



Lincoln County SS4A

Safety - Comprehensive Action Plan

Lincoln County
by Houston Engineering, Inc.
April 2026



RESOLUTION NO. 2026-09

A RESOLUTION OF THE LINCOLN COUNTY, SD BOARD OF COMMISSIONERS AUTHORIZING AND SUPPORTING THE DEVELOPMENT AND IMPLEMENTATION OF A SAFE STREETS FOR ALL (SS4A) COMPREHENSIVE SAFETY ACTION PLAN

WHEREAS, traffic fatalities and serious injuries represent a significant public health concern nationally, statewide, and locally, with rural counties experiencing disproportionately high rates of fatal and serious crashes; and

WHEREAS, the United States Department of Transportation's Safe Streets and Roads for All (SS4A) program, established through the Infrastructure Investment and Jobs Act (IIJA), provides federal funding to support the development and implementation of comprehensive, data-driven roadway safety plans aimed at eliminating traffic-related deaths and serious injuries; and

WHEREAS, a Comprehensive Safety Action Plan is required to identify high-injury networks, analyze crash data, elevate community input, and prioritize evidence-based strategies to reduce and ultimately eliminate fatal and serious traffic crashes; and

WHEREAS, a countywide Comprehensive Safety Action Plan has enabled Lincoln County to establish clear safety goals, performance measures, equity considerations, and implementation strategies that reflect local needs across incorporated and unincorporated areas; and

WHEREAS, adoption of this Resolution demonstrates Lincoln County's commitment to roadway safety and its willingness to dedicate staff time, technical resources, and leadership support to the planning and implementation process; and

WHEREAS, approval of this Resolution satisfies the requirement for formal governing body commitment as part of an application for SS4A Planning, Implementation and Demonstration Grant funding.

NOW, THEREFORE, BE IT RESOLVED BY THE LINCOLN COUNTY BOARD OF COMMISSIONERS:

1. **Authorization.** The Lincoln County Board of Commissioners hereby approves the Lincoln County Safe Streets for All Comprehensive Safety Action Plan consistent with SS4A program requirements.
2. **Commitment to Safety Goals.** The County commits to goal of a 50% reduction of traffic-related fatalities and serious injuries by 2036, supported by data-driven analysis and a Safe System framework. A review of the goals should occur each year to take into consideration significant changes in traffic volumes and population growth
3. **Outcome-based safety metrics.** The County will monitor three outcome-based safety metrics as evidence of progress to reaching their safety goals including:
 - Annual number of roadway fatalities and serious injuries (KSI).
 - Five-year rolling averages for fatalities and serious injuries to smooth annual variability.

- Changes in crash frequency and severity along the High-Injury Network.

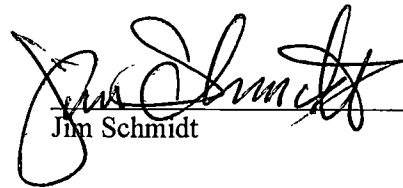
4. **Designation of Responsible Authority.** The Lincoln County SS4A Study Advisory Team is authorized to monitor the implementation of this Resolution and the SS4A Comprehensive Safety Action Plan.

Adopted at Canton, South Dakota this 28th day of April, 2026.

The above and foregoing resolution was moved for adoption and seconded, and upon roll call the Chairman declared the resolution to be duly passed and adopted.

(SEAL)




Jim Schmidt

ATTEST:


Sheri Lund - County Auditor - DEPUTY
ALICIA CAFARO

Lincoln County SS4A Comprehensive Action Plan

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Executive Summary

The Lincoln County Safe Streets and Roads for All (SS4A) Comprehensive Action Plan establishes a data driven, community supported framework to eliminate fatalities and serious injuries on the County's roadway system. Building on the U.S. Department of Transportation's National Roadway Safety Strategy and Safe System Approach, the Plan recognizes that roadway deaths are preventable and that transportation safety must be a foundational priority for all projects and policies.

Between 2019 and 2024, Lincoln County experienced **5,818 total crashes**, including **151 fatal or severe injury (KSI) crashes**. Of these, **4,566 crashes and 101 KSI crashes** occurred on County roadway facilities (excluding interstates and private roads) and were used to identify the High Injury Network (HIN). Analysis shows that **74% of severe crashes occur on just 3% of the County's roadway network**, highlighting the need for focused, systemic safety investments.

The Plan is grounded in robust safety analysis of crash patterns, speed conditions, roadway geometry, and risk factors, supported by GIS mapping, speed data, and contextual reviews of design standards. Key risk factors identified include:

- narrow shoulders
- stop sign adherence and visibility issues
- high prevailing speeds
- challenging curves
- complex and confusing rural intersections
- pavement degradation

Traffic volumes, farm and truck traffic, and population growth further contribute to roadway strain and potential conflicts.

Public and Stakeholder Input

Public engagement was central to plan development, guided by the Study Advisory Team (SAT) and multiple outreach methods: online surveys, an interactive map tool, stakeholder interviews, open houses, and community events. **Engagement produced more than 689 public contributions and 357 survey responses**, providing a rich qualitative dataset to supplement crash analysis.

Across all engagement methods, residents consistently highlighted:

- Distracted driving, speeding, narrow shoulders, and poor road base conditions as top safety issues.
- Rural intersections, especially those connecting County roads to State Highways—as the most dangerous locations.
- A strong desire for redesigned high risk intersections, wider shoulders, improved lighting, enhanced stop sign visibility, and guardrail installation at steep ditch locations.

Special focus group and stakeholder outreach identified additional needs for vulnerable users, including safer bicycling corridors, lighting at key crossings, bicycle friendly rumble strips, and better access to recreational destinations. School districts and human services partners emphasized concerns with bus arm violations, speeding, and challenges accessing Sioux Falls.

Executive Summary

Safety Analysis and High Injury Network

The HIN identifies roadway segments and intersections with the highest concentration of KSI crashes. Results show:

- Severe crashes are clustered at rural intersections with high speeds and limited visibility
- Narrow shoulders, steep slopes, and edge drop off conditions magnify roadway departure crash severity
- Several corridors—including County Roads 105, 106, 110, 116, and SD Highway 11 appear repeatedly in crash analysis, SAT interviews, and public comments

Recommended Countermeasures

The Plan identifies a comprehensive suite of countermeasures aligned with national best practices and tailored to Lincoln County conditions:

- Wider shoulders and wider edge lines
- Centerline and edge line rumble strips
- Enhanced curve delineation
- Roundabout conversions
- Improved stop sign retroreflectivity and LED enhanced signage
- Intersection lighting
- Guardrails or barriers along steep slopes
- Access management strategies
- Speed management treatments, including dynamic feedback signs

For bicyclists and pedestrians, the Plan recommends shoulder widening, multi use path connections, crossing lighting, and consistent bicycle friendly rumble strip standards.

Prioritized Projects and Implementation Strategy

Using crash data, risk factors, engagement results, and equity considerations, the Plan establishes a prioritized list of top projects.

- County Road 105
- County Road 110/SD 11 intersection
- County Road 106, County Road 135
- Key intersections on Highway 11

Each is assigned recommended countermeasures and planning level cost estimates to support Capital Improvement Plan programming and future SS4A Implementation Grant applications.

Vision, Goals, and Long Term Commitment

The Lincoln County Commission has provided a commitment to a 50% reduction in roadway fatalities and serious injuries by 2036, supported by annual progress reporting and ongoing oversight by the SAT. Transparent public reporting, safety education, improved countywide communication tools, and performance tracking ensure the Plan remains a living, accountable framework. The plan also includes safety roadway design standards updates and has identified the following six goals that will guide plan implementation:

- Enhance Safety Education and Transparency
- Reduce Speed throughout the County roadway system
- Increase Stop Sign Compliance at Rural Intersections
- Prioritize Countermeasures that improve safety over capacity and level of service.
- Improve Safety at Rural Intersections
- Find methods to improve safety for vulnerable users

1. Introduction

The SS4A process supports the USDOT's National Roadway Safety Strategy and a goal of zero roadway deaths using a Safe System Approach. Lincoln County has received a SS4A Action Plan grant to develop a strategy that will build upon the planning efforts of Lincoln County.

To satisfy the SS4A Notice of Funding Opportunity (NOFO) requirements and be eligible to apply for an Implementation Grant or a Planning and Demonstration Grant, an Action Plan must look at all modes of transportation. Therefore, this SS4A Action Plan identifies countermeasures that will improve safety for all modes of transportation.

The new USDOT Roadway Safety Vision states the new Action Plan should “lead a significant cultural shift that treats roadway deaths as unacceptable and preventable.” If that is the case, then safety should always be the most important factor in the design of roadways in the new SS4A Action Plan. Lincoln County has prepared this plan to help lead this important discussion for Lincoln County and help move toward a Vision Zero goal.

The Lincoln County SS4A Action Plan will meet the following conditions:

- A focus on preventing roadway fatalities and serious injuries in Lincoln County including projects and strategies that address identified safety problems.
- Meets all requirements in the Self-Certification Eligibility Worksheet as detailed in Appendix 7

What is a Comprehensive Safety Action Plan?

- Aims to reduce and eliminate serious-injury and fatal crashes affecting all roadway users.
- Includes a data analysis to characterize roadway safety problems and strengthen a community's approach through projects and strategies that address the most significant safety risks.



2. Existing Conditions

Lincoln County, located within the Sioux Falls metropolitan region, is one of the fastest growing counties in South Dakota. Its transportation system serves a mix of small cities, rural townships, and rapidly developing suburban areas.

Crash History (Past 5 Years)

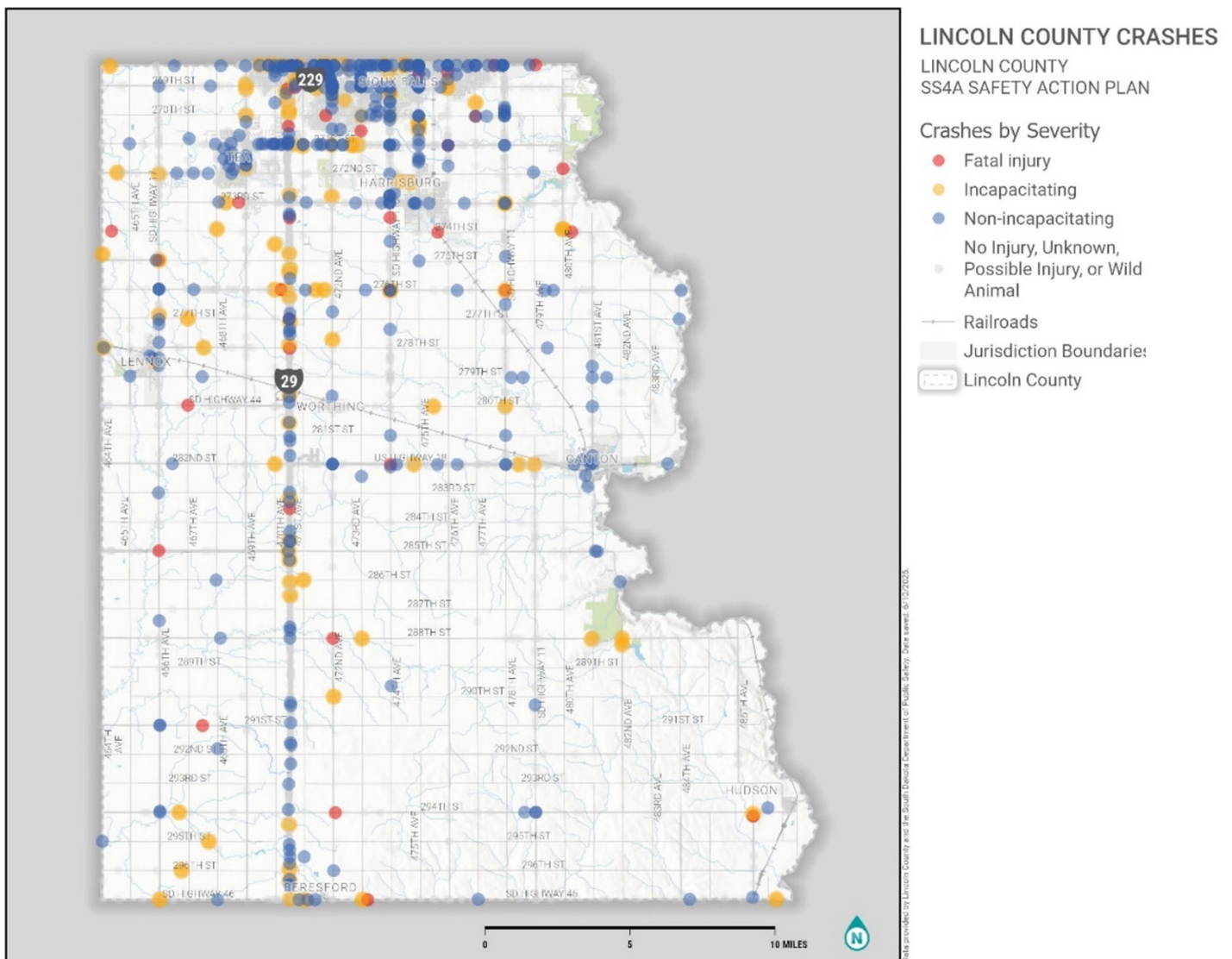
Traffic crashes remain a persistent public safety concern in Lincoln County.

• **Total reported crashes: 4,564** (2021: 1,422; 2022: 1,190; 2023: 1,332; 2024: 619; 2025: 1).

Crash outcomes

- **Fatal: 28** (≈0.6%)
- **Serious injury (incapacitating): 86** (≈1.9%)
- **Minor injury (non incapacitating): 317** (≈6.9%)
- **Possible injury: 187** (≈4.1%)
- **No injury: 3,648** (≈80.0%)

Lincoln County Crash Data Map – 2019 to 2024



Existing Conditions

Demographic Conditions (SS4A Required Data)

Lincoln County's rapid population growth is a defining characteristic that directly influences roadway safety needs. As of **2024**, the county's estimated population is **75,244**, reflecting a 15.5% increase since 2020.

[\[census.gov\]](https://census.gov)

Population & Diversity

The county remains predominantly White (92.2%), with growing representation from Black, Asian, and Hispanic/Latino populations.

Median Age & Age Distribution

Lincoln County has a **median age of 35.8 years**, younger than the state average.

Age distribution highlights a substantial working age population.

- **Under 15 years:** 22.80%
- **Ages 15–29:** 18.78%
- **Ages 30–64:** 44.19%
- **Ages 65–84:** 13.03%
- **85+ years:** 1.19%

Existing Roadway Policies/Guidelines

An analysis of existing policies is important in an SS4A Action Plan because it helps identify where current regulations, design standards, and operational practices may unintentionally contribute to safety risks or limit the effectiveness of new strategies. Below is roadway related safety policies that were analyzed as a part of this study and some recommended changes.

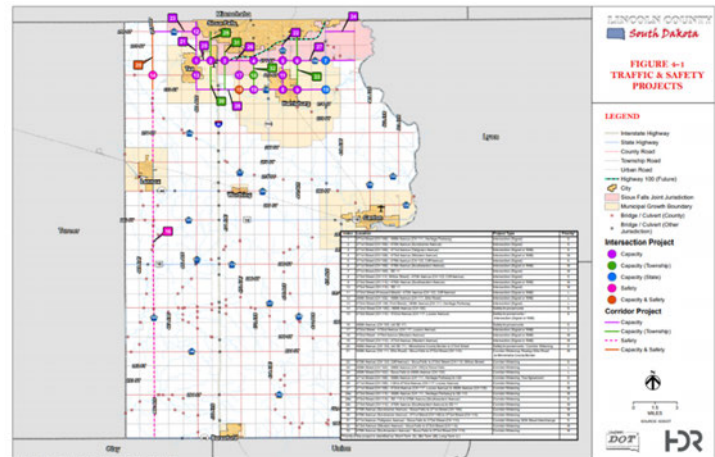
- **Roadway Design Guidelines** – roadway and shoulder width design guidelines should be updated to reflect ASHTO Greenbook standards. See recommended design guidelines
- **Typical Roadway Cross-Sections** – Typical roadway cross-sections do not include enough options for roadway and shoulder width and should be updated to reflect new roadway design guidelines.
- **Traffic Analysis Guidelines** – Current guidelines recommend Level of Service (LOS) B. This plan recommends moving to LOS C to not overbuild intersections that can cause unnecessary encouragement of speeding where congestion is low.
- **Traffic Control and Turn Lane Warrants** – No changes recommended here
- **Traffic Impact Guidance** – No changes recommended here
- **Access Management Guidelines** – Fund proactive access management improvements as a important countermeasure tool.
- **Minimum Upstream Corner Clearance** – Fund proactive obstruction clearance as an important countermeasure.
- **Paved Shoulder Width** – Increase paved shoulder width based on new roadway and shoulder width safety design standards.

