

2025    

# SAFETY POLICY STUDY

B I S M A R C K - M A N D A N M P O

**Policy Board – December 16, 2025**

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# Agenda

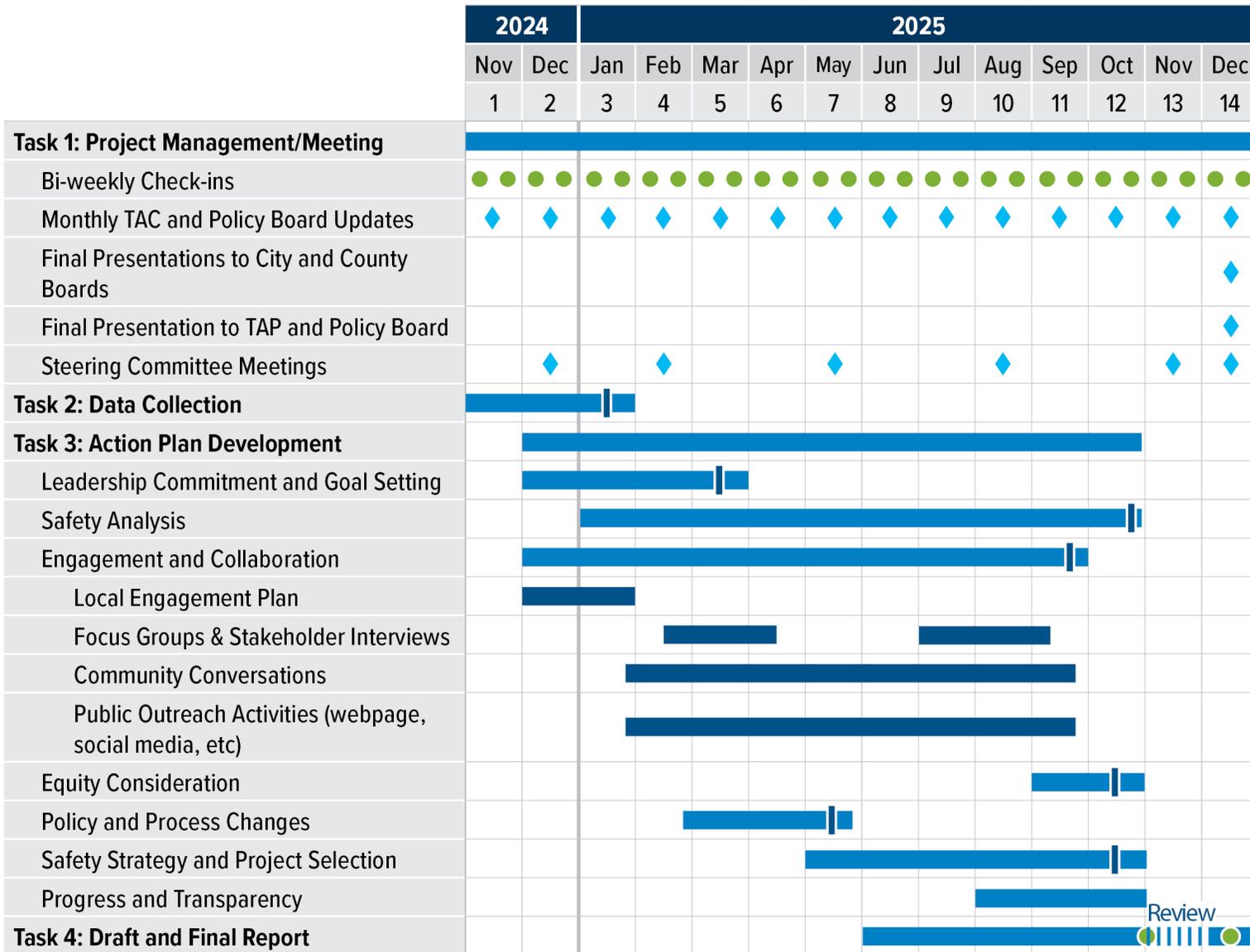
1. Acknowledgements/Project Team
2. Final Report Overview
  - Chapter 1 – Introduction & Background
  - Chapter 2 – Multimodal Transportation Safety In the Region
  - Chapter 3 – State of Practice
  - Chapter 4 – Public Engagement & Outreach
  - Chapter 5 – Data Analysis
  - Chapter 6 – High-Injury Network (HIN) Results
  - Chapter 7 – Safety Strategies & Toolkit
  - Chapter 8 – Implementation & Road to Zero
3. Discussion/Action

# Acknowledgements

1



# Schedule

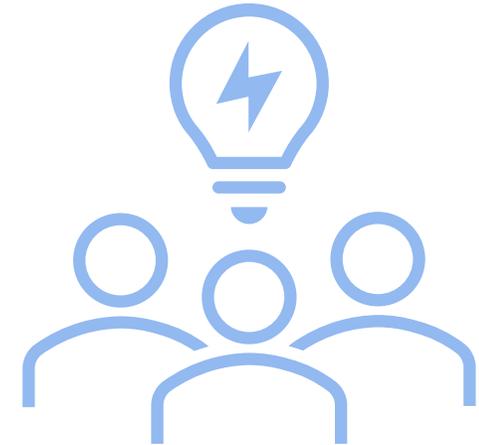


- ▬ Develop Task Technical Memo
- ◆ Engagement/Stakeholder Meeting



Name	Agency
Gabe Schell	City of Bismarck
Daniel Nairn	City of Bismarck
Chris Holzer	City of Bismarck
Deidre Hughes	Bis-Man Transit
Loretta Marshik	City of Lincoln
Jarek Wigness	City of Mandan
Dan Schriock	Burleigh County
Mitch Flanagan	Burleigh County
John Saiki	Morton County
Natalie Pierce	Morton County
Kim Riepl	Bismarck-Mandan MPO
Will Hutchings	NDDOT
Logan Biese	NDDOT – Bismarck District
Kristen Sperry	FHWA – ND Division
Ranae Tunison	FTA – Region 8

# Steering Committee Members





# Consultant Team

Name	Company
Luke Champa	SRF Consulting Group
Jolene Rieck	Emergent Strategies Group
Scott Harmstead	SRF Consulting Group
Sarah Couture	SRF Consulting Group
Erik Thorkelson	SRF Consulting Group
Peter Dirks	SRF Consulting Group
Will Fenner	SRF Consulting Group
Julian Padilla	SRF Consulting Group
Josie Myers	SRF Consulting Group



# Final Report Overview

# 2



- 
- Introduction
  - Why the Safety Policy Study?

## Chapter 1 - Introduction & Background

*Image: Four Quad Gates at Railroad Grad Crossing in Downtown Bismarck*

- 
- **Historical Crash Trend Summary**
  - **Vision & Goals**
  - *Appendix A – Historical Crash Trend Summary*



