalk"	Safe Improvement Ideas
328	Working streetlights. This area has had broken streetlights for 1-2 YEARS	Safe Improvement Ideas
329	Lights on dark walking trail	Safe Improvement Ideas
330	Lights at cty 3 and 7th street	Safe Improvement Ideas
331	Street Lights at cty 3 and 4th street	Safe Improvement Ideas
332	Mini roundabout, or some other form of traffic safety measure. Too many close calls at this intersection. I won't let my kids cross to school here because drivers do not stop for the flashing crosswalk lights. It also is an extremely congested area	Safe Improvement Ideas
333	A roundabout would be a great idea for this intersection. At school start/end times, this is a very hard intersection to cross or turn from. It is also a pedestrian hazard as there is a pedestrian trail that crosses here, but there is no crosswalk.	Safe Improvement Ideas

Comment #	Comment	Category
334	Pedestrian bridge over 52 makes it easier for Elton Hills Residences to bike to Target. If IBM land every becomes something for public, would also add to that.	Safe Improvement Ideas
335	Pedestrian Bridge would connect residential to commercial in way that lowers traffic over a often congested intersection (2nd St)	Safe Improvement Ideas
336	Connecting a trail to the Walmart area would allow many people to go there without having to drive. Getting cars off the streets makes the streets safer!	Safe Improvement Ideas
337	Terrible for kids to cross for school walking and bikes	Safe Improvement Ideas
338	Crosswalk signal needed	Safe Improvement Ideas
339	4 way stop	Safe Improvement Ideas
340	Tunnel or bridge overpass	Safe Improvement Ideas
341	Add a stop light by the high school!	Safe Improvement Ideas
342	Mini roundabout	Safe Improvement Ideas
343	Overpass similar to Kasson	Safe Improvement Ideas
344	Mini roundabout	Safe Improvement Ideas
345	Crosswalk, mini roundabout	Safe Improvement Ideas
346	This corner relies on stop signs. Very fast traffic' many folks taking chances to get across. It needs a stop light or better attention for speed bumps etc. pedestrians and other cars going through on 10th from 14 or the Byron circle at risk for accident	Safe Improvement Ideas
347	Dangerous for people and vehicles! Round about or light, please!	Safe Improvement Ideas
348	A pedestrian crossing with flashing lights would help connect Kellog Neighborhood to Silver Lake Trails.	Safe Improvement Ideas
349	Add curb cuts and connections to trail/sidewalk on both sides of road here. Better line of sight than at footbridge and less conflict than Zumbro intersection.	Safe Improvement Ideas

Comment #	Comment	Category
350	Add a path connecting 26th St to Westridge Lane or Westview Lane. Makes Viking Park more accessible to kids on foot/bike.	Safe Improvement Ideas
351	Street light needed	Safe Improvement Ideas
352	Roundabout	Safe Improvement Ideas
353	Stoplight/traffic light	Safe Improvement Ideas
354	Overpass	Safe Improvement Ideas
355	Railroad crossing arms	Safe Improvement Ideas
356	pave 14th st NW; add lights	Safe Improvement Ideas
357	Clear desire path. Go look	Safe Improvement Ideas
358	put a curb cut with the pedestrian crossing	Safe Improvement Ideas
359	Signs that point towards crossing under Broadway would reduce friction between cars and bikes/peds. Especially important for visitors.	Safe Improvement Ideas
360	Rough transition between path and street/sidewalk.	Safe Improvement Ideas
361	Have lights start blinking as bikes approach. Don't make them have to push it.	Safe Improvement Ideas
362	Need pedestrian activated stop light here	Safe Improvement Ideas
363	A trail through Allendale would allow bikes to avoid much of 18th Ave when going to Flapadoodles.	Safe Improvement Ideas
364	A trail connection here allows peds/bikes to access huge array of businesses while avoiding the busy traffic of 7th St and 11th Ave. Connect Trail to 5th Street on North Side of Civic Center.	Safe Improvement Ideas
365	A formalized RR crossing for bikes/peds would allow great access to Barlow Plaza. Getting in there from North is currently very tricky.	Safe Improvement Ideas
366	add sidewalk/curbcut through park. Give perks to walkers/bikers that cars don't have.	Safe Improvement Ideas

Comment #	Comment	Category
367	Needs a roundabout. Too much traffic and unsafe for everyone.	Safe Improvement Ideas
368	install roundabout to improve ped safety	Safe Improvement Ideas
369	install roundabout to improve ped safety	Safe Improvement Ideas
370	install roundabout to improve ped safety	Safe Improvement Ideas
371	Reduce speed by the school/intersection	Safe Improvement Ideas
372	A grocery store is one the most obvious places to have bikeability if you want to reduce traffic. But all the paths seem to go around this one. There should be paths coming in from every direction. Otherwise you're saying-only drivers welcome.	Safe Improvement Ideas
373	A path connecting neighborhood areas to popular destinations like ROCA could reduce traffic. Need to see trails as more than just recreational. Make them practical.	Safe Improvement Ideas
374	The whole IBM land use seems dysfunctional. A city with stuff in order would have a bicycle path right through connecting 37th Street over to Douglas trail without having to cross all the shopping entrances around Target/Home Depot.	Safe Improvement Ideas
375	This could be a 4 way stop instead of 2 way.	Safe Improvement Ideas
376	Cars get going very fast here for some reason, and there's no N/S stop sign on 7th and 10th. Could we put a stop sign on 10th, or perhaps a 25MPH speed sign, or a SLOW sign? My kid got hit by a car on this stretch of road.	Safe Improvement Ideas
377	There is no stop sign here NS or EW. Not even a yield sign. PLease put in a stop sign! Many kids travel this way as they walk to Folwell, and its a busy area when parents are also driving kids to school.	Safe Improvement Ideas
378	Elton Hills needs lower speed limits and more law enforcement to combat speeders causing terrible situations such as death and injury	Safe Improvement Ideas
379	This would be a perfect place for a roundabout. Children cross with the school there and no crossing guards. Traffic rules are not followed by drivers. Witnessed numerous times no one stops at the designated stop signs.	Safe Improvement Ideas
380	Please lower speed limit on Circle Dr. 40mph would be fast enough.	Safe Improvement Ideas

Comment #	Comment	Category
381	Add a crosswalk so pedestrians can safely cross Salem Rd to get to Mayowood Trail. Reduce speed limit on Salem Rd to 40 mph from Circle Dr to Weatherhill. Lots of bicyclists and pedestrians use Salem Rd in this area.	Safe Improvement Ideas
382	Critically unsafe. Walkway at this intersection feeds directly into Civic Center Dr's right-turn lane. No yield signage for drivers means pedestrians/cyclists are forced into active traffic, facing high collision risk. Hostile design needs urgent fix.	Safe Improvement Ideas
383	This bridge offers no protection from the road, sacrificing pedestrian/cyclist safety for motorist convenience.	Safe Improvement Ideas
384	This bridge offers no protection from the road, sacrificing pedestrian/cyclist safety for motorist convenience.	Safe Improvement Ideas
385	remove the pretty meridian, this is a street not a conservation museum	Safe Improvement Ideas
386	remove this meridian, again this is a street and should function as one, not some pretty conservation district	Safe Improvement Ideas
387	Please work with the City to make Broadway a safer street for pedestrians and those on wheels (that aren't cars). This street needs to not prioritize cars or act like a highway through downtown, traffic calming is important here.	Safe Improvement Ideas
388	Park-bound traffic heading from the south has a very sharp turn onto a narrow sidewalk from a wide paved trail.	Safe Improvement Ideas
389	Installing a HAWK crossing signal would help increase crossing safety here, and would be appropriate to the speed and volume of school traffic on this road.	Safe Improvement Ideas
390	Narrow the road, add a cross walk, speed table, curb cut outs or something to completely stop vehicles before they get to the road.	Safe Improvement Ideas
391	Close this section of 9th ave nw to prevent people from speeding along to cut through to 37th st nw.	Safe Improvement Ideas
392	There is far too much speeding on 37th st nw. Reduce speed to 30 mph as drivers will still continue to speed.	Safe Improvement Ideas
393	No turning lane & speed limit	Safe Improvement Ideas
394	Remove increased speed limit from 45-30	Safe Improvement Ideas
395	Excessive speed increase. Reduce from 45 to 30 with all of the school traffic!	Safe Improvement Ideas
396	Limit speed to less than 45 mph since many drivers exceed that limit but go no lower than 35 mph since it's limited access.	Safe Improvement Ideas

Comment #	Comment	Category
397	Reduce 55 mph to 50 mph for consistency. Many drivers go over the speed limit and don't slow down when they approach the lower speed parts of the road plus they run red lights due to their excessive speed.	Safe Improvement Ideas
398	Add deer crossing signs to alert drivers to watch for animals crossing the roads and prevent accidents between vehicles and animals.	Safe Improvement Ideas
399	Needs a light or 4-way stop	Safe Improvement Ideas
400	The multi-lane four-way stop could be replaced with a roundabout for smoother traffic flow, better safety.	Safe Improvement Ideas
401	This alley way is so dangerous. Personal parkers (imo there should be no parking back here) will park diagonally across 2 compact spaces, some cars are longer than others and so many times distributors will get "stuck" trying to get in or out.	Safe Improvement Ideas
402	There should be no parking affiliated with this building here. Dangerous and not utilized equitable or efficiently.	Safe Improvement Ideas
403	Make s. broad way 2 lane again only... diagonal parking and bring shoppers directly into district and with diagonal will slow down traffic.	Safe Improvement Ideas
404	Need to make S. Broadway on 300 block two-way only. People are unloading here all day long and it is super dangerous.	Safe Improvement Ideas
405	Why is 3rd street blocked off by cops both in Left turning Broadway lane and on 3rd street alley after 10/11 pm? There is no reason for this. It gives the wrong message and is confusing for drivers.	Safe Improvement Ideas
406	This intersection can get very busy during peak hours. I'm not sure if it's worth it, but potentially a round about or lights rather than stop sign? With a potential of 8 different lanes (with turns) and no marked pedestrian paths it is a bit hectic.	Safe Improvement Ideas
407	Speed bump can help neighborhood. People drive high speed due to parkwood Hills park	Safe Improvement Ideas
408	Speed bumps would help slow down cars. Or adding an outlet at the back of the neighborhood.	Safe Improvement Ideas
409	Adding an outlet to the main road so people don’t have to drive by so many houses to get home.	Safe Improvement Ideas
410	A protected bicycle intersection, where bikes cross similarly to a roundabout around the edge of the intersection, would be a great way to separate conflict between cars and other road users.	Safe Improvement Ideas
411	Few fixes for peds crossing: We need foliage in the median to be out of eye-level when driving. Parking spaces on either side of the road need to be	Safe Improvement Ideas

Comment #	Comment	Category
	further from the intersection to give greater viewing for cars. Flashing/more obvious peds crossing sign.	
412	Make this road connect more at a right angle (bump out sidewalk on eastern side). Hard to tell where 4th St & 15th St begin/end.	Safe Improvement Ideas
413	2 Speed bumps on 14th Ave NE to prevent traffic racing up and down the hill	Safe Improvement Ideas
414	Yield sign or stop sign here. Too many close calls.	Safe Improvement Ideas
415	Round about so traffic slows and merging isn't so dangerous	Safe Improvement Ideas
416	Round about so traffic slows and merging isn't so dangerous	Safe Improvement Ideas
417	Create a utility lane or moped lane here for titled vehicles with engines that aren't allowed on highways like mopeds, which also aren't allowed on bike trails	Safe Improvement Ideas
418	Connect road to 100th St. I was told this was in original plans for the subdivision. With addition of Riverwood Ct in 2019, there is too much traffic on Riverwood Drive (see other safety concerns)	Safe Improvement Ideas
419	Turning left off 9th St NW onto northbound W Circle Drive NW is near impossible during rush hour. This leads to impatient drivers making poor decisions and turning out in front of traffic.	Vehicle Safety Concerns
420	This is always a fearful intersection - it would be great if there was a round about that served Starbucks, Walmart, and Taco Bell etc or if traffic had to use the long walmart driveway	Vehicle Safety Concerns
421	High speed and only exit from Tee Time	Vehicle Safety Concerns
422	this entrance to Moka is always so stressful especially going south traffic gets caught up by folks waiting to turn into Moka	Vehicle Safety Concerns
423	It feels like left hand turns shouldn't be allowed here coming out of Kwik trip	Vehicle Safety Concerns
424	Speed limit adjustment needed.	Vehicle Safety Concerns
425	Speed limit concern	Vehicle Safety Concerns
426	Consider restricting left turns in and out of Kwik Trip during morning and afternoon commute time. This has been a common rear end accident scene.	Vehicle Safety Concerns

Comment #	Comment	Category
427	This is a dangerous intersection. To go from WB Civic Center to SB 52 you have to cross 2 lanes of speeding and busy traffic. Getting a safe break in traffic is problematic.	Vehicle Safety Concerns
428	blind angle, and no stop sign, at times means cars go fast even though this is an intersection	Vehicle Safety Concerns
429	Stop sign needed at Berkshire Rd SW and Burncroft	Vehicle Safety Concerns
430	Cars frequently either don't see the N/S stop sign for ignore them	Vehicle Safety Concerns
431	LH turn lane is on 9th St, but 10th St is stop sign free all the way to 8th Ave SE. Make 9th Street have fewer stop signs and 10th have more. Then more cars will use LH lane.	Vehicle Safety Concerns
432	At times, it's very difficult and risky trying to turn onto W Circle Dr SW from Berkshire Rd SW.	Vehicle Safety Concerns
433	Can't see to west unless pulled out into crosswalk	Vehicle Safety Concerns
434	No left turn lane, cars stop suddenly, risk of rear-ending.	Vehicle Safety Concerns
435	no one is going the speed limit here	Vehicle Safety Concerns
436	Cars try to make left out of this and the other 6th st at the same time and accident always looks imminent.	Vehicle Safety Concerns
437	High speeds on 7th Street NE. Hard to pull out of the neighborhood when they are coming so fast down the hill from the west.	Vehicle Safety Concerns
438	Steep ditches, no shoulders for cars	Vehicle Safety Concerns
439	Unsafe left turn	Vehicle Safety Concerns
440	Too many accidents	Vehicle Safety Concerns
441	The j turn causes so many near accidents	Vehicle Safety Concerns
442	This intersection mixed with those entering from highway 14 is overwhelming and leaves a lot of obstacles for drivers to pay attention to. The entrance to frontage road needs to be moved	Vehicle Safety Concerns

Comment #	Comment	Category
443	Need a better turn lane for school traffic	Vehicle Safety Concerns
444	Too many people pull out of this trying to getbin during school traffic hours. I've almost hit two teens driving after they tried to speed out in inclement weather and the vehicles slid all over the ice. Round about?	Vehicle Safety Concerns
445	I've seen many car accidents happen here. You wait many minutes to be able to cross on either side during am and evenings	Vehicle Safety Concerns
446	Really bad intersection	Vehicle Safety Concerns
447	People turning left into KFC can block traffic that's trying to get out of the highway intersection	Vehicle Safety Concerns
448	Very difficult to cross 10th Ave NE from 4th St NE or turn onto 10th Ave NE from 4th St NE due to all the traffic on 10th Ave from either Sommerby or coming in off Hwy. Very dangerous. Have seen many near-misses here--both cars & people.	Vehicle Safety Concerns
449	No turn lane (traffic speed is 55.)	Vehicle Safety Concerns
450	The dip by Kwik Trip needs to be fixed and leveled off. Trying to get into Co. Rd 5 from the frontage road isn't easy. People turning onto Co Rd 5 from Hwy 14 don't pay attention to the cars on the frontage road	Vehicle Safety Concerns
451	We need a roundabout or something here. It is very difficult to turn left from 13th onto Co Rd 5 in the morning before school and after school. When turning left onto 13th St, cars pass the turning car in the right turn lane to continue north, hardly s	Vehicle Safety Concerns
452	Near collisions daily	Vehicle Safety Concerns
453	Near collisions daily	Vehicle Safety Concerns
454	School entrance and exit	Vehicle Safety Concerns
455	School exit and entrance	Vehicle Safety Concerns
456	Needs a bypass lane	Vehicle Safety Concerns
457	extremely busy before/after school, difficult to keep traffic flowing. ?round about?	Vehicle Safety Concerns

Comment #	Comment	Category
458	Site of multiple accidents with heavy traffic before and after school. Considered adding a roundabout or 4 way stop	Vehicle Safety Concerns
459	Due to construction on SE corner having fabric over the fencing, cannot see cars at this intersection. This is a problem coming from both South and East.	Vehicle Safety Concerns
460	cannot see traffic coming from the north until too close when leaving this parking lot.	Vehicle Safety Concerns
461	Heavy kid foot and bike traffic from the schools	Vehicle Safety Concerns
462	Vehicles often do not slow down from Burncroft to Berkshire. Need a stop sign on Burncroft before a vehicle or pedestrian accident happens.	Vehicle Safety Concerns
463	Too many vehicles exceeding the speed limit.	Vehicle Safety Concerns
464	Heavy trucks exceeding 10,000lb Gross Vehicle Weight travel down Berkshire on their way to construction likely in Lily Farms. Semis and flatbeds need to travel down Country Club Road instead of using Berkshire Rd SW.	Vehicle Safety Concerns
465	Vehicles driving in the right, northbound lane of Hwy 63 cannot see the traffic entering from the onramp in time to switch lanes. The vehicles merging must also reach high speeds with low visibility of merge opportunities. They often “gun it” and pray.	Vehicle Safety Concerns
466	Excessive speeding. contacted city with a petition and NOTHING done about it.	Vehicle Safety Concerns
467	Steep hill on both sides, if you are traveling up this hill and turning onto 8th st, you can get hit easily because you cant see whats coming towards you over the hill. I think we need a stop sign or some sort of Low Visibility sign?	Vehicle Safety Concerns
468	It's been better lately, but when the tall grass/plants are not trimmed down on the NE corner, it is impossible to see if there are cars approaching from 37th St. until way past the stop sign.	Vehicle Safety Concerns
469	Dangerous to make a lefthand turn here, especially in winter due to no left turn signal at light and approaching cars only visible at the last minute after they come into view around the bend of silver lake drive.	Vehicle Safety Concerns
470	There is a dedicated turn lane and a straight lane marked only by anearly invisible sign painted on the pavement. Oncoming traffic turning left onto 37th does not yield to vehicles attempting to cross 37th from the Arby's side	Vehicle Safety Concerns
471	During rush hour in the morning traffic backs up almost to the off ramp to get on to Hwy 14 WB	Vehicle Safety Concerns
472	People are speeding at rates over 50 miles an hour and Ive seen many times people, animals and especially KIDS walking to school almost get hit. Several cars have been hit being parked in Elton Hills in the last few weeks.	Vehicle Safety Concerns

Comment #	Comment	Category
473	Blind turn, cars coming from both directions at high speeds. Many cars parked on side of road making it harder to see oncoming traffic. Speed bump maybe helpful. Slow signs?	Vehicle Safety Concerns
474	People exiting 52 to turn left onto S Broadway have to cross several lanes. My idea would be to add a traffic light to the northbound S broadway. When the light turns green for people to turn left, the new light should turn red stopping northbound traffic	Vehicle Safety Concerns
475	Cars exiting Kwik Trip (especially those turning south onto 11th) is very dangerous with civic center dr and 6th St NW being so close.	Vehicle Safety Concerns
476	Lot of conflict at this intersection, plus constant speeding to get to Valleyhigh/W Circle	Vehicle Safety Concerns
477	Double parallel parked cars here create problems. Witnessed many near-misses	Vehicle Safety Concerns
478	A stop sign for east bound traffic on Rose Drive	Vehicle Safety Concerns
479	Traffic coming off Weatherhill Rd SW are often carrying excessive speed due to downhill descent and frequently roll through the stop sign and into the crossing shoulder. Needs a STOP LINE added and ideally rumble strips.	Vehicle Safety Concerns
480	No turn lanes, excessive speed limit	Vehicle Safety Concerns
481	People fly down this road. I have almost been rear ended many times. People also try to pass on the right when I am turning left onto Hiawatha Court. There is a deep ditch there which will flip a car.	Vehicle Safety Concerns
482	Excess speeding up and down the hill.	Vehicle Safety Concerns
483	Cars do not stop for pedestrians in the marked, flashing lights, crosswalk.	Vehicle Safety Concerns
484	There are many animals, especially deer in this area. Add a sign to show deer crossing so that drivers look out for the animals to avoid accidents with them.	Vehicle Safety Concerns
485	Having two high speed streets and no light or 4-way stop is dangerous, especially while taking left turns onto 48th street. People are allowed to drive two fast to have only stop signs on the n/s side of intersection.	Vehicle Safety Concerns
486	Crossing from 34th Ave to the on/off ramps during rush hour (4:30-6pm) can be extremely dangerous, as the volume of traffic on 65th St can be almost non-stop. Every week I witness someone having to gun-it across the road to or from the ramps.	Vehicle Safety Concerns
487	A large amount of traffic with buisnesses in a small area. perhaps a round about or something would be better and safer for pedestrians	Vehicle Safety Concerns

Comment #	Comment	Category
488	No one ever yields at the railroad crossings, and it is extremley nerve racking to consider getting hit by a train. Having railroads in town without gates/lights seems bizarre. This goes for all of them!	Vehicle Safety Concerns
489	Terrible intersection with many backups and low visibility to the broadway intersection if cars are backed up. Getting out of the parking lot can be a nightmare with all the entrances so close together.	Vehicle Safety Concerns
490	Speed limit too high	Vehicle Safety Concerns
491	The wide, empty design of this road makes speeding 10+ over the limit here excessively common.	Vehicle Safety Concerns
492	I can barely see oncoming traffic when traveling on 5th Ave SW north/east/westbound.	Vehicle Safety Concerns
493	Width of road with sun angle at times of year and uphill curve has led to many close calls of two vehicle accidents.	Vehicle Safety Concerns
1	On the south side of this corner, there is a big ledge to get to the sidewalk. It requires you to go up someone's driveway	Accessibility Concerns

Appendix C. Historical Crash Evaluation Memo

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

SAFETY ACTION PLAN

Safety Action Plan

Appendix C - Historical Crash Evaluation

(Phase 1)

October 20, 2025

Executive Summary

The Rochester-Olmsted Council of Governments (ROCOG) Safety Action Plan (SAP) acknowledges that fatal and serious injury crashes occur on all roads, with an over-representation on municipal roads. According to the crash data collected by the Minnesota Department of Transportation (MnDOT), 9,378 total crashes took place in the ROCOG region between 2019 and 2023. 246 of those crashes resulted in at least one person involved receiving a fatal or incapacitating injury, equating to 2.6 percent of total crashes.

To support the efforts to reduce the number of fatal and serious injury crashes within the region, ROCOG is developing a comprehensive safety action plan. The SAP is designed to reduce and ideally eliminate severe crashes over the course of a set timeframe. A key step in developing the safety action plan is analyzing the crashes occurring in the region to gain a better understanding of where, when, and how they occur. The historical crash evaluation consists of a review of crash characteristics through the development of crash summary tables and a crash focus area table.

This evaluation is critical to addressing crashes in the ROCOG region as it serves as a preliminary understanding to show where crashes and related trends stand in the last five-year period of available data (2019-2023).

Key Takeaways

- 246 of the crashes resulted in at least one person suffering a fatality or incapacitating injury, referred to as KA injury crash, equating to 2.6% of all crashes
- County roads make up 24% of ROCOG's system, but 32% of all KA crashes
- Municipal roads make up 31% of ROCOG's system, but 41% of all KA crashes
- 42% of motorcycle-involved crashes resulted in KA injuries and made up 22% of total KA crashes
- 26% of pedestrian-involved crashes result in KA injuries and made up 11% of total KA crashes
- Minor arterials make up 8% of ROCOG's system, but accounted for over 37% of KA crashes
- Four-lane roadways make up 6% of the ROCOG system but account for 30% of KA crashes
- All mode High Injury Network includes 55.9% of KA crashes (B for non-motorized only) on 6.4% of the total regional network

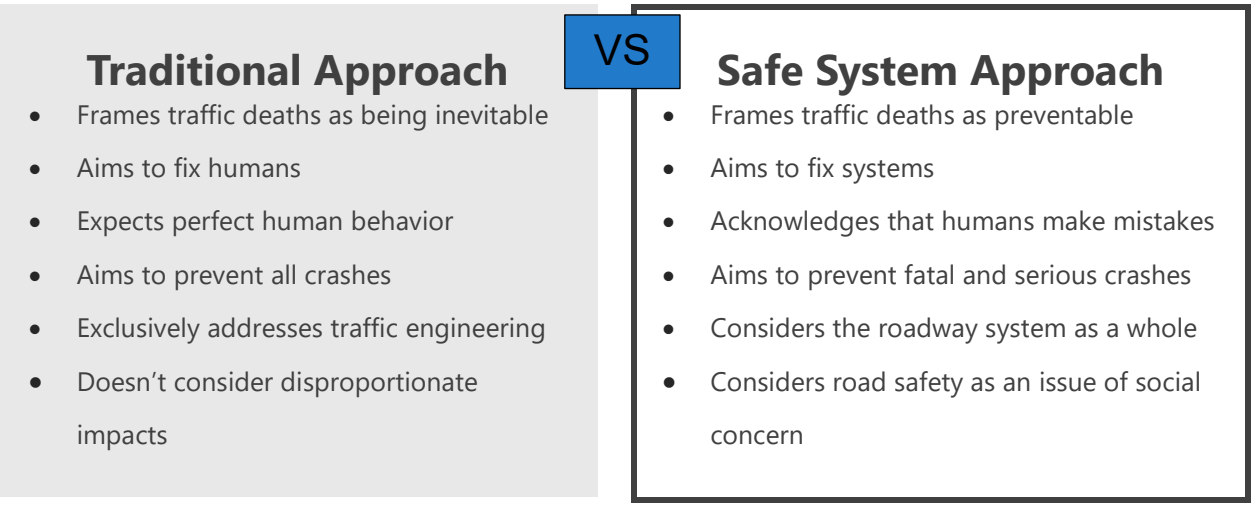
Introduction

Crash analyses typically investigate a variety of summary statistics to understand factors that may have contributed to the crash. Some of these factors may rise to the top in terms of importance; for others, this memo serves merely to document the data in a transparent manner. In this Historical Crash Evaluation, crash severity is examined in conjunction with the following crash characteristics:

- Severity
- Mode Involved
- Density
- Year
- Month of Year
- Hour of Day
- Jurisdiction (Road Ownership)
- Municipality/Township
- Functional Classification
- Weather Conditions
- Lighting Conditions
- Manner of Collision
- Segment vs Intersection
- Roadway Curvature
- Number of Lanes
- Speed Limit
- Focus Area

To address the patterns revealed in the historical crash evaluation, it's important to take a comprehensive approach to address road safety. A Safe System approach (**Figure 1**) focuses on eliminating severe crashes (fatal and serious injury crashes) and understanding that humans are vulnerable and make mistakes. Thus, any systems designed for humans need to be designed accordingly.