3. Consistency with Other Transportation Plans

Consistency with other plans is essential for SS4A action plans because it ensures that safety strategies align with broader community goals, transportation priorities, and existing initiatives. This alignment strengthens coordination, avoids conflicting investments, and helps create a unified, efficient path toward eliminating fatal and serious injury crashes. Below are other Lincoln County Transportation Plans that need to be kept in mind when developing final policies and implementation recommendations.

Lincoln County Master Transportation Plan

- Traffic and Safety Projects recommended
- Most projects in northern portions of county
- 9 sections on 271st Street
- 8 sections on 273rd Street
- 17 signals (10 which could be roundabouts)
- 15 corridor widenings
- 4 other safety improvements



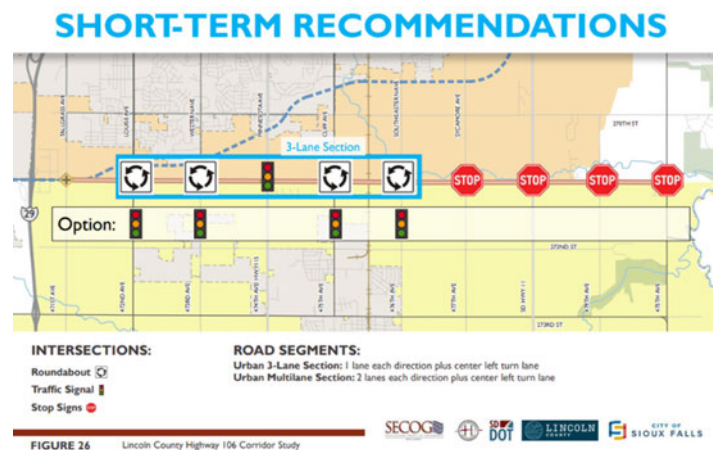
Lincoln Co 106 Corridor Study

There are several improvements recommended on the corridor that should be incorporated into this study including the following.

- Roundabouts at several intersections
- Signal at several intersections
- Four-way Stop signs at several intersections

Lincoln County Comprehensive Plan

- “Municipalities control their own planning and zoning activities”
- “Support the efforts of the municipalities to grow in a coordinated and balanced manner”
- Coordinate with municipalities when projects are within future growth areas.



4. Safe Streets for All Peer Review

A peer review is important for SS4A action plans because it brings independent expertise that can validate methods, challenge assumptions, and strengthen the technical quality of the analysis. It also helps ensure the plan reflects best practices and produces credible, defensible recommendations that stakeholders can trust. Below is a summary of other SS4A Action Plans with similar context with Lincoln County.

Pettis County Missouri

Pettis County is a county located in west central U.S. state of Missouri. As of the 2020 census, the population was 42,980. Its county seat is Sedalia.

Strategic Safety Goals:

- Reduce traffic fatalities and serious injuries.
- Increase pedestrian and cyclist safety.
- Promote transportation equity and access.
- Enhance infrastructure for vulnerable road users.

Performance Indicators:

Establish key performance indicators (KPIs) to measure progress, such as:

- Reduction in traffic fatalities and serious injuries.
- Improvements in pedestrian and cyclist infrastructure.
- Increased public awareness and behavior change.

Midland County Texas

Midland County is a county located in the U.S. state of Texas. As of 2020, the population was 169,983.[1] The county seat is Midland.

Emphasis Areas:

- Distracted Driving
- Roadway and Lane Departures
- Speed-Related
- Intersection-Related
- Impaired Driving
- Unrestrained Persons
- Vulnerable Road Users

Transparency

Vision Zero Task Force is responsible for implementation with an annual report required to show transparency.

4. Safe Streets for All Peer Review

Wayne County, Ohio

Wayne County is a county located in the northeastern quadrant of the U.S. state of Ohio. As of the 2020 census, the population was 116,894.^[3] Its county seat is Wooster.

Progress and Transparency

1. Issue a Press Release upon completion of the Comprehensive Safety Action Plan and maintain access to the document on the Wayne County Engineer's Office website.
2. Maintain updated priority lists
3. Measures of progress will be tracked, including funding secured, studies or projects performed, and items constructed or improved (miles of sidewalk/bike, lanes/road diet, number of intersections, etc.).
4. Crash statistics will be tracked by segment or intersection in the High Injury Network.
5. Measures of progress will be reported to the Safety Action Plan Committee members and member communities annually.

Whitley County, Indiana

Whitley County is a rural county in the U.S. state of Indiana. As of the 2020 United States census, the population was 36,825.

1. Launch a Comprehensive Safety Campaign
2. Implement Measures to Reduce Speeding Countywide
3. Foster a Culture of Shared Responsibility within the County
4. Target High Injury Areas to Reduce Severe Crashes and Speeds
5. Transform Residential Streets into Safe, Low-Speed, Low-Stress Environments
6. Develop Commercial Streetscapes Promoting Safe Speeds and Crossings
7. Implement Systemic Improvements at High-Risk Locations
8. Establish Safe, Accessible Networks for Pedestrians, Cyclists, and Assistive Device Users
9. Ensure Equity in Access to Safe Vehicles
10. Rapid Response to Fatal Crashes
11. Utilize Data and Technology to Understand High-Risk Behaviors and Streets
12. Monitor Progress towards Safety Goals

4. Safe Streets for All Peer Review

Grand Forks/East Grand Forks

The Greater Grand Forks (officially the Grand Forks, ND-MN Metropolitan statistical area), as defined by the Census Bureau as comprising all of Grand Forks County in North Dakota and Polk County in Minnesota, anchored by the twin cities of Grand Forks, North Dakota and East Grand Forks, Minnesota. As of the 2020 census, the population was 104,362

Key Themes

- Engineering Solutions (Countermeasures)
- Intersection Design
- Speed Management
- Safety Education

Rapid Project Delivery Methods

- Demonstration Projects
- Quick-Build Projects

Non-Infrastructure Strategies

- Coordinate safety priorities with local jurisdictions' Capital Improvement Plans (CIPs)
- Facilitate development of local lighting inventories and assessment of lighting needs at high-risk intersections; support adoption of lighting policies
- Promote Vision Zero educational materials from state and national sources, including the Vision Zero Network and NHTSA, to expand local safety messaging efforts



5. Public Engagement

An essential component of the planning process is meaningful engagement with the public and all relevant stakeholders, including private-sector partners and community groups. Through this outreach, the project team gathered valuable insights, perspectives, and lived experiences from those who use and are affected by the transportation system. This collaborative input was then carefully incorporated into the development of the plan, ensuring that the final product reflects community priorities and real-world needs. In the Safe Streets and Roads for All (SS4A) program, inclusive public input is especially critical; hearing from all road users is a key expectation for producing a strong and competitive implementation grant application.

Overall Public Engagement Process

The Action Plan was guided by the Study Advisory Team (SAT) over the course of the project including how public engagement should be considered throughout the plan process. The Action Plan had two phases. Phase 1 was early on in the plan process with a purpose to learn the public's roadway safety issues and priorities before data was available. The phase 2 purpose is to gain the public's understanding of the draft plan and gauge their prioritization of funding projects that are recommended through the Action Plan.

Phase 1 Public Engagement Activities

- SAT Stakeholder Interviews
- Website/Virtual
- Open House #1
- Pop-Up Meetings – Harrisburg and Tea

Phase 2 Public Engagement Activities

- Website/Virtual
 - Fund It Virtual Public Engagement Activities
 - Draft Plan Review – On website
 - Open House #2

Underrepresented and Active Transportation Focus Groups

- See Chapter 7

For more specific description of public engagement activities and their impact on the Safety Action Plan, see Appendix 2.

5. Public Engagement

Planning Structure - Lincoln County SS4A SAT

Study Advisory Team (SAT) guided the public engagement plan and plan public engagement activities. The SAT held seven meetings and also provided as an important sounding board for policies and projects. For instance, the SAT suggested that the first High Injury Network did not have adequate coverage of the County. Based on that suggestion, the consultant team updated the HIN from 2% of the network to 3% of the network which provided greater coverage of the County.

Name	Position
Amanda Kurth	FHWA
Randy Kittle	FHWA
Adam Wirt	Citizen
Harry Johnston	SDDOT Area Engineer
Travis Dressen	SDDOT Region Engineer
David Anderson	Citizen
Chad Skiles	EMT
Scott Coyne	Citizen
Sean Hegyi	SECOG
Harold Timmerman	Lincoln County Emergency Management Director
Ben Lord	Lincoln County Sherrif Office
Chad Brown	Lincoln County Sherrif Office
Toby Brown	Planning Director
Tiffani Landeen	Lincoln County Commissioner
James Jibben	Citizen
Jared Narum	Lincoln County Highway
Rihannon Delle	Lincoln County Highway
Betty Otten	Lincoln County Commissioner
Terry Fluit	Lincoln County Highway Supt
Pete Fahlberg	Pleasant Township

Public Notification for Public Engagement Tools and Events

To adequately inform the public about the SS4A Action Plan, the following public notification items were completed.

- News release to Media
- Email to interested parties
- Social Media – Sherriff's Facebook page
- Notecards with QR Code (available at County offices)
- Work with Cities to distribute information
- County Commission Updates
 - Meeting #1 – Spring 2025
 - Meeting #2 – November 2025
 - Meeting #3 – March 2026? And adoption of plan and resolution

5. Public Engagement

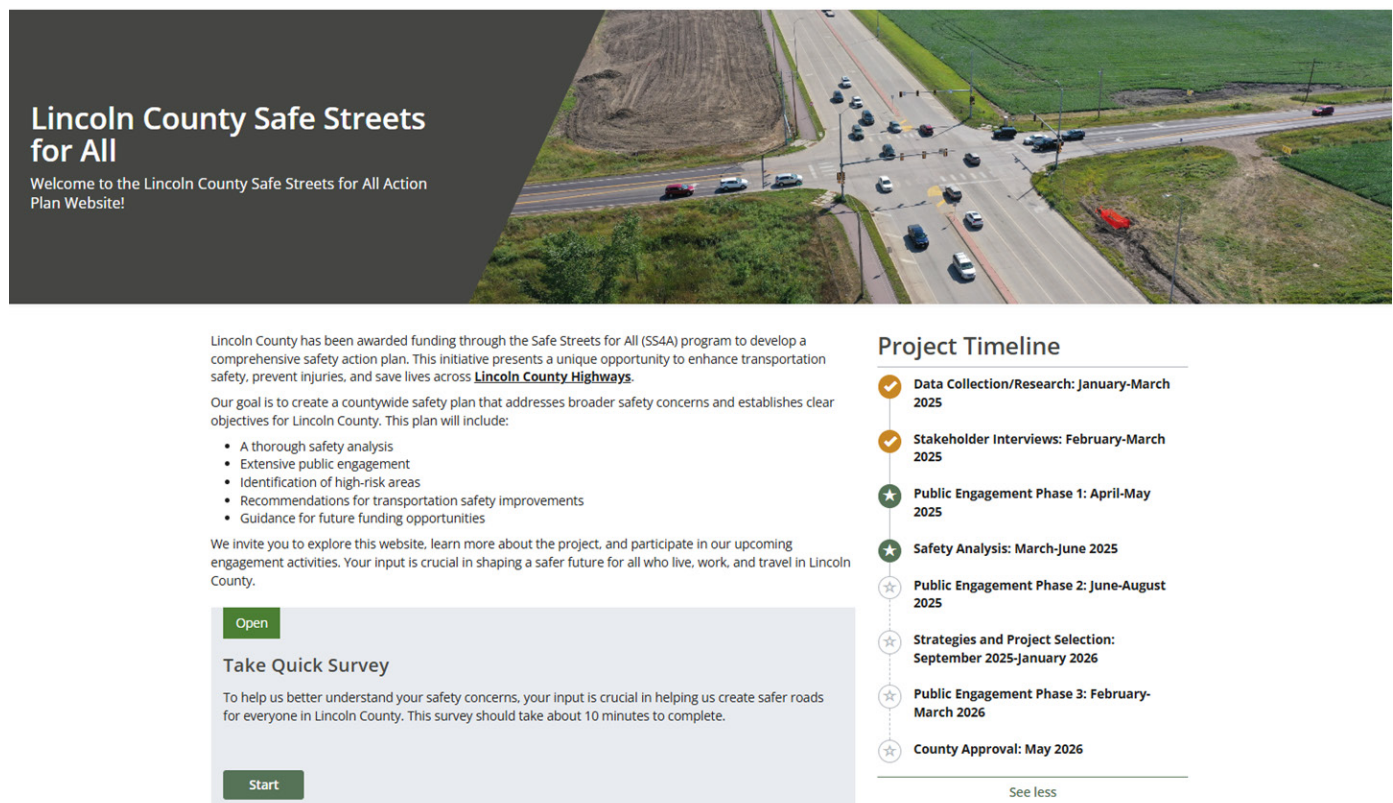
Stakeholder Interview Summary

All members of the SAT were interviewed to gauge a baseline of the issues for roadway safety in Lincoln County and to help develop the public survey. The following themes emerged regarding road safety in Lincoln County.

- Problem Intersections
- Shoulder Width and Edge
- Curves:
- Coordination with State Highways:
- Milling and Overlay Practices:
- Road Base Degradation:
- Traffic Impact:
- Stop Sign Visibility:
- Guardrails:
- Population Growth:
- Reporting System Usage:
- Prison Construction Impact:
- Driver Behavior:

To read the full stakeholder interview summary, see Appendix 1.

Public Engagement – Project Website and Virtual Engagement



The screenshot displays the Lincoln County Safe Streets for All Project Website. The header features an aerial view of a road intersection with the text "Lincoln County Safe Streets for All" and "Welcome to the Lincoln County Safe Streets for All Action Plan Website!". Below the header, the main content area is divided into two columns. The left column contains a "Take Quick Survey" section with a "Start" button. The right column features a "Project Timeline" section with a vertical list of project milestones, each marked with a star icon. The timeline includes: Data Collection/Research: January-March 2025; Stakeholder Interviews: February-March 2025; Public Engagement Phase 1: April-May 2025; Safety Analysis: March-June 2025; Public Engagement Phase 2: June-August 2025; Strategies and Project Selection: September 2025-January 2026; Public Engagement Phase 3: February-March 2026; and County Approval: May 2026. A "See less" link is located at the bottom right of the timeline.

Lincoln County Safe Streets for All
Welcome to the Lincoln County Safe Streets for All Action Plan Website!

Lincoln County has been awarded funding through the Safe Streets for All (SS4A) program to develop a comprehensive safety action plan. This initiative presents a unique opportunity to enhance transportation safety, prevent injuries, and save lives across **Lincoln County Highways**.

Our goal is to create a countywide safety plan that addresses broader safety concerns and establishes clear objectives for Lincoln County. This plan will include:

- A thorough safety analysis
- Extensive public engagement
- Identification of high-risk areas
- Recommendations for transportation safety improvements
- Guidance for future funding opportunities

We invite you to explore this website, learn more about the project, and participate in our upcoming engagement activities. Your input is crucial in shaping a safer future for all who live, work, and travel in Lincoln County.

Take Quick Survey

To help us better understand your safety concerns, your input is crucial in helping us create safer roads for everyone in Lincoln County. This survey should take about 10 minutes to complete.

Project Timeline

- ✓ Data Collection/Research: January-March 2025
- ✓ Stakeholder Interviews: February-March 2025
- ★ Public Engagement Phase 1: April-May 2025
- ★ Safety Analysis: March-June 2025
- ★ Public Engagement Phase 2: June-August 2025
- ★ Strategies and Project Selection: September 2025-January 2026
- ★ Public Engagement Phase 3: February-March 2026
- ★ County Approval: May 2026

[See less](#)

5. Public Engagement

Virtual public engagement has become an essential component of any long-range planning effort. More and more people look to engage through virtual methods. This project utilized Social Pinpoint as the virtual engagement and project website for the entire project. Below is a summary of the virtual engagement results.