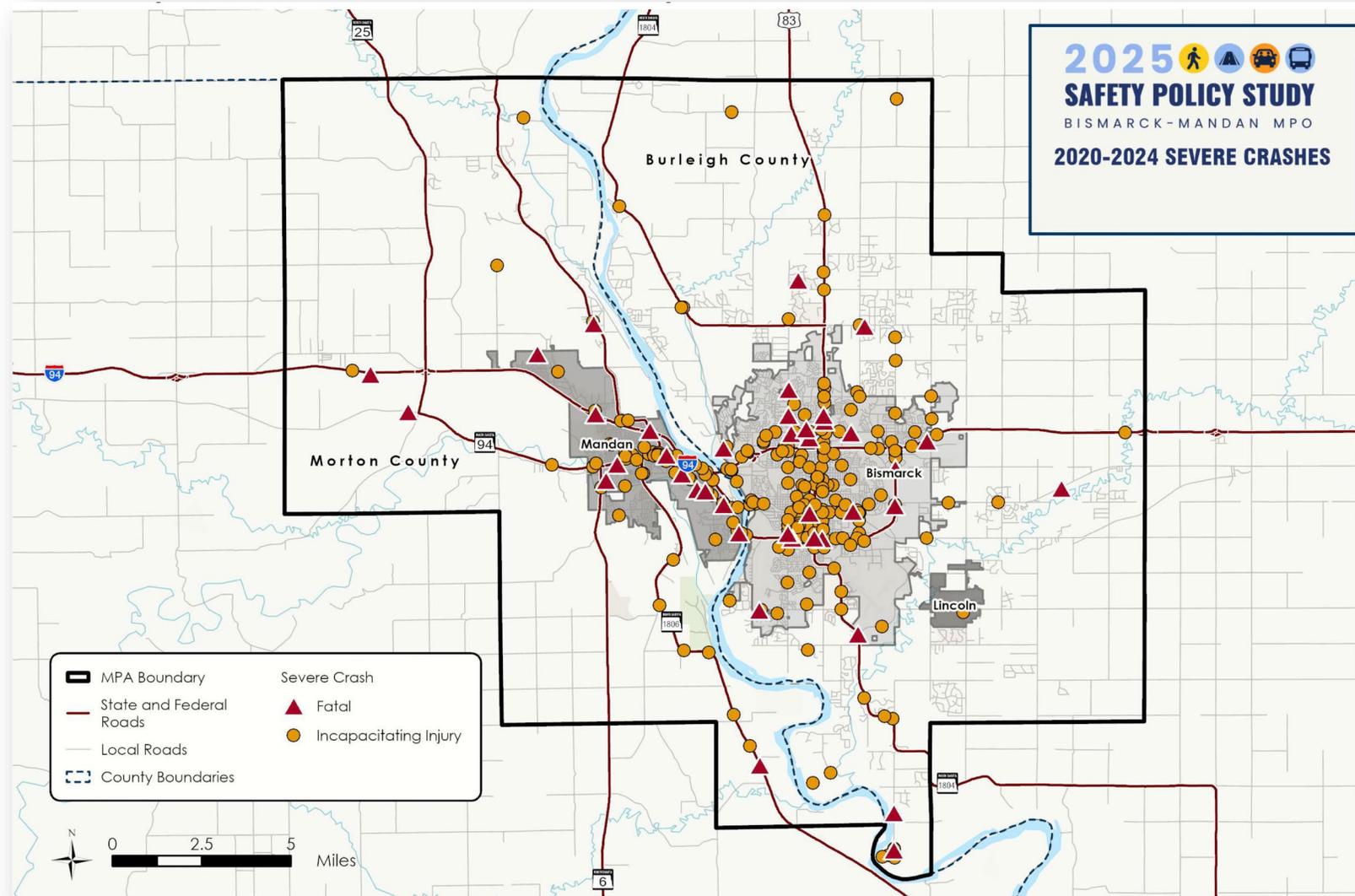
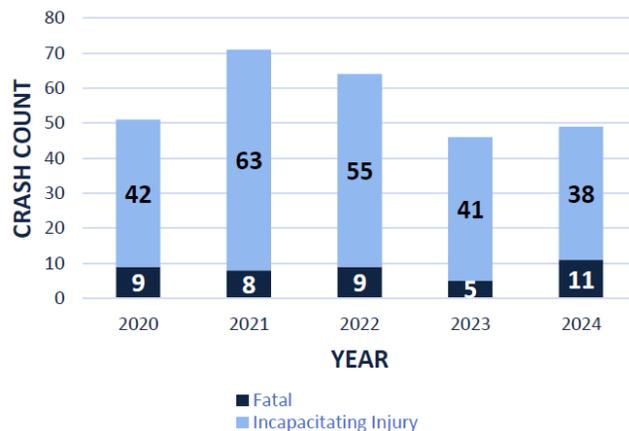
## Chapter 2 - Multimodal Transportation Safety In the Region

*Image: New sidewalk on Dolan Dr. in Lincoln*

# Historical Crash Trend Summary

- Analyzes crash data from 2020-2024 (5-years)
  - 17,497 total crashes
  - 281 severe
- Breakout by mode including transit and railroad incidents

Figure 5. Fatal and Incapacitating Injury Crashes by Year



**2025**   
**SAFETY POLICY STUDY**  
 BISMARCK-MANDAN MPO  
**2020-2024 SEVERE CRASHES**

# Vision & Goals

## ■ Vision

- Zero traffic-related deaths and life-changing injuries on streets within the Bismarck-Mandan region.

## ■ Goals

- Fifty percent (50%) reduction in annual fatal and life-changing injury crashes by 2050, or 35 fatal and serious injury crashes or fewer.

### Vision & Goals

The Bismarck-Mandan MPO seeks proven strategies to achieve a vision for a safer regional transportation system for all users. The Safety Policy Study **establishes a vision of zero traffic-related deaths and life-changing injuries** on streets within the Bismarck-Mandan region, with a specific goal of a 50 percent reduction from 2021 historic crash data to 35 or fewer annual deaths and life-changing injuries by 2050.

Achieving zero severe (fatal and life-changing injury) crashes requires the region's leadership, staff, and even residents, to prioritize safety, and to collaborate with regional partners to do the same. Achieving the vision requires priority and focus on physical engineering efforts and non-engineering efforts such as educational campaigns, high-visibility enforcement, agency collaboration, and policy refinement. **Bismarck-Mandan MPO's vision will be measured on an annual basis starting in 2026, by the percent change in fatal and life-changing injury crashes.**



### Vision

Zero traffic-related deaths and life-changing injuries on streets within the Bismarck-Mandan region.

### Goal

Fifty percent (50%) reduction in annual fatal and life-changing injury crashes by 2050, or 35 fatal and serious injury crashes or fewer.

### Tracking the Goal

A year over year percentage change in severe crashes should be monitored by the BMMPO. To reach the target, an approximate two (2) to three (3) percent reduction would be considered on track. A five-year rolling average should be used to estimate the reduction from 2021's peak of 71 severe crashes (e.g. for the period of 2020-2024, the rolling average equals 56.2 severe crashes). This process is very similar to the data tracked for BMMPO's Performance Measure 1 safety targets, and Safety Policy Study performance review should occur at the same time.

- 
- **Safety Practice in the Bismarck-Mandan Region**
    - State Plans/Policies
    - Regional & Local Plans/Policies
  - **Policy and Process Changes**
  - *Appendix B – State of Practice*

## Chapter 3 - State of Practice

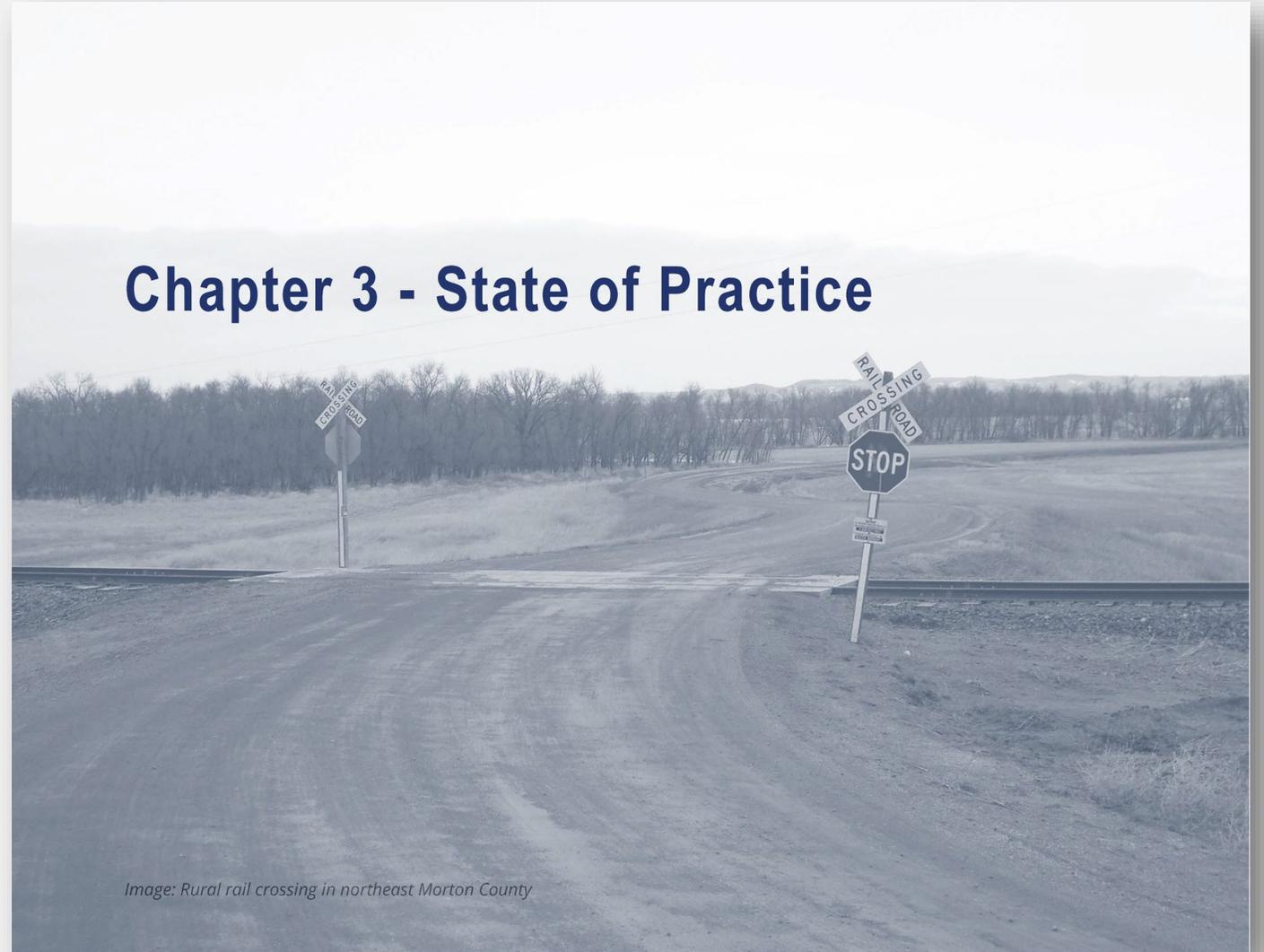


Image: Rural rail crossing in northeast Morton County

- 
- **Summary of Study Engagement**
  - **Engagement Methodology**
  - **Key Findings and Outcomes**
  - **Conclusion & Recommendations**
  - *Appendix C – Public Engagement Summary*

## Chapter 4 - Public Engagement & Outreach

*Image: BMMPO (Kim) facilitates engagement at Mandan's Touch-a-Truck event*

# Engagement Activities

Engagement Activity	Description	Participants	Format
<b>Community Conversations</b>	Pop-up booths at public events including Earth Day Celebration & Touch-a-Truck	General public, families, youth, residents, visitors	In-person mapping, comment boards
<b>Focus Groups</b>	Structured discussions exploring safety by mode and role	First responders and active transportation advocates	Facilitated discussions
<b>Stakeholder Interviews</b>	Semi-structured interviews	Trucking and logistics companies and advocacy organizations, OHV state program manager	In-person and online individual and small group interviews
<b>Youth Perspective Survey</b>	Online questionnaire on safety experiences	Youth ages 13-19 from the MPA	Digital survey

# Key Findings & Outcomes



## Pedestrian and Bicycle Safety

Across all outreach activities, pedestrian safety emerged as the highest safety priority.