Figure 1. Traditional vs. Safe System Approach



The project team utilized crash data provided by the Minnesota Department of Transportation (MnDOT) for crashes that occurred in ROCOG between 2019-2023. The data was provided in the three-table format (ACC, VEH, and PER). Each unit (a vehicle or a pedestrian) involved in a crash was sorted into a mode based on the *Unit Vehicle* and *Vehicle Type* fields from the VEH crash table. Those modes include:

- Passenger Automobile
- Heavy Vehicle (truck)
- Motorcycle
- Pedestrian
- Bicycle

In addition to the five modes listed above, units could be sorted into three additional mode types which were then excluded from analysis: other (people riding on/in ATVs, farm equipment, horses, etc.), parked/unoccupied automobiles, and hit-and-run automobiles. The crashes were then sorted into the three categories in **Table 1** to denote whether they would be included in the calculations for the all-mode, nonmotorized, and/or motorized HINs.

Table 1. Modes of transportation and the modal HINs in which they are included

HIN Category	Modes Included
All-Mode	All
Nonmotorized	Bike and Pedestrian
Motorized	Passenger Automobile, Heavy Vehicle, and Motorcycle

After classifying each unit by mode and excluding units with atypical characteristics, units without occupants, and units on which there was little to no information, the project team determined the Most Severe Injury (MSI) suffered by a person using each of the five modes.

This summary will categorize the severity using the KABCO scale, which is an injury severity classification system developed to standardize the reporting and analysis of traffic crash outcomes. The scale, widely used by law enforcement agencies, categorizes injuries from K (fatal) to O (property damage only). This system was created to ensure consistency in documenting crash data, which aids in tracking trends and identifying safety concerns. For simplicity, the KABCO injury scale is used throughout this summary (a description of the different designations is shown on **Table 2**). Throughout the summary, the label "KA" denotes crashes where the most severe injury suffered by any person involved in the crash was a fatal or incapacitating injury and "BCO" denotes crashes where the most severe injury was a non-incapacitating injury, a possible injury, or no injuries at all.

Table 2. KABCO Injury Scale

Severe (more injurious)	Non-Severe (less injurious)
K – fatal injury	B – non-incapacitating injury
A – incapacitating injury (serious injury)	C – possible injury
	O – property damage only

As an example of assigning modal MSIs using the KABCO scale, if a passenger car with a driver (operator) and two passengers (occupants) strikes a person walking in a crosswalk (pedestrian) and the pedestrian is killed (K), the driver receives a non-incapacitating injury (B), and the two passengers are suspected of having minor injuries (C), the MSI for someone in an automobile would be a minor injury (B), the MSI for a pedestrian would be a fatality (K), and the MSI for the other modes (heavy automobile, cyclist, and motorcycle) would be null. MSIs were also calculated for all modes, motorized only, and non-motorized only.

All of the tables in the following sections include at least seven data points in the columns:

- **Crash Variable Field** – the variable by which crashes are being grouped (e.g. year, roadway functional classification, speed limit, etc.)
- **KA Crashes** – the number of KA crashes with a given value for the crash variable
- **BCO Crashes** – the number of BCO crashes with a given value for the crash variable
- **Subtotal Crashes** – the number of crashes of any severity with a given value for the crash variable
- **Percent of Total KA Crashes** – the proportion of the total KA crash count that the KA crashes with a given value for the crash variable account for. This metric is calculated by dividing the number of KA crashes with a given crash variable value by the number of KA crashes with any crash variable value. For example, the Percent of Total KA Crashes for 2020 in **Table 4** is 18.7 percent (46 out of 246 total KA crashes). This metric illustrates the relative frequency of KA crashes with a given value for the crash variable and allows for easier comparison between crashes with different values for the crash variable.

- **Percent of Total Crashes** – the proportion of the total crash count (any severity) that the crashes with a given value for the crash variable (any severity) account for. This metric is calculated by dividing the number of crashes (any severity) with a given crash variable value by the number of crashes with any crash variable value (any severity). For example, the Percent of Total Crashes for 2020 in **Table 4** is 16.8 percent (1,580 out of 9,378 total crashes). This metric illustrates the relative frequency of crashes with a given value for the crash variable and allows for easier comparison between crashes with different values for the crash variable.
- **KA Percent of Subtotal Crashes** – the proportion of the crash count (any severity) for a given crash variable value that the KA crashes with a given value for the crash variable account for. This is calculated by dividing the KA Crashes column by the Subtotal Crashes column. For example, the KA Percent of Subtotal Crashes for 2020 in **Table 4** is 2.9 percent (46 out of 1,534 crashes in 2020). This metric highlights the likelihood of a crash resulting in KA injuries when it does occur. For example, **Table 3** shows that crashes involving passenger automobiles occurred almost 70 times more often than crashes involving motorcyclists (9,071 automobile-involved crashes vs 132 motorcyclist-involved crashes), but a crash involving a motorcyclist was 26 times more likely to result in a KA injury to a motorcyclist than crashes involving motorists were to result in a KA injury to a motorist (a 41.7% KA rate for motorcyclist-involved crashes vs a 1.6% KA rate for automobile-involved crashes).

When the crash variable relates to the geographic area in which a crash occurred or a characteristic of the facility on which a crash occurred, there are additional fields that help contextualize the crash counts and proportions. For crash variables relating to geographic areas or roadway characteristics, the four added normalization fields are:

- **KA Crashes per 100 Centerline (CL) Miles** – the number of KA crashes that took place in a given geographic area or on a roadway with a given characteristic divided by the number of miles of roadway that exist in a geographic area or have a given characteristic and multiplied by 100. For example, the rate of KA crashes per 100 centerline miles for county-owned roads in **Table 10** is 15.1 (79 KA crashes per 521.7 county-owned centerline miles of roadway). This metric helps to normalize for the different proportions of the network that each geographic area or roadway type accounts for, and if compared to the overall average found in the Total row, helps to highlight geographic areas or roadway types that have disproportionately high densities of crashes. For example, federally- and state-owned roads have far more KA crashes per 100 centerline miles (25.8 and 22.5, respectively) than the systemwide average (12.0).
- **BCO Crashes per 100 Centerline (CL) Miles** – the number of BCO crashes that took place in a given geographic area or on a roadway with a given characteristic divided by the number of miles of roadway that exist in a geographic area or have a given characteristic and multiplied by 100. For example, the rate of BCO crashes per 100

centerline miles for county-owned roads in **Table 10** is 267.4 (1,395 BCO crashes per 521.7 county-owned centerline miles of roadway).

- **Centerline (CL) Miles** – the sum of the lengths of all roadways that are located in a given geographic area or have a given characteristic. For example, **Table 10** shows that the combined length of all county-owned roads in the study area is 521.7 miles.
- **Percent of Centerline (CL) Miles** – the proportion (by length) of the roadway network for which roadways that are located in a given geographic area or have a given characteristic account. For example, **Table 10** shows that county-owned roads account for 25.3 percent of the roadway network in the study area (521.7 out of 2,058.5 total miles of roadway).

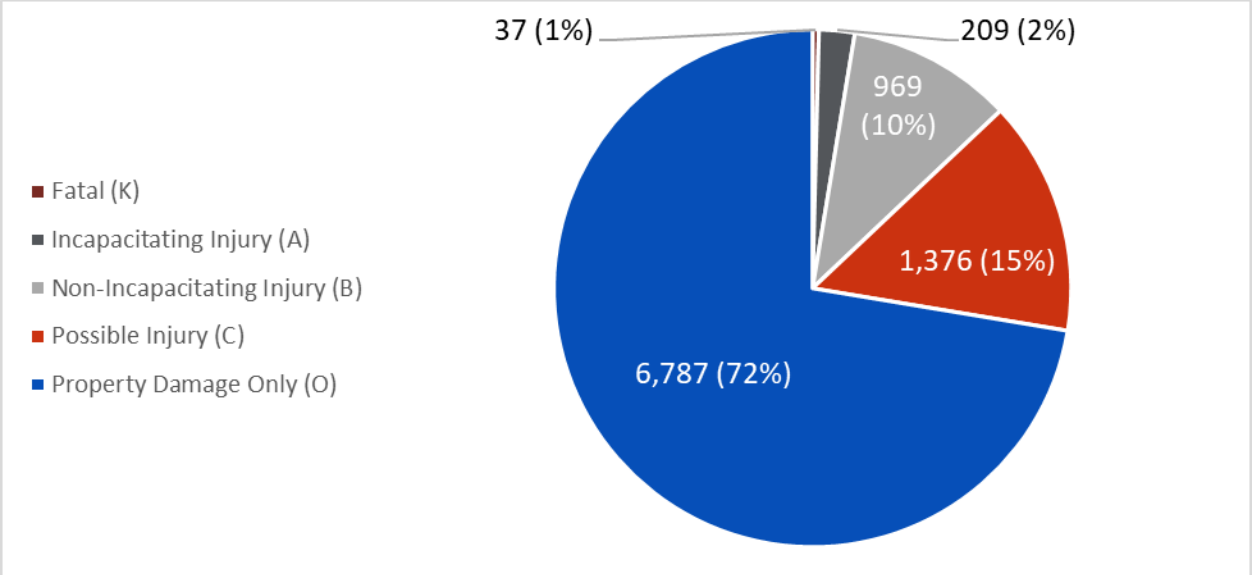
Crash Severity and Mode

Crash Severity

Figure 2 shows crashes by severity. Of the total 9,378 crashes:

- 37 were fatalities
- 209 were incapacitating injuries
- 969 were non-incapacitating injuries
- 1,376 possible injuries
- 6,787 crashes resulted in property damage only
- 246 crashes were severe (fatal and incapacitating injury) and the rest, 9,132, were non-severe (non-incapacitating injury, possible injury, or property damage only).

Figure 2. Crash counts (and percentage of total) by severity



Crashes by Mode Involved

Figure 3 and **Table 3** show crashes by mode. Multiple modes can be involved in a single crash, meaning that the sum of all of the mode-specific crash counts will be more than the 9,378 total crashes that took place during the five-year period.

- Motorcyclists stand out – 42 percent of crashes involving at least one motorcyclists were KA (55 KA crashes out of 132 subtotal crashes).
    - Motorcyclist-involved KA crashes accounted for 22 percent of total KA crashes (55 out of 246 KA crashes).
- Pedestrian-involved crashes also had a high proportion of KA crashes at 26 percent (28 KA crashes of the 108 subtotal crashes).

Figure 3. Crash severity by mode

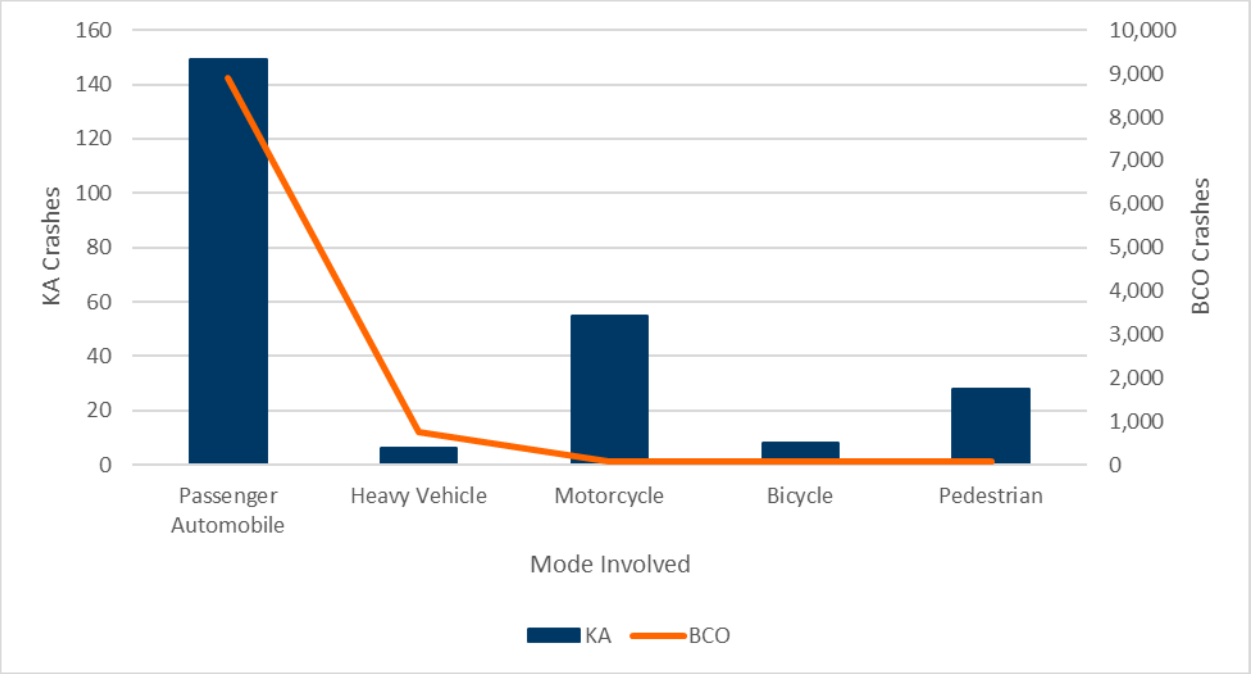


Table 3. Crash counts and proportions by mode involved

Mode Involved	KA Crashes	BCO Crashes	Subtotal Crashes	Percent of Total KA Crashes	Percent of Total Crashes	KA Percent of Subtotal Crashes
Auto	149	8,994	9,071	60.6%	96.7%	1.6%
Heavy Vehicle	6	743	749	2.4%	7.9%	0.8%
Motorcyclist	55	77	132	22.4%	1.4%	41.7%
Bicycle	8	68	76	3.3%	0.8%	10.5%
Pedestrian	28	80	108	11.4%	1.5%	25.9%
All Modes	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Time of Crash

Crashes by Year

Figure 4 and **Table 4** show crash severity by year. Over the five-year period:

- 2019 had the highest number of total crashes with 2,382 (25 percent of total crashes) but had the lowest proportion of KA crashes at 2 percent (44 KA crashes of 2,382 subtotal crashes).
- 2023 had the highest proportion of KA crashes with over 3 percent (57 KA crashes of 1,659 subtotal crashes).
- Total crashes decreased from 2,382 in 2019 to 1,580 in 2020, showing a 34 percent reduction in just a year. VMT also significantly reduced during this period due to the COVID-19 pandemic and the lockdown period, reducing travel. This likely attributed to the reduction in overall crashes during the period.
- KA crashes did noticeably increase after 2021 from 40 KA crashes to 59 KA crashes showing a 48 percent increase. KA crashes then only decreased by 2 the following year (59 KA crashes to 57 KA crashes).

Figure 4. Crash severity by year

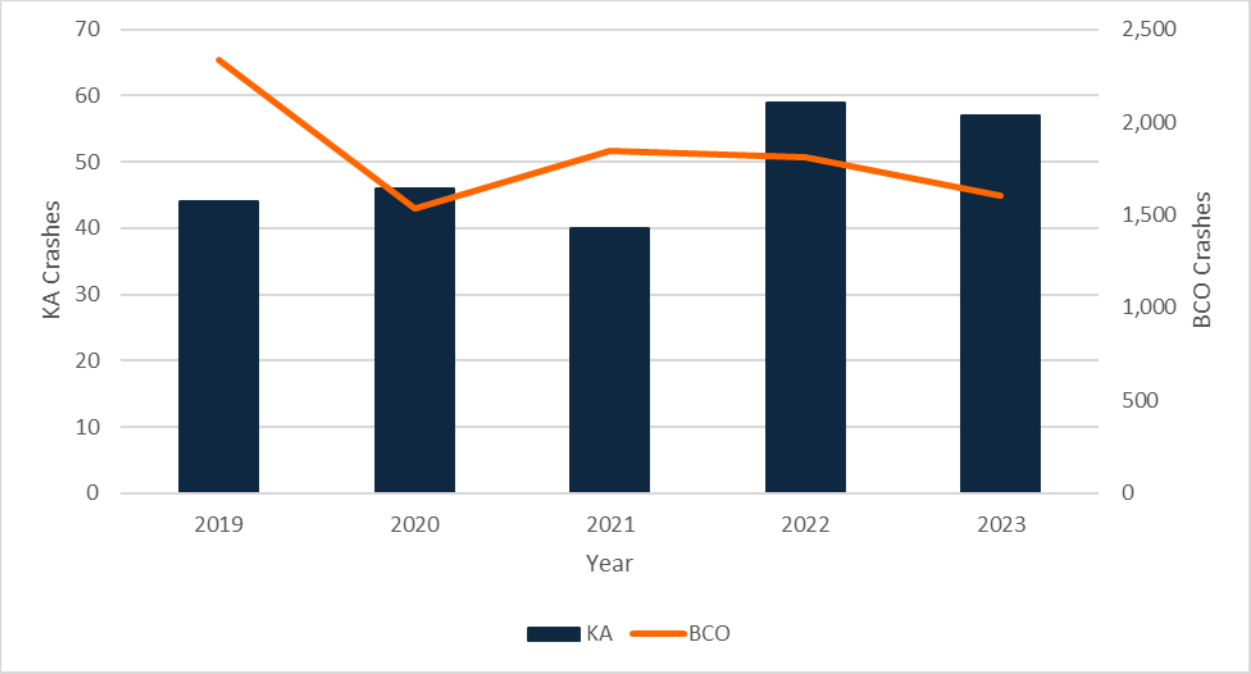


Table 4. Crash counts and proportions by year

Year	KA Crashes	BCO Crashes	Subtotal Crashes	Percent of Total KA Crashes	Percent of Total Crashes	KA Percent of Subtotal Crashes
2019	44	2,338	2,382	17.9%	25.4%	1.8%
2020	46	1,534	1,580	18.7%	16.8%	2.9%
2021	40	1,848	1,888	16.3%	20.1%	2.1%
2022	59	1,810	1,869	24.0%	19.9%	3.2%
2023	57	1,602	1,659	23.2%	17.7%	3.4%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crashes by Month of Year

Figure 5 and **Table 5** show crash severity by month of year. Throughout the five-year period, the winter months had the highest monthly crash counts:

- December had 1,028 subtotal crashes (11 percent of total crashes)
- January had 997 subtotal crashes (11 percent of total crashes)
- February had 1,000 subtotal crashes (11 percent of total crashes)

Conversely, KA crashes were highest in the months in and around the summer:

- Peaked in July at 30 (12 percent of total KA crashes).
- April to August all had higher proportions of KA crashes compared to the other months of the year. KA percent of subtotal crashes were on average around 4 percent for each month in this part of the year.

Figure 5. Crash severity by month of year

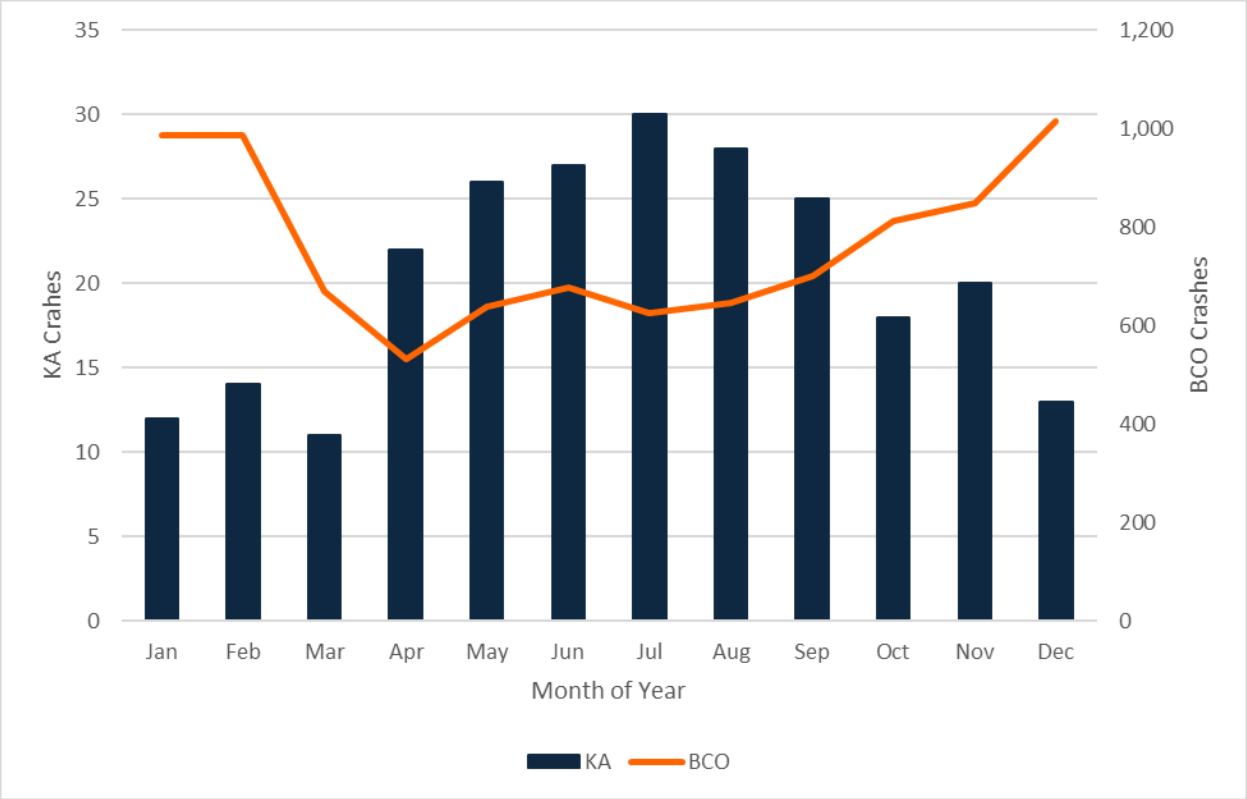


Table 5. Crash counts and proportions by month of year

Month	KA Crashes	BCO Crashes	Subtotal Crashes	Percent of Total KA Crashes	Percent of Total Crashes	KA Percent of Subtotal Crashes
January	12	985	997	4.9%	10.6%	1.2%
February	14	986	1,000	5.7%	10.7%	1.4%
March	11	668	679	4.5%	7.2%	1.6%
April	22	532	554	8.9%	5.9%	4.0%
May	26	639	665	10.6%	7.1%	3.9%
June	27	678	705	11.0%	7.5%	3.8%
July	30	624	654	12.2%	7.0%	4.6%
August	28	645	673	11.4%	7.2%	4.2%
September	25	700	725	10.2%	7.7%	3.4%
October	18	811	829	7.3%	8.8%	2.2%
November	20	849	869	8.1%	9.3%	2.3%
December	13	1,015	1,028	5.3%	11.0%	1.3%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crashes by Day of Week

Figure 6 and **Table 6** show crash severity by day of week. Key takeaways include:

- Total crashes are less frequent on weekends, but a greater proportion of the crashes that do occur on weekends are severe (3.1 percent and 3.3 percent for Saturdays and Sundays, respectively) compared to an overall average of 2.6 percent of all crashes being severe.
- KA crashes are least frequent on Wednesdays and Sundays.

Figure 6. Crash severity by day of week

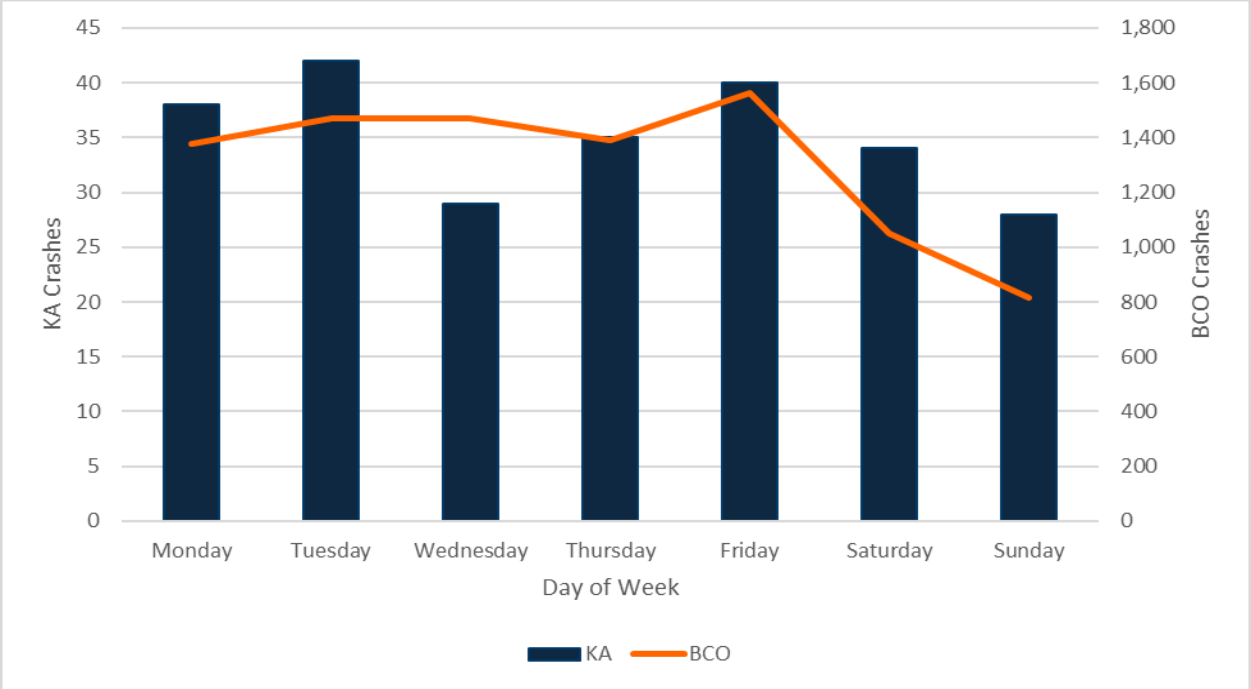


Table 6. Crash counts and proportions by day of week

Day of Week	KA Crashes	BCO Crashes	Subtotal Crashes	Percent of Total KA Crashes	Percent of Total Crashes	KA Percent of Subtotal Crashes
Monday	38	1,375	1,413	15.4%	15.1%	2.7%
Tuesday	42	1,471	1,513	17.1%	16.1%	2.8%
Wednesday	29	1,468	1,497	11.8%	16.0%	1.9%
Thursday	35	1,390	1,425	14.2%	15.2%	2.5%
Friday	40	1,562	1,602	16.3%	17.1%	2.5%
Saturday	34	1,049	1,083	13.8%	11.5%	3.1%
Sunday	28	817	845	11.4%	9.0%	3.3%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crashes by Hour of Day

Figure 7 and **Table 7** show crash severity by hour of day. Key takeaways include:

- Crashes were most frequent during the morning and evening commute, particularly in the late afternoon and early evening (3:00 PM to 6:00 PM).
- Total crashes peaked at 4:00 PM with 939 (18 KA crashes and 921 BCO crashes).
- KA crashes were most frequent at 5:00 PM with 26 KA crashes (11 percent of KA crashes).
- Early morning and late-night hours had higher proportions of KA crashes, most notably at 10:00 PM with 11 crashes accounting for 6 percent of subtotal crashes during that hour.