- Virtual phase 1 engagement was carried out from April 8, 2025, to June 30, 2025. The summary includes engagement metrics for the project's public-facing site and activity within the Houston Engineering project portal.
- Key engagement metrics show 1,981 total views, 1,692 visits, and 1,232 unique visitors to the project site during the period, with 689 contributions across activities and 400 contributors. There were zero followers recorded in this period.
- Participation breakdown by tool indicates Form entries (346) and Social Map contributions (343) as the top engagement methods, with Form activity representing about half of all contributions.
- User engagement details include first-time vs returning visits (1st Time: 1,207; Returning: 485) and acquisition sources showing Social Media as the largest traffic source (939 visits), followed by Direct (550) and Web referrals (180).
- Other aspects documented include engagement time, with an average time marker showing peaks around late April 2025, and a breakdown of visitor languages where Unknown dominates (86.87%) followed by English (13.13%).
- Engagement and participation
 - Views/Visits/Visitors: 1,981; 1,692; 1,232 respectively
 - Contributions/Contributors: 689; 400
 - Top activities: Form (346 contributions, 332 contributors) and Social Map (343 contributions, 185 contributors)
 - Top visited page: Lincoln County Safe Streets for All (100% of visits, 1,691 visits, 1,232 visitors)
 - Visit patterns: 1st-time visitors account for 71.34% (1,207) and returning visitors 28.66% (485)
- Acquisition and sources
 - Social Media referrals dominate: 939 visits (55.50%)
 - Direct traffic: 550 visits (32.51%)
 - Web referrals: 180 visits (10.64%)
 - Other sources (Search Engine, Campaigns): negligible
- Language and translation
 - Languages: Unknown dominates with 1,720 views (86.87%), English 260 views (13.13%)

Question and Answer Survey Results – Phase 1 Engagement

As a part of the virtual public engagement process for the Lincoln County SS4A Action Plan, an on-line survey was conducted through the project website (Social Pinpoint). The Lincoln County Safe Streets for Survey was completed from March 27–June 18, 2025 and presents feedback from 357 community respondents regarding road safety issues, perceptions, and priorities in Lincoln County. Below is a summary of what was found from the survey results. For more complete information about the survey including question by question data, see the Public Engagement Survey Report in Appendix 2

1. ZIP Code issue
Type your answer here... You have 3 characters left

2. On a scale of 1 to 5, to what degree are the following safety issues while traveling in Lincoln County? (Select all that apply)

	1 (minor issue)	2	3	4	5 (major issue)
Speeding vehicles	☐	☐	☐	☐	☐
Distracted driving	☐	☐	☐	☐	☐
Failure to yield right of way	☐	☐	☐	☐	☐
Running stop signs	☐	☐	☐	☐	☐
Narrow shoulder widths	☐	☐	☐	☐	☐
Poor road conditions	☐	☐	☐	☐	☐
Inadequate lighting at intersections	☐	☐	☐	☐	☐
Steep ditch slopes	☐	☐	☐	☐	☐

3. On a scale of 1 to 5, how safe do you feel using the following modes of transportation in Lincoln County? (1 = Very Unsafe, 5 = Very Safe)

	1 (very unsafe)	2	3	4	5 (very safe)
Driving a personal vehicle	☐	☐	☐	☐	☐
Operating farm equipment	☐	☐	☐	☐	☐
Driving a semi-truck	☐	☐	☐	☐	☐
Walking	☐	☐	☐	☐	☐
Bicycling	☐	☐	☐	☐	☐

5. Public Engagement

Key Safety Concerns

Residents cited distracted driving, speeding, narrow shoulder widths, and poor road conditions as the most significant safety challenges, with distracted driving seen as the most severe concern.

Safety Perceptions by Mode

Participants rated driving a personal vehicle as the safest transportation mode (score of 3.72 out of 5), while walking (2.49) and bicycling (2.24) were viewed as the least safe. Operating farm equipment and driving semi-trucks were rated moderately safe.

Dangerous Locations

The most dangerous locations identified include:

- Intersections between county roads and state highways
- Intersections with challenging designs
- Rural roads with narrow shoulders
- Curves leading into intersections
- Residents also highlighted steep ditch slopes as a hazard.

Contributing Factors to Unsafe Conditions

Top-ranked factors contributing to unsafe conditions were distracted driving, speeding, narrow shoulders, poor road base conditions, and inadequate signage. Population growth and increased traffic were also cited as emerging concerns.

Desired Safety Improvements

Respondents most want:

- Wider road shoulders
- Improved street lighting at intersections
- Enhanced stop sign visibility
- Guardrail installation in high-risk areas
- A redesign of dangerous intersections and improved road safety reporting were also suggested.

Desired Safety Improvements

Respondents most want:

- Wider road shoulders
- Improved street lighting at intersections
- Enhanced stop sign visibility
- Guardrail installation in high-risk areas
- A redesign of dangerous intersections and improved road safety reporting were also suggested.

Community Engagement & Awareness

Only 4.6% of respondents had used the county's online safety reporting system, while 82% were unaware it existed. Most are not interested in participating in future safety meetings, with just under 20% expressing willingness.

5. Public Engagement

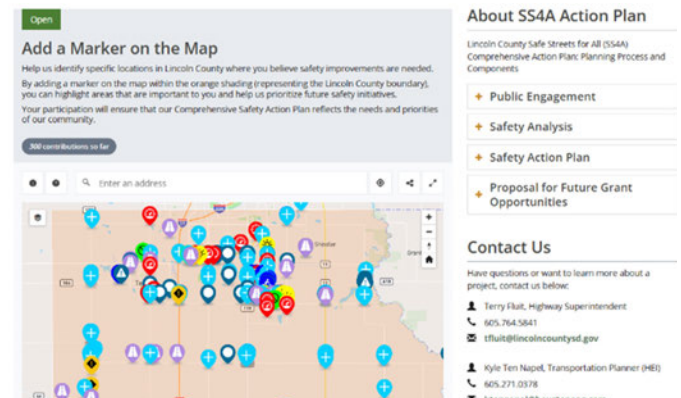
Demographics

The survey group was predominantly white (91%), with ages largely distributed between 35 and 64 years old. Under-18s and individuals identifying as Asian or Native American/Alaska Native made up a very small share.

Map Survey

One of the most successful portions of public engagement was the project website map survey. The public added 393 map pinpoints with comments. This provided the project with vital qualitative data. In addition, the information about problem intersections or corridors that may have not yet experienced serious injuries but may still have serious issues and close calls. Below is a summary of the map survey comments.

- SD Hwy 17 and CR 116 (33 comments) - Misjudging speeds, low visibility, traffic back-up
- SD Hwy 115 and 276th St (CR 116) (29 comments) - Failure to yield, low visibility, misjudging speeds
- SD Hwy 17 and 275th St (CR 116) (13 comments) - Misjudging speeds, low visibility, traffic back-up
- SD Hwy 11 and CR 110 (11 comments) - “Shooting the gap”, traffic back-up, lighting, misjudging speeds
- SD Hwy 11 and CR 116 (9 comments) - Failure to yield
- SD Hwy 17 and CR 106 (7 comments) - Failure to yield
- CR 135 and CR 116 (6 comments) - Failure to yield



Other Concerns

- Steep Ditch Concern
 - CR 135 from 272nd St to 273rd St (13 comments)
- Narrow Shoulder Concern
 - 271st St from SD Hwy 11 to 480th Ave
 - CR 105 from CR 116 to CR 122
 - CR 106 from 479th Ave to CR 135 –
- Speeding Concern
 - CR 111 & CR 106
- Lighting Concern
 - CR 106



5. Public Engagement

In Person Public Engagement - Summer 2025

In person public engagement remains important to include as a part of any planning project to ensure all people are given the opportunity to provide input to the plan,

- **Harrisburg Days: June 14** – Chamber Event at Liberty Elementary – 12:30 pm to 4 pm
About 40-50 people engaged at our exhibit and were directed to the project website. A few people seemed to visit the website after the event.
- **Teapot Days: June 21** – Tea City Park – Brian Street – 10 am to 4 pm.
The weather was very hot and windy. About 50 people were handed project notecards during a 2-3 hour period. A few people seemed to visit the website after the event.
- **Public Open House: June 17** – Lincoln County Courthouse – Canton (5:00 pm to 6:30 pm)
About 15-20 people attended the Open House with some engagement most notably in regards to bicycle and pedestrian comments.
 - TV News Story - Lincoln Co. awarded funding through 'Safe Streets For All'
 - Kelo On-line story

Phase 2 – Public Engagement

Once a draft SS4A Action was completed, the project website was updated to include two major components.

1. Full Draft Plan for public review and comment

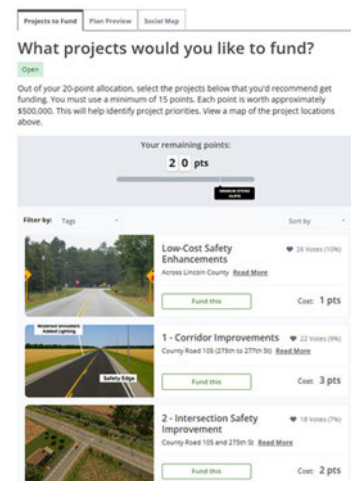
- High Injury Map
- Priority Project Implementation Map
- Priority Project Table and Phasing

2. Virtual Engagement Tool to Prioritize Top 10 Projects

- The top ten projects were posted and the public was encouraged to choose projects based on a limited budget.

3. Open House #2

- Attended by approximately 50 people with a number of people interacting with staff and consultants to provide input. The Open House encouraged people to comment on the project website also. The meeting was notified through all official Lincoln county newspapers and through social media and project website.



5. Public Engagement

How Did Public Comments Get Incorporated into the Action Plan?

For each public engagement tool, there were results that shaped and influenced the Lincoln County SS4A Plan. Below are a quick summary. More detailed information is included in the Appendix.

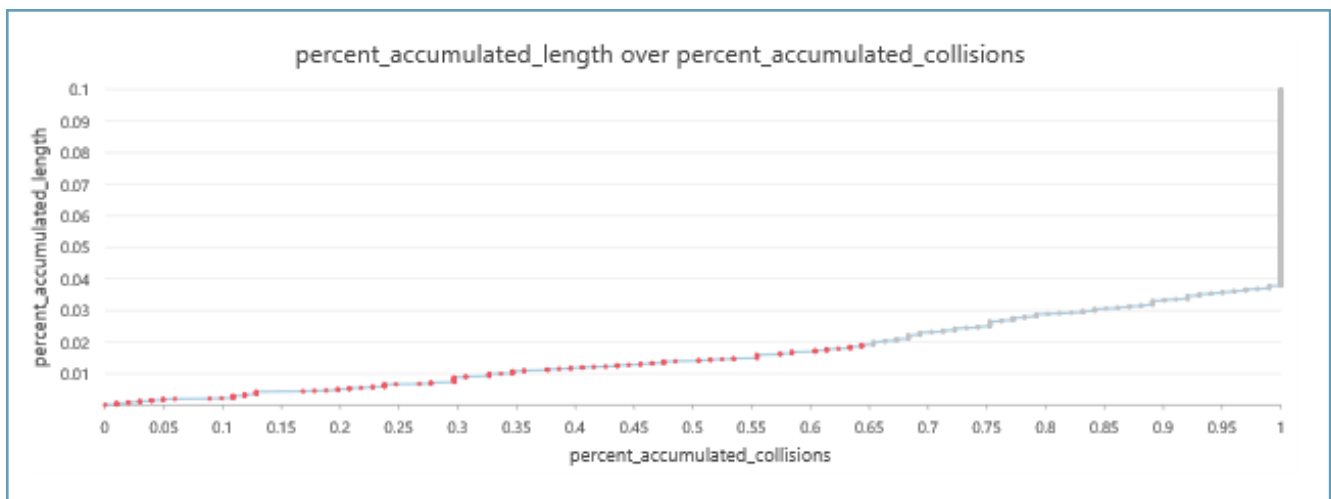
1. SAT Meetings – Provided the basis for the public engagement plan and assisted in helping to determine adjustment to the High Injury Network and Project Prioritization.
2. Stakeholder Interview – This set of interviews helped determine the questions for the public survey and set overall direction of the public engagement plan.
3. Public Survey – The survey guided the development of the policies for the plan.
4. Map Survey – The map survey was directly incorporated into the prioritization through the scoring metrics. In addition, the number of comments identified was compared to the HIN. Generally, the public map comments were very consistent with the HIN.
5. Underrepresented engagement activities – The bicycle/pedestrian focus group directly contributed to the scoring metrics through bicycle/pedestrian routes. The other underrepresented interviews with schools, transit agencies, and county agencies that assisted with policy development.
6. In-person public engagement activities – Phase 1 – Was key to spreading the word to additional people not reached by virtual and social media methods.
7. Phase 2 – Virtual Fund It prioritization:
 - 38 people took the time to vote on projects.
 - The Fund It activity provided feedback on the top 10 projects. Generally the public ranked projects consistent with the rankings. However, additional priority should be given to Project 8b for signal conversion and a Roundabout conversion at Southeastern and LC 106.
8. Phase 2 – Open House:
 - The open house pushed people toward the Fund It and Question and Answer activities.
9. County Commission Meetings:
 - Final adoption of the plan will occur in April 2026.

6. Safety Analysis

The safety analysis evaluates five years of crash data to identify patterns, risk factors, and locations most associated with fatal and serious injury (KSI) crashes across Lincoln County's roadway network. Findings show that a small portion of the network—primarily high speed rural corridors and stop controlled intersections—accounts for a disproportionate share of severe crashes, underscoring the importance of targeted systemic countermeasures. Below is a summary of the safety crash analysis.

Overall County Crash Analysis – 2019-2024

- 5,818 collisions were analyzed of which 151 were KSI crashes.
- 4,566 collisions, of which 101 KSI collisions, were associated with roadways that weren't interstates or private roads and used to calculate the HIN.
- The HIN accounted for 75% of KSI crashes on 3% of roadway centerline miles throughout the study area.



Crash Type	% of All KSI Crashes	% of KSI Crashes on the HIN	% of all Countywide Crashes
Angle	31%	46%	26%
Head-on (front to front)	5%	7%	1%
Single vehicle collision	54%	35%	36%
Rear-end (front to rear)	9%	12%	27%

6. Safety Analysis

HIN Network

This analysis focuses on identifying and understanding fatal and severe injury crashes throughout the County. By examining both where crashes occur and how severe their outcomes are, the study pinpoints the locations most in need of safety improvements. These findings directly guide policy development and help prioritize projects that can reduce serious roadway harm. The assessment includes all roads within the County roadway system, with the exception of interstate highways, ensuring a comprehensive view of local and regional safety needs. Also, there was consideration for the following.

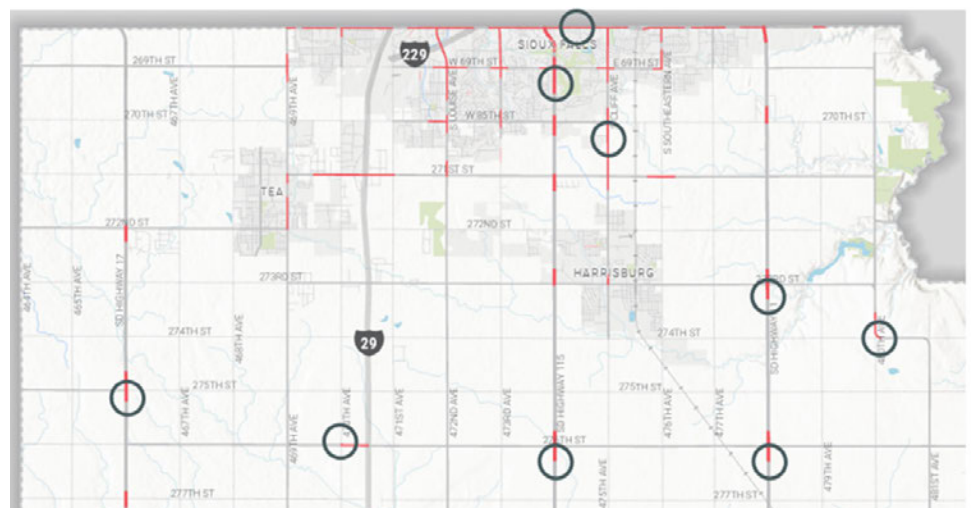
- Results were developed into segments
 - Longer in rural areas, shorter in urban/suburban
- Weighting factors for HIN
 - Fatal or Severe Injury = 4
 - Minor Injury = 1
 - Property Damage – 0.5
- HIN Rolling Window Approach – A Rolling Window analysis was utilized to ensure that the most natural clustering of crashes for analysis was determined. For a more detailed analysis, see Appendix 3 for entire HIN network analysis

Below is a summary of the HIN Results. For a more detailed analysis, see the HIN Network Technical Report in the Appendix.