Participants described unsafe crossings near schools, poor visibility, and a lack of infrastructure continuity or gaps in the network. Youth and adults alike expressed frustration with fading crosswalk paint, missing sidewalks, and inconsistent maintenance.

### Participant Thoughts on Pedestrian Safety & Crossings

*"Drivers still go through despite flashing lights and crosswalks."* – Community Conversation participant, Touch-a-Truck Event

### Shared pedestrian and bicyclist observations:

- Unprotected crossings near schools and parks (e.g., Solheim Elementary, Century Avenue)
- Trail and sidewalk gaps connecting neighborhoods, workplaces, and commercial areas
- Poor visibility and inadequate lighting along pedestrian corridors
- The need for better maintenance, particularly snow and debris removal

Whether voiced by families, active transportation advocates, or freight operators observing pedestrian conflicts, the message was consistent: **safer infrastructure and maintenance practices benefit everyone.**



## Driver Behavior and Distracted Driving

Nearly all participants named distracted, impatient, and aggressive driving as significant threats to roadway safety. First responders described frequent crash responses linked to phone use; community members noted speeding in residential zones; freight operators highlighted conflicts caused by driver inattention. **Participants widely supported stronger education and enforcement campaigns to curb distracted driving and promote courteous behavior behind the wheel.**

### Participant Thoughts on Distracted and Impatient Driving

*"We've turned into a society where we sit at green lights and run red ones because you're on your da\*\* phone."* – First Responders Focus Group Participant

### Common driver behavior concerns:

- Phone use while driving or at intersections
- Speeding near schools and parks
- Tailgating and failure to yield at crosswalks
- Inconsistent enforcement of existing traffic laws



## Infrastructure Gaps & Intersection Design

Infrastructure gaps and challenging intersections were cited by nearly every participant group. Freight operators described difficult turning movements and congestion; bicyclists and pedestrians noted inconsistent connections; residents identified confusing roundabouts and short light cycles. **Together, these findings suggest that design consistency and multimodal considerations are critical for future safety investments.**

### Common infrastructure/intersection locations and challenges:

- Congestion at high-volume intersections such as U.S. Highway 83, 19th Street, and Washington Street
- Roundabouts are too small for local delivery/service truck maneuvering
- Sidewalks that end abruptly or lack ADA-compliant transitions
- Need for clearer signage and signal timing that accounts for pedestrians and freight



## Transit Accessibility & Reliability

Transit users and service providers agreed that coverage, frequency, and stop safety limit the usability of public transit. Participants across demographics noted that limited evening hours and long wait times discourage regular ridership. **Expanding reliable, accessible transit options can advance rider experience for the region's most vulnerable populations and improve overall system safety.**

### Common feedback about transit:

- Improve route connections between residential, college, and employment centers
- Enhance lighting and visibility at stops for safety and comfort
- Explore later or weekend service to reduce reliance on single-occupancy vehicles

# Key Findings & Outcomes



## Freight and Commercial Vehicle Operations

Participants in the freight industry emphasized infrastructure bottlenecks, insufficient truck parking, and driver education needs. Residents also raised concerns about congestion and safety in freight corridors.

**Collaboration between agencies and carriers can improve operational efficiency and enhance public safety.**

### Key points on freight and commercial vehicles:

- Shortage of secure truck parking with basic amenities
- Tight turning radii and congestion at major intersections
- Need for public education on safe driving around large trucks



## Off-Highway & Micromobility Vehicle Use

Use of off-highway vehicles (OHVs), e-bikes, scooters, and golf carts is increasing within city limits and rural edges. Participants cited confusion about where such vehicles are permitted and emphasized the importance of consistent enforcement and clear communication of rules.

**Ensuring that emerging modes coexist safely with traditional traffic is an evolving need.**

### Shared priorities for OHVs:

- Clarify local ordinances for OHV and micromobility use
- Increase education on helmet use and age requirements
- Coordinate enforcement among city, county, and state agencies



## Seasonal Conditions and Maintenance

Winter weather and construction seasons present recurring safety challenges. All participant groups recognized that snow, ice, and poor lighting increase crash risk and limit accessibility for pedestrians and bicyclists.

**Maintaining safe conditions year-round supports the region's goal of efficient, multimodal mobility.**

### Consensus themes on seasonal conditions and maintenance:

- Timely and consistent snow and ice removal
- Clear visibility and lighting during dark winter months
- Maintenance of sidewalks, trails, and shoulders after storms or construction



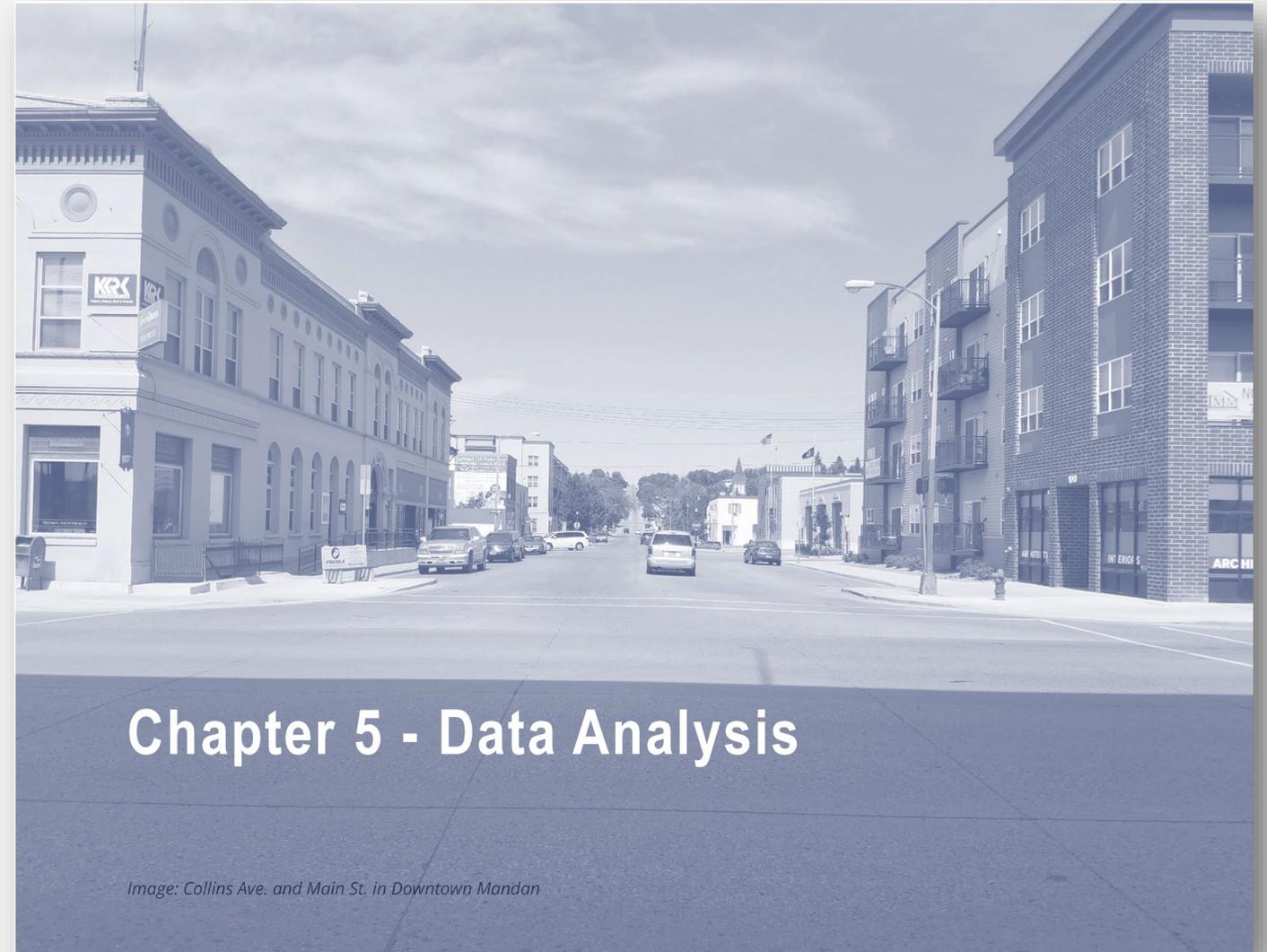
## Education, Enforcement & Collaboration