Figure 7. Crash severity by hour of day

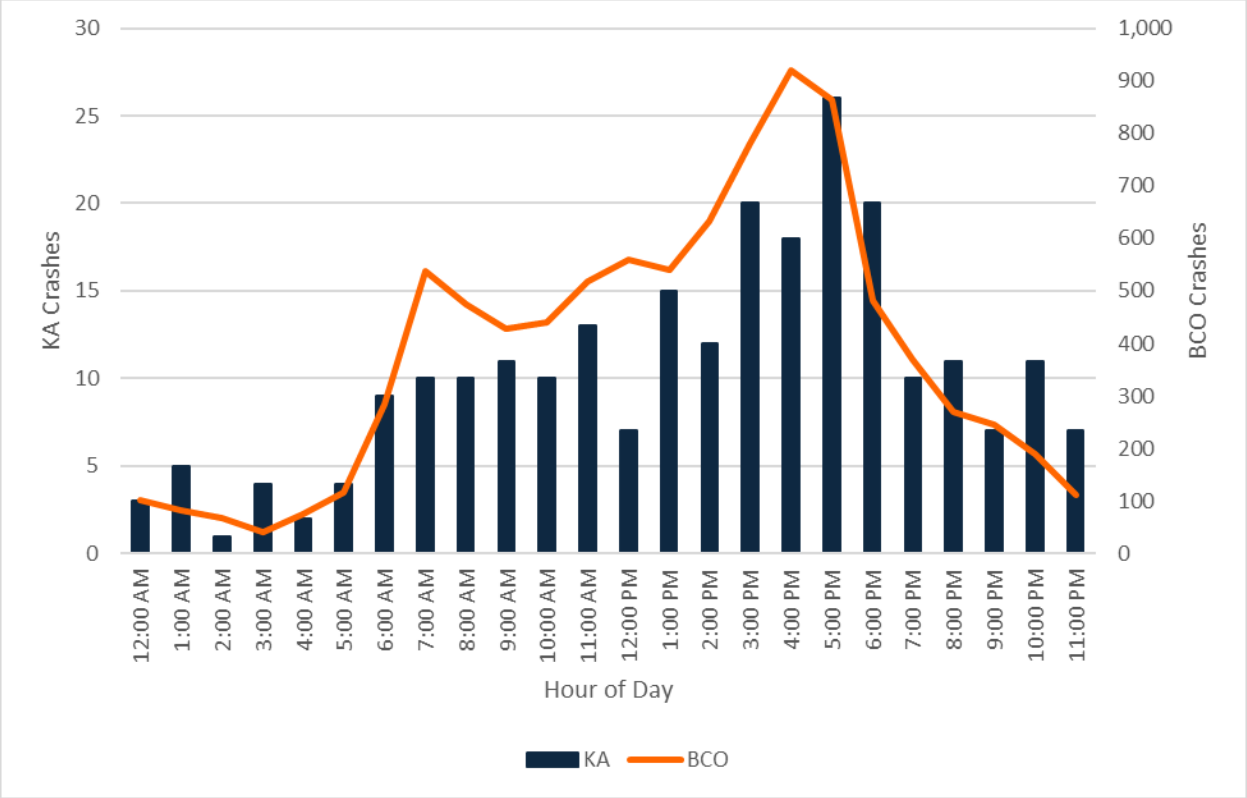


Table 7. Crash counts and proportions by hour of day

Hour of Day	KA Crashes	BCO Crashes	Subtotal Crashes	Percent of Total KA Crashes	Percent of Total Crashes	KA Percent of Subtotal Crashes
12:00 AM	3	102	105	1.2%	1.1%	2.9%
1:00 AM	5	82	87	2.0%	0.9%	5.7%
2:00 AM	1	68	69	0.4%	0.7%	1.4%
3:00 AM	4	42	46	1.6%	0.5%	8.7%
4:00 AM	2	74	76	0.8%	0.8%	2.6%
5:00 AM	4	116	120	1.6%	1.3%	3.3%
6:00 AM	9	284	293	3.7%	3.1%	3.1%
7:00 AM	10	537	547	4.1%	5.8%	1.8%
8:00 AM	10	474	484	4.1%	5.2%	2.1%
9:00 AM	11	429	440	4.5%	4.7%	2.5%
10:00 AM	10	441	451	4.1%	4.8%	2.2%
11:00 AM	13	518	531	5.3%	5.7%	2.4%
12:00 PM	7	560	567	2.8%	6.0%	1.2%
1:00 PM	15	541	556	6.1%	5.9%	2.7%
2:00 PM	12	632	644	4.9%	6.9%	1.9%
3:00 PM	20	780	800	8.1%	8.5%	2.5%
4:00 PM	18	921	939	7.3%	10.0%	1.9%
5:00 PM	26	864	890	10.6%	9.5%	2.9%
6:00 PM	20	481	501	8.1%	5.3%	4.0%
7:00 PM	10	369	379	4.1%	4.0%	2.6%
8:00 PM	11	269	280	4.5%	3.0%	3.9%
9:00 PM	7	246	253	2.8%	2.7%	2.8%
10:00 PM	11	190	201	4.5%	2.1%	5.5%
11:00 PM	7	112	119	2.8%	1.3%	5.9%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crash Location

Crash Density

Figure 8 shows a heat map of all crashes from 2019 to 2023. A heat map illustrates where the highest occurrence of crashes took place.

- The City of Rochester is identified as an area with high crash density.
- Other high-crash areas highlighted are:
  - Highway 63 through Stewartville
  - Highway 14 through Byron
  - Highway 52 through Pine Island, Oronoco and Chatfield
  - Key interchanges such as Interstate 90 and Highway 52

Figure 8. Geographic density of crashes (all severities) in the study area

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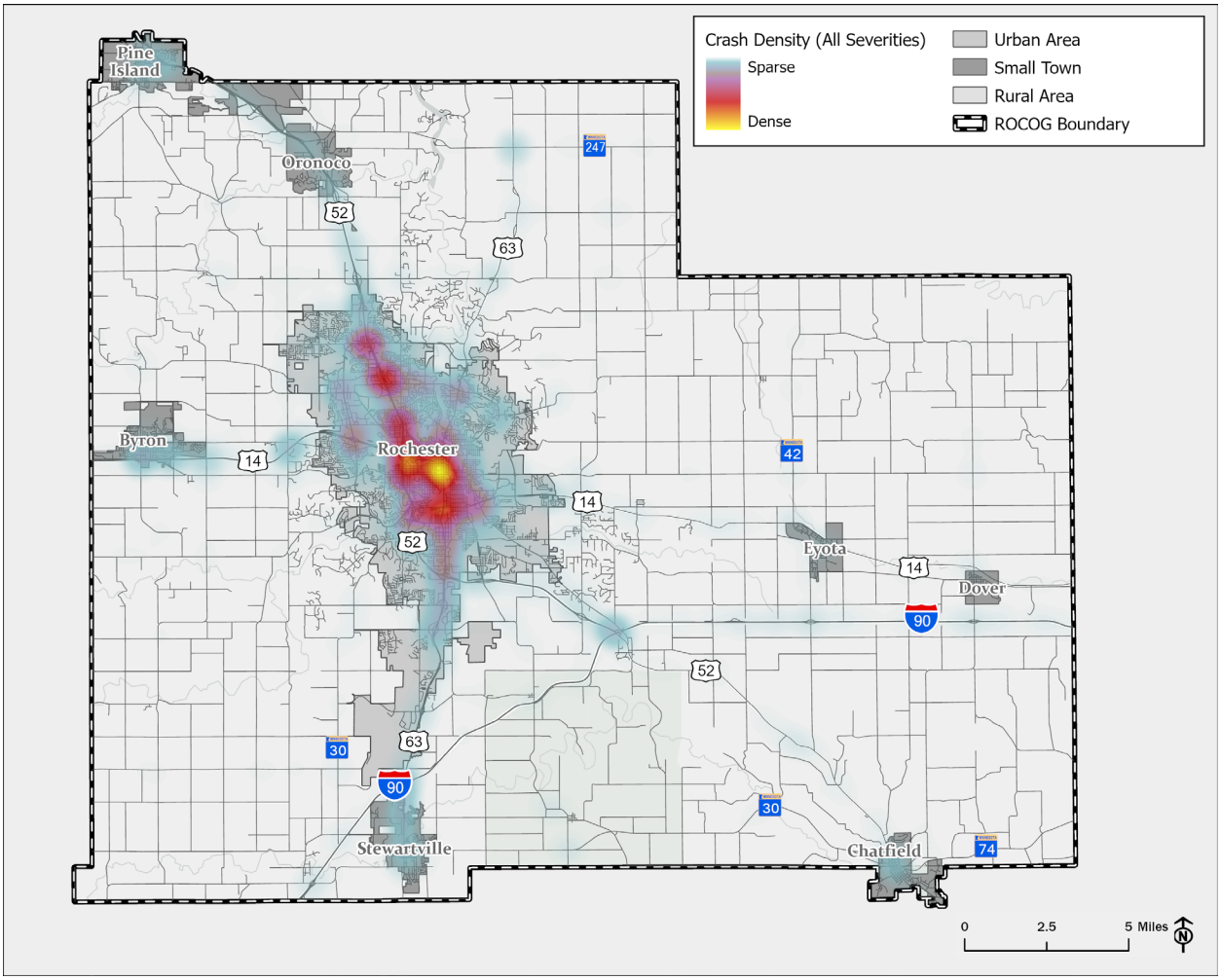


Crashes by Area Type

Figure 9 and **Table 8** show crash severity by area type. Area type was identified by how the reporting officer designated the crash.

- Urban roadways account for 31 percent of ROCOG roadways but 74 percent (6,927 crashes) of all crashes and 50 percent (137 KA crashes) of the total KA crashes in the region.
- Rural roadways had a higher proportion of KA crashes at 5 percent (68 KA crashes of 1,824 subtotal crashes).

Figure 9. Crash severity by area type

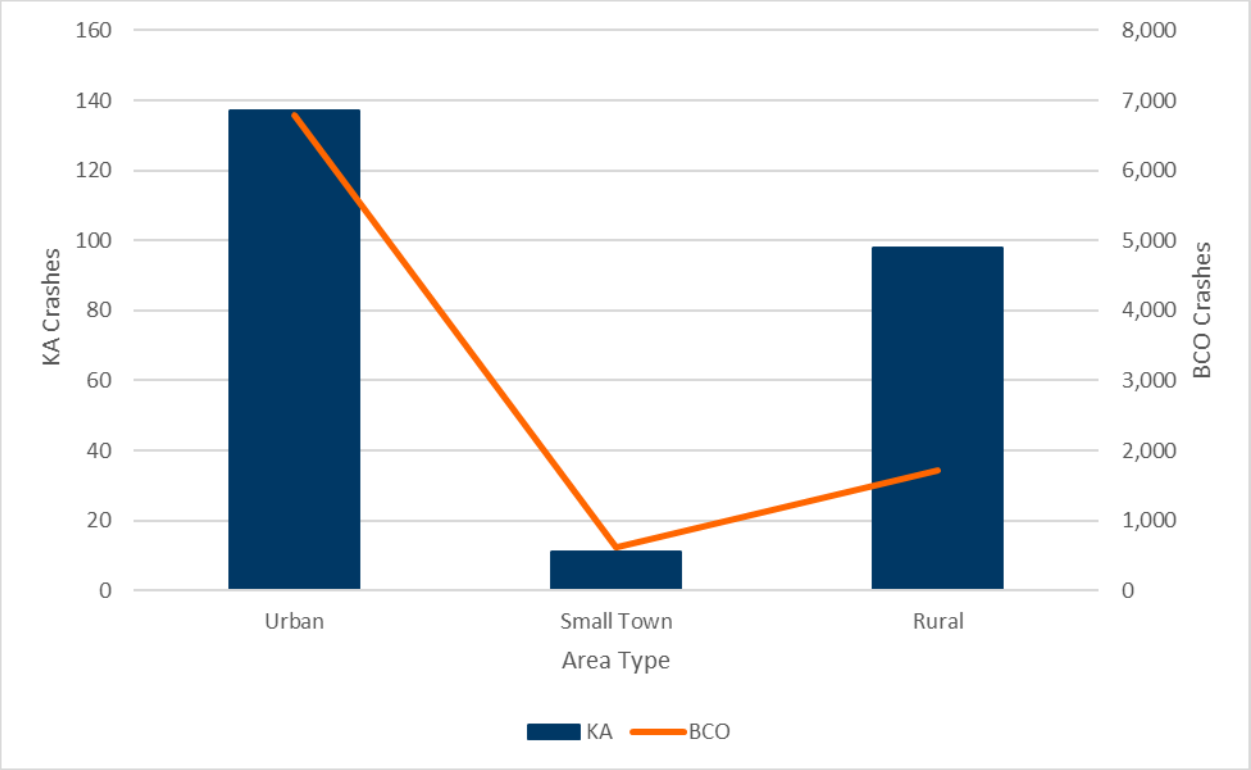


Table 8. Crash rates and proportions by area type

Area Type	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles	Percent of CL Miles
Urban	137	6,790	6,927	55.7%	73.9%	2.0%	21.7	1,075.9	631	30.7%
Small Town	11	616	627	4.5%	6.7%	1.8%	5.9	332.5	185.2	9.0%
Rural	98	1,726	1,824	39.8%	19.4%	5.4%	7.9	139.2	1,240.3	60.3%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**	**12.0**	**443.6**	**2058.5**	**100.0%**

Crashes by Municipality/Township

Table 9 categorizes crashes by municipalities and townships located within the region as reported by the responding officer.

- The City of Rochester had 6,904 crashes (74 percent of total crashes in the region), while accounting for 31 percent of the region's roadways. The City had 137 KA crashes accounting for 56 percent of total KA crashes.
- Marion Township had the second most crashes with 282 (3 percent of all crashes).

The top cities by KA crashes are as follows:

1. City of Rochester – 137 (2 percent of 6,904 KA crashes)
2. City of Eyota – 4 (12 percent of 33 subtotal crashes)
3. City of Byron – 3 (2 percent of 135 subtotal crashes)
4. City of Pine Island – 3 (2 percent of 133 subtotal crashes)
5. City of Oronoco – 1 (1 percent of 74 subtotal crashes)

The top townships by KA crashes are as follows:

1. Farmington Township – 10 (9 percent of 117 subtotal crashes)
2. Cascade Township – 9 (6 percent of 159 subtotal crashes)
3. Dover Township – 9 (10 percent of 95 subtotal crashes)
4. Marion Township – 8 (3 percent of 282 subtotal crashes)
5. New Haven Township – 8 (8 percent of 96 subtotal crashes)

These crash statistics demonstrate that townships are more likely to have a KA crash than cities in the ROCOG region, but it's important to remember that these locations have smaller crash sample sizes.

Table 9. Crash counts and proportion by city/township

City / Township	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles	Percent of CL Miles
City of Rochester	137	6,767	6,904	55.7%	73.6%	2.0%	21.7	1,072.2	631	30.7%
City of Stewartville	1	181	182	0.4%	1.9%	0.5%	2.9	521.2	35	1.7%
City of Byron	3	132	135	1.2%	1.4%	2.2%	7.5	331.6	40	1.9%
City of Pine Island	3	130	133	1.2%	1.4%	2.3%	8.1	350.6	37	1.8%
City of Chatfield	0	81	81	0.0%	0.9%	0.0%	0.0	309.7	26	1.3%
City of Oronoco	1	73	74	0.4%	0.8%	1.4%	4.0	293.0	25	1.2%
City of Eyota	4	29	33	1.6%	0.4%	12.1%	26.3	190.7	15	0.7%
City of Dover	0	4	4	0.0%	0.0%	0.0%	0.0	50.0	8	0.4%
Marion Township	8	274	282	3.3%	3.0%	2.8%	8.6	294.3	93	4.5%
Kalmar Township	6	188	194	2.4%	2.1%	3.1%	8.7	272.0	69	3.4%
High Forest Township	2	168	170	0.8%	1.8%	1.2%	2.3	190.0	88	4.3%
Cascade Township	9	150	159	3.7%	1.7%	5.7%	18.2	302.9	50	2.4%
Oronoco Township	5	135	140	2.0%	1.5%	3.6%	6.2	166.6	81	3.9%

City / Township	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles	Percent of CL Miles
Eyota Township	5	124	129	2.0%	1.4%	3.9%	6.2	153.0	81	3.9%
Farmington Township	10	107	117	4.1%	1.2%	8.5%	16.6	177.5	60	2.9%
New Haven Township	8	88	96	3.3%	1.0%	8.3%	10.2	112.2	78	3.8%
Dover Township	9	86	95	3.7%	1.0%	9.5%	14.6	139.3	62	3.0%
Rochester Township	5	74	79	2.0%	0.8%	6.3%	9.0	133.1	56	2.7%
Orion Township	2	70	72	0.8%	0.8%	2.8%	3.5	122.7	57	2.8%
Pleasant Grove Township	6	63	69	2.4%	0.7%	8.7%	8.5	89.0	71	3.4%
Salem Township	7	52	59	2.8%	0.6%	11.9%	9.0	67.1	77	3.8%
Haverhill Township	4	51	55	1.6%	0.6%	7.3%	6.2	78.5	65	3.2%
Viola Township	3	31	34	1.2%	0.4%	8.8%	4.5	46.8	66	3.2%
Rock Dell Township	4	19	23	1.6%	0.2%	17.4%	6.0	28.5	67	3.2%
Elmira Township	2	16	18	0.8%	0.2%	11.1%	3.2	25.9	62	3.0%
Quincy Township	1	13	14	0.4%	0.1%	7.1%	1.7	22.3	58	2.8%
Total	**246**	**9,132**	**9,378**	**100.0**	**100.0**	**2.6%**	**12.0**	**443.6**	**2,058**	**100.0%**

Crashes by Jurisdiction (Road Ownership)

Figure 10 and **Table 10** show crash severity by jurisdiction as reported by the responding officer.

- Between 2019 and 2023, over half (51 percent) of the total crashes occurred along municipal roads which make up approximately 31 percent of roadways centerline miles in the ROCOG region.
    - Municipal roads had the largest share of KA crashes (101 KA crashes) accounting for 41 percent of total KA crashes.
- On the other hand, township roads make up 29 percent of roadway centerline miles in the ROCOG region but 2 percent (139 subtotal crashes) of all crashes and 4 percent (10 KA crashes) of total KA crashes.
- County roads had 79 KA crashes, making up a third of all KA crashes in the five-year period (32 percent of total KA crashes).
    - County roads had a higher proportion of KA crashes accounting for 5 percent of total county road crashes (79 KA crashes of 1,474 subtotal crashes), demonstrating they are the most at risk of severe crashes compared to other roadways in the ROGOG region.
- Federal roadways have the most BCO crashes per 100 centerline miles at 1,689.1.

Figure 10. Crash severity by jurisdiction

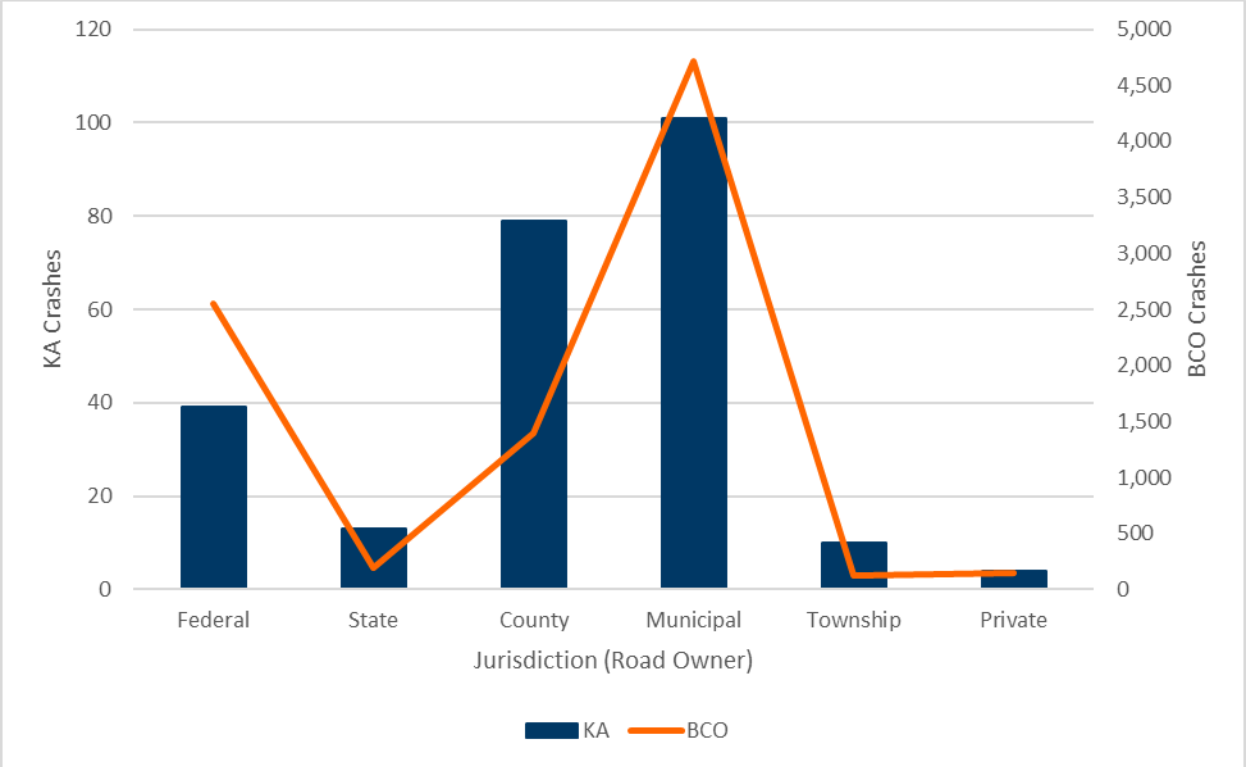


Table 10. Crash counts and proportions by jurisdiction

Jurisdiction	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles	Percent of CL Miles
Federal	39	2,557	2,596	15.9%	27.7%	1.5%	25.8	1,689.1	151.0	7.4%
State	13	192	205	5.3%	2.2%	6.3%	22.5	332.5	57.7	2.8%
County	79	1,395	1,474	32.1%	15.7%	5.4%	15.1	267.4	521.7	25.3%
Municipal	101	4,710	4,811	41.1%	51.3%	2.1%	16.0	745.6	631.7	30.7%
Township	10	129	139	4.1%	1.5%	7.2%	1.7	21.5	600.1	29.2%
Private	4	149	153	1.6%	1.6%	2.6%	4.2	155.4	95.9	4.7%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**	**12.0**	**443.6**	**2,058.5**	**100.0%**

Crashes by Functional Classification

Figure 11 and **Table 11** show crash severity by functional classification. Functional classification is a system used to categorize streets and highways based on the type of service they provide. This classification helps in understanding the role each road plays in the overall network. It defines the role of each road in facilitating the flow of trips through the network, grouping roads into different classes or systems. The classification is used in state and local planning and to determine eligibility for Federal and State Aid. MnDOT collaborates with various organizations to review and update the classification system regularly. Federal law mandates that state transportation agencies develop and update the functional classification for all public roads.

- Minor arterials had the highest number of total crashes at 2,895 (31 percent of total crashes in the region) yet make up 8 percent of roadways in the ROCOG region, demonstrating they are at higher risk for crashes.
    - Minor arterials also had the highest number of KA crashes at 92 (37 percent of total KA crashes).
- Local roads had the second highest number of total crashes at 2,778 (30 percent of total crashes in the region) yet make up the majority of roadway centerline miles in the region (69 percent), may be a lower risk for crashes.
    - Local roads also had 59 KA crashes (24 percent of total KA crashes).
- Minor collectors make up 7 percent of roadways in the ROCOG region and 11 percent (28 KA crashes) of total KA crashes.
    - Minor collectors also had the highest proportion of KA crashes at 7 percent (28 KA crashes of 415 subtotal crashes).
- Principal arterials – other freeways and expressways make up 1 percent of roadways in the ROCOG region but 7 percent (675 subtotal crashes) of total crashes.