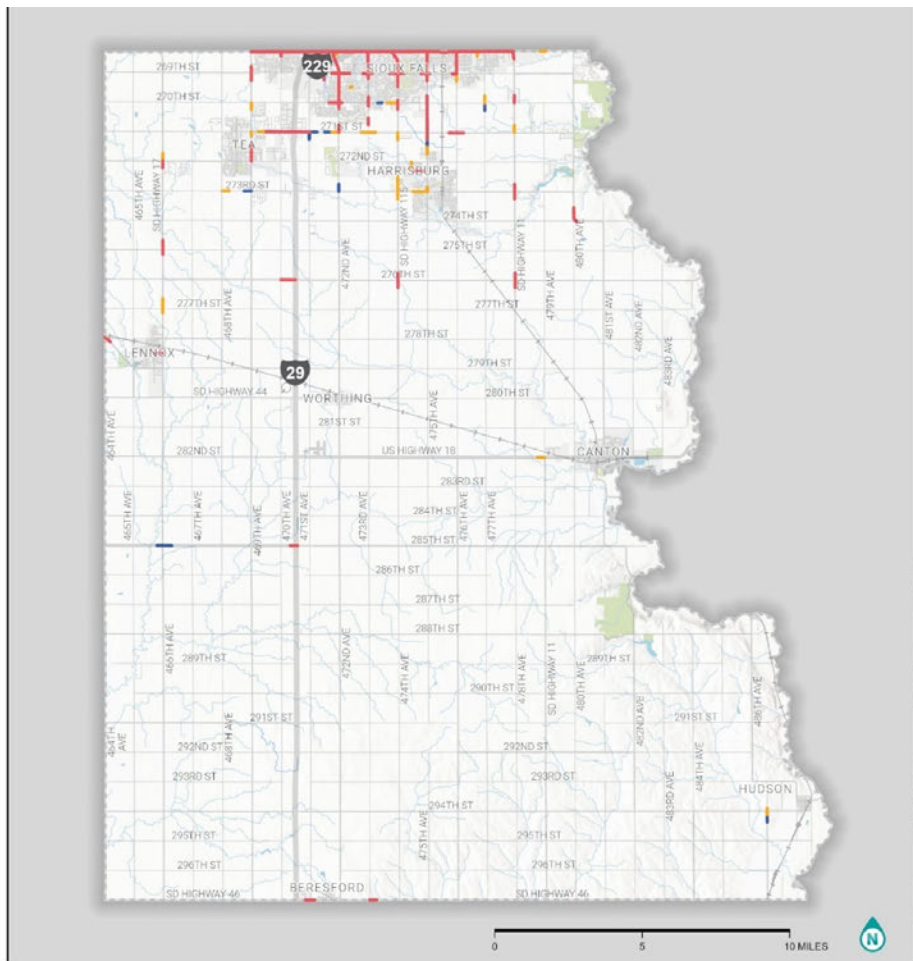
- First draft of the HIN had **65%** of severe collisions on **2%** of the roadway network
- Adjusted thresholds based on SAT feedback
- Added 10% of KSI collisions and <1% of roadway mileage
- **74%** of severe collisions on **3%** of the roadway network



- There were 10 segments with more than 1 severe collision as shown on the map to the right
- As you can see quite a few 276th St intersections stand out as having more than 1 severe collision.



6. Safety Analysis



HIGH INJURY NETWORK LINCOLN COUNTY SS4A SAFETY ACTION PLAN

- Roadway on the 65% HIN
- Roadway on the 70% HIN
- Roadway on the 75% HIN
- Roadway not on the HIN
- Railroads
- Jurisdiction Boundaries
- Lincoln County

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Risk Factor Analysis

Risk factors are contextual characteristics or exposures that are associated with an increased likelihood of harm from a crash. The analysis looks ahead to find where road dangers are most likely. It examines different road conditions—like speed limits, road layout, and intersection features—to see which ones are linked to more crashes. Since there were very few walking or biking crashes, the analysis focused mainly on factors that affect vehicle crashes. On the next page is a summary of the Risk Factor Analysis. The full Risk Factor Analysis can be found in Appendix 4 of this Action Plan.

6. Safety Analysis

Possible Contextual Factor	Data Source
Posted Speed	Lincoln County (Edited by Houston Engineering)
Road functional class	Lincoln County
Road width	Lincoln County
Lane width	Highway Performance Monitoring System (HPMS)
Presence of parking lane	Highway Performance Monitoring System (HPMS)
Presence of turn lanes	Highway Performance Monitoring System (HPMS)
Presence of signal	Highway Performance Monitoring System (HPMS)
95 th Percentile speed	UrbanSDK
Average annual daily traffic (AADT)	UrbanSDK

Additional attributes available through UrbanSDK, but which Alta does not anticipate using for this analysis, include: Travel Time Index, Planning Time Index, Buffer Time Index, Vehicle Miles Traveled, Average Annual Hourly Traffic, 85th percentile speed, 85th percentile difference, and 95th percentile difference, among others.

- Left Turn Lane – presence of left turn lanes has higher crash risk
- Presence of a Signal – Much higher crash risk because of higher volumes and higher rear-end crashes.
- Functional Class – Minor arterials have the highest crash risk - most in cities
- Speeds – When a person was speeding
- 26% of crashes on roads with 35-40 mph speed limit
- 50% of crashes on roads with 55 mph or higher speed limit
- Traffic Volume – Higher traffic volumes are associated with the greatest number of crashes but KSI crashes still occur on all roadways.

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
Over 10,000	21.98%	6.84%	20.90%	1.05%	15.2	6.52	20.94	19.93
6001 - 10,000	16.77%	11.11%	16.29%	1.53%	22.1	7.26	10.95	10.64
3001 - 6000	11.52%	19.66%	12.19%	3.52%	50.9	5.58	3.27	3.46
NA	19.58%	19.66%	19.79%	9.16%	132.5	2.15	2.14	2.16
1001 - 3000	14.90%	15.38%	15.00%	10.47%	151.4	1.47	1.42	1.43
1000 or less	15.27%	27.35%	15.83%	74.26%	1073.8	0.37	0.21	0.21

6. Safety Analysis

Contextual trends associated with **more crashes** and **higher crash risk**:

- Wider lane widths
- Left-turn lanes*
- Right-turn lanes
- Very narrow or very wide lanes
- Presence of a signal
- Concrete or gravel roadways
- Minor arterials
- Posted speed 35-40 mph (prevailing speeds 41-50 mph)
- High traffic volume (over 10,000 AADT)

Contextual trends associated with **fewer crashes** and the **lowest crash risk**:

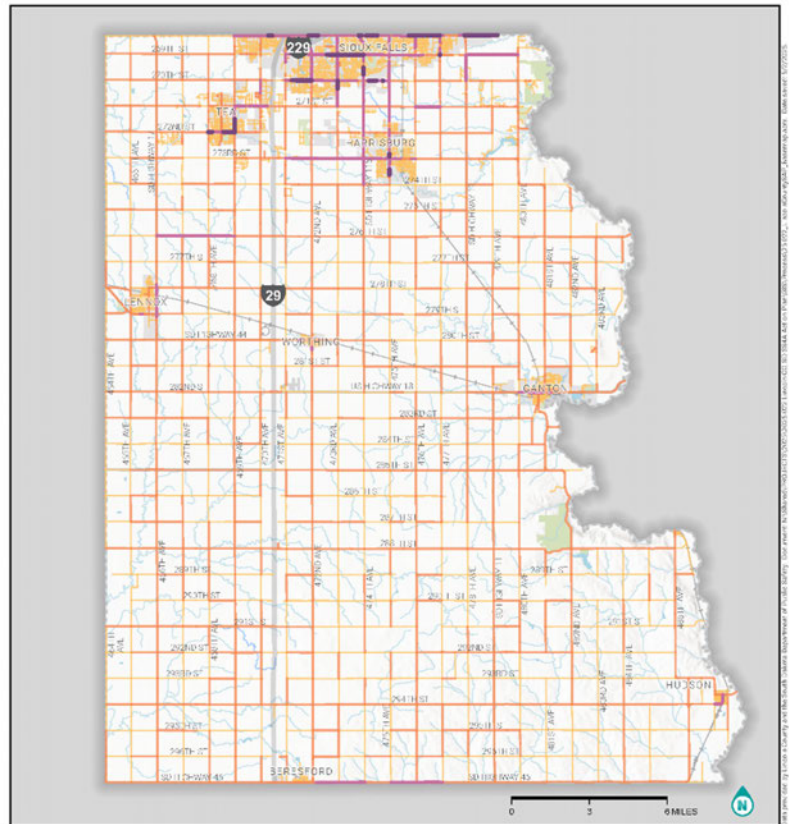
- 10' lane width
- No turn lanes
- Parking lane present
- 21-30 mph prevailing speeds
- Low traffic volumes

Countermeasures Identified

The plan has identified a key set of countermeasures, based on:

- Systemic best practices
- Broad applicability

Using GIS analysis, the plan consultant team evaluated where the greatest potential benefits could be achieved across the study area. This process produced a series of maps that visually highlight the locations with the highest opportunities for improvement, helping guide data driven decision making throughout the plan. For a detailed analysis see the Countermeasure Selection Documentation in Appendix 5.



RISK FACTOR ANALYSIS

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

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Legend

Composite Risk Score	
13 - 18	Lincoln County
7 - 12	Railroads
2 - 6	Water Bodies
0 - 1	Parks + Outdoor Space

Roadway Departure



Longitudinal Rumble Strips and Stripes on Two-Lane Roads



Median Barriers



Roadside Design Improvements at Curves



Wider Edge Lines

Intersections



Backplates with Retroreflective Borders



Corridor Access Management



Dedicated Left- and Right-Turn Lanes at Intersections



Reduced Left-Turn Conflict Intersections



Roundabouts



Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections



Yellow Change Intervals

6. Safety Analysis

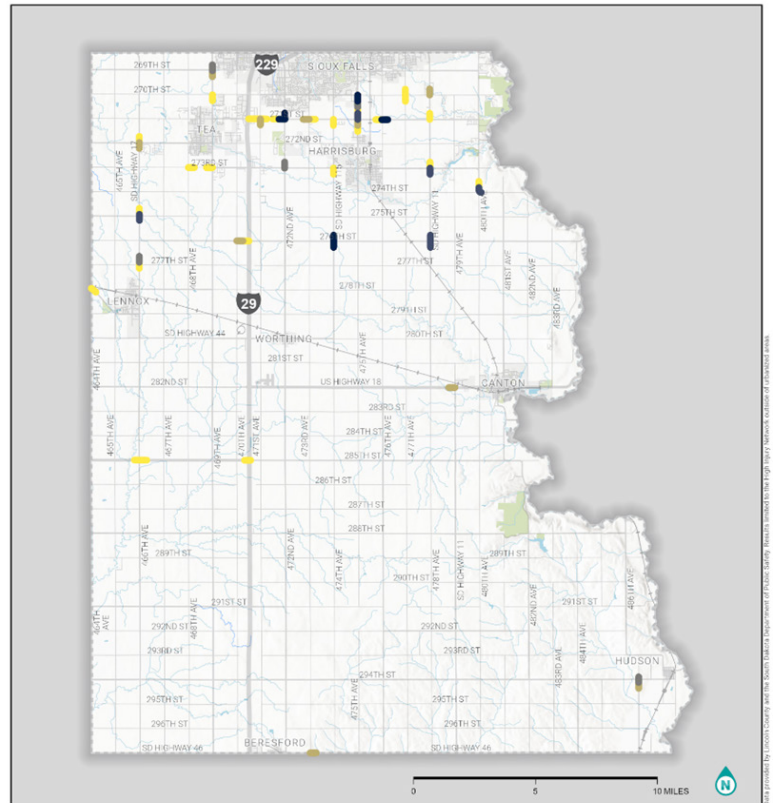
Countermeasures recommended

- Wider edge line
- Longitudinal rumble strips and stripes on two-lane roads
- Centerline rumble strips
- Increase retroreflectivity of stop signs
- Conversion of intersection into single-lane roundabout
- Systemic application of multiple low-cost countermeasures at stop-controlled intersections
- Dedicated left- and right-turn lanes at intersections
- Pavement friction management
- Lighting
- Install roadside barrier
- Appropriate speed limits for all road users
- SafetyEdge
- Enhanced delineation for horizontal curves
- Roadside design improvements at curves
- Median barriers
- Backplates with retroreflective borders
- Corridor access management
- Reduced left-turn conflict intersections
- Yellow change intervals
- Variable speed feedback sign
- Pave deteriorated 2-ft shoulder
- Widen paved shoulder from 3 ft to 5 ft
- Remove or relocate fixed objects outside of the clear zone

Additional Countermeasures – Pedestrian and Bicyclist Facilities

- Crosswalk visibility enhancements
- Bicycle lanes (including bicycle shoulders)
- Rectangular Rapid Flashing Beacons (RRFB)
- Leading Pedestrian Interval
- Medians and pedestrian refuge islands in urban and suburban areas
- Walkways and trails

**For targeted application in bike/ped contexts based on public engagement and compatibility with other planning efforts*



COUNTERMEASURE ANALYSIS Total Applications
 Total Countermeasure Applications at 70th Percentile
 LINCOLN COUNTY
 SS4A SAFETY ACTION PLAN

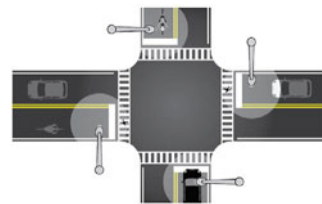
0
 1 - 2
 2 - 3
 4 - 5
 < 7

— Railroads
 — Jurisdiction Boundaries
 Lincoln County

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Wider edge line



Lighting



Backplates with retroreflective borders

7. Underrepresented Populations Analysis

Underrepresented - Bicyclists/Pedestrians

A bicycle/pedestrian focus group was held in the summer of 2025. Six people attended and provided the following issues to be addressed:

- Bikers expressed a clear preference for roads with wider shoulders and advocated for rumble strips that are placed close to the edge line rather than the middle of the shoulder to maximize usable area for bicycling.
- The most frequently used county highways for bicycle travel in Lincoln County are Highway 135, Highway 102, and Highway 106.
- A long-term vision is to establish a separated multi-use path along Highway 135, connecting Good Earth State Park, Lake Alvin Recreation Area, and Newton Hills State Park to enhance safe access for bicyclists and pedestrians between key recreational destinations.
- Safety and driver behavior are the top concerns for bicyclists on the County highway system.
- Potential to use less traveled parallel roads compared to roads with higher traffic.

Underrepresented - Schools, Low Mobility, Low Income Stakeholder Interviews

The following agencies were contacted for their viewpoints about safety on Lincoln County roads and highways.