Education and outreach were viewed as essential to long-term safety improvements. Participants across all backgrounds and sectors called for continued partnerships among schools, law enforcement, and local governments to promote awareness and accountability on the regional transportation system. **By fostering consistent messages and shared responsibility, education and enforcement can shape safer habits throughout the community.**

### Representative ideas about education, enforcement, and collaboration:

- Expand defensive-driving and pedestrian safety education in schools
- Provide community presentations or "safety days" in public spaces
- Increase visibility of enforcement in high-risk areas
- Use plain-language communication and accessible outreach materials

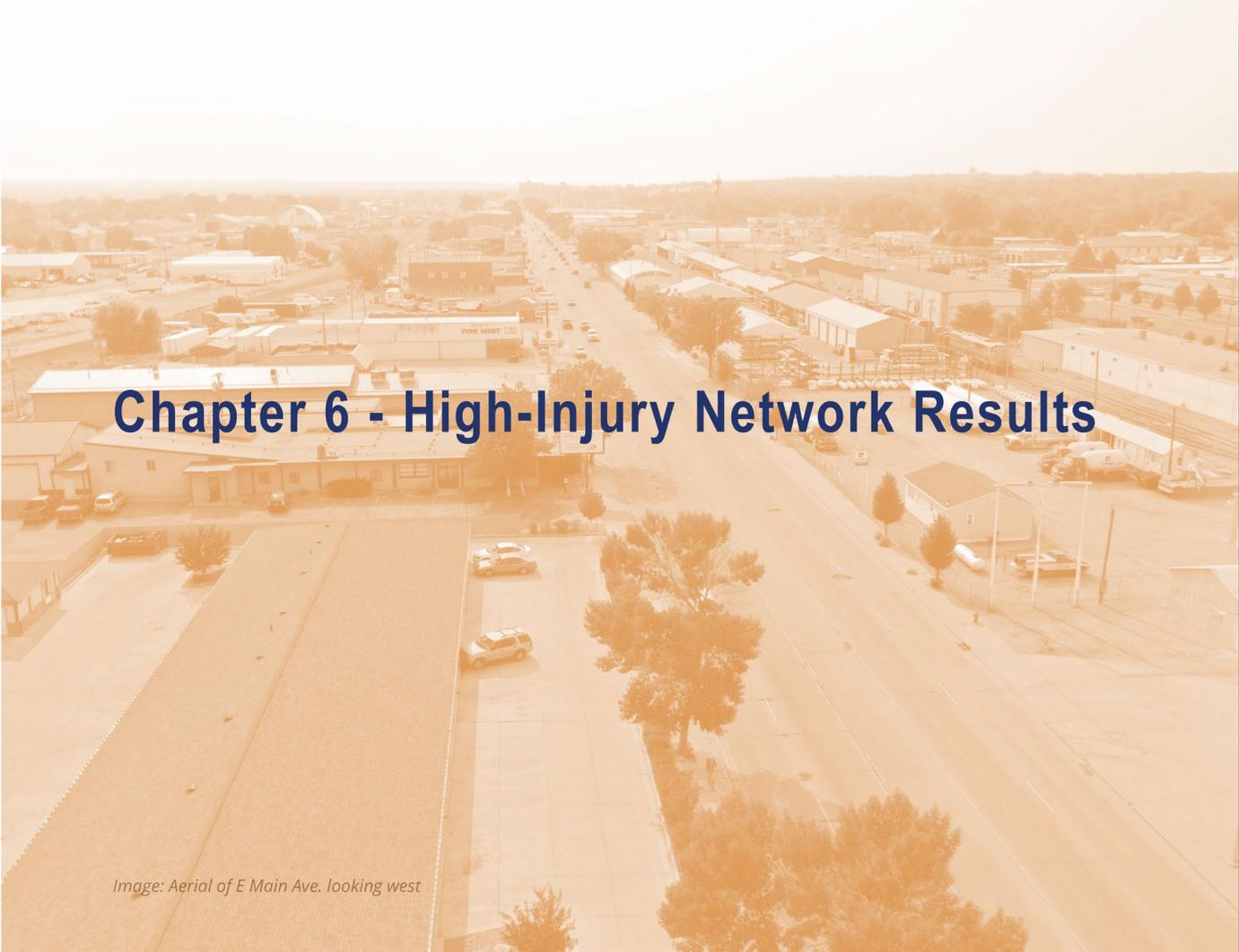
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- **Safety Analysis**
  - **Demographic Analysis**
  - *Appendix D – High-Injury Network Methodology*



## Chapter 5 - Data Analysis

*Image: Collins Ave. and Main St. in Downtown Mandan*

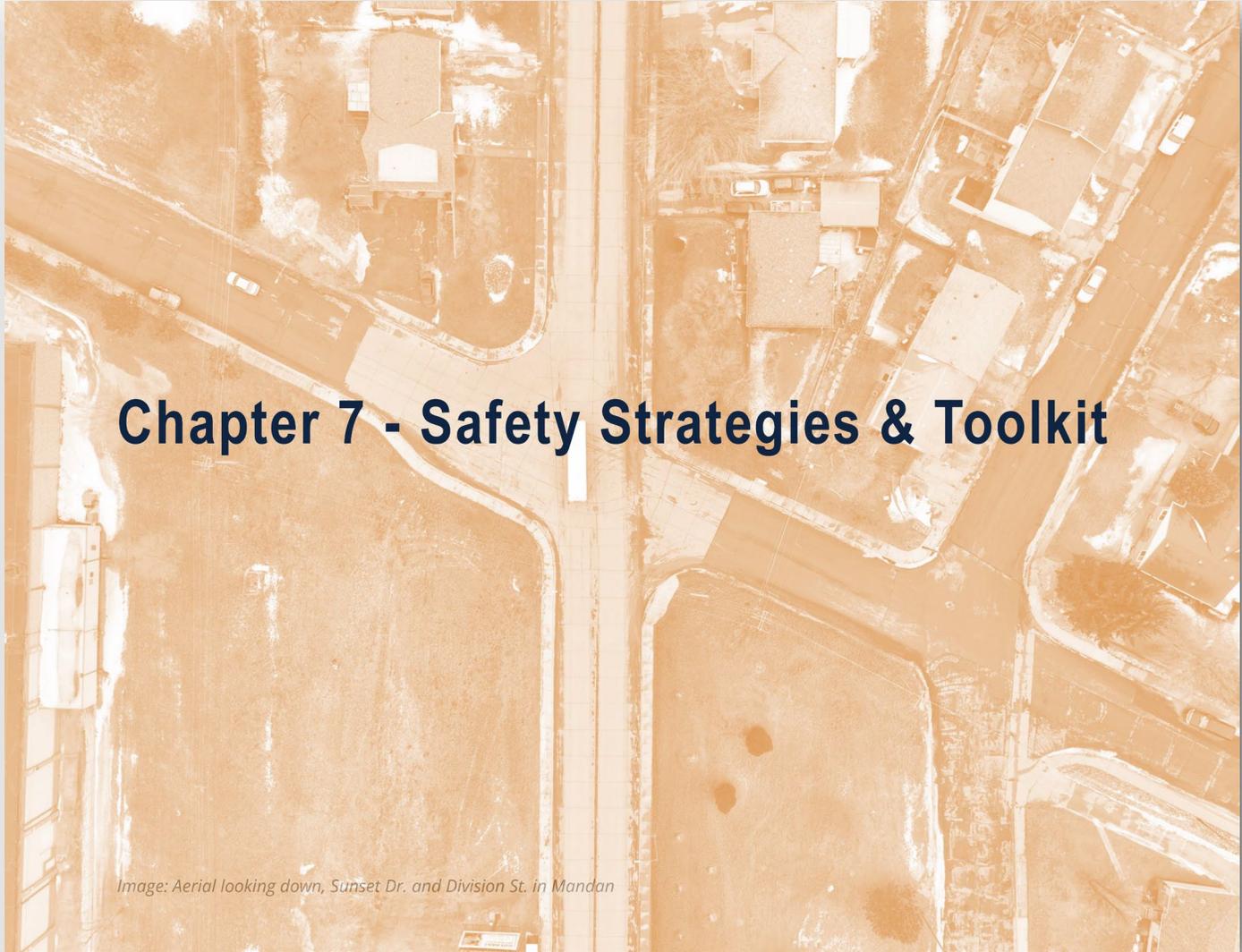
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- **Modal High-Injury Network (HIN) Results**
  - **Pedestrian HIN**
  - **Bicycle HIN**
  - **Motorcycle HIN**
  - **Automobile HIN**
  - **All-Mode HIN**
  - *Appendix E – HIN One-Pagers*



## Chapter 6 - High-Injury Network Results

*Image: Aerial of E Main Ave. looking west*

- 
- **Introduction**
  - **Engineering Strategies**
  - **Building Safety Beyond Infrastructure**
  - **Other Multimodal Strategies**
  - *Appendix F – Safety Strategies Toolkit*



## Chapter 7 - Safety Strategies & Toolkit

*Image: Aerial looking down, Sunset Dr. and Division St. in Mandan*

# Priority Engineering Strategies

Tiers one (1) through three (3) focus on countermeasures and strategies related to removing roadway conflicts, managing speeds, and separating vulnerable road users. Tier four (4) identifies countermeasures and strategies to improve road user attentiveness and awareness to alert road users of risks so appropriate action or road user behavior can take place.