Figure 11. Crash severity by functional classification

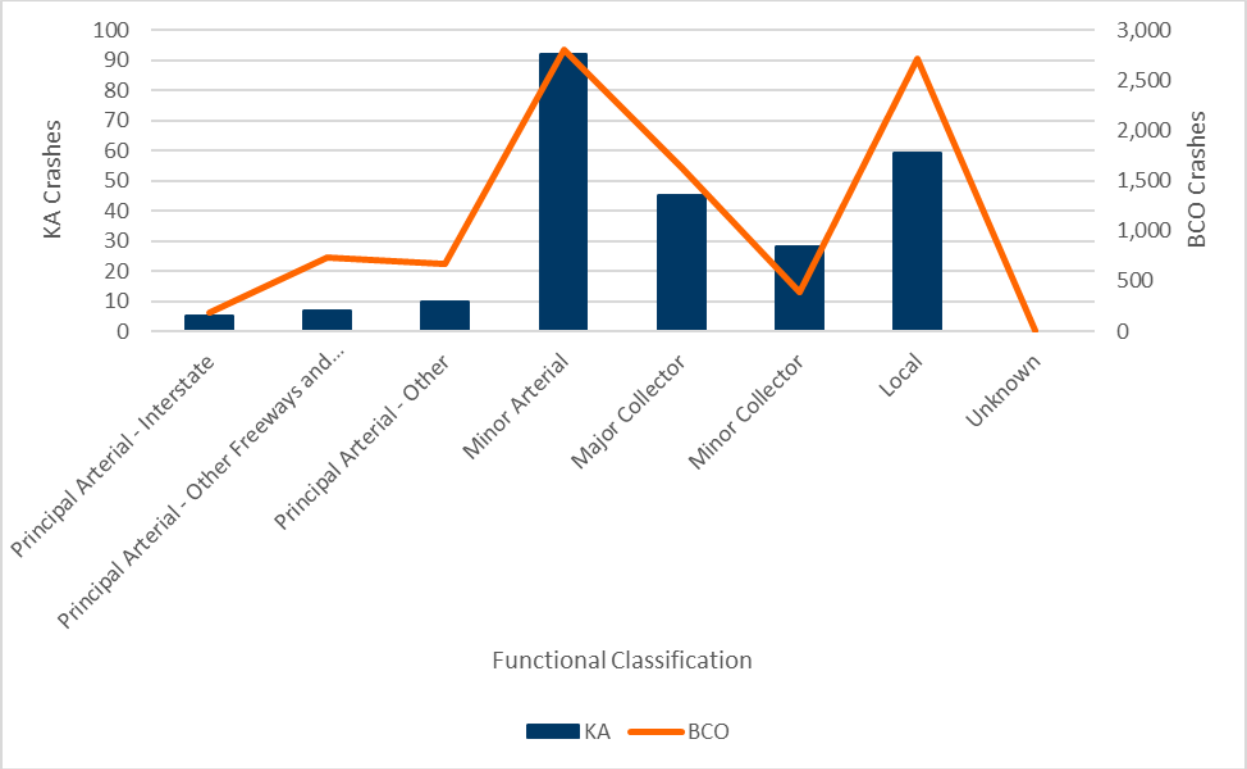


Table 11. Crash counts and proportions by functional classification

Functional Classification	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles	Percent of CL Miles
Principal Arterial - Interstate	5	183	188	2.0%	2.0%	2.7%	18.4	672.2	27.0	1.3%
Principal Arterial - Other Freeways and Expressways	7	741	748	2.8%	8.0%	0.9%	30.3	3,203.1	23.1	1.1%
Principal Arterial - Other	10	665	675	4.1%	7.2%	1.5%	27.0	1,795.9	37.0	1.8%
Minor Arterial	92	2,803	2,895	37.4%	30.9%	3.2%	57.8	1,760.5	159.2	7.7%
Major Collector	45	1,629	1,674	18.3%	17.9%	2.7%	17.8	645.0	252.6	12.3%
Minor Collector	28	387	415	11.4%	4.4%	6.7%	20.3	279.9	138.3	6.7%
Local	59	2,719	2,778	24.0%	29.6%	2.1%	4.2	192.3	1,414.0	68.7%
Unknown	0	5	5	0.0%	0.1%	0.0%	0.0	70.8	7.1	0.3%
Total	**246**	**9,132**	**9,378**	**100.0**	**100.0%**	**2.6%**	**12.0**	**443.6**	**2,058.5**	**100.0%**

Environmental Factors

Crashes by Weather Conditions

Figure 12 and **Table 12** show crash severity by weather conditions.

- Sleet, hail, and/or freezing rain were the most significant weather conditions factoring into 951 crashes (10 percent of total crashes).
    - Sleet, hail, and/or freezing rain weather conditions did have a relatively low number of KA crashes though at 5 (only 1 percent of total crashes for the subtotal crashes).
- Fog/Smog/Smoke also factored into many crashes at 515 (6 percent of total crashes).

Figure 12. Crash severity by weather conditions

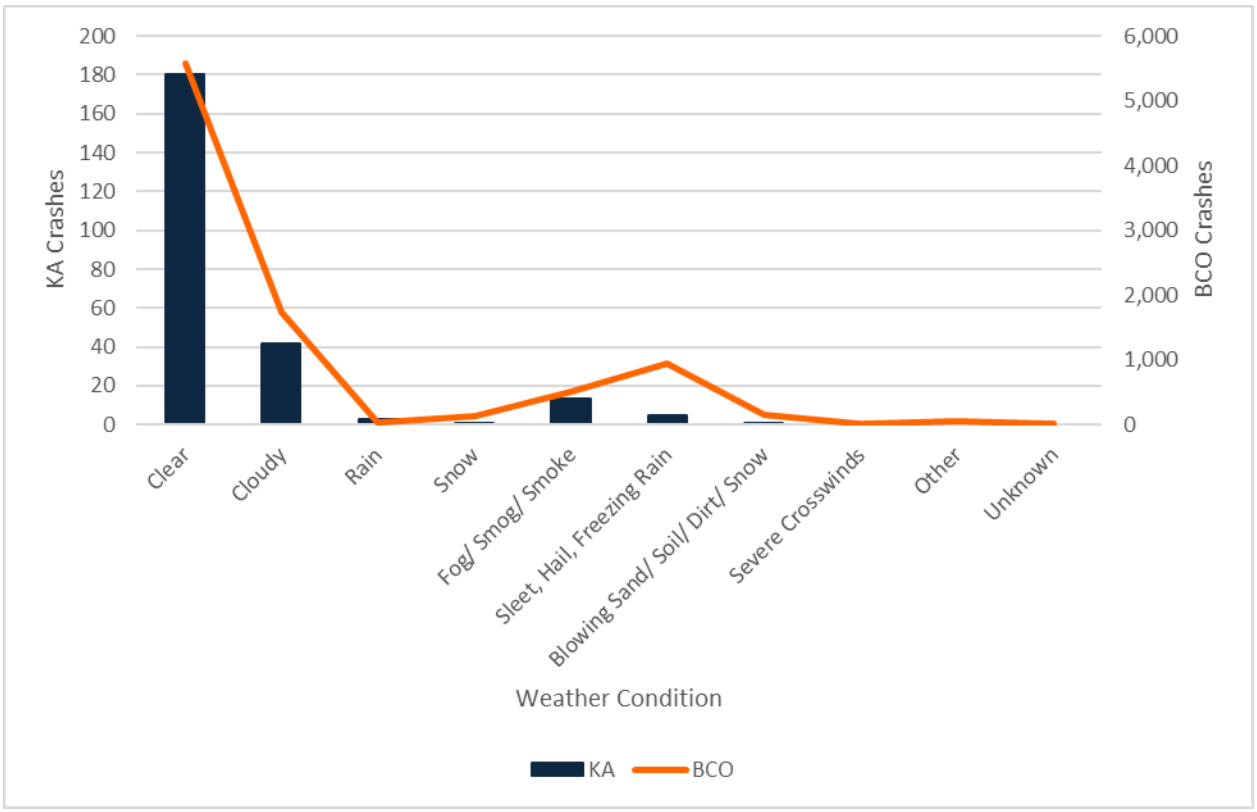


Table 12. Crash counts and proportions by weather conditions

Weather	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal Crashes
Clear	180	5,570	5,750	73%	61%	3.1%
Cloudy	42	1,730	1,772	17%	19%	2.4%
Rain	3	30	33	1%	0%	9.1%
Snow	1	125	126	0%	1%	0.8%
Fog/ Smog/ Smoke	13	500	513	5%	5%	2.5%
Sleet, Hail, Freezing Rain	5	946	951	2%	10%	0.5%
Blowing Sand/ Soil/ Dirt/ Snow	1	158	159	0%	2%	0.6%
Severe Crosswinds	1	15	16	0%	0%	6.3%
Other	0	52	52	0%	1%	0.0%
Unknown	0	6	6	0%	0%	0.0%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crashes by Lighting Conditions

Figure 13 and **Table 13** show crash severity by lighting conditions.

- Most crashes took place in daylight conditions with a subtotal of 6,657 (71 percent of total crashes).
    - 159 KA crashes took place in these conditions (65 percent of total KA crashes).
    - These KA crashes accounted for 2 percent of the subtotal crashes (159 KA crashes of 6,657 subtotal crashes).
- Dark (no streetlights) conditions had a high proportion of KA crashes at 5 percent (27 KA crashes of 537 subtotal crashes) compared to other lighting conditions.
- Dark (streetlights on) had the second highest number of crashes with 537 subtotal crashes (6 percent of total crashes).
    - 38 KA crashes took place in these conditions (11 percent of total KA crashes).
    - These KA crashes accounted for 2 percent of the subtotal crashes (38 KA crashes of 1,612 subtotal crashes).

Figure 13. Crash severity by lighting condition

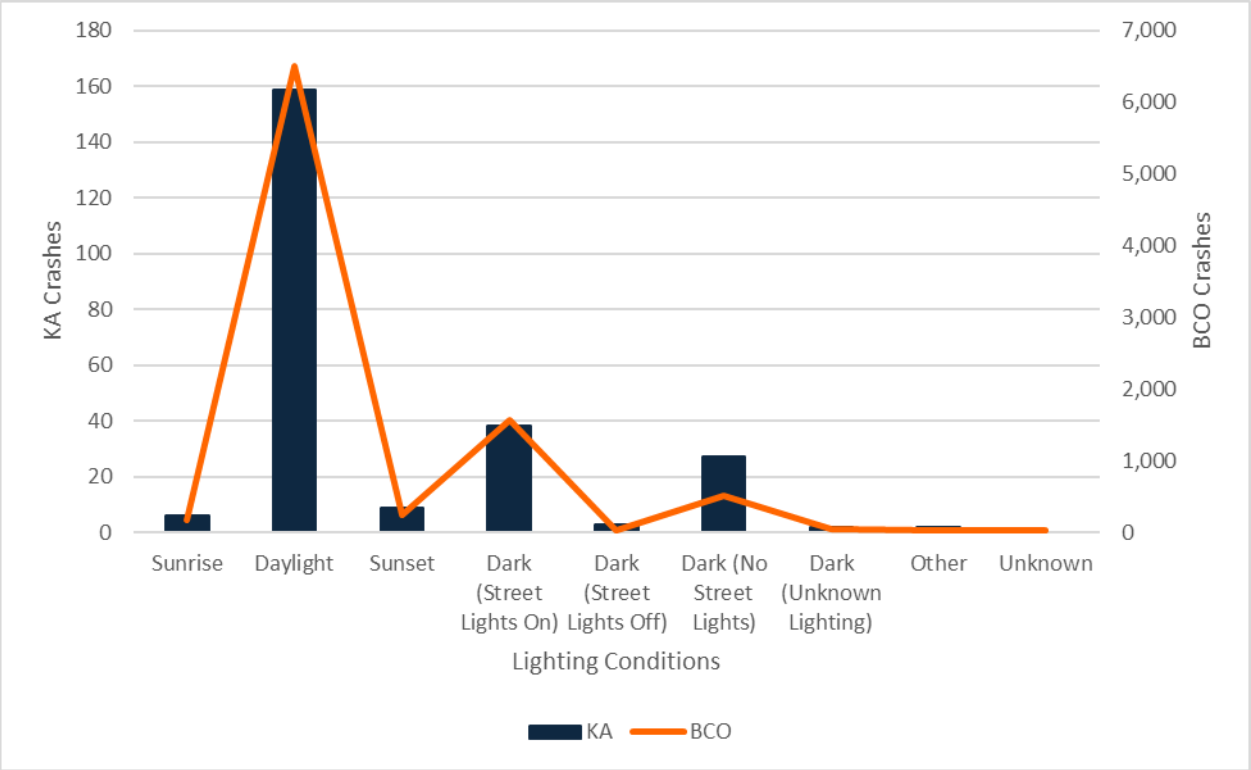


Table 13. Crash counts and proportions by lighting conditions

Lighting Condition	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal Crashes
Sunrise	6	170	176	2.4%	1.9%	3.4%
Daylight	159	6,498	6,657	64.6%	71.0%	2.4%
Sunset	9	250	259	3.7%	2.8%	3.5%
Dark (Street Lights On)	38	1,574	1,612	15.4%	17.2%	2.4%
Dark (Street Lights Off)	3	35	38	1.2%	0.4%	7.9%
Dark (No Street Lights)	27	510	537	11.0%	5.7%	5.0%
Dark (Unknown Lighting)	2	42	44	0.8%	0.5%	4.5%
Other	2	26	28	0.8%	0.3%	7.1%
Unknown	0	27	27	0.0%	0.3%	0.0%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crash Characteristics

Crashes by Manner of Collision

Figure 14 and **Table 14** show crash severity by manner of collision.

- Amongst known crash types, front to rear were the most common at 2,561 (27 percent of total crashes).
    - These types of crashes only resulted in KA crashes 1 percent of the time (21 KA crashes of 2,561 subtotal crashes), making them relatively low risk.
- Angle crashes were also very common at 2,291 (24 percent of total crashes) but account for 70 KA crashes (29 percent of total KA crashes).

Figure 14. Crash severity by manner of collision

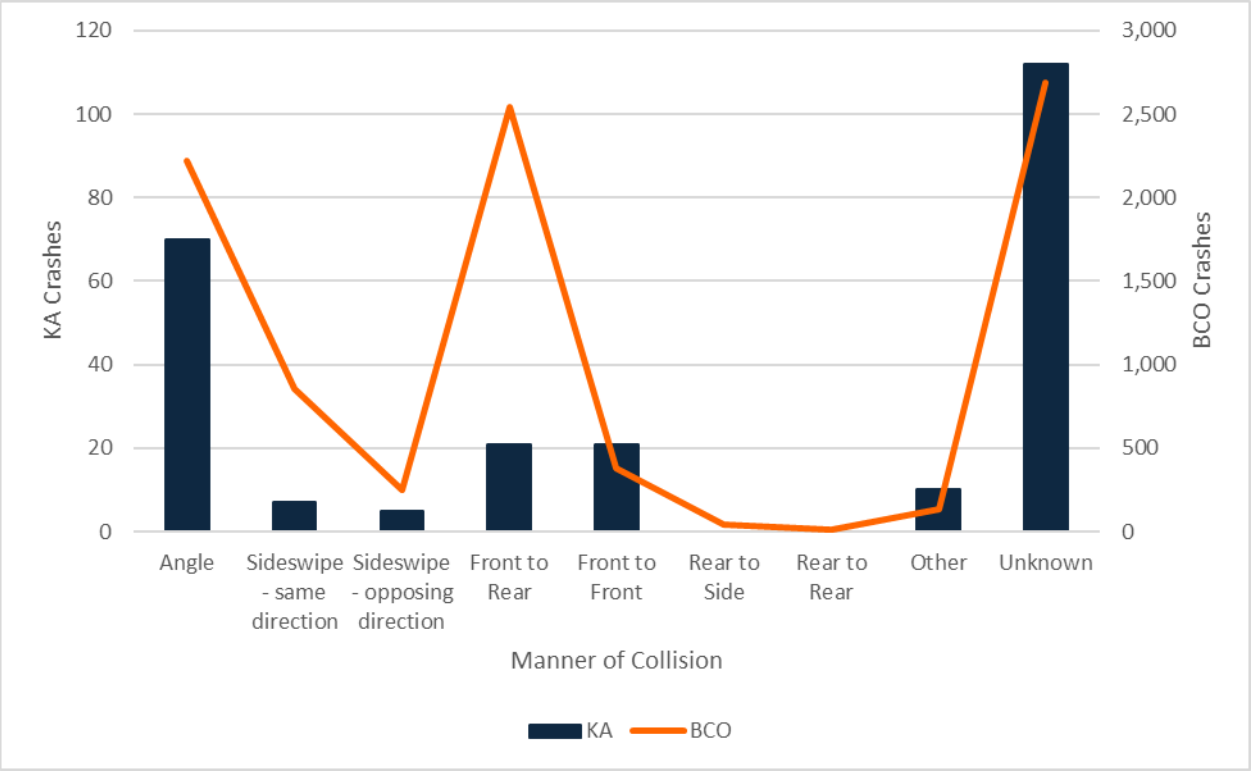


Table 14. Crash counts and proportions by manner of collision

Manner of Collision	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal Crashes
Angle	70	2,221	2,291	28.5%	24.4%	3.1%
Sideswipe – same direction	7	859	866	2.9%	9.2%	0.8%
Sideswipe – opposing direction	5	253	258	2.0%	2.8%	1.9%
Front to Rear	21	2,540	2,561	8.5%	27.3%	0.8%
Front to Front	21	383	404	8.5%	4.3%	5.2%
Rear to Side	0	42	42	0.0%	0.5%	0.0%
Rear to Rear	0	14	14	0.0%	0.2%	0.0%
Other	10	134	144	4.1%	1.5%	6.9%
Unknown	112	2,686	2,798	45.5%	29.8%	4.0%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Roadway Characteristics

Crashes by Segment vs Intersection

Figure 15 and **Table 15** show crash severity by intersection vs. segment.

- 57 percent of total crashes (5,300 subtotal crashes) occurred at intersections.
- 43 percent of total crashes (3,993 subtotal crashes) occurred along segments.
- Segments have a higher proportion of KA crashes at 3 percent (115 KA crashes of 3,993 subtotal crashes) than intersections at 2 percent (129 KA crashes of 5,171 subtotal crashes).

Figure 15. Crash severity by crash location (intersection vs. segment)

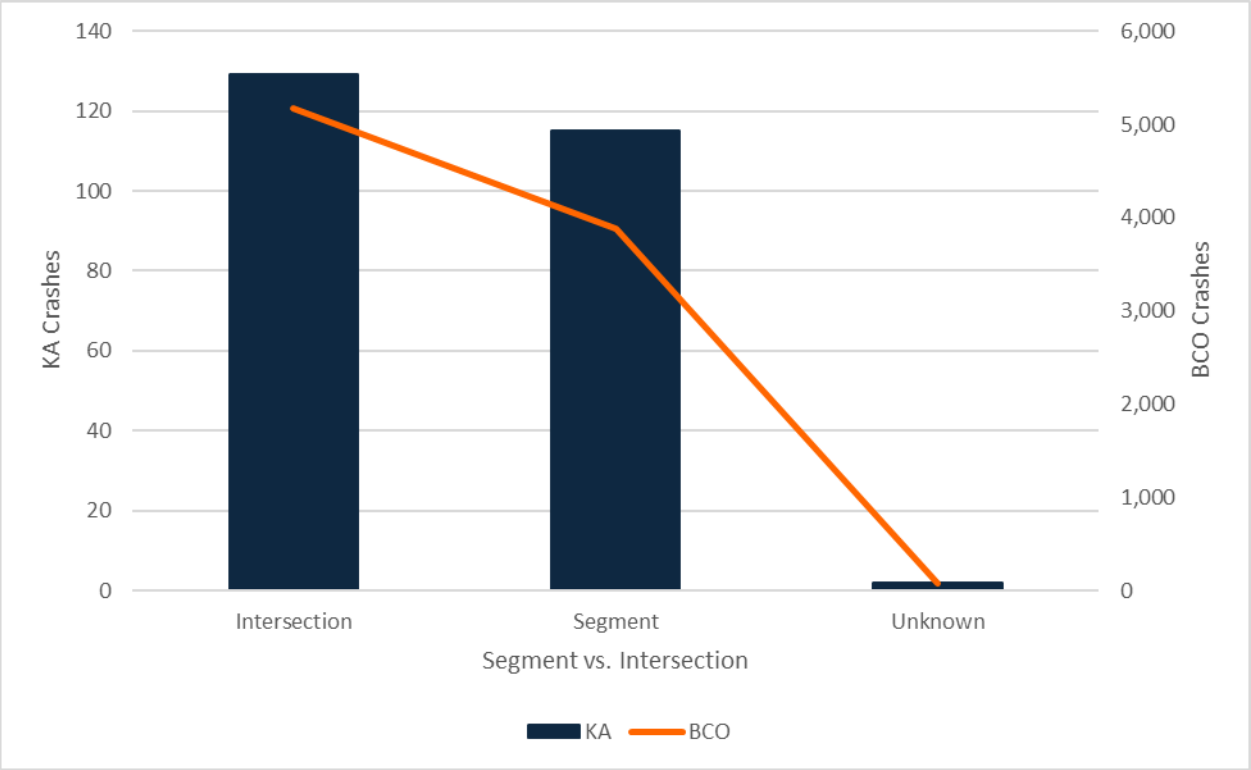


Table 15. Crash counts and proportions by crash location (intersection vs. segment)

Location	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal Crashes
Intersection	129	5,171	5,300	52.4%	56.5%	2.4%
Segment	115	3,878	3,993	46.7%	42.6%	2.9%
Unknown	2	83	85	0.8%	0.91%	2.4%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crashes by Intersection Control Type

Figure 16 and **Table 16** show crash severity by intersection control type. The intersection control category includes all crashes, even those located along segments. Crashes under the "Not applicable" category occurred along segments.

- Amongst the intersection control types, 1,996 crashes were at intersections with a thru-stop/yield (44 percent of total intersection crashes).
    - Intersections with a thru-stop/yield had 72 KA crashes (59 percent of total KA intersection crashes).
- Intersections with traffic control signals had 2,224 crashes (49 percent of total intersection crashes).
    - These signalized intersections had 43 KA crashes (35 percent of total KA crashes).

Figure 16. Crash severity by intersection control type

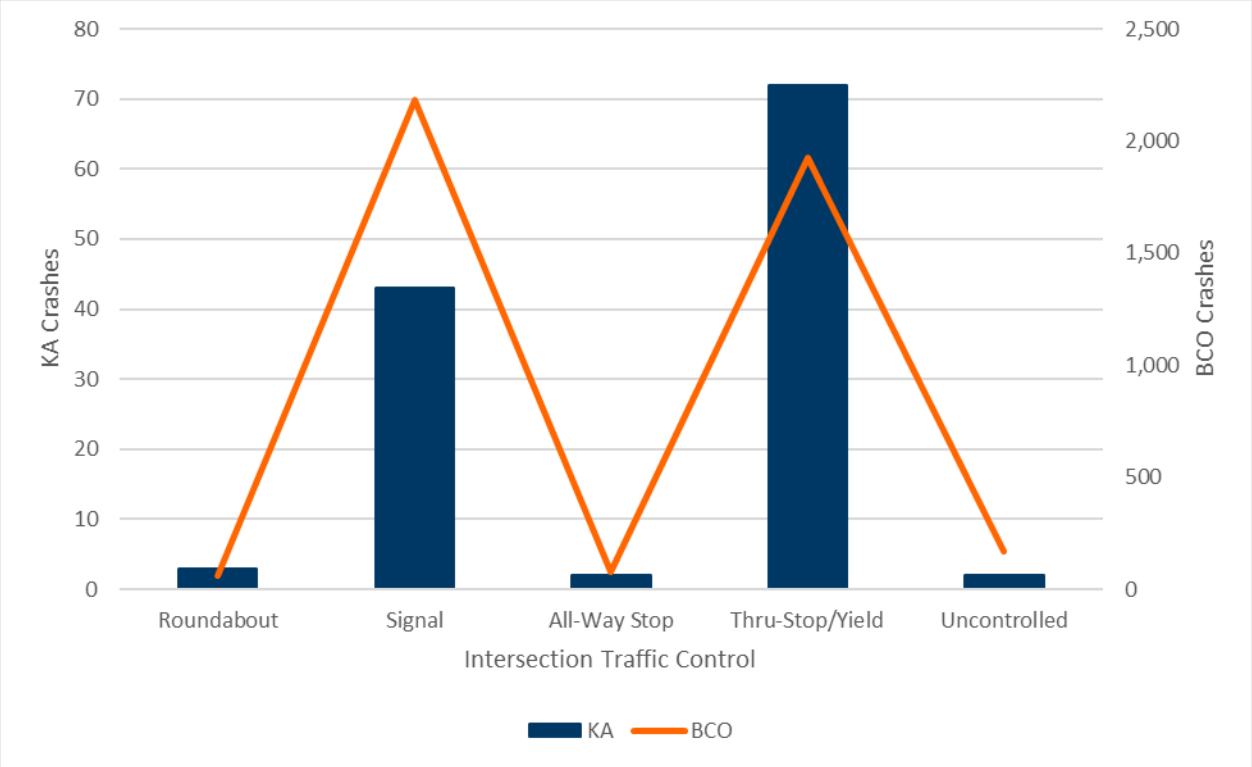


Table 16. Crash counts and proportions by intersection control type and severity

Intersection Type	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal Crashes
Roundabout	3	58	61	2.5%	1.3%	4.9%
Signal	43	2,181	2,224	35.2%	49.1%	1.9%
All-Way Stop	2	78	80	1.6%	1.8%	2.5%
Thru-Stop/Yield	72	1,924	1,996	59.0%	44.1%	3.6%
Uncontrolled	2	167	169	1.6%	3.7%	1.2%
Total	**122**	**4,408**	**4,530**	**100.0%**	**100.0%**	**2.7%**

Crashes by Roadway Curvature

Figure 17 and **Table 17** show crash severity by roadway curvature.

- Straight roadway segments accounted for 7,942 crashes or 85 percent of the crashes in the ROCOG region.
- Overall KA and BCO crashes remain fairly proportional for all roadway curvature types.