- School Districts (Tea, Harrisburg, Lennox, Canton)
- Lincoln County Human Services
- Lincoln County Veterans Affairs
- Transit Agencies
 - Canton
 - Lennox
 - Beresford

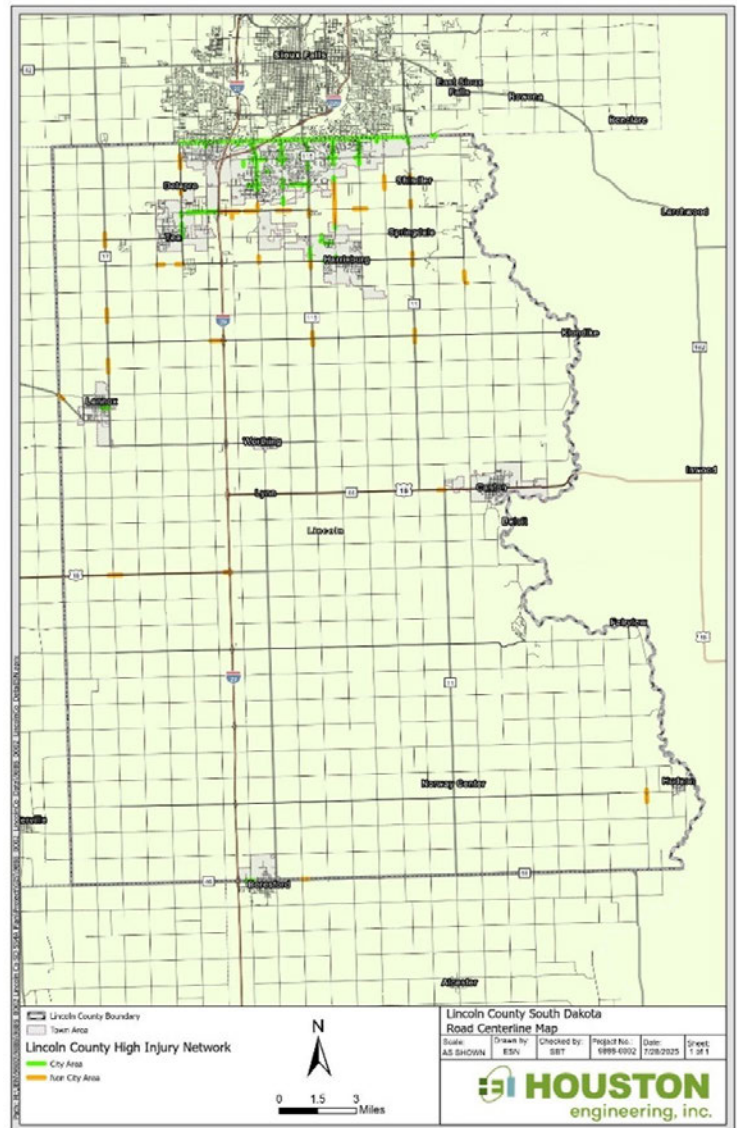
Issues Identified

- Problems with stop sign compliance county-wide.
- Getting into Sioux Falls area is difficult with traffic.
- Harvest season is an issue for truck/farm equipment.
- School bus arm non-compliance is big issue.
- Speeding is an issue.
- Lack of Transportation to services.
- Specific Highway issues.
 - Tea-Ellis Road between Tea and Sioux Falls (very little shoulder, not in good condition, narrow road and high traffic)
 - Highway 17 South of Lennox and in Lennox
 - SD 115 and County 106
 - Co Hwy 135 and 276th Street
 - Western and County 106
 - County 135 from Good Earth to Canton has narrow shoulder for bicycles.

8. Project Selection and Prioritization

The Lincoln County SS4A Action Plan focused on a subset of the HIN with greatest County influence. Therefore, HIN segments were included that are within Lincoln County and Outside of municipalities (orange colored roadways on map to right). HIN Segments were not included that are inside city-limits (green colored roadways on map to right).

The Lincoln County HIN was analyzed based on a group of metrics that included six areas that the SAT and Lincoln County found best represented the priorities for roadway improvements.



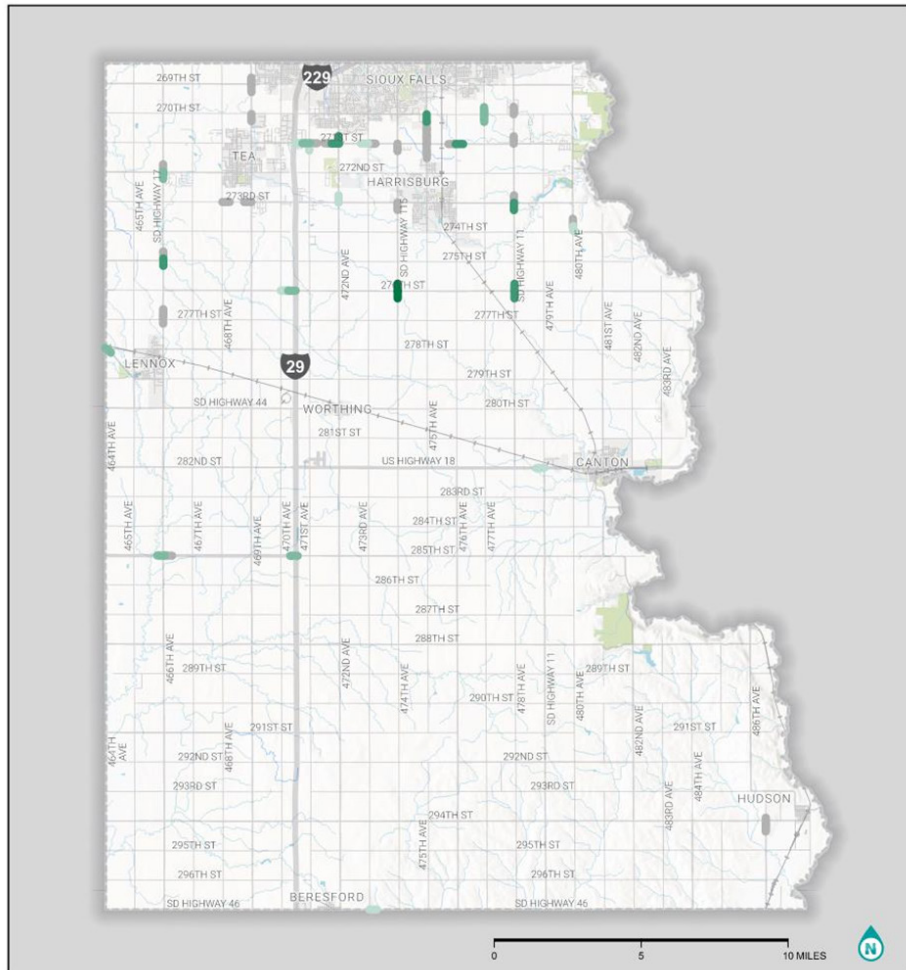
DRAFT - Lincoln County Prioritization Scoring Metrics

Category	Weight	Criteria	Base Score	Final Score
High Injury Network	40%	Crash Weight - Over 10 (72 segments)	1.00	40.00
		Crash Weight - 7.5 to 10 (29 segments)	0.75	30.00
		Crash Weight - 5.0 to 7.5 (56 segments)	0.50	20.00
		Crash Weight - 2.5 to 5.0 (141 segments)	0.25	10.00
High Risk Network	20%	Total Composite Score - 12 to 18	1.00	20.00
		Total Composite Score - 6 to 12	0.50	10.00
Planning Consistency	10%	Recently Improved or in Urban Growth Area	-1.00	-10.00
		Programmed in CIP/Budget- major reconstruction	1.00	10.00
		Programmed in CIP/Budget- maintenance	0.5	5.00
Under Represented	10%	Within Lowest Income Census Tracts	1.00	10.00
		Within Low-Moderate Income Census Tracts	0.50	5.00
Priority Bicycle Areas	10%	Roadway on a priority bicycle corridor	1.00	10.00
Public Engagement	10%	Top 5 Pinpoint Location	1.00	10.00
		Top 10 Pinpoint Location	0.75	7.50
		Top 20 Pinpoint Location	0.50	5.00

8. Project Selection and Prioritization

Weighted Collision Per Mile

Weighted collisions per mile were incorporated at 40% of the scoring metrics process to account highly for especially fatal and serious crash issues that have occurred in Lincoln County based on the below map that was developed as a part of the Safety Analysis.



COUNTERMEASURE ANALYSIS Weighted Collisions per Mile

Dedicated Turns Benefit Index

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

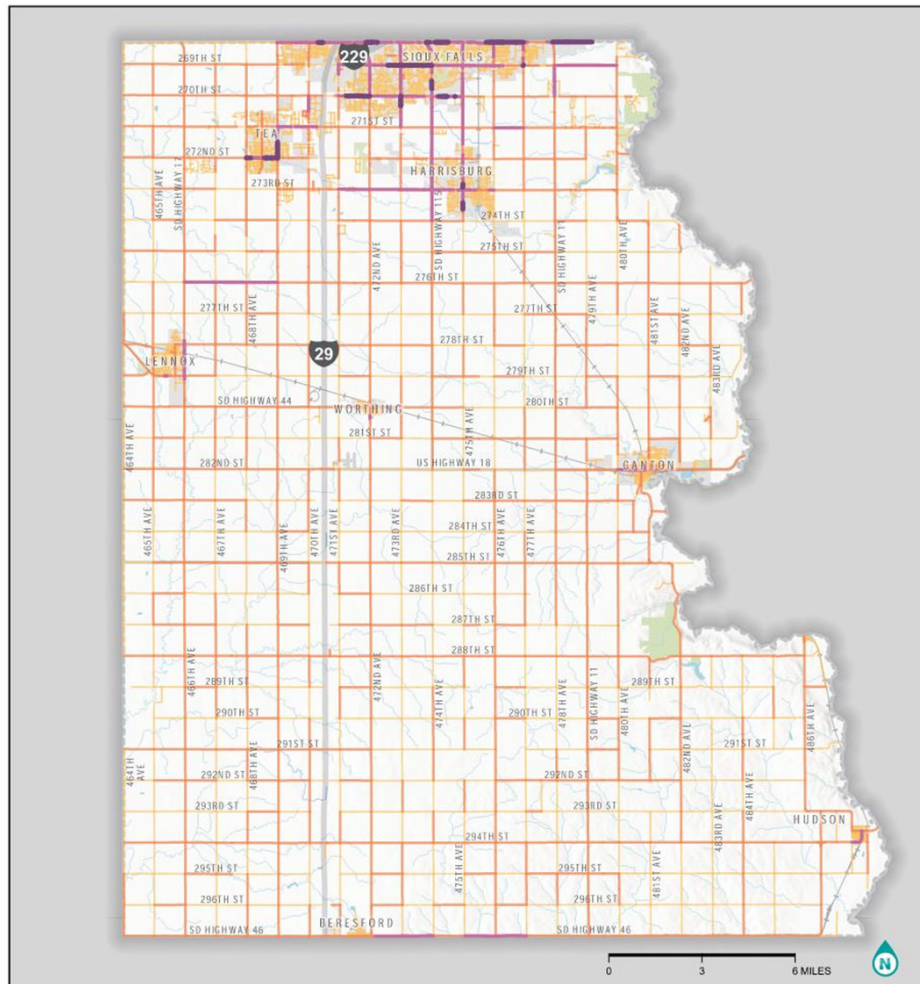
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8. Project Selection and Prioritization

Risk Factor Areas

The below map that was developed as part of the Safety Analysis identifies the areas of the county that have higher roadway risk factors. Risk factors are 20% of the scoring metric and are important to account for including contextual factors such as wider lane widths, left-turn lanes, right-turn lanes, very narrow or very wide lanes, presence of a signal.



RISK FACTOR ANALYSIS LINCOLN COUNTY SS4A SAFETY ACTION PLAN

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Legend

Composite Risk Score

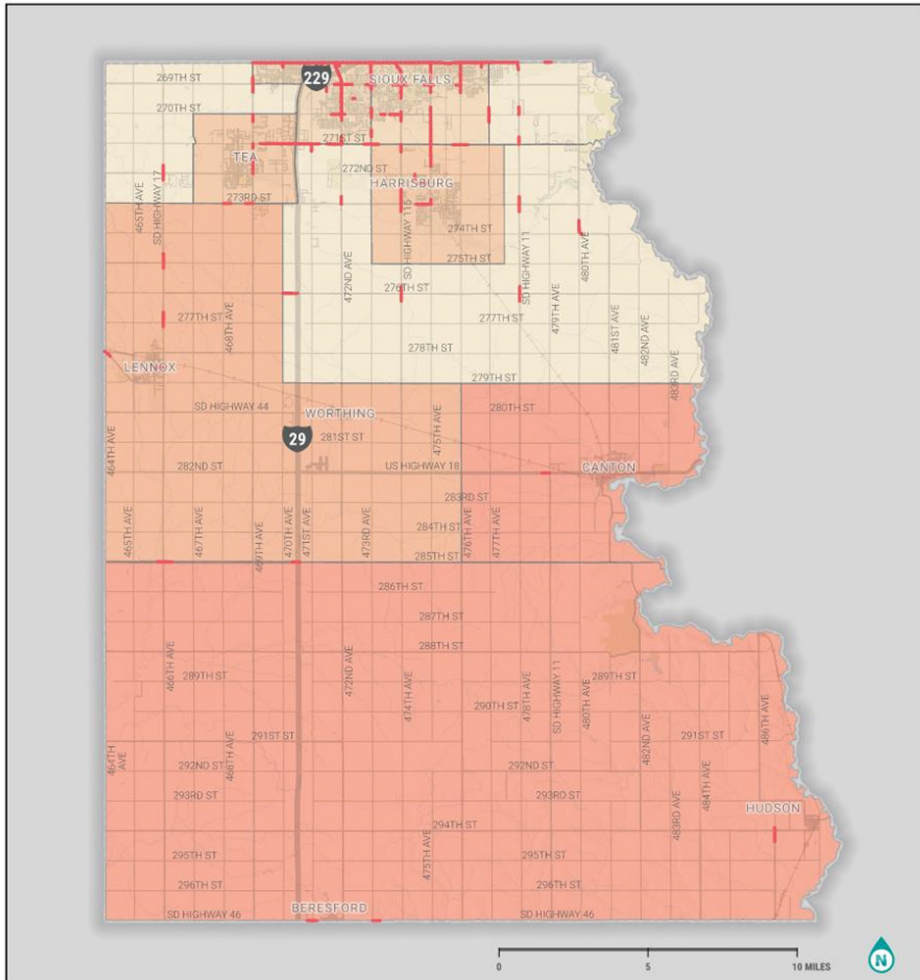
- 13 - 18
- 7 - 12
- 2 - 6
- 0 - 1

- Lincoln County
- Railroads
- Water Bodies
- Parks + Outdoor Space

8. Project Selection and Prioritization

Lowest Income Areas

The map below shows the lower income census tracts in Lincoln County. The SAT noted that some additional priority should be provided to areas that have lower incomes to help balance the areas of the county that are growing rapidly.



Equity data provided by the US Council on Environmental Quality's Climate & Economic Justice Screening Tool (CEJST) last published in 2024.