## Engineering 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 challenges facing the BMMPO and partner jurisdictions. An abbreviated list of priority engineering strategies is described in more detail below. An expanded list is shown in **Table 16** for urban strategies and **Table 17** for rural strategies. The strategy list includes the following key information:

- Street location typology
- Description
- Estimated implementation cost
- Strategy effectiveness based on Crash Reduction Factor (CRF)
  - Low (CRF of 0-29 percent)
  - Moderate (CRF of 30-59 percent)
  - High (CRF of 59 percent or more).
- Applicable SSRDH tier

See **Appendix F** for the complete toolkit of strategies and strategy selection guidance.

## Priority Engineering Strategies

Priority engineering strategies are identified based on potential to address key severe crash themes in **Chapter 2** and HIN crash profiles in **Chapter 6**.

### Vulnerable Road Users

Priority engineering strategies to increase safety for vulnerable users focus on increasing visibility and driver awareness, removing conflicts, and filling gaps in bicycle and pedestrian network. Examples include:



#### Bicyclists

- **Bike Lane / Boulevard** – A designated on-street space or low-traffic roadway that prioritizes bicyclists, reducing interactions with faster-moving vehicles.
- **Buffered Bike Lane** – A bike lane with painted buffer zones that increase separation from traffic or parked cars, enhancing rider comfort and safety.
- **Separated Trail / Path** – An off-street facility shared by bicyclists and pedestrians, completely removed from vehicular traffic for safer travel.
- **Grade Separated Pedestrian Crossing (Underpass/Overpass)** – Physical separation of bicycle and pedestrian crossing; typically bringing a

sidewalk or shared use path over or under the street.

- **Lighting** – lighting to increase visibility of bicyclists and pedestrians; typically at crossing locations or intersections.



#### Pedestrians

- **Sidewalks, Trail / Path** – Designed walking areas separated from roadways that reduce pedestrian exposure to vehicle traffic.
- **High-Intensity Activated Crosswalk (HAWK) Beacon / Pedestrian Hybrid Beacon (PHB)** – A signalized crossing that stops traffic when activated, allowing pedestrians crossing at unsignalized crosswalks, increasing driver yield rates.
- **Rapid Rectangular Flashing Beacons** – Flashing light that alert drivers to pedestrians crossing at unsignalized crosswalks, increasing driver yield rates.
- **Curb Extensions / Bulb-Outs** – Physical extension of curbs at intersections to shorten crossing distances and improve pedestrian visibility.
- **Raised Crosswalks** – Crosswalk constructed with a speed table or vertical elevation change which increases driver's visibility of the crosswalk.
- **No Right Turn on Red** – Signage or adaptive signal at intersections prohibiting right turns on red. Typically to reduce right turn crashes involving pedestrians and bicyclists.



#### Motorcyclists

- **Access Management** – Reduce driveway conflict points, typically through consolidation.
- **High-Friction Surface Treatments** – Specialized pavement materials applied to curves or intersections to reduce skidding and improve traction for motorcyclists.
- **Improved Curve Signage and Delineation** – Clear, visible signs and markings help motorcyclist anticipate curve and adjust speed appropriately.
- **Edgeline Rumble Strips** – Audible and tactile warning placed along road edges that alert distracted drivers without intruding into the motorcyclists' travel path. **Intersection Lighting and Visibility Enhancements** – Better lighting at intersections improves motorcyclists visibility to other road users, reducing crash risk.

#### Vulnerable User Implementation Opportunities:

- Pedestrian, Bicycle, and Motorcycle HIN Corridors
- Disadvantaged Communities
- Bis-Man Transit Fixed-Routes

# Priority Engineering Strategies



## Intersection-Related

Intersections were the most prominent in every single modal HIN's crash profile. In addition to the vulnerable user intersection strategies identified, the following strategies are oriented toward vehicles.

- **Roundabout** – Circular intersections that slow vehicle speed and reduce conflict points, lowering the risk and severity of crashes.
- **Mini Roundabout** – Similar to roundabout but takes up less right-of-way making it easier for application at existing intersections.
- **Lane Constrictor Intersection** – Reduced lane widths and median buffer space on the major, uncontrolled legs of a stop controlled intersection to reduce speed through the intersection.
- **Signalized or Unsignalized RCUT** – Removes left-turn conflict points by constructing a median and U-turn lanes. Left-hand turns are replaced by right-hand turns and subsequent U-turn. Traffic signals may also be utilized at the intersection.
- **Reduce-Turn / Right-Turn Lanes** – Separate turn lanes that organize vehicle movement and reduce turning conflicts with through traffic.
- **Lighting** – Enhanced illumination at intersections improves visibility for all users, especially at nighttime or during low-light conditions.

- **Confirmation Lights** – Supplemental signals that indicate when a red light has been activated, helping law enforcement and improving driver compliance.
- **Corridor Signal Timing to Reduce High-Speed Flow** – Sequential signal timing to reduce high-speed traffic from going through multiple signals in a row while still maintaining good flow of traffic.
- **Appropriately Timed Yellow Change Intervals** – The length of time between green and red lights at signalized intersections. Proper timing is important to maximize signal timing and make sure the intersection is clear before the next leg gets a green light.



## Speeding

Speeding was identified as a prominent factor of the motorcycle and automobile HIN's contributing crash profiles.

- **Road Diet (3- & 5-Lane Conversions)** – Reducing the number of travel lanes help calm traffic, lower speeds, and improve safety for all road users.
- **Reduce Lane Width** – Narrower lanes encourage slower driving by increasing driver attentiveness and perceived risk.
- **Curb Extensions / Bulb-Outs** – Sidewalk widenings at intersections that shorten crossing distances and improve pedestrian visibility.

- **Horizontal Chicanes** – Alternating curb extensions or lane shifts create a winding path that naturally slows vehicles.
- **Appropriate Speeds** – Designing roads to match safe, context-sensitive speed limits reduces crash severity and improves safety for all users.
- **Dynamic Speed Feedback Sign** – Speed limit signs with dynamic display that shows drivers speed as they go by, typically most effective where a street transitions from a higher to lower speed limit.



## Single Vehicle Run Off Road

- **Enhanced Edgeline (6" or 8")** –
- **Rumble Strips (Centerline and Edgeline)** – Audible and tactile warnings alert drivers when they drift from their lane, helping prevent roadway departures.
- **Clear Zone Maintenance** – Keeping roadside areas free of fixed objects provides space for out-of-control vehicles to recover safely.
- **Delineators** – Reflective roadside markers improve nighttime and low-visibility guidance, helping drivers stay on the road.
- **Non-Recoverable Inslope Protection** – Barriers or treatments on steep roadside slopes prevent vehicles from overturning or crashing off-road.
- **Shoulder Paving (2', 4', or 6')** – Paved shoulders offer recovery space for vehicles that veer off the travel lane, reducing crash severity.

- **Ditch/Embankment/Side Slope Improvements** – Improves the slope of ditches by making them less steep, to increase the likelihood of recovery for vehicles that depart the roadway.



## Impaired Driving

- **Wrong-Way Driving Detection** – Technology that alerts drivers and authorities when a vehicle enters a roadway in the wrong direction, helping prevent head-on collisions.
- **Median Barrier** – A physical barrier that separates opposing traffic lanes, prevent crossover crashes often associated with impaired driving.
- **Non-Recoverable Inslope Protection** – Safety treatments on steep roadside slopes that reduce the severity of crashes when impaired drivers leave the roadway.

Single vehicle run off road and impaired driving are contributing factor in 23% and 22% of severe crashes in the MPA, respectively. The priority strategies above are geared towards rural and limited urban applications.