Figure 17. Crashes severity by roadway curvature

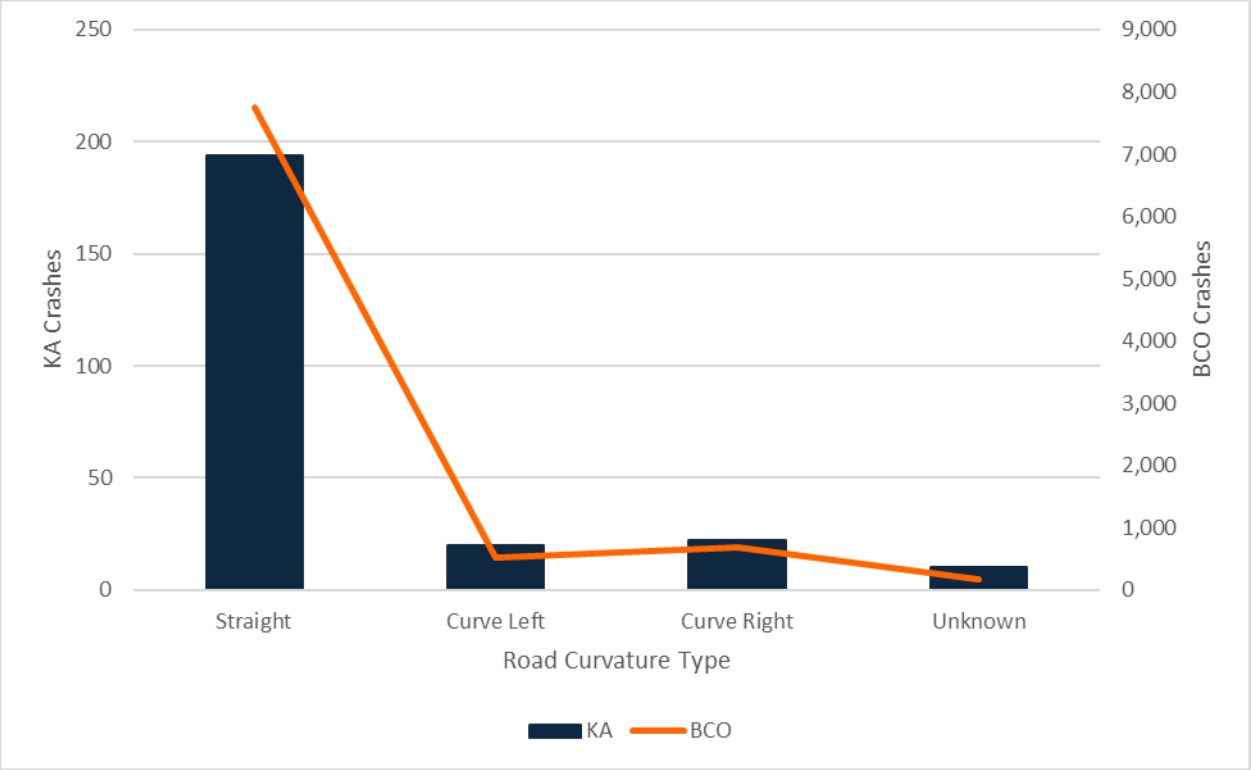


Table 17. Crashes severity by roadway curvature

Year	KA Crashes	BCO Crashes	Subtotal Crashes	Percent of Total KA Crashes	Percent of Total Crashes	KA Percent of Subtotal Crashes
Straight	194	7,748	7,942	78.9%	84.7%	2.4%
Curve Left	20	531	551	8.1%	5.9%	3.6%
Curve Right	22	679	701	8.9%	7.5%	3.1%
Unknown	10	174	184	4.1%	2.0%	5.4%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

Crashes by Number of Lanes

Figure 18 and **Table 18** show crash severity by number of lanes.

- Two-lane roadways make up the largest proportion (91 percent) of ROCOG roadways and recorded 4,496 crashes (47 percent of total crashes in the region).
    - Of these, 155 were KA crashes along two-lane roadways (63 percent of total KA crashes).
- Three-lane roadways had the most KA crashes per 100 centerline miles at 108.5. A three-lane roadway is defined as a road with two through lanes in one direction and one through lane in the other direction or a road with one through lane in each direction and a center two-way left-turn lane. Three-lane roadways account for just 0.1 percent (less than 2 miles) of the roadways in the ROCOG region.
- Four-lane roadways had the next highest number of crashes at 3,601 (38 percent of total crashes in the region) but make up 6 percent of roadways in the ROCOG region, demonstrating the roadway type is more a risk for crashes. Of those 3,601 crashes, 74 were KA (30 percent of total KA crashes).
- Six-lane roadways make up less than 1 percent of centerline miles in the ROCOG region but had the most BCO crashes per 100 miles at 4,733.4.

Figure 18. Crashes severity by number of lanes

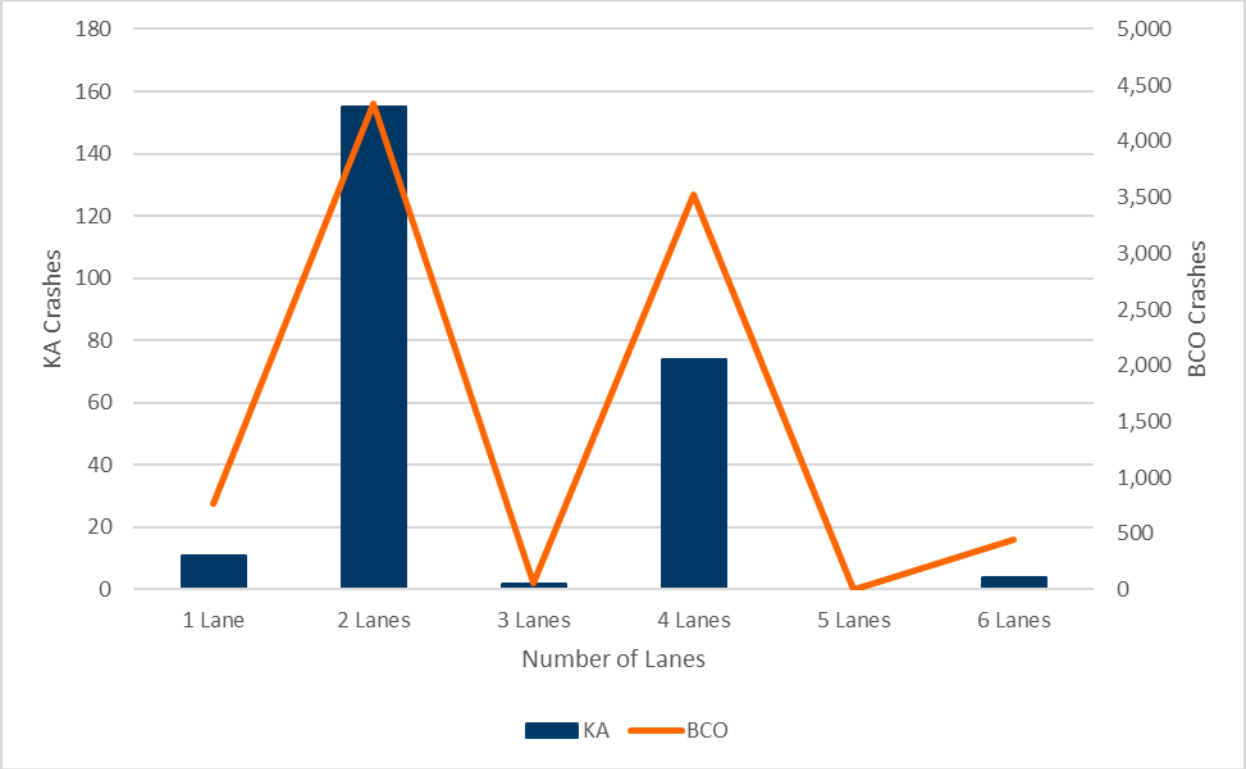


Table 18. Crash counts and proportions by number of lanes

Lanes	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles	Percent of CL Miles
1 Lane	11	761	772	4.5%	8.2%	1.4%	22.2	1,538.0	49	2.4%
2 Lanes	155	4,341	4,496	63.0%	47.9%	3.4%	8.3	232.2	1,869.6	90.8%
3 Lanes	2	56	58	0.8%	0.6%	3.4%	108.5	3,038.9	1.8	0.1%
4 Lanes	74	3,527	3,601	30.1%	38.4%	2.1%	57.7	2,750.0	128.3	6.2%
5 Lanes	0	0	0	0.0%	0.0%	-	-	-	0.0	0.0%
6 Lanes	4	447	451	1.6%	4.8%	0.9%	42.7	4,773.4	9.4	0.5%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**	**12.0**	**443.6**	**2058.5**	**100.0%**

Traffic Volume

Figure 19 and **Table 19** show crash severity by Annual Average Daily Traffic (AADT).

- Roadway segments carrying under 5,000 vehicles per day (VPD) made up the largest proportion of total crashes with 2,712 (29 percent of total crashes) and KA crashes in the region with 110 (45 percent of total KA crashes) while making up 80 percent of ROCOG roadways.
- 5,000 – 10,000 VPD roadways made up 5 percent of roadways in the ROCOG region but 17 percent (1,601 crashes) of total crashes and 13 percent (33 KA crashes) of total KA crashes.
- 10,000 – 15,000 VPD roadways make up 2 percent of ROCOG roadways but 12 percent (1,160 crashes) of all crashes and 11 percent of total KA crashes (28 KA crashes).

Figure 19. Crash severity by AADT

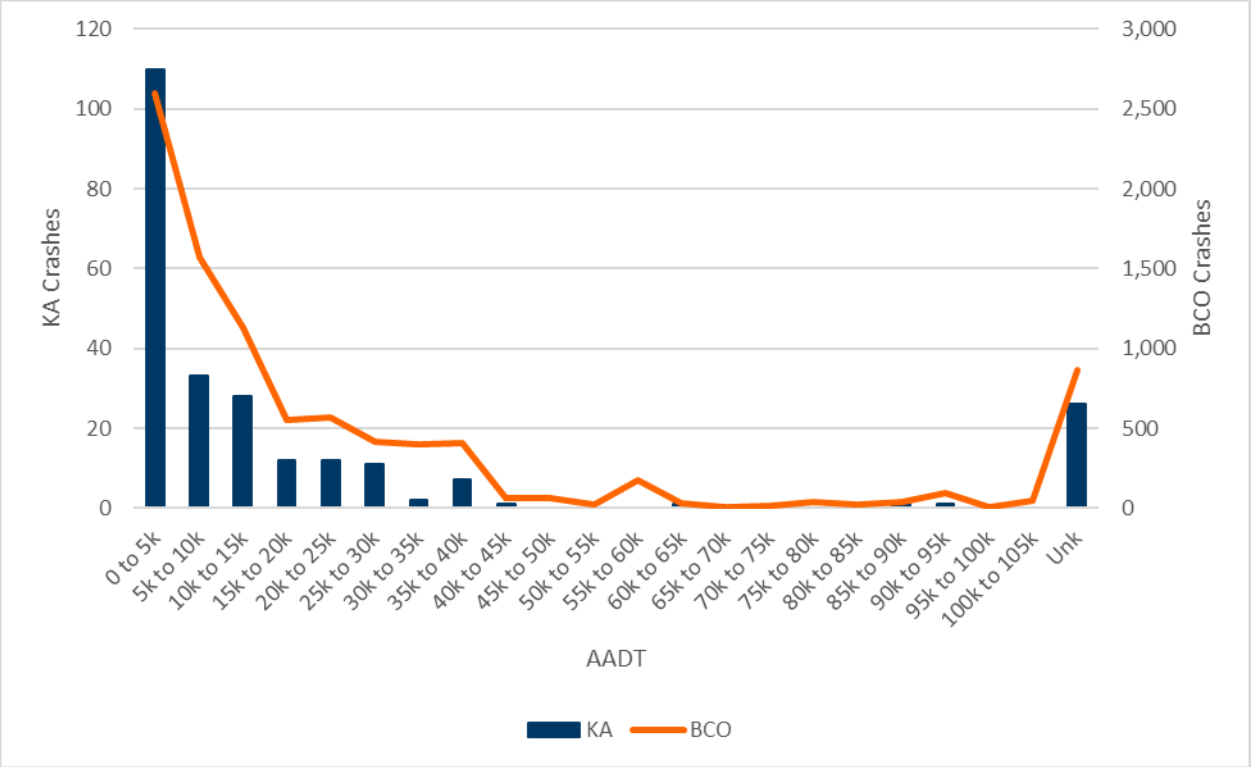


Table 19. Crash rates and proportions by AADT

Segment AADT	KA Crashes	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles
0 to 5k	110	2,602	2,712	44.7%	28.9%	4.1%	6.7	158.1	1,645.7	79.9%
5k to 10k	33	1,568	1,601	13.4%	17.1%	2.1%	29.8	1417.4	110.6	5.4%
10k to 15k	28	1,132	1,160	11.4%	12.4%	2.4%	58.3	2355.0	48.1	2.3%
15k to 20k	12	552	564	4.9%	6.0%	2.1%	73.0	3360.1	16.4	0.8%
20k to 25k	12	566	578	4.9%	6.2%	2.1%	58.0	2738.0	20.7	1.0%
25k to 30k	11	417	428	4.5%	4.6%	2.6%	118.9	4508.6	9.2	0.4%
30k to 35k	2	396	398	0.8%	4.2%	0.5%	15.7	3115.3	12.7	0.6%
35k to 40k	7	409	416	2.8%	4.4%	1.7%	47.9	2799.0	14.6	0.7%
40k to 45k	1	66	67	0.4%	0.7%	1.5%	56.9	3754.7	1.8	0.1%
45k to 50k	0	66	66	0.0%	0.7%	0.0%	0.0	2693.6	2.5	0.1%
50k to 55k	0	25	25	0.0%	0.3%	0.0%	0.0	3707.1	0.7	0.0%
55k to 60k	0	172	172	0.0%	1.8%	0.0%	0.0	3724.3	4.6	0.2%
60k to 65k	1	33	34	0.4%	0.4%	2.9%	169.3	5587.3	0.6	0.0%
65k to 70k	0	4	4	0.0%	0.0%	0.0%	0.0	2504.8	0.2	0.0%
70k to 75k	0	14	14	0.0%	0.1%	0.0%	0.0	3591.4	0.4	0.0%
75k to 80k	0	35	35	0.0%	0.4%	0.0%	0.0	3481.8	1.0	0.0%
80k to 85k	1	26	27	0.4%	0.3%	3.7%	238.5	6201.0	0.4	0.0%
85k to 90k	1	42	43	0.4%	0.5%	2.3%	103.7	4355.3	1.0	0.0%
90k to 95k	1	93	94	0.4%	1.0%	1.1%	69.9	6500.0	1.4	0.1%
95k to 100k	0	4	4	0.0%	0.0%	0.0%	0.0	3886.3	0.1	0.0%
100k to 105k	0	43	43	0.0%	0.5%	0.0%	0.0	11579.6	0.4	0.0%
Unknown	26	867	893	10.6%	9.5%	2.9%	15.7	524.0	165.5	8.0%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**	**12.0**	**443.6**	**2,058.5**	**100.0%**

Crashes by Speed Limit

Figure 20 and **Table 20** show crash severity by speed limit.

- Roadways with speed limits of 25 MPH had the most crashes in the region at 3,370 (36 percent of total crashes) while making up 22 percent of roadways in the ROCOG region.
    - Roadways with speed limits of 25 MPH had 66 KA crashes making up 2 percent of subtotal crashes (3,081 crashes). These 66 KA crashes account for 27 percent of the total KA crashes.
- Roadways with speed limits of 40 MPH had the most KA crashes per 100 centerline miles with 62.2 while making up under 2 percent of roadways in the ROCOG region.
- Roadways with speed limits of 55 MPH had the highest number of KA crashes at 80 (33 percent of total KA crashes) compared to other roadways.
    - Roadways with 55 MPH speed limits had the highest proportion of KA crashes with 6 percent compared to other speed limits.
- Roadways with speed limits of 60 MPH had the most BCO crashes per 100 centerline miles with 4,286.3 while making up less than 1 percent of roadways in the ROCOG region.

Figure 20. Crash severity by speed limit

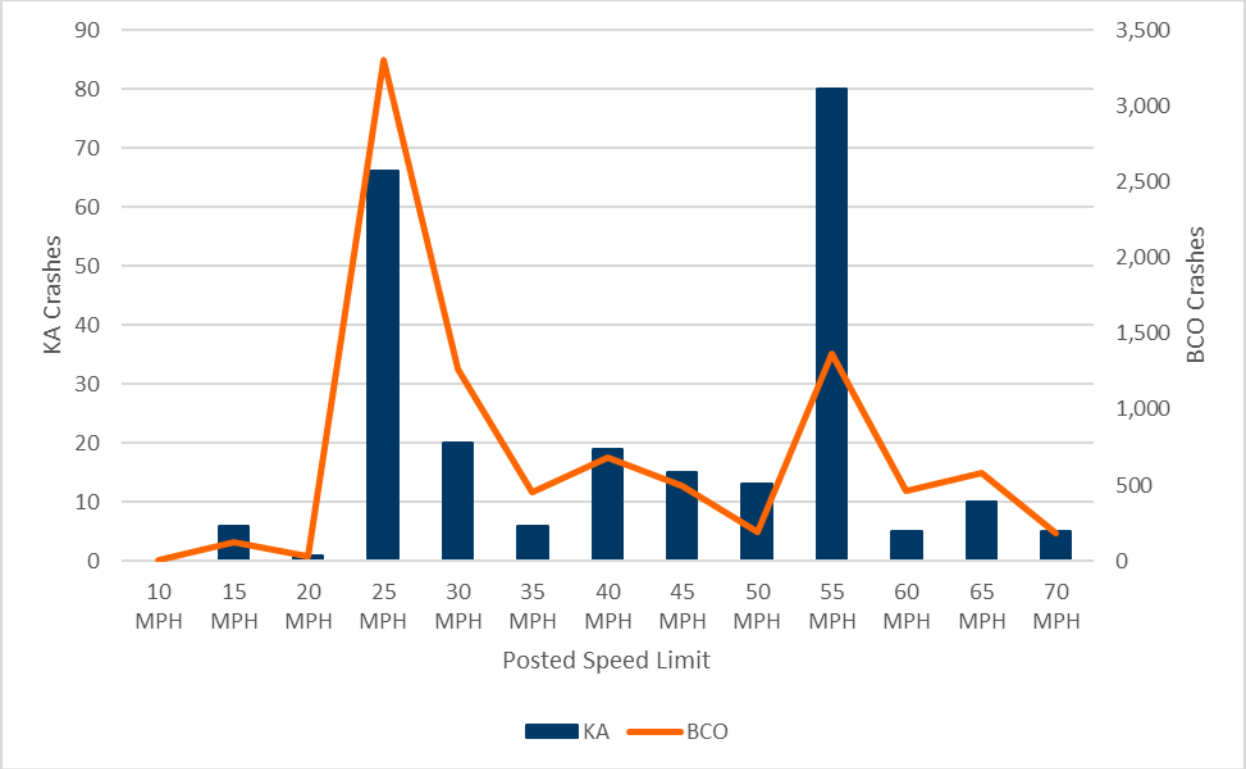


Table 20. Crash counts and severity by speed limit

Posted Speed	KA Crashes	BCO Crashes	Subtotal Crashes	KA Subtotal Percent of KA Total	Subtotal Percent of Total	KA Percent of Subtotal	KA Crashes per 100 CL Miles	BCO Crashes per 100 CL Miles	CL Miles	Percent of CL Miles
10 MPH	0	2	2	0.0%	0.0%	0.0%	0.0	86.4	2	0.1%
15 MPH	6	120	126	2.4%	1.3%	4.8%	11.6	232.0	51.7	2.5%
20 MPH	1	29	30	0.4%	0.3%	3.3%	7.0	204.4	14.2	0.7%
25 MPH	66	3,304	3,370	26.8%	35.9%	2.0%	14.7	736.7	448.5	21.8%
30 MPH	20	1,265	1,285	8.1%	13.7%	1.6%	6.1	385.4	328.2	15.9%
35 MPH	6	454	460	2.4%	4.9%	1.3%	20.6	1,562.2	29.1	1.4%
40 MPH	19	684	703	7.7%	7.5%	2.7%	62.2	2,237.8	30.6	1.5%
45 MPH	15	494	509	6.1%	5.4%	2.9%	38.3	1,261.8	39.1	1.9%
50 MPH	13	189	202	5.3%	2.2%	6.4%	2.2	31.7	596.7	29.0%
55 MPH	80	1,367	1,447	32.5%	15.4%	5.5%	17.7	302.4	452.1	22.0%
60 MPH	5	459	464	2.0%	4.9%	1.1%	46.7	4,286.3	10.7	0.5%
65 MPH	10	582	592	4.1%	6.3%	1.7%	35.6	2,069.5	28.1	1.4%
70 MPH	5	183	188	2.0%	2.0%	2.7%	18.4	672.2	27.2	1.3%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**	**12.0**	**443.6**	**2058.5**	**100.0%**

Crashes by Focus Area

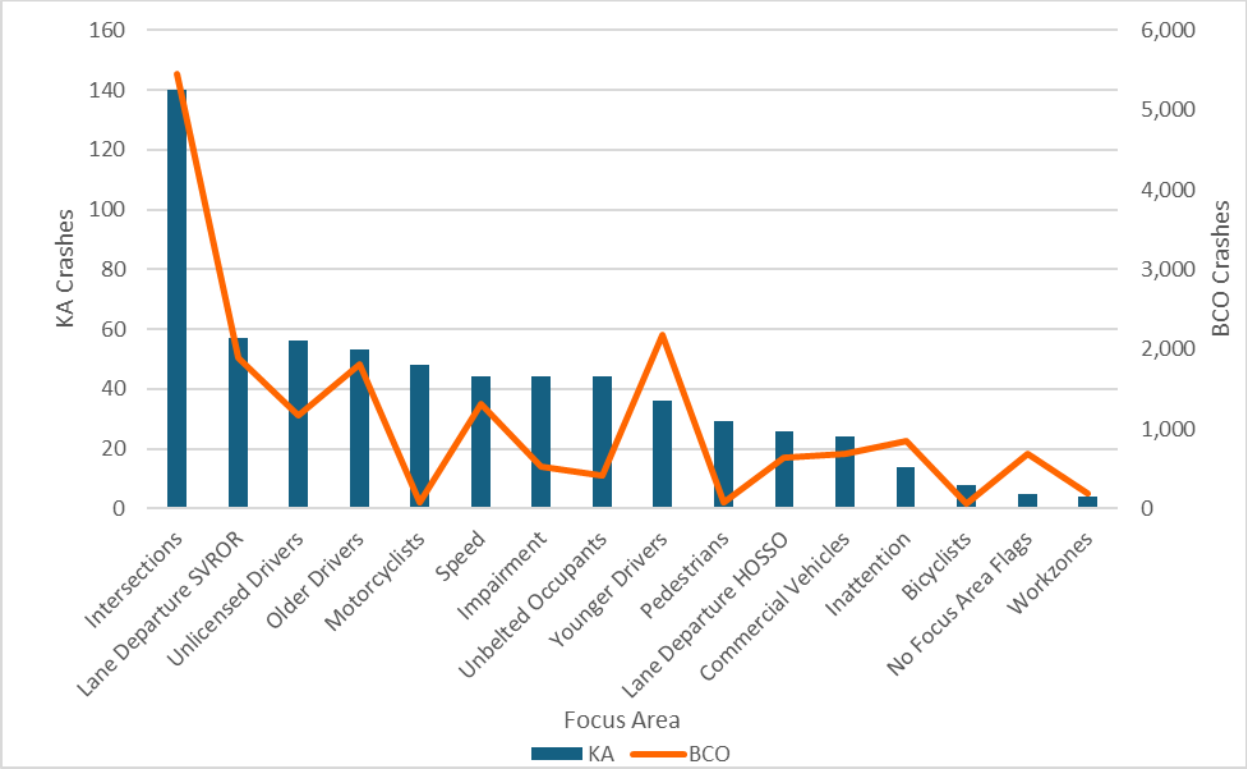
Figure 21 and **Table 21** show crash severity by focus area. A crash can have multiple focus area flags applied to it. For example, if an impaired driver is speeding and collides with another vehicle at an intersection, the impairment, speed, and intersections focus areas would apply. It's important to note that impairment can involve drivers on prescription medication that made them dizzy or drowsy. Overall, 2.6 percent of the 9,378 crashes that took place during the five-year analysis period resulted in a fatal or serious injury. Below are some of the focus areas associated with severe crash rates that are notably higher than that average:

- 15 percent (1,361 out of 9,378 total crashes) had the speed flag applied to them.
- Bicyclists and motorcyclists had the highest proportions of KA crashes:
    - Motorcyclists stand out the most – of the 123 crashes involving motorcyclists, 48 (39 percent) resulted in a fatal or serious injury
    - 27 percent of pedestrian-involved crashes resulted in a fatal or serious injury
    - 11 percent of bicyclist-involved crashes resulted in a fatality or serious injury
- Behavioral factors accounted for a large share of the total KA crashes in the ROCOG region over the five-year period:
    - Unlicensed Drivers – 56 KA crashes (23 percent of all KA crashes)
    - Speed – 44 KA crashes (18 percent of total KA crashes)
    - Impairment – 44 KA crashes (18 percent of total KA crashes)
    - Unbelted occupants – 44 KA crashes (18 percent of total KA crashes)
    - Inattention – 14 KA crashes (6 percent of total KA crashes)

Overall, the top five focus areas, ranked by number of KA crashes, are as follows:

1. Intersection – 140 KA crashes (57 percent of all KA crashes)
2. Lane Departure (Single Vehicle Run Off Road) – 57 KA crashes (23 percent of all KA crashes)
3. Unlicensed Drivers – 56 KA crashes (23 percent of all KA crashes)
4. Older Drivers – 53 KA crashes (22 percent of all KA crashes)
5. Motorcyclists – 48 KA crashes (20 percent of all KA crashes)

Figure 21. Crash severity by focus area



* SVROR – Single Vehicle Run Off Road
** HOSSO - Head-On or Sideswipe Opposing

Table 21. Crashes counts and proportions by focus area

Focus Area	KA Crashes	BCO Crashes	Subtotal Crashes	KA Percent of Total KA Crashes	Percent of Total Crashes	KA Percent of Subtotal Crashes
Intersection	140	5,446	5,586	56.9%	59.6%	2.5%
Lane Departure SVROR*	57	1,884	1,941	23.2%	20.7%	2.9%
Unlicensed Drivers	56	1,165	1,221	22.8%	13.0%	4.6%
Older Drivers	53	1,808	1,861	21.5%	19.8%	2.8%
Motorcyclists	48	75	123	19.5%	1.3%	39.0%
Speed	44	1,317	1,361	17.9%	14.5%	3.2%
Impairment	44	522	566	17.9%	6.0%	7.8%
Unbelted Occupants	44	408	484	17.9%	5.2%	9.1%
Younger Drivers	36	2,171	2,207	14.6%	23.5%	1.6%
Pedestrians	29	80	109	11.8%	1.2%	26.6%
Lane Departure HOSSO**	26	633	659	10.6%	7.0%	3.9%
Commercial Vehicles	24	687	711	9.8%	7.6%	3.4%
Inattention	14	853	867	5.7%	9.2%	1.6%
Bicyclist	8	67	75	3.3%	0.8%	10.7%
No Focus Area Flags	5	686	691	2.0%	7.4%	0.7%
Work Zones	4	184	188	1.6%	2.0%	2.1%
Total	**246**	**9,132**	**9,378**	**100.0%**	**100.0%**	**2.6%**

** SVROR – Single Vehicle Run Off Road*
*** HOSSO - Head-On or Sideswipe Opposing*

Appendix D. High Injury Network Memo

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

SAFETY ACTION PLAN

Safety Action Plan

Appendix D - High Injury Network Analysis

October 20, 2025

Introduction

The Rochester-Olmsted Council of Governments (ROCOG) Safety Action Plan (SAP) relies on a thorough understanding of crash trends to inform strategic investments in projects aimed at improving the safety of all road users throughout the region. One component of the analysis needed to gain that understanding is a High-Injury Network (HIN) for the region.