HIGH INJURY NETWORK AND EQUITY AREAS

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

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Relative Area Median Income

- Highest Area Income
- Average Area Income
- Lowest Area Income

- Roadway on the HIN
- Railroad
- Jurisdiction Boundary
- Lincoln County

8. Project Selection and Prioritization

Priority Bicycle Areas

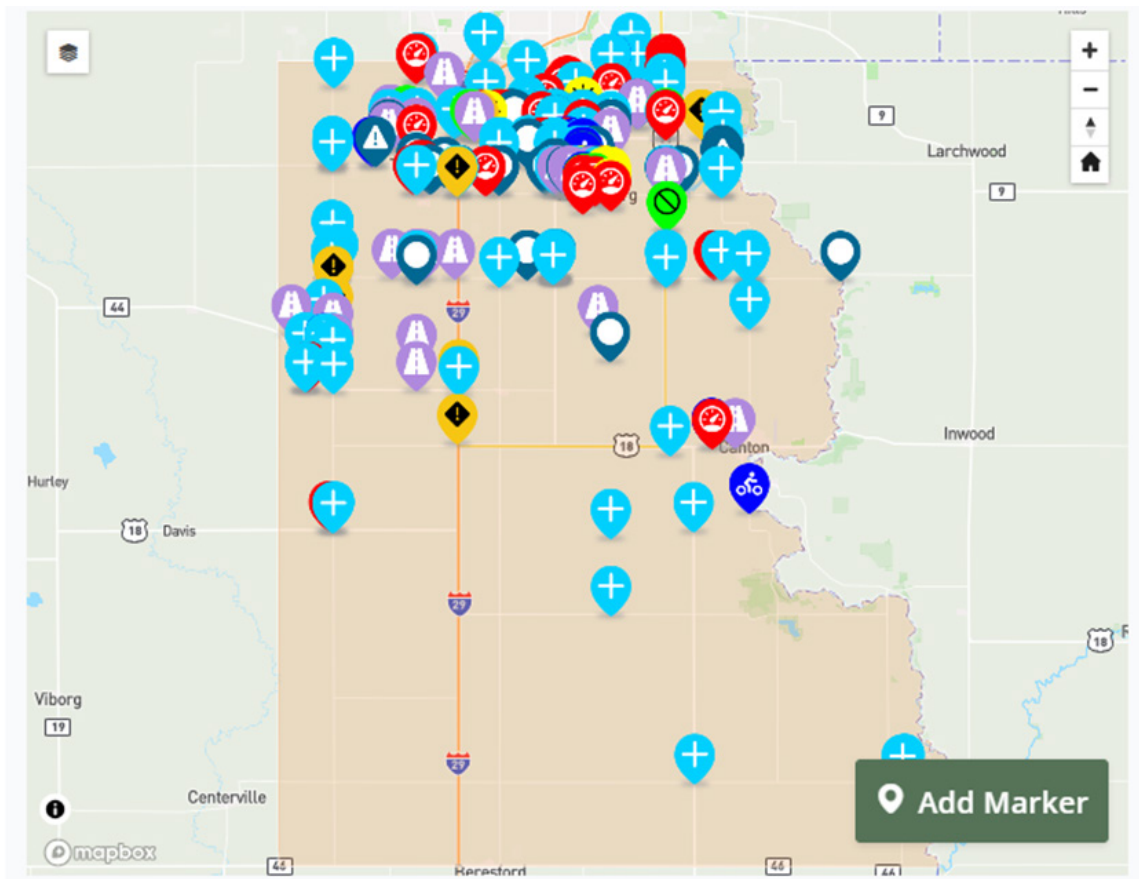
Priority bicycle areas were based on Bicycle and Pedestrian Focus Group, Map survey comments, and in-person public engagement events. Those areas were the following corridors.

- County Highway 135 (north-south)
- County Highway 102 – SD 11 to County Highway 135 (east-west)
- County Highway 116 (east-west)

Public Engagement Areas

The public engagement areas reflect the top locations where comments were posted on the project website. The scoring metrics were ranked for scoring

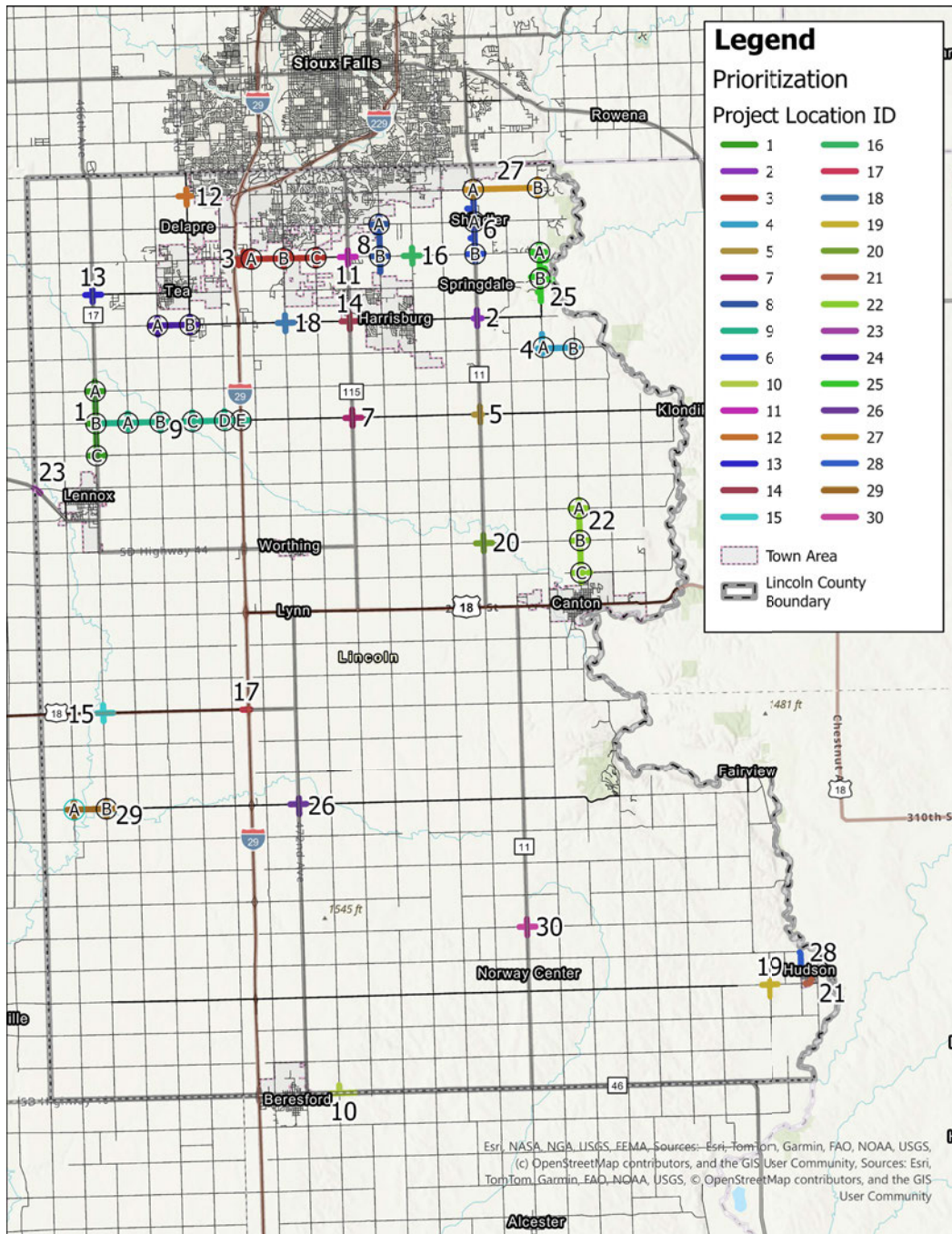
- Top 5 Comment Locations
- Top 10 Comment Locations
- Top 20 Comment Locations



8. Project Selection and Prioritization

Project Prioritization Map

The following top 30 Projects were then identified from the scoring metrics process



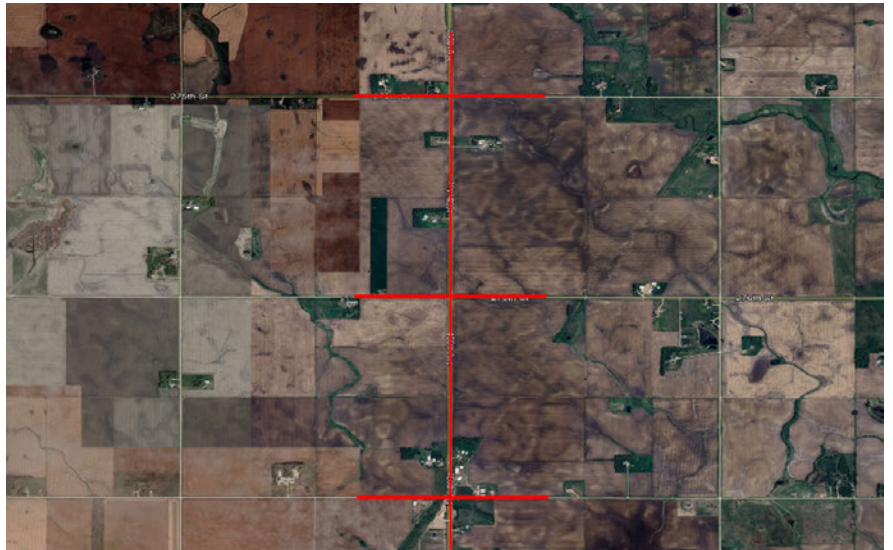
On the following pages are the top 9 ranked project locations in greater detail.

8. Project Selection and Prioritization

County Road 105 (Rank 1)

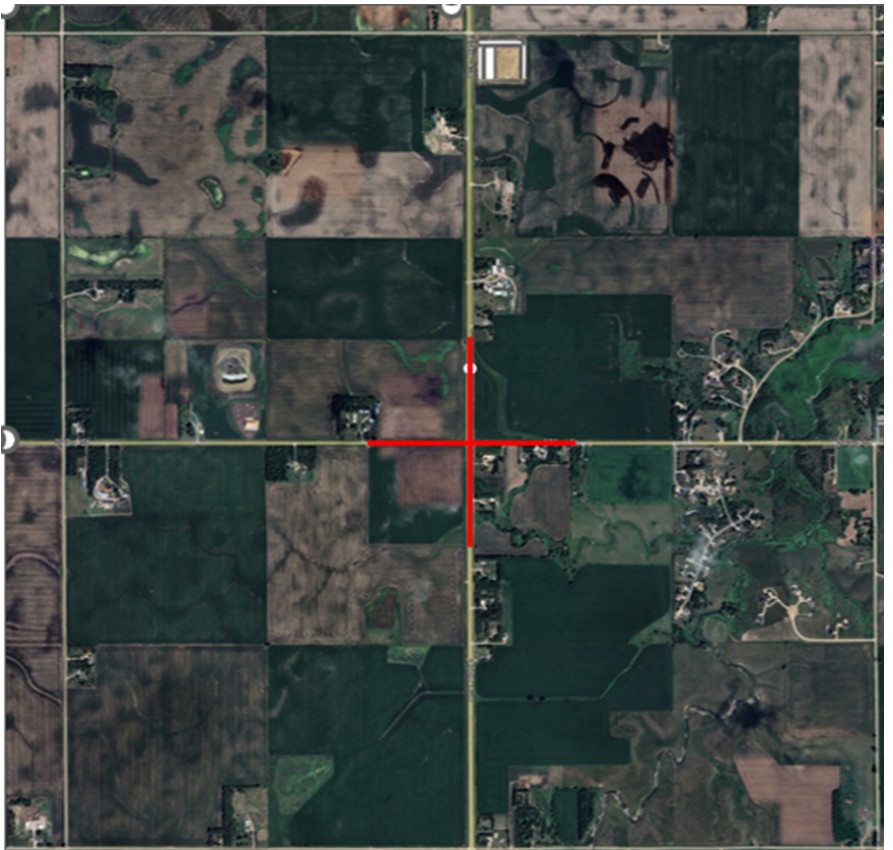
From 275th Street to 277th Street

Includes the intersections of CR 105/275th St, CR 105/276th St, and CR 105/277th St



CR 110/Highway 11 (Rank 2)

Intersection of County road 110 and SD Highway 11

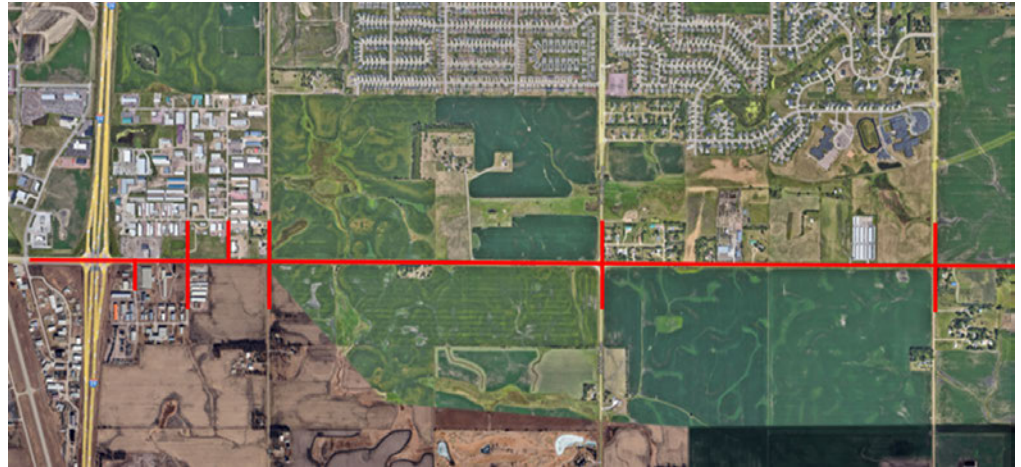


8. Project Selection and Prioritization

County Road 106 (Rank 3)

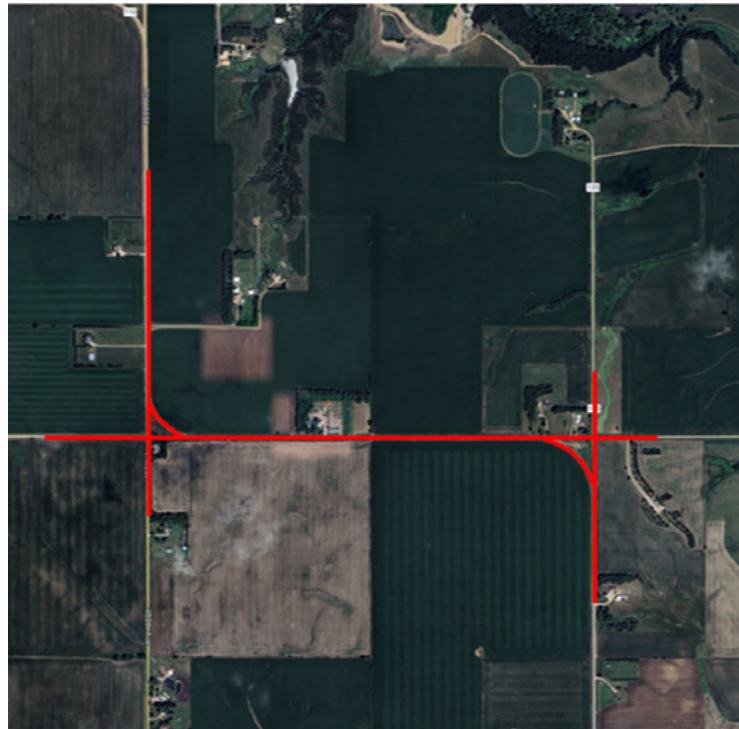
From Sky Lane to S
Western Ave

Includes the intersections of
CR 106/Independence Ave,
CR 106/Albers Ave, CR 106/
Mueller PI, CR 106/Tallgrass
Ave, CR 106/S Louise Ave,
and CR106/Western Ave



County Road 135 (Rank 4)

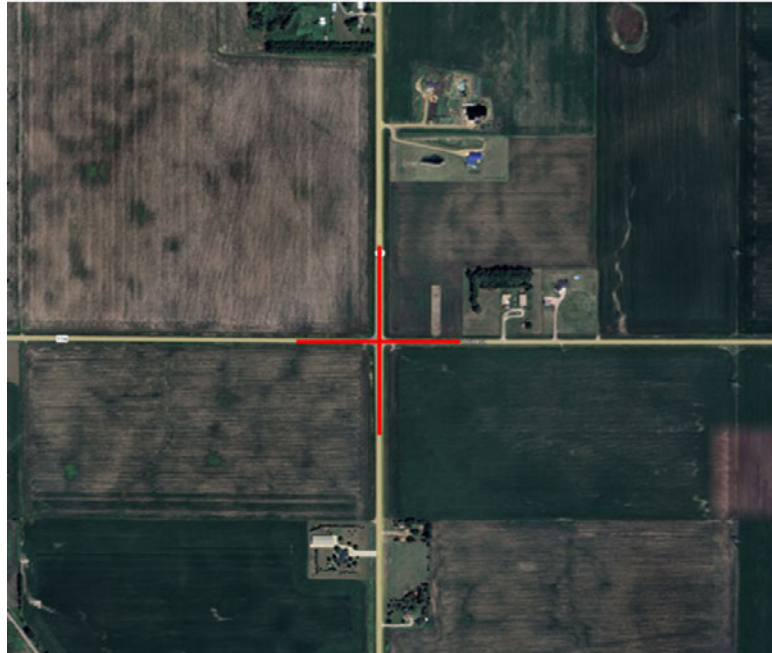
Includes the intersections of
480th Ave/274th St, 481st
Ave/274th St