# Priority Engineering Strategies

Figure 29. Safe System Roadway Design Hierarchy (FHWA)

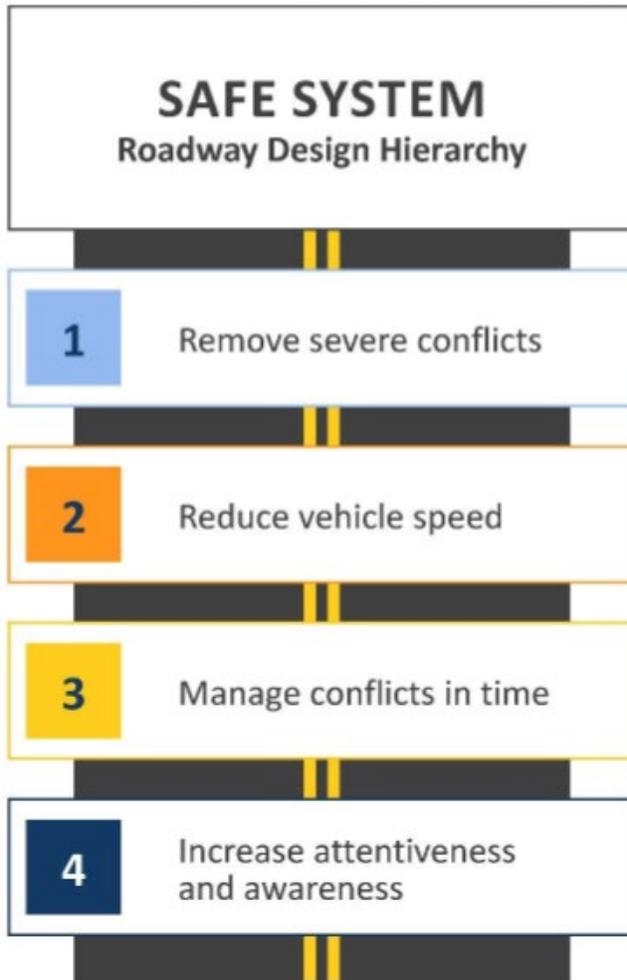


Table 17. Rural Safety Countermeasures

Location Typology	Description	Rural Safety Countermeasures		Safe System Hierarchy Tiers			
		Estimated Implementation Cost	Estimated Effectiveness*	Remove Severe Conflicts	Reduce Vehicle Speeds	Manage Conflicts in Time	Increase Attentiveness & Awareness
Segment	Access Management	Low/Moderate (\$10,000-\$350,000 per mile.)	High (Up to 50% reduction of all crash severities and types.)	X			
Segment	Centerline Rumble/Sinusoidal Mumble	Low (Less than \$10,000 per mile.)	Moderate (36% reduction of severe, single-vehicle run off road crashes on 2-lane rural roads.)				X
Segment	Clear Zone Maintenance/Enhancements	Low/Moderate (\$10,000-\$350,000 per mile.)	Moderate/High (Varies, clear zone enhancements from 3.3 feet to 16.7 feet: 22% reduction of all crash severities and types. From 16.7 feet to 30 feet: 44 percent reduction of all crash severities and types.)	X			
Segment	Ditch/ Embankment / Side Slope Improvements	Moderate/High (\$50,000 to \$350,000 per mile.)	Low (14% reduction of fatal and injury-, rollover crashes.)	X			
Segment	Divided Roadway (buffers or median)	Moderate/High (\$60,000 to \$1 million per mile.)	Moderate/High (43% reduction of fatal crashes and 30% reduction of injury crashes.)	X			
Segment	Enhanced Edgeline (6" or 8")	Low (Less than \$10,000 per mile.)	Low (18% reduction of all crash severities and types.)				X
Segment	Non-Recoverable Inslope Protection (guardrail)	Moderate/High (\$200,000 to \$350,000 per mile.)	Moderate (35% reduction of fatal and injury crashes.)	X			

# Non-Engineering Strategies

- Education and Awareness
- Community Collaboration and Partnerships
- Motorcycle Safety and Rider Awareness
- Enforcement and Behavior Change
- Encouragement and Community Engagement
- Emergency Services and Coordination
- Access and Inclusion
- Policy and Regulations
- Legislative Change
- Moving Forward Together

can reinforce community-wide campaigns (e.g., seatbelt use, distracted driving, motorcycle safety), under a "Safe Driving Challenge" umbrella.

### Encouragement and Community Engagement

Encouragement programs reward safe choices and build positive peer pressure to do the right thing. Parents and youth often raise concerns about safety near schools and parks. Expanding the Safe Routes to School and Safe Routes to Parks efforts, which are already a national best practice, can combine education, encouragement, and evaluation.

Ideas include:

- "Walk and Roll Wednesdays" or "Bike Bus" days.
- Student-created safety murals or signage.
- Neighborhood "Slow Down" pledge campaigns.

**"20 is Plenty" – Slowing Down for Safer Neighborhoods**

This safety campaign encourages drivers to slow down to 20 mph on neighborhood streets. NDCC §39-09 establishes a default speed limit of 25 mph on residential streets; however, jurisdictions can lower this limit through local ordinances.

### Recognizing Safe Behavior

Positive recognition can be powerful. The BMMPO could highlight safe behavior through short features, "Saved by the Belt" stories, driver spotlights, or youth safety awards at community events. These celebrations help make safety visible and relatable.

"It is not a race. People should be proud to drive smart." - Youth Comment.

### Emergency Services and Coordination

When crashes do occur, fast and coordinated responses save lives, and the information gathered afterward helps prevent similar incidents in the future.

### Strengthen Data Sharing

First responders and hospitals collect valuable crash information that can help pinpoint risk patterns. Building a shared, regional traffic safety data network that links police, EMS, and BMMPO stakeholders can improve trend analysis and near-miss reporting. This coordination mirrors successful approaches in other MPOs across the U.S., where integrating crash data, citations, and hospital records has allowed traffic safety partners to target education and enforcement more effectively.

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# Other Multimodal Strategies

continue to identify opportunities to include the following in plans, corridor studies, and reconstruction projects:

- **Bus turnouts** – provides a designated lane or stopping area along the street to remove transit vehicles from conflicts with traffic.
- **Designated stops with shelters** – [increases](#) visibility of transit riders, to remove severe conflicts and conflicts in time, currently associated with the flagging system

Figure 30. Potential Bus Stop/Pull Out Area – E. Main Corridor Study



## On the Road Safety

Improving transit safety while vehicles are in operation depends heavily on skilled drivers and well-maintained equipment. Comprehensive driver training programs should emphasize safe operating practices in all weather conditions, with particular focus on navigating wet, icy, or

low-visibility environments, as over one third of Bis-Man Transit's crashes occurred in these conditions. Regular refresher courses and simulations can help drivers remain prepared for seasonal challenges and emergency situations. Equally important is a rigorous maintenance program that ensures buses are in good condition. This includes frequent inspections of brakes, tires, wipers, lights, and heating systems to maintain traction, visibility, and passenger comfort.

The BMMPO and Bis-Man Transit should also keep a pulse on technological advancements for the safety of transit riders on the road. Vehicle technology is rapidly evolving to include innovative safety systems:

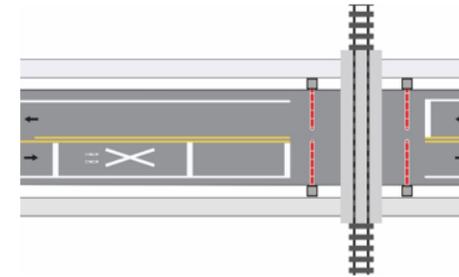
- **Collision avoidance systems** – Uses sensors to detect potential crashes and alert the driver or operator with visual and auditory warnings. Some advanced systems can even apply the brakes and/or take other actions to mitigate or prevent the collision.
- **Lane departure warning systems** – Uses sensors to detect lane departure and alert the driver or operator with visual and auditory warnings. Some advanced systems can automatically steer the vehicle back into the lane.
- **Onboard cameras for monitoring passenger and driver safety** – Used to identify and mitigate unsafe passenger and driver behavior, typically after something has been flagged. Some advanced

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## Four Quad Gates

Four-quadrant gates are an effective active warning system designed to virtually eliminate the dangerous and illegal maneuver of driving around lowered crossing gates. Unlike traditional two-quadrant gates that only block the entrance lanes, the four-quadrant system features gates on both the entrance and exit side of the tracks, effectively creating a "closed" barrier. A critical component is the use of a time delay for the descent of the exit gates, which allows any vehicles already on the tracks to safely clear the crossing before the area is fully sealed. This improvement option has the advantage of causing minimal impact to accessing adjacent properties.

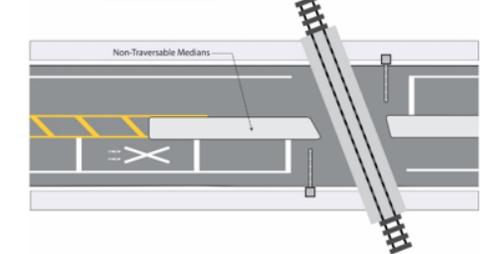
Figure 33. Four Quad Gates - Plan View



## Non-Traversable Medians

Non-traversable medians prevent motorists from swerving into the opposing lane to bypass the warning system. Accesses should be closed or relocated if they are within the extents of the [median](#). When no other access options exist, private accesses may remain within the extents of the median but would be limited to right-in/right-out access. Non-traversable medians are generally four feet wide and six inches tall, and the length of several queueing vehicles, but may vary depending on roadway limitations. In some cases, crossing improvements may be difficult or impossible due to the configuration of roadways, accesses, and other factors. Cost estimates for medians range significantly depending on the need for roadway widening, access modifications, drainage, and other associated modifications.