A High Injury Network (HIN) is a subset of a road network that has been identified as having high concentrations of crashes that result in fatal and serious injury crashes. A HIN analysis looks at the densities of severe crashes along a corridor and selects the portions of corridors that have high concentrations of severe (fatal and serious injury) crashes. The crash densities are calculated using a sliding window approach where a “window” of a predetermined length “slides” along the corridor at a specific increment and the density of injuries that occurred within that window are calculated and assigned to the segments within that window. This reduces edge effects at the ends of corridors, allows injuries along a corridor to be included in the analysis whether they occurred at an intersection or somewhere midblock, and ensures that the segments selected are an appropriate length (i.e. the length of the sliding window). Based on user-defined criteria, a minimum crash density is selected and any road segment with a calculated injury density above that threshold is included in the HIN. The resulting HIN represents a prioritized subset of the road network, focusing on roadway corridors with the highest prevalence of severe crashes.

Developing the High Injury Network

The development of an HIN consists of six steps: compiling the crash data, creating a base road network, creating short and long windows from a base road network, assigning crashes to long windows, calculating short and long window scores, and setting a minimum short window crash score threshold for inclusion in the final selection. All six steps are described below.

Compiling the Crash Data

The project team utilized crash data provided by the Minnesota Department of Transportation (MnDOT) for crashes that occurred in ROCOG planning area between 2019-2023. The data was provided in the three-table format (crash-level, vehicle/unit-level, and person-level). Each unit (a vehicle or a pedestrian) involved in a crash was sorted into a mode based on the *Unit Vehicle* and *Vehicle Type* fields from the vehicle/unit-level table. Those modes include:

- Passenger Automobile
- Heavy Vehicle (truck)
- Motorcycle
- Pedestrian
- Bicycle

In addition to the five modes listed above, units could be sorted into three additional mode types which were then excluded from analysis: other (people riding on/in ATVs, farm equipment, horses, etc.), parked/unoccupied automobiles, and hit-and-run automobiles. The crashes were then sorted into the three categories in **Table 1** to denote whether they would be included in the calculations for the all-mode, nonmotorized, and/or motorized HINs.

Table 1. Modes of transportation and the modal HINs in which they are included

HIN Category	Modes Included
All-Mode	All
Nonmotorized	Bike and Pedestrian
Motorized	Passenger Automobile, Heavy Vehicle, and Motorcycle

After classifying each unit by mode and excluding units with atypical characteristics, units without occupants, and units on which there was little to no information, the Most Severe Injury (MSI) suffered by a person using each of the five modes was determined. The severity of injuries is denoted using the KABCO scale, which consists of five crash severities that are used as an industry shorthand when discussing crash severity. **Table 2** includes descriptions of each of the codes and categorizes them into severe and non-severe groups. As an example of assigning modal MSIs using the KABCO scale, if a passenger car with a driver and two passengers strikes a person walking in a crosswalk and the pedestrian is killed (K), the driver receives a non-incapacitating injury (B), and the two passengers are suspected of having minor injuries (C), the MSI for someone in an automobile would be a minor injury (B), the MSI for a

pedestrian would be a fatality (K), and the MSI for the other modes (heavy automobile, cyclist, and motorcycle) would be null. MSIs were also calculated for all modes, motorized only, and non-motorized only.

Table 2. KABCO injury scale

Severe (more injurious)	Non-Severe (less injurious)
K – fatal injury A – incapacitating injury (serious injury)	B – non-incapacitating injury C – possible injury O – property damage only

Creating the Base Network

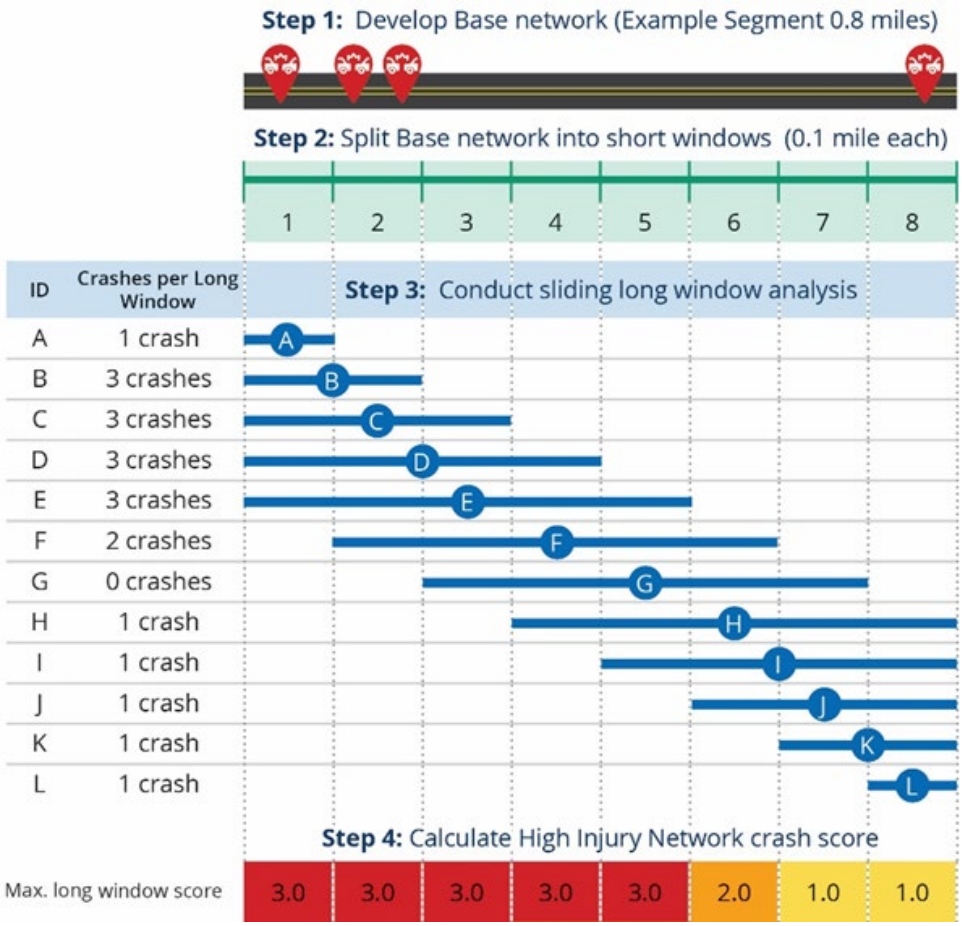
To reduce the number of artificial breaks in the analysis network, the project team manually validated the network topology and geometrics. The first step of this process consisted of adjusting road segments that were missing or improperly aligned and simplifying complex intersections such as roundabouts to ensure contiguous road segments that intersect at only one location. The second step consisted of merging the individual segments that form each road into contiguous corridors by dissolving the lines based on the street name. These contiguous lines were then used to create the short and long window analysis segments.

Creating the Short and Long Windows from the Base Network

Once the base network was finished, the corridors were then split into 0.1-mile segments, called “short windows”, that correspond to the increment by which the long window is moved along the corridor. In the example shown in **Figure 1**, the main corridor is shown as a road at the top of the diagram and measures 0.8 miles long. The short windows (represented by the green line segments at the top of the diagram in **Figure 1** are the same length as the increment by which the sliding long window slides. The short windows are split from the corridor starting at one end (in this case, on the left end) which results in short windows of 0.1 mile each.

The sliding windows, often referred to as “long windows” (represented by the blue lines in Figure 1), are created by merging short windows in overlapping groups of five or ten to create 0.5- or 1.0-mile-long windows, respectively. In **Figure 1**, the standard long window length is 0.5 miles and therefore consists of five short windows. As the long windows get closer to the ends of the corridor, the long windows decrease in length to ensure that each short window has the same number of long windows overlapping it. In the example, Long Windows A, B, C, D, H, I, J, K, and L are shorter than the standard 0.5 miles.

Figure 1. Diagram illustrating the sliding window analysis



Assigning Crashes to Long Windows

Once the long windows have been created from the short windows, the individual crashes are mapped to the long windows. To account for the width of the road, minor inaccuracies in the coordinates assigned to each crash, and discrepancies in the geometries representing roads in different datasets, a buffer of 50 meters is used when joining the crashes to the long windows. 50 meters was selected as the buffer distance because it captures the majority of crashes along segments even in cases where crashes occurred on divided roadways or were imprecisely geolocated. While using a buffer helps reduce the number of crashes that are unintentionally left off of a long window, it does increase the likelihood of crashes being assigned to too many long windows – especially at intersections and in locations where two roads run parallel to each other such as frontage roads along freeways. The effects of this over-assignment of crashes to long windows is mitigated by manually excluding short windows that have been assigned an erroneously high injury score. Because an individual crash that occurred at an intersection may be assigned to long windows from both of the intersecting corridors, there is no need to split the crash between the two corridors. After all, a crash that occurs at an intersection occurs on both corridors and splitting the crash between the two corridors would result in the undercounting of intersection crashes across the entire network.

Calculating Short Window Crash Scores

Once the crash points were joined to the long windows, the crash score for each long window was calculated based on the number and severity of crashes that are joined to it. The long window crash scores were, in turn, used to calculate the short window crash scores. In the example shown in **Figure 1**, the long window crash score (equal to the Crashes per Long Window column on the righthand side of the figure) simply reflects the number of crashes that lie within a given long window. For simplicity's sake, the example does not employ any weighting by severity. In other words, one crash equates to one point as opposed to the relative weights (discussed later in this section) that are assigned to each severity.

The short window score is calculated as the maximum score of any of the long windows that overlap it. In **Figure 1**, Short Window 6 has a maximum long window score of 2.0, which comes from long window F. In the example shown in **Figure 1**, if the threshold for inclusion in the HIN is set to 2.0, six short windows (1, 2, 3, 4, 5, and 6) have scores above the threshold (3.0, 3.0, 3.0, 3.0, 3.0, and 2.0, respectively), resulting in a total of 0.6 miles included in the HIN.

To maintain the focus on the most harmful crashes despite their relative infrequency, only the K, A, and B crashes are considered in the score calculations. To further reduce the likelihood of less severe (and far more prevalent) crash types overshadowing the most harmful crash types, two additional measures are employed: the K and A crashes are given a relative weight of 3 and the B crashes are given a weight of 1, and the automobile B crashes are excluded entirely from the crash score calculations. As seen in **Table 3**, Automobile B crashes account for approximately 56 percent of all K, A, and B crashes and 78 percent of all B crashes; removing them from the crash score calculations ensures that these relatively minor injuries do not overshadow the other modes' crashes. Note that, because a crash can involve multiple modes, the sums of the modal crash totals are often larger than the corresponding All Motorized, All Nonmotorized, or All Modes crash totals. For example, there were 11,565 crashes that involved at least one motorized mode (passenger automobiles, heavy vehicles, or motorcycles), but adding up the counts of passenger automobile crashes (11,188), heavy vehicle crashes (908), and motorcycle crashes (158) yields 12,254 – far greater than the 11,565 motorized vehicle crashes – which indicates that at least some of the motorized vehicle crashes involved multiple motorized modes.

Table 3. Most Severe Injury (MSI) by mode

Mode	K	A	B	C	O	Total
Passenger Automobile	30	150	1,017	1,605	8,386	11,188
Heavy Vehicle	0	6	28	34	840	908
Motorcycle	7	53	59	18	21	158
All Motorized	***37***	***209***	***1,097***	***1,641***	***8,581***	***11,565***
Bicycle	1	8	53	32	5	99
Pedestrian	5	27	48	33	18	131
All Nonmotorized	***6***	***35***	***101***	***65***	***23***	***230***
All Modes	**43**	**244**	**1,198**	**1,704**	**8,391**	**11,580**

Setting a Threshold for Inclusion in the HIN

The HIN is identified using crash score thresholds across the study area. The project team uses the following rough targets to recommend thresholds, which vary by mode:

- **Coverage of target (KAB) crashes** – are roughly 40-60 percent of target crashes covered by the HIN?
- **Mileage or extent of HIN streets and intersections** – is the total length of the HIN streets roughly 1-5 percent of the total length of the entire network?
- **Natural breaks** – does increasing or decreasing the threshold result in a significant change in severe crash density on the network? Are there natural breaks in the data where severe crash density dramatically changes?
- **Minimum threshold** – thresholds that are too low dilute the meaning of HIN. The team recommends a minimum crash score threshold of 6.0 for all modes, which equates to at least two life-changing crashes (e.g. two K or A crashes, one K or A crash and three B crashes, etc.) per mile over the past five years.

In short: minimum thresholds should be set high enough to imply a spatial pattern of severe crashes – HIN segment status should not be driven by just one severe crash.

The four targets above are sometimes at odds with one another and require a balanced and comprehensive approach. For example, covering 50 percent or more of KA crashes may result in a high number of miles being included in the HIN or may require a minimum crash score threshold that is so low that even segments with just one crash end up being included in the HIN. A higher minimum crash score threshold is recommended to provide a more targeted HIN.

A preliminary analysis of thresholds showed that the metrics/criteria listed above would be optimized by using the minimum threshold of 6 for all of the HINs except for the all-mode and

motorized HINs, which were optimized with a threshold of 7. In much the same way that severe crashes are clustered in Rochester (see **Figure 2**), the roadway segments included in the HINs are also clustered in Rochester. To increase the sensitivity of the HINs in areas outside of Rochester without over-including segments in Rochester, the team elected to use a split threshold for the all-mode and motorized HINs where the thresholds for inclusion in the two HINs were kept at 7 within the Rochester city limits and reduced to 6 outside of the City of Rochester. This geographic approach increases the sensitivity of the HINs in rural and small-town contexts outside of the City of Rochester without resulting in an overabundance of HIN segments in Rochester only.

Table 4 shows the combined length of all segments in the network and the total number of KAB crashes by mode and compares them to the combined lengths of the segments selected and count and percentage of the KAB crashes covered by each mode's HIN as defined by their proposed thresholds.

Table 4. Threshold-setting metrics for each modal HIN at proposed thresholds

Mode	Total Network Miles	Total KAB* Crashes	Proposed Threshold	Network Miles on HIN	KAB* Crashes on HIN
Passenger Automobile	2,172	180	6	100.5 (4.6%)	88 (48.9%)
Heavy Vehicle	2,172	34	6	0.0 (0.0%)	0 (0.0%)
Motorcycle	2,172	119	6	17.0 (0.8%)	21 (17.6%)
All Motorized	***2,172***	***332***	***7 in urban areas 6 in rural areas/ small towns******	***110.4 (5.1%)***	***155 (46.7%)***
Bicycle	2,068**	62	6	5.0 (0.2%)	10 (16.1%)
Pedestrian	2,068**	80	6	15.3 (0.7%)	29 (36.3%)
All Nonmotorized	***2,068****	***142***	***6***	***20.3 (1.0%)***	***51 (35.9%)***
All Modes	**2,172**	**474**	**7 in urban areas 6 in rural areas/ small towns*****	**139.0 (6.4%)**	**265 (55.9%)**

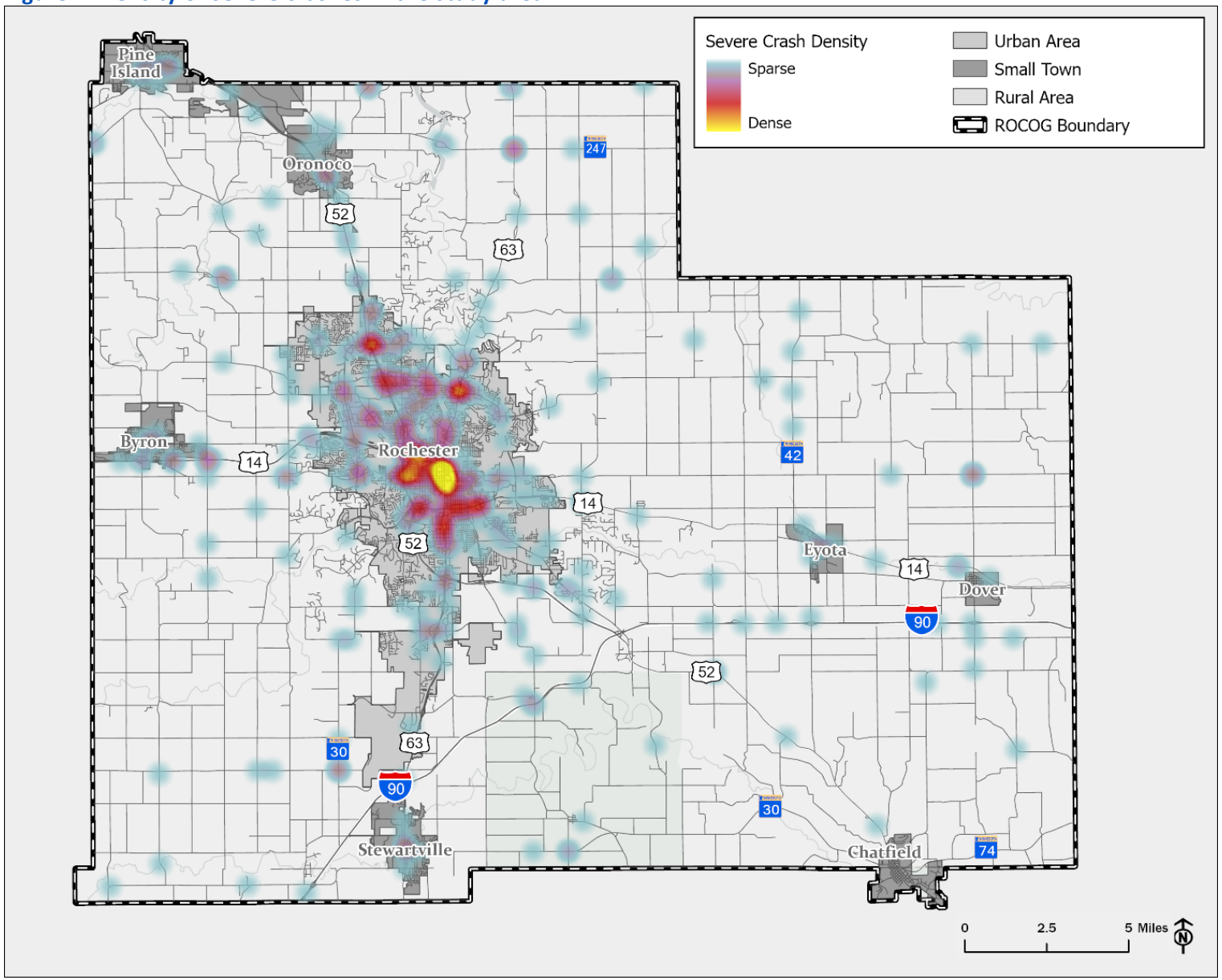
*Crash counts include K, A, and B crashes except for automobile B crashes

**Bicycle and Pedestrian networks do not include freeways (nonmotorized modes are prohibited from using freeways)

***All areas outside of the City of Rochester

In cases where crashes resulting in severe injuries to a given mode are particularly infrequent and/or sparsely distributed, there may not be any network segments with scores above the minimum meaningful threshold of 6.0. In these instances, it is recommended that the HIN results be supplemented with systemic methods (proactive) to help identify safety needs in areas with few or no identified HIN streets. Systemic methods to identify safety needs may include analyzing crash rates relative to physical roadway attributes, operational configurations, adjacent land use, and/or stakeholder feedback to identify common characteristics of the infrastructure types most associated with high crash rates.

Figure 2. Density of severe crashes in the study area



Overview of Results

As seen in **Table 4**, the crash score thresholds for the motorized and all-modes HINs were set to 7 in Rochester and 6 everywhere else; for all other modes, a threshold of 6 was used. This resulted in the HINs shown in **Figure 3** (all-mode),**Figure 4** (motorized-only), and **Figure 5** (nonmotorized-only) and summarized below:

- The all-modes HIN includes 139.0 miles of roadway in the Region (6.4 percent of the 2,172 total network miles).
    - Large sections of Broadway Ave/CSAH (County State Aid Highway) 22/CSAH 33, US 14, and CSAH 22 (E Circle Dr)/37th St NE in Rochester, all have all-mode crash scores of 20 or higher.
    - The northern portion of Broadway Ave between CSAH 22 (E Circle Dr)/37th St NE and 48th St NE has an all-mode crash score of 26.
    - The largest concentrations of severe all-mode crash scores are around the intersections of Broadway Ave and US 14 with other principal arterials in the region. Nine intersections along Broadway Ave and six intersections along US 14 register on the all-mode HIN.
    - Many of the highest crash scores for all three HINs are within downtown Rochester. Some of the segments of Broadway Ave with the highest severe crash scores lie within the downtown boundary along with roadways like 3rd Ave SE, W Center St/E Center St, 2nd St SW, 4th St SE,11th Ave NW.
    - The majority of segments that had high crash scores on the all-mode HIN are high-volume, multi-lane arterials in the region - many of which are US highways or CSAHs/county roads.
    - The segments surrounding the intersection of US 14 with CSAH 5 have a relatively high crash severity score for the all-mode HIN in Byron.
    - Many of the segments that had high crash scores for the all-mode HIN were in areas of Rochester surrounded by commercial or mixed-use zoning such as Broadway Ave. Others were key thoroughfares through residential areas such as Country Club Rd.
    - Segments that register on the all-mode HIN outside of Rochester are:
        - A section of CSAH 14 (75th St NW) in northwest Olmsted County near Genoa and Douglas.
        - US 14, CSAH 5/2nd Ave NW, and CSAH 3 in Byron.
        - US 14, CSAH 44 (60th Ave NW), and CSAH 34 (Country Club Rd W) west of Rochester.
        - CSAH 8 (Bamber Valley Rd SW) southwest of Rochester.
        - CSAH 7/MN TH (Minnesota Trunk Highway) 42, SW Madison Ave, and SW South Front St SE in Eyota.
        - A segment of Interstate 90 southwest of Eyota
        - CSAH 12 around the river crossing, the area surrounding the intersection of US 63 & CSAH 12/CR 247, and the area surrounding the intersection of CSAH 11 & 75th St NE in the northeast part of the county.

        - Area surrounding the intersection of CSAH 9 & CSAH 10 and the segment of US 14 north of Dover.
        - CSAH 10 south of Dover and Interstate 90.
        - MN TH 30 and CSAH 1 near the southern boundary of the county, south of Pleasant Grove.
- The motorized HIN includes 110.4 miles of roadway in the Region (5.1 percent of the 2,172 total network miles).
    - Segments included in key intersections in the region such as the Broadway Ave/CSAH 22 & CSAH 22 (E Circle Dr)/37th St NE, Broadway Ave & US 14, US 63 & US 14, and 11th Ave NW & Civic Center Dr interchanges are included in the all-mode and motorized HINs.
    - The highest concentration of severe crashes on the motorized HIN were along US 14 and Broadway Ave/US 63.
    - Many of the roadways that register highest for the all-mode HIN in Rochester register on the motorized network such as N Broadway Ave, CSAH 22 (E Circle Dr/W Circle Dr)/37th St NE, E Center St/W Center St, Civic Center Dr NW, 2nd St SW, 4th St SE, 11th Ave NW and 14th St.
    - The same segments outside of Rochester that appeared on all the all-mode HIN also registered on the motorized HIN:
        - A section of CSAH 14 (75th St NW) in northwest Olmsted County near Genoa and Douglas.
        - US 14, CSAH 5/2nd Ave NW, and CSAH 3 in Byron.
        - US 14, CSAH 44 (60th Ave NW), and CSAH 34 (Country Club Rd W) west of Rochester.
        - CSAH 8 (Bamber Valley Rd SW) southwest of Rochester.
        - CSAH 7/MN TH 42, SW Madison Ave, and SW South Front St SE in Eyota.
        - A segment of Interstate 90 southwest of Eyota
        - CSAH 12 around the river crossing, the area surrounding the intersection of US 63 & CSAH 12/CR 247, and the area surrounding the intersection of CSAH 11 & 75th St NE in the northeast part of the county.
        - Area surrounding the intersection of CSAH 9 & CSAH 10 and the segment of US 14 north of Dover.
        - CSAH 10 south of Dover and Interstate 90.
        - MN TH 30 and CSAH 1 near the southern boundary of the county, south of Pleasant Grove.
- The nonmotorized HIN includes 20.3 miles of roadway in the Region (1.0 percent of the 2,068 non-freeway network miles).
    - All segments included on the nonmotorized HIN were within Rochester.
    - The largest concentration of segments that register on the nonmotorized HIN are around the Kutzky Park and Pill Hill neighborhoods which are known for having steep topography and poor visibility at many locations.