8. Project Selection and Prioritization

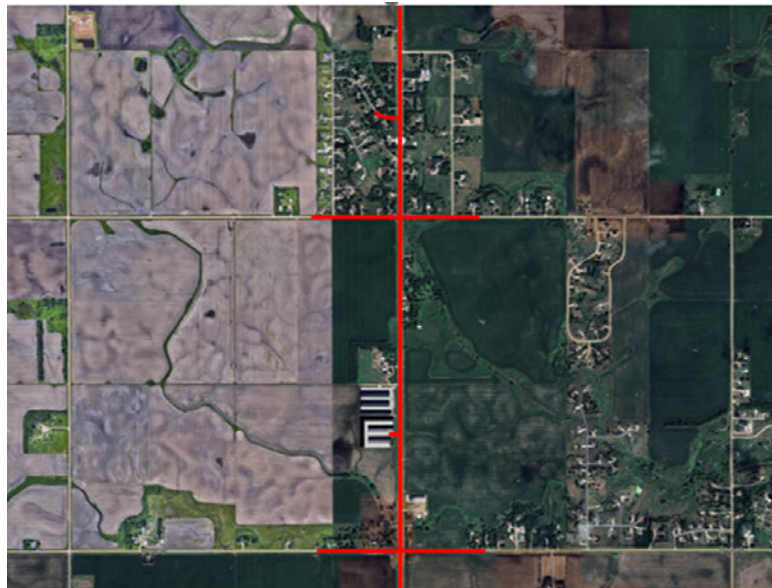
County Road 116 (Rank 5)

Intersection of Highway 11
and CR 116



Highway 11 (Rank 6)

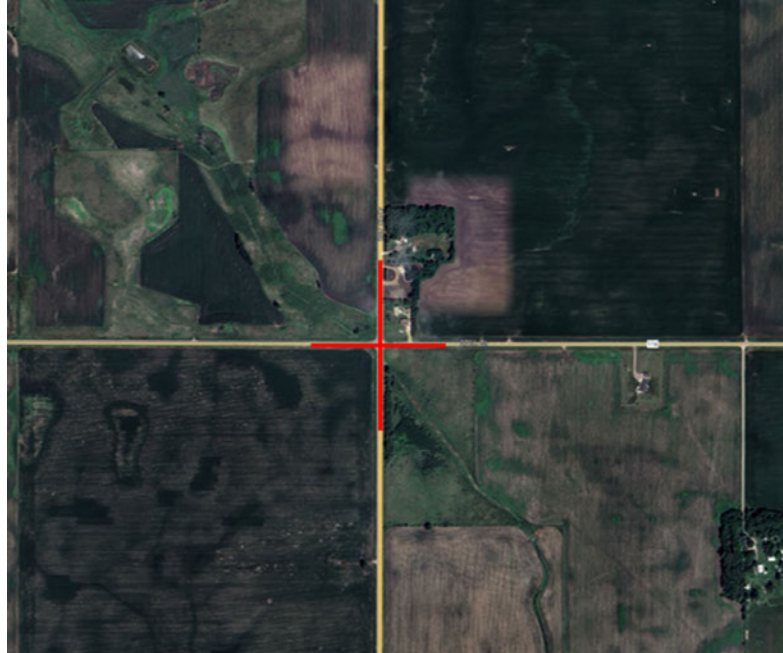
From CR 106 and CR 102
Includes intersections of
Hwy 11/270th St, Hwy 11/
Julie Rd, Hwy 11/ CR 106



8. Project Selection and Prioritization

County Road 116 (Rank 7)

Intersection of Hwy 115 and
CR 116



County Road 123 (Rank 8)

From Sioux Falls border to
Harrisburg border

Includes the intersections
of CR 123/CR 106, CR
123/270th St, and CR 123/E
90th St



8. Project Selection and Prioritization

County Road 116 (Rank 9)

From CR 105 to I-29

Includes the intersections of CR 116/CR 105, CR 116/467th Ave, and CR 116/468th Ave, CR 116/CR 111, CR 116/470th Ave



9. Vision, Goals, Objectives

Leadership Commitment

An important component of the Comprehensive Safety Action Plan is to have the Lincoln County Commission approve the SS4A Action Plan that includes a public commitment to an eventual goal of zero roadway fatalities and serious injuries achieved through one or both of the following methods:

- Target date for achieving zero roadway fatalities and serious injuries; and/or
- An ambitious percentage reduction in roadway fatalities and serious injuries.

After review of the Action Plan, the Lincoln County Commission adopted the Plan through Resolution 2026-09 that included a 50% reduction in roadway fatalities and serious injuries by 2036. A review of the goals should occur each year to take into consideration significant changes in traffic volumes and population growth

In addition, the resolution has identified the current SAT as the long-term County committee to have oversight of the SS4A Action Plan development, implementation, and monitoring. The resolution then states that the SAT will convene as least once per year to review progress reports that include project implementation, crash data, quick build implementation. The SAT will then guide Lincoln County staff with recommendations for the reaching goals and continued successful implementation of the plan.

Measurable Progress and Transparency

The Safe Streets and Roads for All (SS4A) program requires communities to monitor, document, and report progress toward reducing roadway fatalities and serious injuries. To comply with federal expectations and ensure accountability, Lincoln County will evaluate progress through an

1. outcome-based
2. implementation-based safety metrics.
3. Process and administrative Metrics

Outcome-based safety metrics

These metrics measure whether the County is achieving its central SS4A goal—reducing fatalities and serious injuries.

- Annual number of roadway fatalities and serious injuries (KSI).
- Five year rolling averages for fatalities and serious injuries to smooth annual variability.
- Changes in crash frequency and severity along the High-Injury Network.

Implementation Metrics

These indicators measure the County's progress in carrying out projects, strategies, and countermeasures identified in this Action Plan.

- Number of intersections improved with safety countermeasures such as enhanced signing, lighting, roundabouts, or high visibility treatments.
- Miles of roadway receiving shoulder widening, rumble strips, pavement markings, or other roadway departure countermeasures.
- Number of systemic countermeasures implemented (e.g., LED stop signs, SafetyEdge, curve delineation).

9. Vision, Goals, Objectives

Process and Administrative Metrics

These metrics track progress in plan governance, coordination, and safety management capacity—requirements emphasized in the SS4A Action Plan structure.

- SAT (Study Advisory Team) meeting attendance, supporting the Action Plan’s implementation oversight function.
- Completion of annual Action Plan progress reports, documenting project status and safety outcomes.
- Number of county safety policies adopted (e.g., speed management updates, design standard modifications, access management guidelines).
- Compliance with SS4A reporting requirements, including documented grant administration steps, reimbursement submittals, and project closeout tasks.

SS4A Action Plan Goals

1. Enhance Safety Education and Transparency
2. Reduce Speed throughout the County roadway system
3. Increase Stop Sign Compliance at Rural Intersections
4. Prioritize Countermeasures that improve safety over capacity and level of service.
5. Improve Safety at Rural Intersections
6. Find methods to improve safety for vulnerable users

Goal 1: Safety Education and Transparency

Policies

- Reduce distracted driving by working with partners such as the SD Safety Council’s “Do It For Me” distracted driving campaign
- Improve the public’s usage of the county’s online system for reporting road safety concerns.
- Develop a steering committee to review progress of the Action Plan on a yearly basis, provide an annual report, and recommend updates as needed.

Goal 2: Reduce Speed throughout the County roadway system

Policies

- Add wider edge lines that can visually narrow the road and influence driver perception of a narrower road.
- Consider adding dynamic speed feedback signs that show drivers their current speed in high-speed areas.
- Consider reduced lane width with increased shoulder width in rural to urban transitional areas where speed limits are 50 mph or under.
- Discourage using the 85th-percentile speed as the sole basis for setting speed limits on rural main streets and arterials. This change supports context-sensitive design, which may include narrower lanes to reduce speeds and crash severity. (Source: MUTCD)



9. Vision, Goals, Objectives

Goal 3: Increase Stop Sign Compliance at Rural Intersections

Policies

- Consider adding roundabouts at intersections with high traffic and poor stop sign compliance.
- Prioritize locations on the HIN that could benefit for flashing LED stop signs to improve stop compliance.
- Develop an enhanced mowing plan of roadways to control noxious weeds, improve safety, and sustain a clear line of vision on the highway right-of-way for any intersection.
- Add low-cost countermeasures at stop-controlled intersections such as oversized advance intersection warning signs, retroreflective sheeting on sign posts, stop ahead intersection warning signs with flashing beacons.



Goal 4: Prioritize Countermeasures that improve safety over capacity and level of service.

Policies

- Implement design standards that include narrower lanes on county roadways to calm traffic where speed limits are below 55 .
- Increase shoulder rural collector widths to at least 2 feet of paved surface where possible with additional shoulder width recommended on arterials and roadways projected with higher volumes.
- Guardrails should be considered where steep ditch sections are present.
- Widen shoulders on all new resurfacing or reconstruction projects. Wider shoulders not only provide a recovery zone for vehicles that stray off the highway but also provide a refuge for slow moving vehicles, bicycles, and pedestrians.
- Widen pavement edge lines to increase drivers' perception of the edge of the travel lane and provide a safety benefit to drivers.
- Provide edge line rumble strips when resurfacing to reduce crashes by alerting distracted, drowsy, or otherwise inattentive drivers who drift from their lane.
- Other roadway departure countermeasures should be incorporated into projects based on their safety benefit including:
 - Enhanced delineation of horizontal curves
 - Roadside improvements at curves (i.e. widen shoulders, barrier and guardrails and slope flattening)
 - Safety Edge should be incorporated with all repaving projects to reduce car tires sudden drop from road and to enhance shoulder life.



9. Vision, Goals, Objectives

Goal 5: Improve Safety at Rural Intersections

Policies

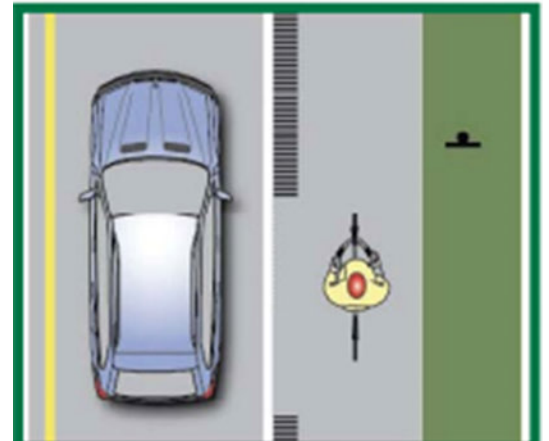
- Redesign and reconstruct intersections with confusing design features meant to improve traffic flow but create crash and overall safety issues.
- Improve lighting at intersections along HIN to reduce nighttime serious and fatal injuries (nighttime rates are 3 times higher than during the daylight).
- Consider constructing roundabouts at higher volume intersections on the HIN. Roundabouts can reduce fatal and serious injuries by 82%.
- Consider RCUTs at 2-way stop intersections on the HIN with high traffic volumes. RCUTs can reduce fatal and serious injuries by 54%.
- Apply corridor access management principles to reduce conflict points for drivers, bicyclists, and pedestrians.
- Incorporate dedicated turn lanes only where it is determined that it will improve safety.



Goal 6: Find methods to improve safety for vulnerable users

Policies

- Find methods to improve bicycling and walking safety and comfort including the following methods
 - Widen shoulders on bike routes to provide a safety area for bicycles and pedestrian.
 - Work with communities and SDDOT to implement trail plans and designate trail system connections.
 - Provide lighting to improve safety at key pedestrian and bicycle crossing locations.
 - Incorporate only bicycle-friendly rumble strips on roadways including the following:
 - All roadways should include a gap of at least 10 feet for every 40 feet of milled area
 - Rumble strips should be as close to the white outside travel lane line as possible.



10. Roadway Safety Design Standard Recommendations

Roadway Safety Design Standards/Implementation

Based on the review of current plans, design standards, safety and countermeasure analysis, and public engagement, the safety design recommendations below have been included in this plan.

Other roadway design standards should follow the AASHTO Green Book Standards, SDDOT Roadway Design Manual, and Lincoln County Master Transportation Plan.

1. Below are the typical recommended **design lane and shoulder width** for rural roads and highways.

Road Type	Lane Width	Shoulder Width	Lane Width Notes
Rural Collectors (& speed limit under 50 mph and ADT under 400)	11 feet	2 feet	
Rural Collectors (speed limit over 50 mph and ADT under 400)	12 feet	2 feet	Allow 11-feet where constraints exist
Rural Collectors (speed limit under 50 mph and ADT 400 to 2,000 AADT)	11 feet	4 feet 2 feet allowed where constraints	
Rural Collectors speed limit over 50 mph and ADT 400 to 2,000 AADT)	12 feet	4 feet 2 feet allowed where constraints	Allow 11-feet where constraints exist
Rural Collectors (ADT over 2,000)	12 feet	6 feet 4 feet allowed where constraints	Allow 11-feet where constraints exist
Rural Arterials (speed limit under 50 mph and ADT under 400)	11 feet	4 feet 2 feet allowed where constraints	
Rural Arterials (speed limit over 50 mph and ADT under 400)	12 feet	4 feet 2 feet allowed where constraints	Allow 11-feet where constraints exist
Rural Arterials (speed limit under 50 mph and ADT 400 to 2000)	11 feet	6 feet 4 feet allowed where constraints	
Rural Arterials (speed limit over 50 mph and ADT 400 to 2000)	12 feet	6 feet 4 feet allowed where constraints	Allow 11-feet where constraints exist
Rural Arterials (speed limit 35- 50 mph and ADT over 2000)	12 feet	8 feet 6 feet allowed where constraints	Allow 11-feet where constraints exist
Rural Arterials (speed limit over 50 mph and ADT over 2000)	12 feet	8 feet 6 feet allowed where constraints	

10. Roadway Safety Design Standard Recommendations

2. The above roadway and shoulder widths are generally recommended and can be adjusted based on context, traffic volume, and design speed. The Greenbook encourages context-sensitive design and allows for design exceptions when justified.
3. Before reducing roadway lane width below 12 feet and when the speed limit is over 50 mph, ensure truck traffic is under 10%, shoulder width is at least 4 feet, and ADT is not projected to increase.
4. Typical cross sections within the Lincoln County Master Transportation Plan should be updated to be consistent with these plan recommendations.

SDDOT 3R Projects Design Standards

Table 7-2. Lane & Shoulder Widths for 3R Projects (Non-Interstate NHS)

CURRENT ADT	<1499	>1500
Minimum Lane Width (ft) ¹	10	11
Combined Lane and Shoulder Width (ft) ^{2,3}	12	13

¹ Desirable lane width is 11 feet. If feasible, 12 feet is preferable. Where truck volumes exceed 15%, a minimum of 11-foot lanes are to be considered.

² If Truck ADT is >100, minimum shoulder width = 3 feet

³ Where pedestrians and bicyclists are to be accommodated on the shoulders, follow guidance on page 7-4 and the AASHTO Guide for Development of Bicycle Facilities.

5. Access Management standards should be utilized as a countermeasure to reduce turning movement conflict consistent with the Lincoln County Master Transportation Plan. (see below)

Table 3-3. Lincoln County Access Location Criteria

Lincoln County Highway Major Roads Plan Designation	Signal Spacing (miles)	Minimum Unsignalized Access Spacing (feet)	Access Density (accesses / side / mile)
Paved - Urban	1/4	1,000	5
Paved - Truck Route	1/4	1,000	5
Paved	1/4	1,000	5
Gravel	N/A	1,000	5

Notes:

1. Access locations within Municipal Growth Boundary or Sioux Falls Joint Jurisdiction area shall be coordinated with the County and local authority.
2. Access locations within ½-mile of SDDOT facility shall be coordinated with the County and SDDOT.
3. Lincoln County may defer to stricter local or State standards.
4. Minimum unsignalized access spacing applies to full-movement and partial-movement access.

10. Roadway Safety Design Standard Recommendations

1. Increase the frequency of resurfacing projects and prioritize rural segments on the High Injury and High Risk Networks.
2. Consider a policy or a revised policy to clear vegetation that is affecting sight distance at intersections consistent with the minimum upstream corner clearance guidelines from the Lincoln County Master Transportation Plan (see table below). In some cases, this may involve acquiring corners of farm fields.

Table 3-4. Minimum Upstream Corner Clearance Guidelines

Speed (mph)	Corner Clearance (feet)
30	200
35	225
40	250
45	280
50	350
55	425

11. Implementation Plan

Improving the safety of roadways with proven countermeasures is a priority of the Safe System Approach. This chapter begins with implementation strategies and then a prioritized project list.