Figure 34. Non Traversable Medians - Plan View



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# Appendix F – Safety Strategy Toolkit

## Safety Countermeasure Toolkit

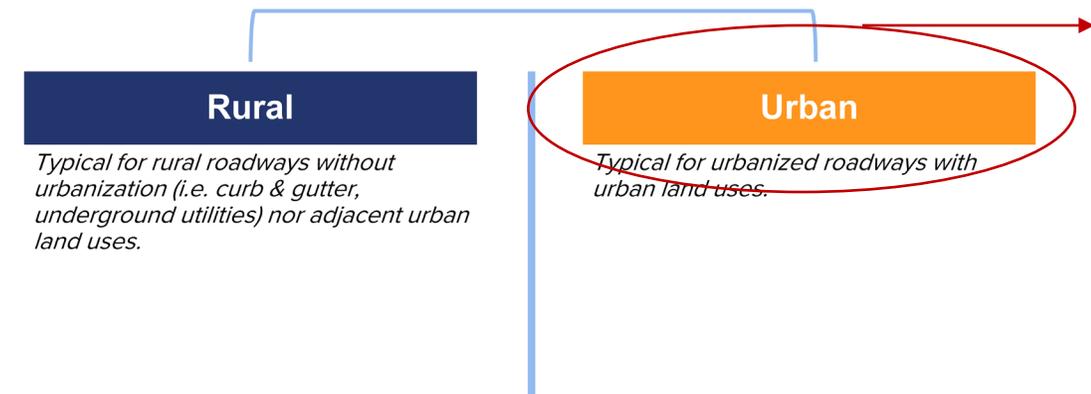
### Rural Strategies

- Typical for rural roadways without urbanization (i.e. curb & gutter, underground utilities) nor adjacent urban land uses.
- Categories:
  - [Intersection](#)
  - [Segment](#)
  - [Curve](#)

### Urban Strategies

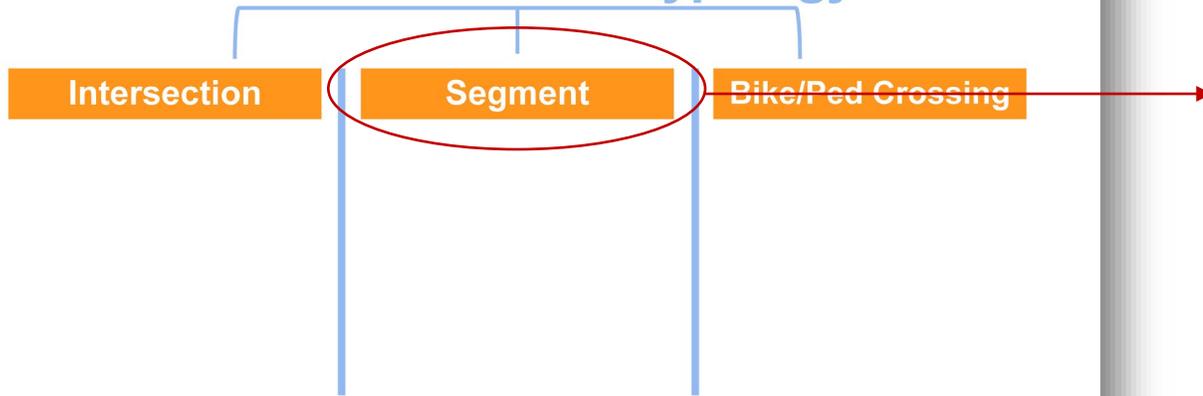
- Typical for urbanized roadways with urban land uses.
- Categories:
  - [Intersection](#)
  - [Segment](#)
  - [Bike/Ped Crossing](#)

## What is the street cross section?



# Appendix F – Safety Strategy Toolkit

## What is the urban location typology?



*BACK To Street Cross Section*

## Urban Segment Strategies

Description	Estimated Cost	Estimated CRF	Safe System Hierarchy Tiers (Click Tier to Sort)			
			1. Severe Conflicts	2. Vehicle Speeds	3. Conflicts in Time	4. Attentiveness/Awareness
<a href="#">Access Management</a>	High	High	X			
<a href="#">Bike Lane/ Boulevard</a>	Mod/High	*High	X			X
<a href="#">Buffered Bike Lane</a>	Mod/High	*High	X			
<a href="#">Divided Roadway</a>	Mod/High	Moderate	X			
<a href="#">Median Barriers</a>	High	Moderate	X	X		
<a href="#">Road Diet</a>	Low/High	High	X	X		
<a href="#">Variable Advisory Speed Limits</a>	Low	Moderate		X		
<a href="#">Cycle Track</a>	High	High	X			
<a href="#">Dynamic Speed Feedback Sign</a>	Low	Low		X		X
<a href="#">Appropriate Speeds</a>	Low/Mod.	Low		X		
<a href="#">Horizontal Chicanes</a>	Low/Mod.	*Moderate		X		
<a href="#">Pedestrian Barriers to Prevent Mid-Block Crossing</a>	High	High	X			
<a href="#">Plowable Centerline Reflective Markers</a>	Low	Moderate				X
<a href="#">Reduce Lane Width</a>	Low/Mod.	Low/High		X		
<a href="#">Sidewalks, Trail/ Path</a>	Mod/High	Moderate	X			
<a href="#">Urbanization</a>	High	Varies		X		
<a href="#">Wrong-Way Driving Detection</a>	Low/Mod.	*Low/High				X
<a href="#">Speed Cameras</a>	Low/Mod.	High		X		

*BACK To Urban Location Typology*

# Appendix F – Safety Strategy Toolkit

## Urban Segment Strategies

Description	Estimated Cost	Estimated CRF	Safe System Hierarchy Tiers (Click Tier to Sort)			
			1. Severe Conflicts	2. Vehicle Speeds	3. Conflicts in Time	4. Attentiveness/Awareness
Median Barriers	High	Moderate	X	X		
Road Diet	Low/High	High	X	X		
Variable Advisory Speed Limits	Low	Moderate		X		
Dynamic Speed Feedback Sign	Low	Low		X		X
Appropriate Speeds	Low/Mod.	Low		X		
Horizontal Chicanes	Low/Mod.	*Moderate		X		
Reduce Lane Width	Low/Mod.	Low/High		X		
Urbanization	High	Varies		X		
Speed Cameras	Mod./High	High		X		

Additional Filters: Sort for Functional Classification & Right-of-Way Constraint

Low Classification

High Classification

ROW Constraint

[BACK To Urban Segment Strategies](#)



## Urban Segment Strategies

Description	Estimated Cost	Estimated CRF	Safe System Hierarchy Tiers (Click Tier to Sort)			
			1. Severe Conflicts	2. Vehicle Speeds	3. Conflicts in Time	4. Attentiveness/Awareness
Road Diet	Low/High	High	X	X		
Dynamic Speed Feedback Sign	Low	Low		X		X
Appropriate Speeds	Low/Mod.	Low		X		
Horizontal Chicanes	Low/Mod.	*Moderate		X		
Reduce Lane Width	Low/Mod.	Low/High		X		
Urbanization	High	Varies		X		

Additional Filters: Sort for Functional Classification & Right-of-Way Constraint

Low Classification

High Classification

ROW Constraint

[BACK To Urban Segment Strategies](#)



# Appendix F – Safety Strategy Toolkit

## Urban Segment Strategies

### Horizontal Chicanes



#### Cost

\$15,000-\$50,000 per location.

#### Purpose

Creates an S-shaped path by alternating horizontal deflections through staggered curb extensions or other means to force vehicles into lateral shifts.

#### Considerations

Should only be considered on local and collector roadways. Should be considered a traffic calming strategy.

#### Effectiveness

**29%** Reduction of all crash severities and types.

#### SSRDH Tier

2. Reduce Vehicle Speeds

[BACK](#)

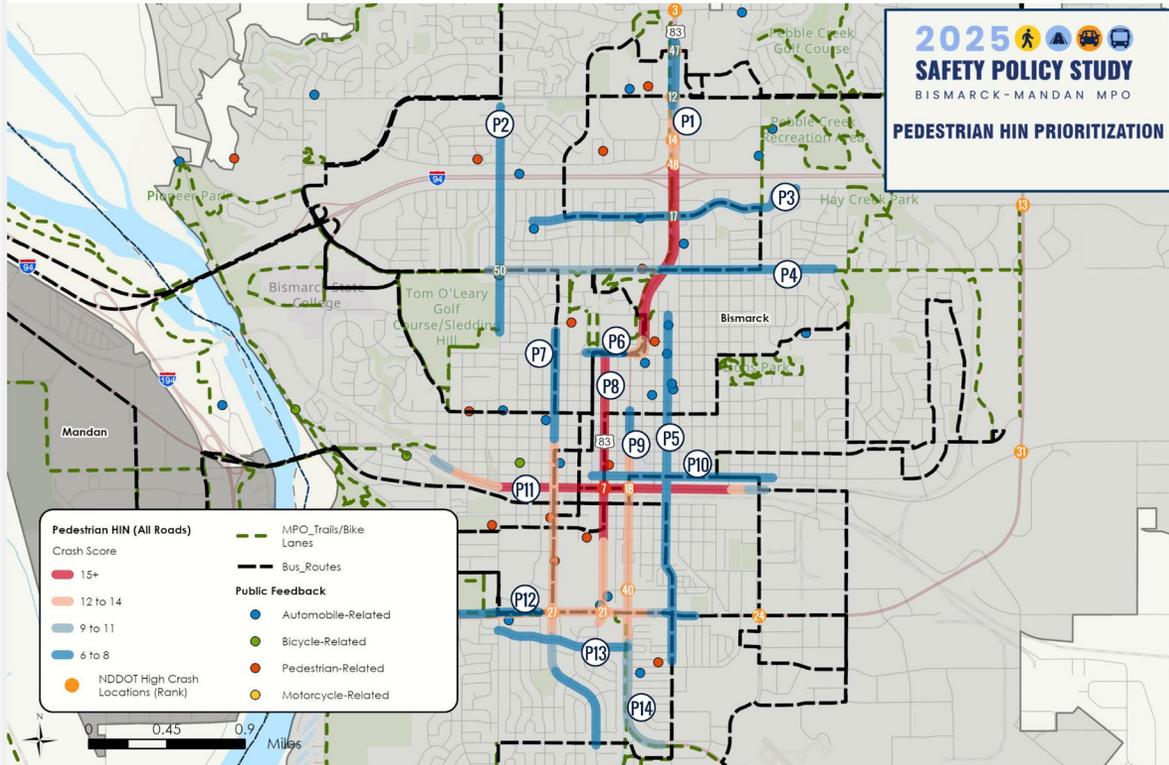
- 
- **Putting the Toolkit into Action**
  - **Prioritized Locations**
  - **Prioritized Implementation Actions**