Figure 3. HIN for all modes (using a crash score threshold of 7 in Rochester and 6 everywhere else)

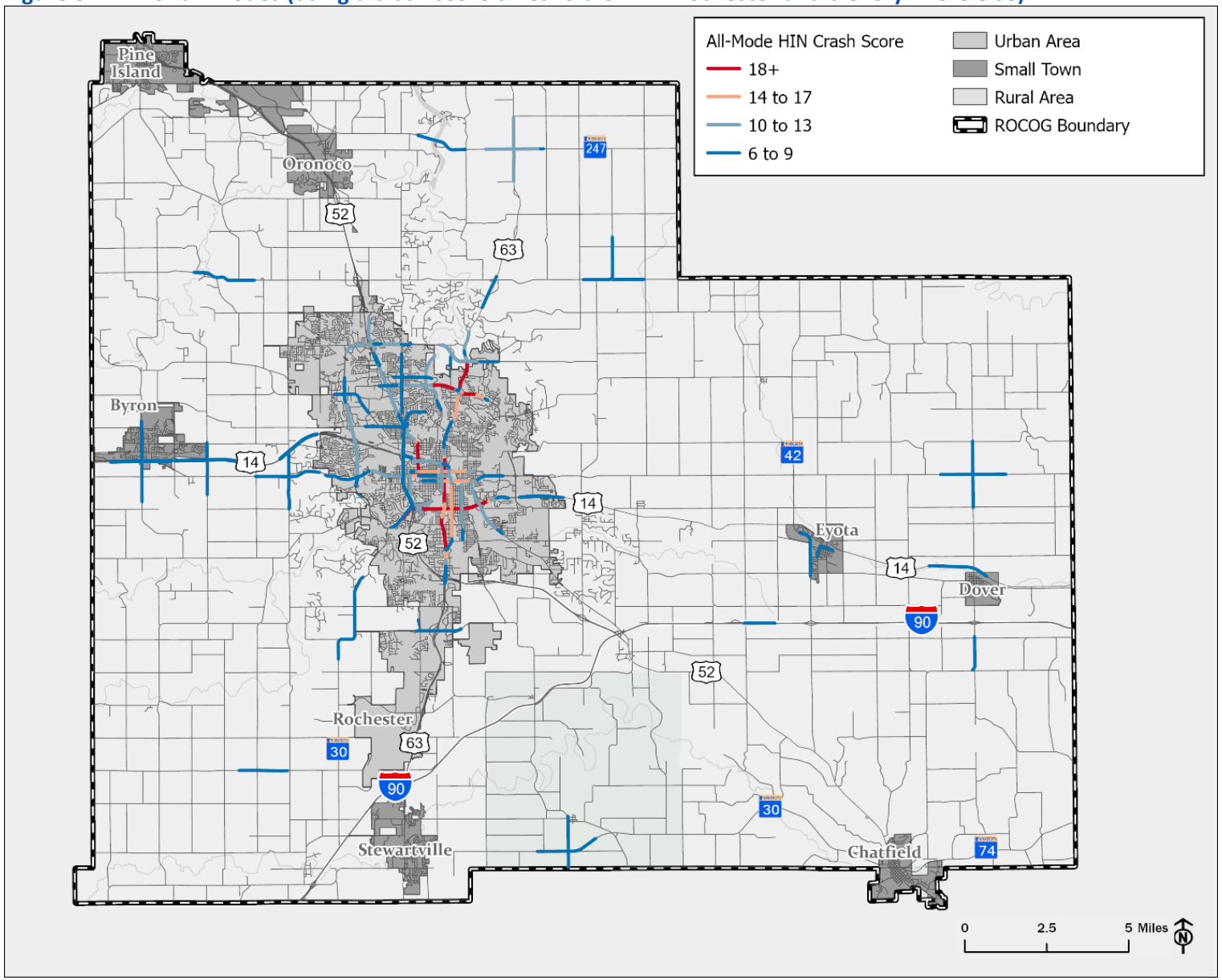


Figure 4. HIN for motorized (using a crash score threshold of 7 in Rochester and 6 everywhere else)

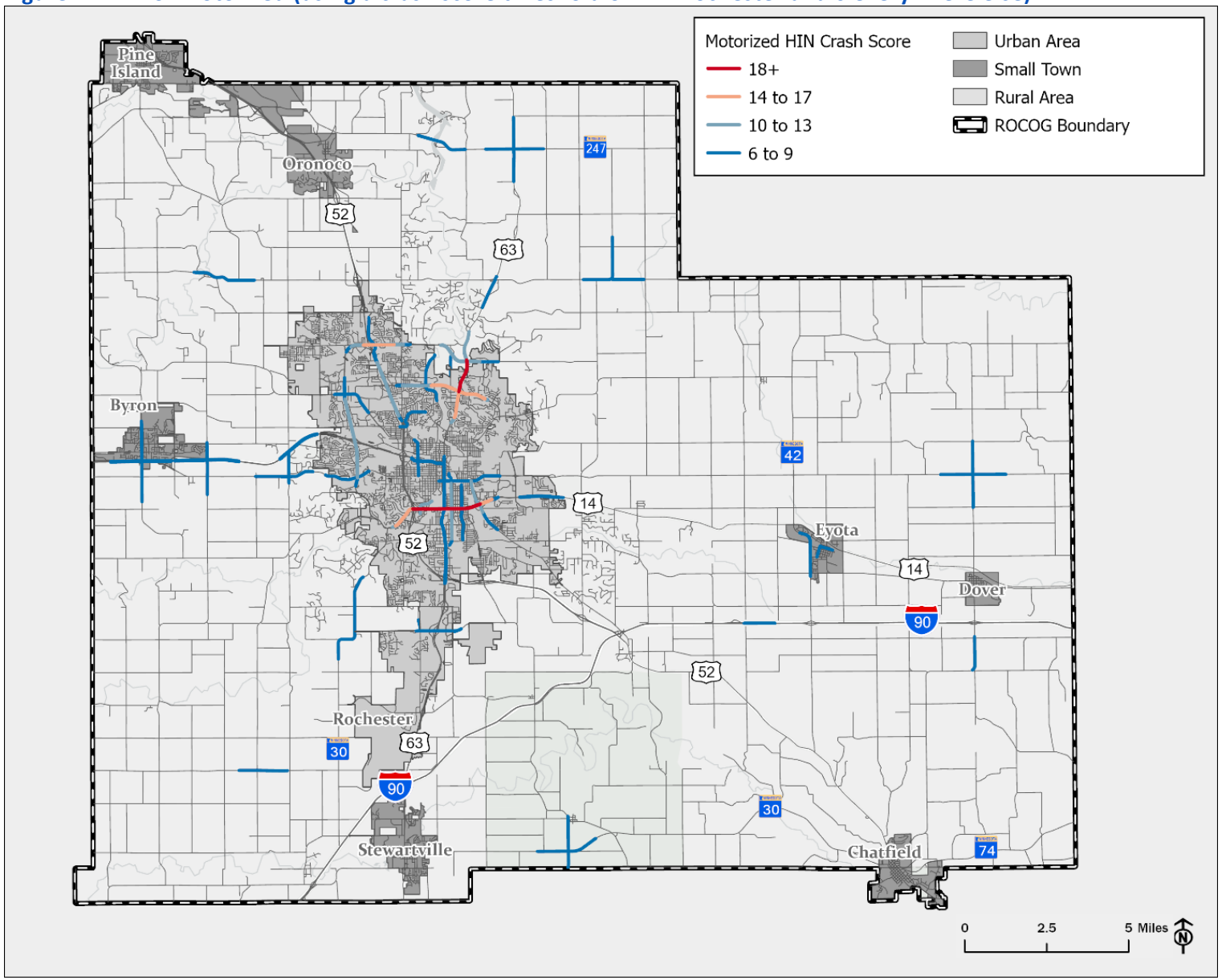
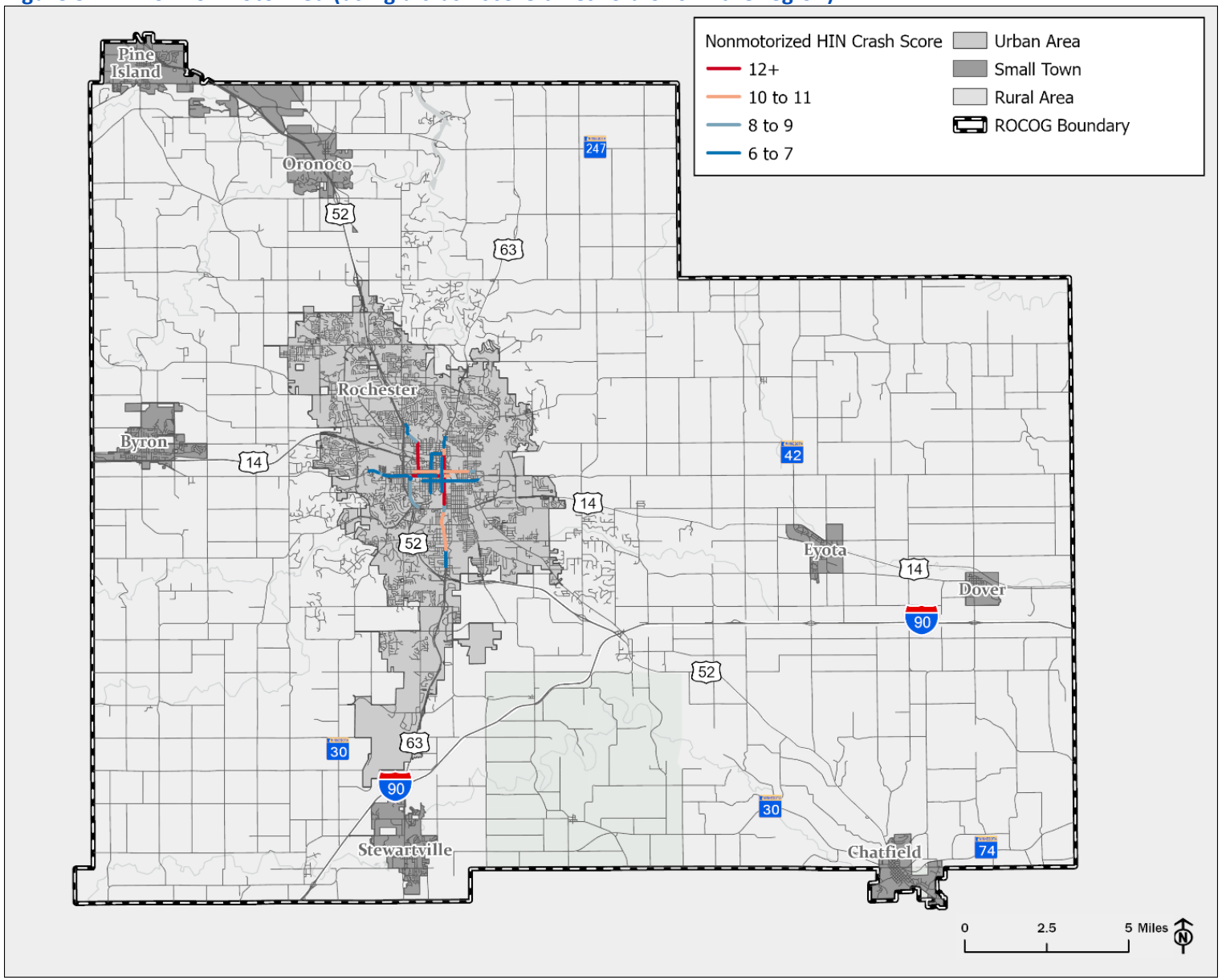


Figure 5. HIN for nonmotorized (using a crash score threshold of 6 in the region)



Appendix E. Systemic Analysis Memo

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

SAFETY ACTION PLAN

Safety Action Plan

Appendix E - Systemic Safety Conditions

(Phase 2)

November 5, 2025

Introduction

A systemic analysis is an approach to improving roadway safety by identifying risk factors that can be applied across a region's network, rather than focusing only on locations with a history of crashes. The goal of a systemic analysis is to identify subsets of facility types (e.g. crash profiles) that account for a large percentage of severe crashes but only a small percentage of the network extent. Focusing time and funding on these crash profiles will make a focused contribution toward eliminating serious and fatal crashes. This analysis considered crashes across all travel modes, including those involving nonmotorized only such as pedestrians and cyclists.

The systemic analysis was completed by grouping intersections and roadways by characteristics like rural or urban location, average daily traffic volume, speed and roadway classification, then determining which groups had the highest severe crash rates for all modes of travel and for nonmotorized only. Facility types were analyzed, and crash profiles were selected based on intersection and segment facility types with significant severe crash rates.

The resulting crash profiles provide a list of the facility types that have the largest proportional impact on severe crash rates. Agencies can use the list of crash profiles to focus safety improvements on the facilities that account for a disproportionate number of severe crashes.

Identifying Roadway Features for Categorizing Facilities

Identifying crash profiles from a set of facility types requires selecting a set of facility features that are both linked to the severe crash risk and are identifiable using available datasets. Two sets of roadway characteristics were chosen to define facility types: one for segments and one for intersections. These characteristics were selected based on their similarity to traditional road safety planning facility descriptors and their consistency across the network. Each of the characteristics are described further in the following sections.

Roadway centerlines and associated data fields were gathered from multiple sources, including Olmsted, Goodhue, and Fillmore counties, as well as MnDOT and Replica[1]. In cases where data differed, Olmsted County's data was considered authoritative. Additional data was collected manually to fill gaps as needed. Intersection points were derived from MnDOT's statewide intersection file and then individually verified using aerial imagery and Google Street View. In addition to adding missing intersection points, moving misplaced intersection points,

[1] The Replica platform provides origin-destination data for all user groups. More information can be found here https://www.replicahq.com/

and removing incorrect intersection points, the intersections' geometric configuration and traffic control type were also documented.

Segment Differentiating Characteristics

Urbanicity

This characteristic labels segments as urban or rural based on whether they are located within or outside the city limits of a municipality (e.g., Urban, Small Town, and Rural). Any segments within the City of Rochester were considered "Urban", any within other municipalities/townships were considered "Small Town", and all others were considered "Rural". To ensure adequate sample sizes in each category, the Small Town and Rural labels were combined for the purposes of the systemic analysis. Centerlines were then mapped to their respective labels for the segment analysis as shown in **Table 1.**

Table 1. Urbanicity Field Mapping

Input Dataset Value	Segment Differentiator Label
Urban	Urban
Rural	Rural
Small Town	Rural

Federal Functional Class

This characteristic describes the general function or intended role of a roadway segment. The functional classification information in the centerline data was grouped into three categories: Local, Collector, and Non-Freeway Arterial (freeways were excluded). **Table 2** shows how the groups were defined for systemic analysis.

Table 2. Functional Class Field Mapping

Input Dataset Value	Segment Differentiator Label
Principal Arterial – Other	Non-Freeway Arterial
Minor Arterial	Non-Freeway Arterial
Minor Collector	Collector
Major Collector	Collector
Local	Local
Unknown	Unknown

Number of Lanes

This characteristic describes the number of through lanes on a roadway segment. The data contained roads with one to six lanes. Most roads had either two or four lanes, while three-lane

roads typically included a two-way left-turn lane or a unidirectional passing lane. **Table 3** shows how lane groups were defined for the systemic analysis.

Table 3. Number of Lanes Field Mapping

Input Dataset Value	Segment Differentiator Label
1	1 to 3
2	1 to 3
3	1 to 3
4	4+
6	4+

Speed Limit

This characteristic defines the posted speed limit on each roadway segment. Segment speed limit data was collected from multiple sources, including MnDOT's centerline dataset, Replica data, and manual review of geospatial information. Speed limits were then grouped into three categories based on the relationship between vehicle travel speed and crash injury severity. **Table 4** shows how the input dataset values were grouped for the systemic analysis.

Table 4. Speed Limit Group Field Mapping

Input Dataset Value	Segment Differentiator Label
10	30 and Under
15	30 and Under
20	30 and Under
25	30 and Under
30	30 and Under
35	35 to 50
40	35 to 50
45	35 to 50
50	35 to 50
55	55 and Up
60	55 and Up
65	55 and Up
70	55 and Up

Annual Average Daily Traffic

This characteristic represents the typical daily travel demand for a roadway segment. The Annual Average Daily Traffic (AADT) represents the average number of vehicles on a segment on a typical day over the course of a year. AADT data came from one of two sources: MnDOT's published AADTs or bidirectional volumes from Replica (average weekday volumes from the

Spring of 2024 were utilized). MnDOT data was used wherever available, and Replica data filled gaps where MnDOT values were not provided. For segments missing data in both of these sources, an estimated AADT was assigned based on the average AADT of other segments with the same facility type. The average AADTs that were used to fill in missing AADTs are shown below in **Table 5**.

Table 5. Average AADTs Used for Missing Data

Urban/ Rural	Functional Class	Speed	Average AADT (VPD)	Number of Segments	Segments Without AADTs
Urban	Unknown	30 and Under	50	37	19
Urban	Local	30 and Under	6,450	4,665	730
Urban	Collector	30 and Under	7,700	589	6
Urban	Non-Freeway Arterial	30 and Under	18,050	269	1
Urban	Local	35 to 50	5,250	51	6
Rural	Unknown	30 and Under	3,300	33	29
Rural	Local	30 and Under	300	2,381	407
Rural	Non-Freeway Arterial	30 and Under	12,200	88	2
Rural	Unknown	35 to 50	3,400*	5	5
Rural	Local	35 to 50	300	1,038	69
Rural	Non-Freeway Arterial	35 to 50	9,750	28	1
Rural	Local	55 and Up	600	115	9

*AADT interpolated from similar groups

After missing values had been interpolated, AADT data was split into the three groups shown in **Table 6**. These group cutoffs were determined based on the similarity of safety issues observed on roads with comparable traffic volumes.

Table 6. AADT Groups

Intersection Differentiator Label
1 to 1,000 VPD
1,000 to 10,000 VPD
10,000+ VPD

Intersection Differentiating Characteristics

Urbanicity

This characteristic defines intersections as urban or rural based on the urbanicity labels assigned to the intersection legs. If any of the legs of an intersection are labeled as urban, the intersection is labeled as urban; if all of the legs of an intersection are labeled as rural, the intersection is labeled as rural.

Federal Functional Class

For intersections, the characteristic functional classification describes the type of roads that make up the intersection. The relative relationship of the functional classification between intersection legs is of high importance in the context of safety. For instance, an intersection between two arterials has different safety planning implications than the one between an arterial and a collector or local road. Values describing this relative relationship were assigned to each intersection (see **Table 7**). This classification helps simplify the dataset while still capturing the essential information.

Table 7. Intersection Leg Functional Class Mapping

Minimum Leg Functional Class	Maximum Leg Functional Class	Intersection Differentiator Label
Arterial	Arterial	High vs High
Local Road or Collector	Arterial	Low vs High
Local Road or Collector	Local Road or Collector	Low vs Low

Configuration

The intersection configuration describes the geometry or layout of an intersection. This characteristic includes the number of intersection legs and information about the leg types and context. Intersections labeled “4 Legs (X) Including Driveway” indicate that one of the legs is a private street or driveway that functions as the fourth leg of the intersection. Intersections labeled “4 Legs (X) Including Ramps” indicate that at least one leg is a ramp connected to a controlled access facility. Intersection configuration values are displayed in **Table 8**.

Table 8. Intersection Configuration Mapping

Dataset Value	Systemic Analysis Group
3 Legs (T)	3 Legs (T)
3 Legs on Curve (TT)	3 Legs on Curve (TT)
4 Legs (X)	4 Legs (X)
4 Legs (X) Including Driveway	4 Legs (X)
4 Legs (X) Including Ramps	4 Legs (X) Including Ramps
5+ Legs	5+ Legs

Traffic Control

The intersection traffic control characteristics describe the mechanism, or lack of mechanism, for controlling traffic at an intersection. Intersections with different types of traffic controls will often have unique safety issues. The intersection traffic control values are displayed in **Table 9**.

Table 9. Intersection Traffic Control Mapping

Dataset Value	Systemic Analysis Group
Signal (Traffic Light)	Signal
All-Way Stop (4-Way Stop Signs)	All-Way Stop
All-Way Yield (Roundabout)	Roundabout
Thru-Stop/Yield (2-Way Stop Signs)	Thru-Stop/Yield
Uncontrolled	Uncontrolled

Intersection Traffic Counts

Intersection average daily traffic (ADT) volumes came from two sources, MnDOT traffic counts and Replica data. An ADT, based on similar intersect types, was used for intersections with no available ADT. The ADT values were applied by facility type using a process similar to the one used to fill in missing segment volumes. **Table 10** shows the facility types that were missing volumes and the volumes used to fill in those missing values.

Table 10. Daily Entering Traffic Group Averages

Urban/ Rural	Functional Class	Type	Traffic Control	Count	Count with Volume	Percent with Volume	Count Missing Volume	Average Volume
Rural	Low vs Low	3 Legs	Uncontrolled	104	93	89%	11	520
Rural	Low vs Low	3 Legs	Thru-Stop/Yield	675	664	98%	11	1,114
Urban	Low vs Low	3 Legs	Uncontrolled	1047	1015	97%	32	681
Urban	Low vs Low	3 Legs	Thru-Stop/Yield	991	950	96%	41	2,257
Urban	Low vs Low	4 Legs	Uncontrolled	158	156	99%	2	703
Urban	Low vs Low	4 Legs	Thru-Stop/Yield	668	649	97%	19	2,463
Urban	Low vs Low	4 Legs	All-Way Stop	45	40	89%	5	4,415
Urban	Low vs Low	5+ Legs	Thru-Stop/Yield	2	0	0%	2	2,463*

*Interpolated from similar facility types

Calculating Crash Rate Indices

Using the segment and intersection characteristics identified in the previous section, the intersections and segments were grouped into facility types with each type representing one of the possible combinations of facility characteristics.

Crash rates for each facility type were calculated by dividing the number of severe crashes that occurred during the study period (2019 to 2023) by the count of intersections by facility type or the sum of the mileage for segments per segment facility types. Note that the severe crash counts for the nonmotorized only crash rate indices include minor injury (B) crashes in addition to fatal (K) and serious injury (A) crashes to increase the sample size. Facility type crash rates were then scaled against the rural or urban average.

To calculate the Relative Crash Ratio Index, the following three equations were used.$Segment\ Facility\ Type_i\ Crash\ per\ Mile = \frac{\sum Segment\ Facility\ Type_i\ Crashes}{\sum Segment\ Facility\ Type_i\ Length}$

$$Area_u\ Segments\ Crash\ per\ Mile = \frac{\sum Area_u\ Segment\ Crashes}{\sum Area_u\ Segment\ Length}$$

$$Crash\ Rate\ Index_{iu} = \frac{Segment\ Facility\ Type_i\ Crash\ per\ Mile}{Area_u\ Segments\ Crash\ per\ Mile}$$

The total crashes for segment facility type i (segments facility types defined above) located in area u (urban or rural) was divided by the total mileage on the facility type i to calculate the correct crashes per mile. That value was then divided by the crashes per mile for all segments located in u, the same location as the facility type. Practically this means that the segment per mile crash rates were scaled by the average rates in the rural or urban area, whichever was appropriate.

For intersections, the same approach was used except that the total number of crashes was divided by the number of intersections rather than the mileage.

$$Crashes\ Per\ Intersection\ Facility\ Type_i = \frac{\sum Intersection\ Facility\ Type_i\ Crashes}{n_{Facility_i}}$$

$$Area_u\ Crashes\ per\ Intersection = \frac{\sum Area_u\ Intersection\ Crashes}{n_{Area_u}}$$

$$Crash\ Rate\ Index_{iu} = \frac{Crashes\ Per\ Intersection\ Facility\ Type_i}{Area_u\ Crashes\ per\ Intersection}$$

Once the values are calculated, segment and intersection facility types were ranked, highest to lowest, based on their crash rate indices.

Identifying Crash Profiles

Crash profiles were identified by finding the top 10 facility types from urban and rural areas ranked by crash rate index. These top 10 lists were examined to identify significant break points in the values. These break points, or a sudden change in value, can help identify the most significant group of facility types in each top 10 list. A total of eight top 10 lists were created for segments and intersections ranking the facility types by urban/rural and all modes/nonmotorized only.

Top tiers were identified from the urban and rural top 10 list by looking for major changes in value in the crash rate index. The number of top tier facility types varied from each list because each break point was specific to each list. The top tier facility types from the urban and rural lists were combined to create the crash profiles for segments and intersections measuring all modes and VRU crash rate indexes. The crash profiles are the primary result of the systemic analysis.

Segment Crash Profiles

Segment crash profiles for all modes and for nonmotorized only are shown in **Table 13** and **Table 14**, respectively**.** These organize the top segment types, by crash-risk, based on the differentiating characteristics listed above. **Figure 1** shows a map of the segment crash profiles. The all mode segment crash profiles capture 22 percent of the severe segment crashes on the network but account for only five percent of the total network length. This suggests that addressing these issues will have a relatively large impact on overall network safety. Identifying these crash-prone segments helps to target safety treatments which can help in attaining the interim and overall goal of reducing serious injury and fatal crashes in the ROCOG planning area. Of the nine included crash profiles three are in urban areas and six are in rural areas. For nonmotorized only, the crash profiles include 34 percent of all severe nonmotorized only segment crashes but account for only four percent of the total network mileage. The nonmotorized only segment crash profiles consist of four urban crash profiles and four rural crash profiles.

Figure 1. Segment Crash Profiles

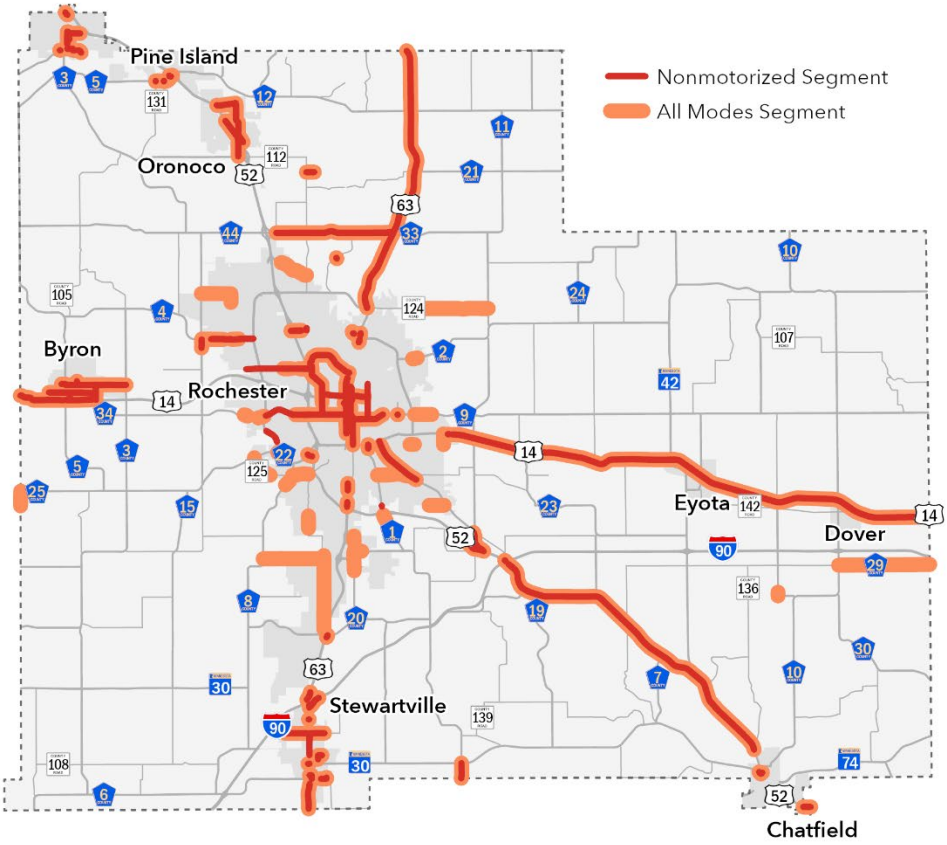


Table 11. Segment Crash Profiles - All Modes

Urban vs Rural	Functional Class	Number of Lanes	Speed Limit (MPH)	Annual Average Daily Traffic (VPD)	Total Segment Length (miles)	Fatal Crashes	Serious Injury Crashes	Total Severe Crashes	Severe Crashes Per Mile	Crash Rate Index
Rural	Non-Freeway Arterial	4+	30 and Under	1K to 5K	1.2	0	1	1	0.84	19.05
Rural	Collector	4+	55 and Up	10K and Up	1.4	0	1	1	0.69	15.66
Rural	Collector	1 to 3	30 and Under	10K and Up	2.0	0	1	1	0.50	11.24
Urban	Non-Freeway Arterial	1 to 3	35 to 50	10K and Up	2.2	0	2	2	0.92	11.06
Rural	Collector	1 to 3	35 to 50	Under 1K	7.5	0	2	2	0.27	6.02
Rural	Non-Freeway Arterial	1 to 3	55 and Up	10K and Up	43.4	1	9	10	0.23	5.21
Urban	Non-Freeway Arterial	4+	30 and Under	10K and Up	15.2	0	6	6	0.39	4.73
Rural	Local	1 to 3	30 and Under	1K to 5K	15.5	0	3	3	0.19	4.38
Urban	Collector	1 to 3	35 to 50	1K to 5K	11.4	1	2	3	0.26	3.14
Total					99.8	2	27	29	0.29	
Network Total					2,186.2	23	110	133	0.06	
Percentage of Network Total					5%	9%	25%	22%		

Table 12. Segment Crash Profiles – Nonmotorized Only

Urban vs Rural	Functional Class	Number of Lanes	Speed Limit (MPH)	Annual Average Daily Traffic (VPD)	Total Length (miles)	Fatal Crashes	Serious Injury Crashes	Minor Injury Crashes	Total Severe Crashes	Severe Crashes Per Mile	Crash Rate Index
Rural	Non-Freeway Arterial	4+	35 to 50	10K and Up	1.9	0	0	1	1	0.52	111.74
Rural	Collector	1 to 3	30 and Under	10K and Up	2.0	0	1	0	1	0.50	106.02
Rural	Local	1 to 3	30 and Under	1K to 5K	15.5	0	0	1	1	0.06	13.78
Rural	Non-Freeway Arterial	1 to 3	55 and Up	10K and Up	43.4	0	2	0	2	0.05	9.82
Urban	Non-Freeway Arterial	1 to 3	35 to 50	10K and Up	2.2	0	1	0	1	0.46	8.02
Urban	Non-Freeway Arterial	4+	30 and Under	10K and Up	15.2	0	4	3	7	0.46	8.00
Urban	Collector	4+	55 and Up	10K and Up	2.5	0	0	1	1	0.40	6.96
Urban	Non-Freeway Arterial	1 to 3	30 and Under	10K and Up	6.3	0	0	2	2	0.32	5.52
Total					88.9	0	8	8	16	0.18	
Network Total					2,186.2	2	20	25	47	0.02	
Percentage of Network Total					4%	0%	40%	32%	34%		

Intersection Crash Profiles

Intersection crash profiles are in **Table 15** and **Table 16** below. These organize the top intersection types, by crash-risk, based on the differentiating characteristics listed above. **Figure 2** shows a map of the intersection crash profiles. The all-mode intersection crash profiles cover 87 percent of the severe intersection crashes but account for only three percent of the total intersections. Of the nine all-mode intersection crash profiles, seven are in urban areas and two are in rural areas. The intersection crash profiles for nonmotorized cover 47 percent of the severe intersection crashes but account for only five percent of all intersections. Of the eight nonmotorized only intersection crash profiles, seven are in urban areas and one is in a rural area.

Figure 2. Intersection Crash Profiles

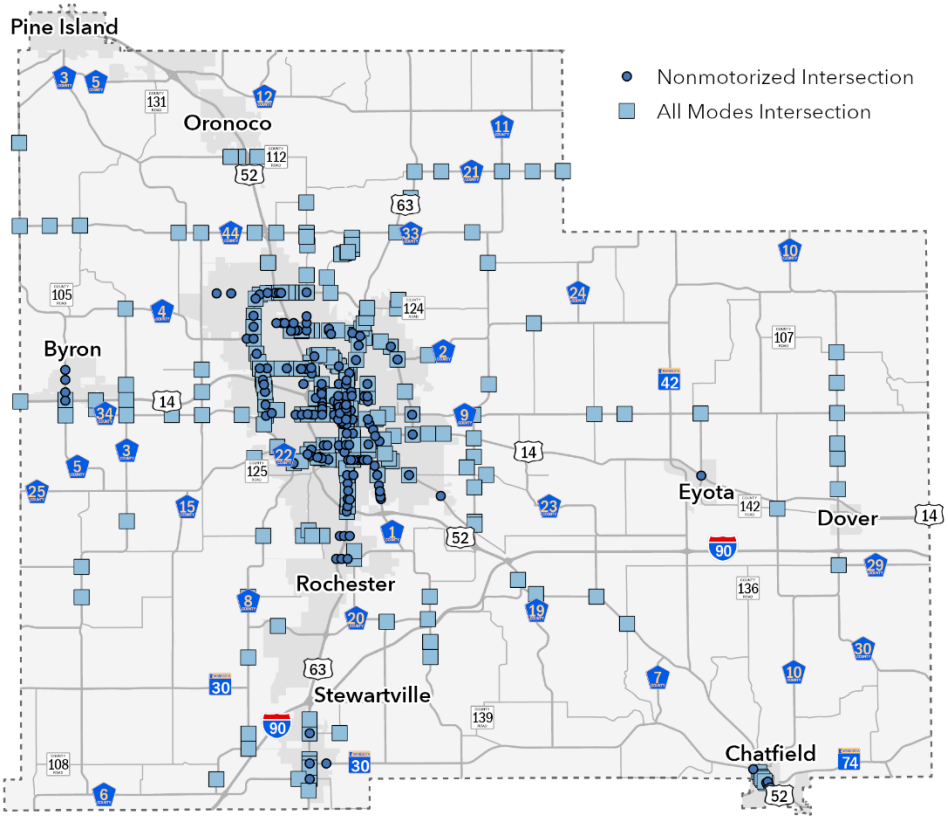


Table 13. Intersection Crash Profiles - All Modes

Urban vs Rural	Functional Class	Intersection Configuration	Traffic Control Type	Average Daily Entering Traffic (VPD)	Intersections	Fatal Crashes	Serious Injury Crashes	Total Severe Crashes	Severe Crashes per Intersection	Crash Rate Index
Rural	Low vs High	4 Legs (X)	Signal	1 to 1,000	4	0	4	4	1.00	30.71
Urban	Low vs High	4 Legs (X)	Signal	1 to 1,000	26	1	11	12	0.46	19.88
Urban	Low vs High	4 Legs (X)	Signal	1,000 to 10,000	39	1	12	13	0.33	14.36
Urban	Low vs Low	4 Legs (X)	Roundabout	1,000 to 10,000	7	1	1	2	0.29	12.31
Urban	Low vs High	4 Legs (X)	Signal	10,000+	14	0	4	4	0.29	12.31
Urban	Low vs High	3 Legs (T)	Signal	1,000 to 10,000	10	0	2	2	0.20	8.61
Urban	Low vs High	4 Legs (X) Including Ramps	Signal	1 to 1,000	5	0	1	1	0.20	8.61
Urban	High vs High	4 Legs (X)	Signal	1,000 to 10,000	5	0	1	1	0.20	8.61
Rural	Low vs High	4 Legs (X)	Thru-Stop/Yield	1 to 1,000	32	3	3	6	0.19	5.76
Total					142	6	39	45	0.32	
Network Total					4,748	23	99	52	0.01	
Percentage of Network Total					3%	26%	39%	87%		

Table 14. Intersection Crash Profiles – Nonmotorized Only

Urban vs Rural	Functional Class	Intersection Configuration	Traffic Control Type	Average Daily Entering Traffic (VPD)	Intersections	Fatal Crashes	Serious Injury Crashes	Minor Injury Crashes	Total Severe Crashes	Severe Crashes per Intersection	Crash Rate Index
Urban	Low vs High	4 Legs (X)	Signal	1 to 1,000	26	0	2	8	10	0.38	21.30
Urban	Low vs High	4 Legs (X)	Signal	1,000 to 10,000	39	0	4	6	10	0.26	14.20
Urban	Low vs Low	4 Legs (X)	Signal	1,000 to 10,000	12	0	0	3	3	0.25	13.85
Urban	Low vs High	4 Legs (X)	Signal	10,000+	14	0	1	2	3	0.21	11.87
Urban	Low vs High	3 Legs (T)	Signal	1,000 to 10,000	10	0	0	2	2	0.20	11.08
Urban	Low vs High	4 Legs (X) Including Ramps	Signal	1 to 1,000	5	0	0	1	1	0.20	11.08
Urban	High vs High	4 Legs (X)	Signal	1,000 to 10,000	5	0	1	0	1	0.20	11.08
Rural	Low vs Low	4 Legs (X)	Thru-Stop/Yield	1 to 1,000	132	1	0	0	1	0.01	3.18
Total					243	1	8	22	31	0.13	
Network Total					4,748	2	12	52	66	0.01	
Percentage of Network Total					5%	50%	67%	42%	47%		

Appendix F. Countermeasure Toolkit

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

SAFETY ACTION PLAN

Safety Action Plan

Appendix F - Safety Strategy Toolkit

November 5, 2025

Introduction

The Strategy Toolkit is a range of facilities, treatments, strategies, and actions to make the roadways in the Rochester-Olmsted Council of Governments (ROCOG) planning area safer for users of all modes. This Toolkit focuses on safety for all modes. The Toolkit may be used by agencies to help identify potential strategies to consider on priority safety corridors and intersections by reviewing the categories and relevance to key findings. Complementary strategies and initiatives should be considered when implementing traffic safety strategies to support a change to safety culture. Each strategy includes an estimated cost, crash reduction factor (CRF) or effectiveness, and a connection to the Safe System Hierarchy. That said, there is no one-size-fits-all approach. Engineers should use their engineering judgment and seek expert advice when necessary.

How to use the Toolkit?

The Toolkit supports the implementation of the Safety Action Plan by providing a comprehensive framework of roadway safety strategies that can be tailored to specific locations, enabling engineers and planners to prioritize and effectively apply safety improvements. Additionally, it serves as a valuable resource for identifying potential projects for funding by outlining the expected crash reduction or effectiveness, along with associated costs, facilitating informed decision-making and strategic investment in road safety.

The Toolkit guides users through a framework of questions to narrow down options and compiles a list of potential strategies for any given combination of answers focusing on high-level attributes, including context/area type, facility type, divided or undivided roadway and the relevance to findings. From there, depending on the attribute combinations, you can select the relevance to the Plan findings, existing road geometry, road user type, and desired cost range. It is critical to understand that this Toolkit applies a one-size-fits-most approach to a problem that inherently demands tailored solutions, and should therefore serve as an initial reference, to be supplemented with project-specific data and engineering judgment.

In addition to the static PDF of the Toolkit, an excel spreadsheet may be used. Two tabs exist within the Excel Toolkit. A summary of each tab is described below in Table 1.

Table 1. Toolkit Tabs

Excel Tab	Description	Notes
Toolkit Output Table	Summary table of strategies with leading questions and output for quick resource.	*No data in this table should be edited.*
Matrix	Appendix F Static table of all strategies within the Toolkit Output Table.	

Toolkit Legend

Estimated Effectiveness

Due to the complexity of applying crash reduction factors, the Toolkit summarized whether a strategy was tried, documented, or proven. Table 3 provides the definition for each.

Table 2. Estimated Effectiveness Definitions

Category	Description
Tried	While there is anecdotal evidence that the strategy may work, no formal study or crash modification factor exists to reliably measure its effectiveness.
Documented	The strategy is supported by documented national research studies and/or the CMF Clearinghouse, but does not appear as a FHWA Proven Safety Countermeasure.
Proven	The strategy appears in the list of FHWA Proven Safety Countermeasures.

Estimated Implementation Costs

Each strategy includes a cost estimate, indicated by Low, Moderate, or High, that reflects its relative price as shown in Table 2. A legend is provided below to explain the cost range. Some strategies' costs vary widely and may fall into multiple cost ranges, depending on their length, context, and materials. When costs varied, the highest cost was considered. The estimated costs represent the full, permanent construction costs. Strategies may have quick-build options that are lower cost while delivering the same or similar safety benefits.

Table 3. Estimated Implementation Cost

Category	Cost
Low	Less than $60,000
Moderate	$60,000 - $200,000
High	Greater than $200,000

The Safe System Roadway Design Hierarchy Tiers

The U.S. Department of Transportation (USDOT) adopted the Safe System Approach (SSA), which is a guiding paradigm in developing the Safety Action Plan for the ROCOG planning area. The SSA is a roadway safety framework that seeks to eliminate road traffic deaths and serious injuries by designing and building roadways to accommodate human mistakes and human vulnerability. The Toolkit references the Safe System Roadway Design Hierarchy (SSRDH) as a part of the output. The Federal Highway (FHWA) developed the SSRDH to assist transportation agencies and practitioners to identify and prioritize infrastructure-based strategies relative to their alignment with the SSA. The SSRDH organizes infrastructure strategies into four tiers:

Tier 1 Remove severe conflicts

Tier 2 Reduce vehicle speeds

Tier 3 Manage conflicts in time

Tier 4 Increase attentiveness and awareness.

Each strategy in the toolkit was assigned to the tier it most closely aligns with. Strategies that could fall under multiple tiers were categorized according to their primary alignment. For further information, see: Safe System Roadway Design Hierarchy | FHWA

Toolkit Sources

Table 4 summarizes the key source materials used to develop the toolkit and inform recommended strategies.

Table 4. Toolkit Sources

Source	Link
MnDOT District Safety Plan Road Safety Strategies ("Big Book of Ideas")	https://edocspublic.dot.state.mn.us/edocs_public/DMResultSet/download?docId=37383665
FHWA Proven Safety Countermeasures	https://highways.dot.gov/safety/proven-safety-countermeasures
NHTSA Countermeasures That Work	https://www.nhtsa.gov/book/countermeasures/countermeasures-that-work
FHWA Safe System Roadway Design Hierarchy	https://highways.dot.gov/sites/fhwa.dot.gov/files/202401/Safe_System_Roadway_Design_Hierarchy.pdf
NCHRP 926, Guidance to Improve Pedestrian and Bicyclist Safety at Intersections	https://nap.nationalacademies.org/catalog/25808/guidance-to-improvepedestrian-and-bicyclist-safety-at-intersections

Appendix F - Strategy Toolkit (Static PDF)

#	Strategy	Effectiveness	Estimated Implementation Timeline	Estimated Implementation Cost	Context		Facility Type			Division		Safe System Hierarchy				Relevance to Findings								
					Urban	Rural	Segment	Curve	Intersection	Divided	Undivided	Tier 1 - Remove Severe Conflicts	Tier 2 - Reduce Vehicle Speeds	Tier 3 - Manage Conflicts in Time	Tier 4 - Increase Attentiveness & Awareness	Midblock Crossing	Alternate Intersection	Severe Crash Reduction	Lane Departure Crash Reduction	Pedestrian and Bicyclist Related Crash Reduction	Angle Crash Reduction	Conflict Point Reduction	Speed Management	Driver Attention/Awareness
1	Appropriate Speed Limits For All Users	Proven	1 - 2 years	Moderate	X	X	X	X	X	X	X		X			X		X	X	X			X	
2	Warning Sign with Edge-Mounted LED Lights	Tried	Less than 1 year	Low	X	X	X	X			X				X	X			X	X				X
3	Access Management	Proven	Less than 1 year	Moderate	X	X	X			X	X	X						X			X			
4	Divided Roadway	Documented	More than 2 years	High	X	X	X				X	X						X	X					
5	Plowable Centerline Reflective Markers	Documented	Less than 1 year	Low	X	X	X				X				X				X					X
6	Speed Safety Cameras*	Proven	Less than 1 year	Low	X	X	X			X	X		X					X					X	
7	Lighting	Proven	1 - 2 years	Moderate	X	X		X	X	X	X				X	X		X		X				X
8	Reconstruct TT to a Single T Intersection	Tried	More than 2 years	High	X	X		X	X		X	X						X			X			
9	Retroreflective Strips on Sign Posts	Tried	Less than 1 year	Low	X	X		X	X	X	X				X			X						X
10	Median U-Turn	Documented	More than 2 years	Moderate	X	X			X	X		X					X		X		X			
11	Remove Sightline Obstructions/Maintain Vision Triangles	Tried	Less than 1 year	Low	X	X			X	X	X	X						X		X	X			
12	Roundabout	Proven	More than 2 years	High	X	X			X	X	X	X					X	X			X	X	X	X
13	Turn Lanes (Offset, Channelized)	Proven	1 - 2 years	High	X	X			X	X	X	X									X	X		
14	Curb Extensions/Bump Outs	Proven	1 - 2 years	Moderate	X		X		X	X	X		X			X				X		X	X	X
15	Grade Separated Pedestrian Underpass/Overpass	Tried	More than 2 years	High	X		X		X	X	X			X		X				X		X		
16	Signalized Mid-Block Crossing	Proven	1 - 2 years	Moderate	X		X		X	X	X			X		X				X				X
17	Reduce Lane Width	Proven	More than 2 years	High	X		X		X	X	X		X			X							X	
18	Reflective Traffic Signal Backplate	Proven	Less than 1 year	Low	X		X		X	X	X				X									X
19	Urbanization (reconstruct rural road with curb and gutter)	Tried	More than 2 years	High	X		X		X	X	X		X					X					X	X
20	Bike Lane/Boulevard	Tried	1 - 2 years	Low	X		X			X	X	X								X				
21	Buffered Bike Lane	Documented	1 - 2 years	High	X		X			X	X	X								X		X		
22	Dynamic Speed Feedback Sign	Proven	Less than 1 year	Low	X		X			X	X		X						X				X	X
23	Horizontal Chicanes	Tried	Less than 1 year	Low	X		X			X	X		X										X	
24	Overhead Pedestrian Warning Sign at Mid-Block Crossing	Tried	1 - 2 years	Moderate	X		X				X			X						X				X
25	Pedestal-Mounted Flashing Signal Beacons	Tried	1 - 2 years	Low	X		X			X	X				X	X				X		X		X
26	Pedestrian Barriers to Prevent Mid-Block Crossing	Documented	1 - 2 years	Moderate	X		X			X	X			X				X		X				
27	Lane Conversions [3- & 5-Lane Conversions)	Proven	More than 2 years	Moderate	X		X			X		X						X					X	
28	Sidewalks	Proven	1 - 2 years	High	X		X			X	X	X								X		X		
29	Wrong-Way Driving Detection	Tried	1 - 2 years	Moderate	X		X			X					X							X		X
30	3/4 Intersection	Documented	More than 2 years	High	X				X	X		X									X			
31	Appropriately Timed Yellow Change Intervals	Proven	1 - 2 years	Low	X				X	X				X				X			X	X	X	X
32	Bike Box	Tried	Less than 1 year	Low	X				X	X	X	X								X				
33	Continuous Flow Intersection	Documented	More than 2 years	High	X				X	X		X		X			X	X			X	X		
34	Enhanced Signing and High Visibility Crosswalk Markings	Proven	Less than 1 year	Low	X				X	X	X				X					X				X
35	Enhanced Transit Stops and Bus Transit	Documented	More than 2 years	Moderate	X				X	X	X				X					X				
36	Flashing Yellow Arrow	Proven	1 - 2 years	Low	X				X	X	X			X							X	X		X
37	Leading Pedestrian Intervals	Proven	Less than 1 year	Low	X				X	X	X			X						X		X		
38	Mini Roundabout	Documented	More than 2 years	High	X				X		X	X					X	X			X	X	X	X
39	No Right Turn on Red	Documented	1 - 2 years	Low	X				X	X	X			X							X	X		

#	Strategy	Effectiveness	Estimated Implementation Timeline	Estimated Implementation Cost	Context		Facility Type			Division		Safe System Hierarchy				Relevance to Findings								
					Urban	Rural	Segment	Curve	Intersection	Divided	Undivided	Tier 1 - Remove Severe Conflicts	Tier 2 - Reduce Vehicle Speeds	Tier 3 - Manage Conflicts in Time	Tier 4 - Increase Attentiveness & Awareness	Midblock Crossing	Alternate Intersection	Severe Crash Reduction	Lane Departure Crash Reduction	Pedestrian and Bicyclist Related Crash Reduction	Angle Crash Reduction	Conflict Point Reduction	Speed Management	Driver Attention/Awareness
40	Partial Grade-Separated Intersection	Tried	More than 2 years	High	X				X	X		X					X				X	X		
41	Pedestrian Countdown Timers (visual and audible)	Documented	1 - 2 years	Low	X				X	X	X			X						X		X		
42	Raised Crosswalk	Documented	1 - 2 years	Low	X				X		X				X	X		X		X				X
43	Reduce Crosswalk Length	Tried	1 - 2 years	Moderate	X				X	X	X	X						X		X				
44	Advance "Yield Here" Sign and Stop Bar	Documented	Less than 1 year	Low	X					X	X				X	X				X				X
45	Colored Pavement/Brick Pavers	Tried	1 - 2 years	Low	X						X				X	X				X			X	X
46	Echelon	Tried	More than 2 years	High	X					X		X					X	X			X	X		
47	Lane Constrictor Intersections	Documented	More than 2 years	Low	X						X		X				X						X	
48	Median and Pedestrian Refuge Island	Documented	More than 2 years	Low	X					X	X	X				X				X				
49	Parking Restriction on Crosswalk Approach	Documented	Less than 1 year	Low	X					X	X	X				X		X		X				
50	Rectangular Rapid Flashing Beacon	Proven	1 - 2 years	Low	X					X	X			X		X				X		X		X
51	Signalized RCUT	Tried	More than 2 years	High	X					X		X					X				X			
52	Single-Point Urban Interchange (SPUI)	Tried	More than 2 years	High	X					X		X					X	X			X	X		X
53	High Friction Surface Treatment (HFST)	Proven	1 - 2 years	High		X	X	X	X	X	X	X						X	X					
54	Non-Recoverable Inslope Protection	Documented	1 - 2 years	High		X	X	X	X	X	X				X			X	X					X
55	Chevrons	Proven	Less than 1 year	Low		X	X	X		X	X	X							X				X	X
56	Clear Zone Maintenance/Enhancements	Documented	1 - 2 years	Moderate		X	X	X		X	X	X						X		X				X
57	Enhanced Edgeline (6" & 8")	Proven	Less than 1 year	Low		X	X	X		X	X				X				X					X
58	Shoulder Paving	Proven	More than 2 years	Moderate		X	X	X		X	X	X							X	X				
59	Transverse Rumble Strips	Documented	Less than 1 year	Low		X	X		X	X	X				X			X	X					X
60	Centerline Rumble Strip	Proven	Less than 1 year	Low		X	X				X				X				X					X
61	Ditch Embankment/Side Slope Improvements	Documented	Less than 1 year	Low		X	X			X	X	X							X					
62	High-Tension Cable Barrier	Proven	More than 2 years	High		X	X			X		X							X					
63	Passing Lanes	Documented	1 - 2 years	High		X	X				X			X				X	X			X		
64	Safety Edge	Proven	Less than 1 year	Low		X	X			X	X	X						X	X					
65	Separated Bike Trail/Path	Documented	1 - 2 years	Moderate		X	X			X	X	X								X		X		
66	Shoulder/Edgeline Rumble Strip	Documented	1 - 2 years	High		X	X			X	X				X				X					X
67	Snow Fencing	Documented	1 - 2 years	Moderate		X	X			X	X	X						X						X
68	Transverse Pavement Markings	Tried	Less than 1 year	Low		X	X			X	X				X								X	X
69	Delineators	Documented	Less than 1 year	Low		X		X		X	X	X							X				X	X
70	Dynamic Curve Signing	Tried	1 - 2 years	Moderate		X		X		X	X		X						X				X	X
71	All-Way Stop/Yield	Documented	1 - 2 years	Moderate		X			X	X	X	X						X		X	X	X		X
72	Continuous Green T	Documented	More than 2 years	High		X			X	X				X				X			X	X	X	
73	Enhanced Stop Bar	Documented	Less than 1 year	Low		X			X	X	X				X					X				X
74	J-Turn/Restricted Crossing U-Turn (RCUT)	Documented	More than 2 years	High		X			X	X		X						X			X			
75	LED Stop Signs/Flashing Beacon Stop Signs	Documented	1 - 2 years	Low		X			X	X	X				X			X		X				X
76	Median Acceleration Lane	Documented	1 - 2 years	High		X			X	X	X			X				X			X	X		
77	Offset T-Intersection	Tried	More than 2 years	High		X			X	X	X	X						X			X			
78	Oversized Warning Signs/Stop Signs	Documented	Less than 1 year	Low		X			X	X	X				X									X
79	Remove Skew	Proven	More than 2 years	High		X			X	X	X	X						X		X	X			
80	Corridor Signal Timing to Reduce High-Speed Flow	Proven	1 - 2 years	Low						X	X		X									X	X	X

*Speed safety cameras not authorized in state law as of October 2025 except for pilot communities.