## Chapter 8 - Implementation & Road to Zero

*Image: 80<sup>th</sup> St NE, Burleigh County*

# Prioritized Locations

Figure 37. Pedestrian HIN Prioritization



## Pedestrian Priority Locations

Table 19. Pedestrian High-Injury Network (HIN) Prioritization

Label	Corridor (Location)	HIN Score (top 2 tiers)	NDDOT High Crash Location(s)	Trail Connection	Transit Connection	Public Comment	TOTAL SCORE
P1	State St.	X	X	X	X	X	5
P2	Washington St.		X	X	X		3
P3	E Capitol Ave.		X	X	X	X	4
P4	Divide Ave.		X	X	X	X	4
P5	12 <sup>th</sup> St.				X	X	2
P6	E Boulevard Ave.			X	X		2
P7	3 <sup>rd</sup> St.	X	X		X	X	4
P8	7 <sup>th</sup> St.	X	X	X	X	X	5
P9	9 <sup>th</sup> St.	X	X	X	X		4
P10	E Broadway Ave.				X		1
P11	Main Ave.	X	X		X		3
P12	Bismarck Expy.	X	X	X	X	X	5
P13	Denver Ave.			X			2
P14	University Dr.	X		X	X		3

# Prioritized Implementation Actions

- Roadway Infrastructure Actions
- Behavioral Actions
- Growing Safety Culture within BMMPO
- Potential Funding Opportunities

**Growing Safety Culture within BMMPO**  
 Foundational change has already begun within the BMMPO's MPA. Through the process of creating this Study, BMMPO engaged communities to identify opportunities to address transportation safety and change the safety culture. The cultural actions (CAs) listed in **Table 23** will support the region's vision to achieve zero traffic-related fatal and incapacitating injury crashes on streets within the MPA by 2050. Further, CAs will serve as the groundwork for the implementation of countermeasures identified through this Study's development and analysis process.

**Potential Funding Opportunities**  
 The BMMPO and partner jurisdictions have a variety of funding sources that can be used to address safety across the MPA. Sources can be used to reconstruct roadways, install ped/bike facilities, implement education and enforcement strategies, and complete other transportation-related projects that improve safety. Coordination with Township, City, and State agencies will also be important to harness available funding. In addition, there are some competitive grant programs that BMMPO could harness as well. Below is an overview of potential state and federal grant funding opportunities anticipated to be available in 2026 and beyond.

**Table 23. BMMPO Cultural Actions (CA)**

#	Action	Timeline
CA.1	BMMPO's Policy Board adopts Study and commits to the Safety Vision and Goal for the MPA.	Q4 2025
CA.2	Share the Study's deliverables and analysis, including GIS data to all local governments within the BMMPO MPA for analysis and identification of countermeasures to implement.	Q1 2026
CA.3	Incorporate tracking and evaluation of progress toward the Study's implementation, vision, and goal. The BMMPO will incorporate into routine, recurring procedures of the Technical Advisory Committee (TAC). Such as through development of the annual Monitoring Report Update and annual Performance Measure 1 review.	Initiate: Q3 2026 Annually, thereafter
CA.4	Continue to engage local partners to monitor progress on the Study.	Continuous
CA.5	BMMPO will coordinate and assist local agencies to apply for funding to address roadway safety priorities including an application for the Safe Streets and Roads for All (SS4A) grant program, if applicable.	Annually

# Prioritized Implementation Actions

#	Action	Timeline
CA.6	Incorporate the HIN, crash profiles, and potential strategies into long range metropolitan transportation planning efforts.	Continuous
CA.7	Continue to update datasets and evaluate crash data for the MPA to guide safety strategies and decision-making.	Continuous
CA.8	Monitor progress on an annual basis toward regional safety vision and goals, convening an annual meeting with local partners to review crash statistics and the Study's implementation efforts.	Annually
CA.9	Present annually to the BMMPO Policy Board on the status of Study actions and strategy implementation.	Annually
CA.10	Establish a specific "Regional Traffic Safety" or "Multimodal Traffic Safety" subcommittee comprised of TAC members, to be tasked with implementation, tracking, and evaluation of the Study's vision and goal. Identify additional members including representation from law enforcement, emergency services,	Long-Term

#	Action	Timeline
	freight, bike and ped, and schools including higher education.	

## 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 the fourth quarter of 2025. Federal funds provide 90 percent with a 10 percent match from the local agency or the State of North Dakota.

## 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.

- FRA Railroad Crossing Elimination (RCE) Program
- FHWA Section 130 Railway-Highway Crossings Program
- NDDOT Rail Crossing Program

## Evaluation and Tracking

As led by the BMMPO, the Safety Policy Study Steering Committee has been tasked with overall development of this Study. Moving forward, the BMMPO and the TAC will be responsible for implementation, evaluation, and tracking of progress toward eliminating traffic-related fatalities and incapacitating injuries on streets in the MPA. A majority of the Study's Steering Committee members are also TAC members, which provides valuable insight and momentum to make progress and forward the vision of eliminating traffic-related fatal and incapacitating injuries.

The BMMPO will use an annual report card to evaluate progress toward this Study's vision and safety goal. The yearly reporting will be posted on BMMPO's website and will include the status of Study implementation and the most recent crash statistics. BMMPO will convene a meeting with local partners and relevant departments annually to review the report, which should be incorporated into the MPO's current recurring processes.

Specific performance measures to track in the annual report card should include:

- **Number of fatal and incapacitating injury crashes by mode and location (map/table).**
- **Five-year rolling average of total severe crashes (table).**
- **Number of safety engineering projects implemented by strategy, location and investment amount (narrative, bulleted list).**
- **Number of non-engineering countermeasures implemented by type of strategy, location (if applicable), and investment amount (narrative, bulleted list, if quantifiable).**

# Safety Policy Study Implications

## SS4A Eligibility & Relationship to Study

Eligibility Component	Safety Policy Study
1. Leadership Commitment & Goal Setting	<ul style="list-style-type: none"> <li>• Resolution of Adoption/Commitment</li> <li>• Chapter 2 – Multimodal Transportation Safety</li> </ul>
2. Planning Structure	<ul style="list-style-type: none"> <li>• Chapter 1 – Introduction</li> <li>• Chapter 8 – Implementation</li> </ul>
3. Safety Analysis	<ul style="list-style-type: none"> <li>• Chapter 2 – Multimodal Transportation Safety</li> <li>• Chapter 5 – Data Analysis</li> <li>• Chapter 6 – HIN Results</li> </ul>
4. Engagement & Collaboration	<ul style="list-style-type: none"> <li>• Chapter 4 – Public Engagement</li> </ul>
5. Policy & Process Change	<ul style="list-style-type: none"> <li>• Chapter 3 – Current State of Practice</li> </ul>
6. Strategy & Project Selections	<ul style="list-style-type: none"> <li>• Chapter 7 – Safety Strategies &amp; Toolkit</li> <li>• Chapter 8 – Implementation</li> </ul>
7. Progress & Transparency	<ul style="list-style-type: none"> <li>• Chapter 2 – Multimodal Transportation Safety</li> <li>• Chapter 8 - Implementation</li> </ul>

# Commitment

- Policy Board Commits (through resolution) to adopt a Vision Zero and 2050 goal
  - Planning tool used to track and evaluate traffic safety in the region
- HIN – referenced in implementation grant submittals (FY '25)
- Toolkit – guides decision-making and project selections for implementation in the region



## Vision

Zero traffic-related deaths and life-changing injuries on streets within the Bismarck-Mandan region.

## Goal

Fifty percent (50%) reduction in annual fatal and life-changing injury crashes by 2050, or 35 fatal and serious injury crashes or fewer.

# Thank you!

# Q&A



*Today's Potential Actions:*

- *Approve the Safety Policy Study Final Report*
- *Adopt the Leadership Commitment Resolution*