Implementation Strategies

1. Develop a quick build program to incorporate inexpensive and easy to incorporate countermeasures.
2. Incorporate safety countermeasures into already programmed projects
3. Coordinate opportunities in urban platting jurisdictions to identify corridors with wider ROW to provide wider shoulders and other countermeasure incorporation.
4. Work with Lincoln County communities for roadway jurisdictional coordination within urban growth areas to determine priorities for interim safety measures rather than expensive reconstruction efforts.



Project Funding Options

Developing and implementing projects identified through a Safe Streets for All (SS4A) Action Plan often requires a coordinated funding strategy that leverages federal, state, and local resources. Communities can pair SS4A grant opportunities with complementary programs—such as transportation safety, multimodal, and infrastructure funding sources—to advance high impact safety improvements from planning through construction. By aligning project goals with the priorities of various grant programs, local agencies can maximize investment, accelerate project delivery, and build a sustainable pipeline of safety initiatives that support long-term Vision Zero or similar community safety goals. Below are options for identified projects grant funding.

Federal Grants

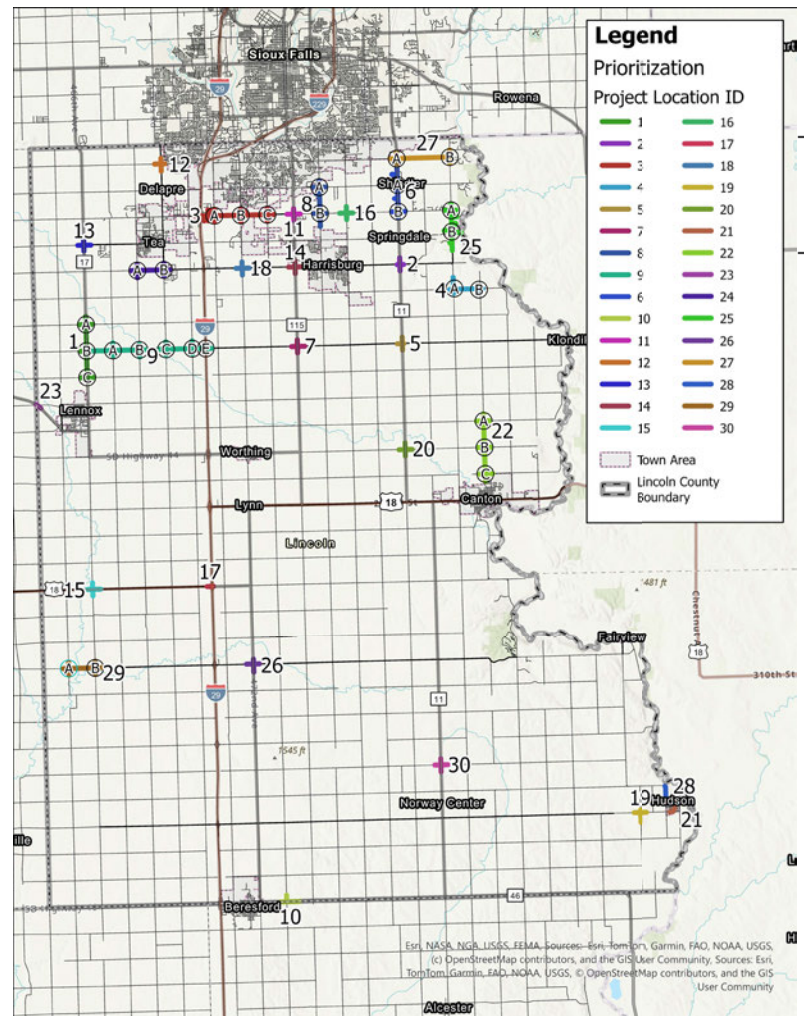
- Safe Streets and Roads for All (SS4A) Implementation Grant – grants to support implementation of projects included jurisdiction action plans
- Rural Surface Transportation Grant Program (RURAL) - Supports rural surface transportation projects
- INFRA Grants (Nationally Significant Multimodal Freight & Highway Projects) - Focused on nationally or regionally significant freight and highway projects
- Mega Grants (National Infrastructure Project Assistance) - Supports large, complex highway and transportation projects

11. Implementation Plan

- **BUILD Grants (Better Utilizing Investments to Leverage Development)** - Significant local or regional transportation infrastructure projects.
- **Bridge Investment Program (FHWA)**
A competitive program for bridge repair and rehabilitation
- **Railroad Crossing Elimination Program (FRA)**
Funds grade-crossing safety projects benefiting rural areas, though the exact funding amount is not listed in the excerpt. [transportation.gov]

State of South Dakota Grants

- **Rural Access Infrastructure Fund (RAIF)** – most directly targeted to rural township and county roadways - SDDOT
- **Bridge Improvement Grant (BIG) Program** – major bridge funding source through SDDOT
- **LIIP and transportation economic development grants** – when tied to economic growth.



Prioritized Project List

The next three pages include a phased project list including countermeasures based on the High Injury Network, Screening Analysis, and benefit-cost analysis to determine specific project countermeasures and planning-level costs. These tables are intended to assist with programming of future Capital Improvement Plan budgets and with the countermeasures that should be included as the engineering design process proceeds.

In many cases, a project location includes more than one phase of countermeasures. Keep in mind that the evaluation process will determine if the second and/or third phases of countermeasures are needed based on analysis of the Lincoln County SAT through updated crash data and safety data.

The first two pages are Lincoln County jurisdictional project with county highways and roadways. The third page is a list of South Dakota Department of Transportation (SDDOT) jurisdictional roadways. These lists will give each Lincoln County and SDDOT with a clear understanding of the roadway safety priorities for Lincoln County.

11. Implementation Plan

Lincoln County Projects - Lincoln County SS4A Area

Rank	Location	Project	Quick Build	Cost	Countermeasures	Cost	Term
1	County Road 105 from 275th to 277th Street - 2 miles	Overall Corridor	Wider Edge Line	\$12,000	Safety Edge	\$30,000	Short
			Speed Limit Adjust	\$10,000	Corridor Access Man	\$300,000	
			Shoulder and Centerline Rumble Strips	\$10,000	Increase shoulder 2-4 feet	\$540,000	
				\$8,000	Roadside barrier	\$400,000	
				\$40,000	Lighting	\$150,000	
						\$1,420,000	
1a	County Road 105 from 275th to 277th Street	CR 105/275th Street			Left/Right Turn Lanes	\$800,000	Short
					Lighting	\$150,000	
					Roundabout	\$1,800,000	Long
1b	County Road 105 from 275th to 277th St	CR 105/276th Street			Roundabout	\$1,800,000	Short
					Lighting	\$150,000	2026
1c	County Road 105 from 275th to 277th Street	CR 105/277th Street	Low Cost Stop Control Countermeasures	\$20,000	Lighting	\$150,000	Short
			Stop Sign Retroreflectivity	\$2,000	Left/Right Turn Lanes	\$800,000	
3	County Road 106 from I-29 to Western Ave	Corridor	Remove Fixed Objects	\$40,000	Lighting	\$300,000	Short
			Speed Feedback Signs	\$40,000	Corridor Access Man.	\$300,000	
			Narrow Lanes	\$24,000			
3a	LC 106/Western	Intersection			Roundabout	\$1,800,000	2030
4	County Road 135 from 480th to 481st Ave	Corridor/ Intersections	Wider Edge Line	\$12,000	Wider Shoulders, 4 ft	\$400,000	Mid
			Speed Limit Adjust	\$10,000	Safety Edge	\$10,000	
			Enh. Curve Delineation	\$40,000	Lighting	\$250,000	
			Speed Feedback Signs	\$24,000	Sidepath	\$250,000	
			Shoulder Rumble Strips	\$5,000			
			Pavement Friction Man.	\$30,000			
			Remove Fixed Objects	\$25,000			
8	Cliff Avenue (CR 123)	Corridor	Speed Feedback Signs	\$24,000	Corr. Access Management	\$150,000	Mid
8a	Cliff and 85th Street	Intersection			City of Sioux Falls Jurisdiction		
8b	Cliff and Co Rd 106	Intersection	Low Cost Stop Control	\$20,000	Signal	\$300,000	Mid

Short-term	0-5 years
Mid-term	5-12 years
Long-term	13 or more years

11. Implementation Plan

Rank	Location	Project	Quick Build	Cost	Countermeasures	Cost	Term
9	County Road 116 from CR 105 to I-29	Corridor	Speed Limit Adjust	\$20,000	Lighting for 4 mile corridor	\$1,000,000	Mid
			Remove Fixed Objects	\$50,000	Is Shoulder already 5 or more feet???	\$1,000,000	
			Speed Feedback Signs	\$24,000	Left/Right Turn Lanes	\$400,000	
			Wider Edge Line	\$36,000	increase shoulder width?		
			Centerline Rumble Strips	\$16,000			
9a	LC 116 / 467th Ave	Intersection			Lighting		Mid
9b	LC 116 / 468th Ave	Intersection			Lighting		Mid
9c	LC 116 / LC 111 (469th Ave)	Intersection	Remove Fixed Objects	\$25,000			
			Stop Control Enhance	\$20,000			
			Stop Sign Retroreflectivity	\$2,000			
12	Lincoln County 111 and 69th Street	Intersection	Stop Control Enhance	\$20,000	Roundabout	\$1,800,000	Mid
			Stop Sign Retroreflectivity	\$2,000	Lighting	\$150,000	
13	Lincoln County 105 and Lincoln County 106	Intersection	Stop Control Enhance	\$20,000	Roundabout	\$1,800,000	Long
16	Southeastern Ave and Lincoln Co. 106	Intersection			Roundabout	\$1,800,000	Long
					Lighting		
18	Lincoln Co 110 and Lincoln County 117	Intersection	Stop Control Enhance	\$20,000	Roundabout	\$1,800,000	Mid
19	Lincoln County 152 and Lincoln County 143	Intersection			Reconstruct to 2-way stop	\$2,500,000	Mid
					& remove curves		
21	Lincoln Co. 152 from 7th to Wheelock St. In Hudson 1/2 mile	Corridor	Wider Edge Line	\$3,000	SafetyEdge	\$5,000	Mid
			Curve Delineation	\$10,000	Roadside Design at Curves	\$5,000	
			Shoulder Rumble Strips	\$2,500	Widen Shoulder 2 to 4 ft	\$200,000	
			Remove Fixed Objects	\$10,000			
			Pavement Friction Man.	\$15,000			

Short-term	0-5 years
Mid-term	5-12 years
Long-term	13 or more years

11. Implementation Plan

Rank	Location	Project	Quick Build	Cost	Countermeasures	Cost	Term
22	Lincoln Co. 135 from LC 122 to Canton	Corridor	Wider Edge Line	\$12,000	SafetyEdge	\$20,000	Mid
			Appropriate Speed Limit	\$10,000	Guardrails at Steep Ditches	\$60,000	
			Enh. Delineation Curves	\$40,000	2-4 feet paved shoulders	\$400,000	
					Lighting	\$500,000	
22a	LC 135 and LC 122	Intersection	Stop Control Enhance	\$20,000	Left/Right Turn Lanes		Mid
					Lighting		
22b	LC 135 and 280th Street	Intersection	Pavement Friction Man.	\$15,000	Lighting		Mid
24	273rd from 468th to LC 111	Corridor	Wider Edge Line		SafetyEdge		
	Tea Growth Area		Approp Speed Limit		Corridor Access Management		
	Township Road		Speed Feedback Signs		Guardrails at Steep Ditches		
			Shoulder Rumble Strips		Install Roadside Barrier		
24a	273rd and 468th	Intersection	Remove Fixed Objects				
24b	LC 110 (273rd St) / LC 111	Intersection	Stop Control Enhance	\$20,000	Left/Right Turn Lanes	\$400,000	Mid
			Pavement Friction Man.	\$15,000	Lighting		
25	Lincoln Co. 135 from Spruce PI to LC 106	Corridor	Wider Edge Line	\$12,000	SafetyEdge	\$20,000	Long
			Appropriate Speed Limit	\$10,000	Shoulder to 2-4-ft Paved	\$600,000	
			Shoulder Rumble Strips	\$10,000	Lighting	\$500,000	
			Remove Fixed Objects	\$40,000			
25a	Lincoln Co. 135 and Lincoln Co. 106	Intersection	Remove Fixed Objects	\$25,000	Left/Right Turn Lanes	\$400,000	Long
			Pavement Friction Man	\$15,000	Lighting	\$150,000	
25b	Lincoln Co. 135 and 272nd Street	Intersection	Stop Control Enhanc	\$20,000	Left/Right Turn Lanes	\$400,000	Long
					Lighting	\$150,000	
26	Lincoln Co. 117 and Lincoln Co. 140	Intersection	Stop Control Enhance	\$20,000	Left/Right Turn Lanes	\$400,000	Long

Short-term	0-5 years
Mid-term	5-12 years
Long-term	13 or more years
Separate Jurisdiction	

11. Implementation Plan

Rank	Location	Project	Quick Build	Cost	Countermeasures	Cost	Term
27	Lincoln County 102 from SD 11 to LC 135	Corridor	Speed Limit Adjust	\$10,000	reduce lane width Lighting Widen Shoulder 2→4 ft	\$300,000 \$600,000	Long
28	LC 143 north Hudson	Corridor			Pave 2-ft Shoulder	\$100,000	Long
29	LC 140 from 465th Ave to LC 105	Corridor	Pavement Friction Man.	\$30,000	Widen Shoulder 2→4 ft	\$300,000	Long
29b	LC 140 / LC 105	Intersection	Pavement Friction Man. Low Cost Stop Control	\$15,000 \$20,000			

Short-term	0-5 years
Mid-term	5-12 years
Long-term	13 or more years

SDDOT Projects Within Lincoln County SS4A Area

Rank	Location	Project	Countermeasure (Quickbuild)	Cost	Countermeasures	Cost	Year	Term
2	LC 110/ SD 11	Intersection	Stop Control Countermeasures Stop Sign Retroreflectivity	\$20,000 \$2,000	Intersection Improvements Lighting	\$1,800,000 \$150,000	2034	Mid
5	LC 116/ SD 11	Intersection	Stop Control Countermeasures 4-way Stop Stop Sign Retroreflectivity	\$20,000 \$2,000	Intersection Improvements	\$1,800,000	2034	Mid
6	SD 11 from 69th to LC 106	Corridor	Wider Edge Line		Lighting Corridor Access Management Intersection Improvements	\$150,000 \$150,000/mile	2030	Short
6a	SD11/85th St	Intersection	Stop Control Countermeasures	\$20,000	Lighting	\$1,800,000	2030	Short
6b	SD11/LC 106	Intersection	Stop Sign Retroreflectivity	\$2,000	Signal Left/Right Turn Lanes Lighting Intersection Improvements	\$300,000 \$400,000 \$150,000	2030	Short

Short-term = 0 to 5 years
Mid-term= 5-15 years
Long-Term = 15 or more years

11. Implementation Plan

Rank	Location	Project	Countermeasure (Quickbuild)	Cost	Countermeasures	Cost	Year	Term
7	SD 115/ LC 116	Intersection	<i>**A four-way stop was added while this plan was being prepared. Review if future countermeasures are needed.</i>		Roundabout Intersection Improvements	\$1,800,000	2036	Mid
9e	LC 116/129 Ramps	Intersection/ Ramp	Remove Fixed Objects Stop Control Enhancements Stop Sign Retroreflectivity	\$20,000 \$2,000	Lighting	\$150,000		Long
10	SD 46/ 473rd St.	Intersection	Stop Control Countermeasures Pavement Friction Man.	\$20,000	Intersection Improvements	\$1,800,000		Long
11	SD 115/ LC 106	Intersection			Data could reflect crashes before intersection redesign			
14	SD 115/ LC 110	Intersection			Lighting Intersection Improvements	\$1,800,000 \$150,000		Long
15	US 18/ LC 105	Intersection	Stop Control Enhancements Stop Sign Retroreflectivity	\$20,000 \$2,000				Long
17	US 18 (285 St) & I-29 Ramps	Interchange	Remove Fixed Objects Stop Control Enhancements	\$20,000	Intersection Improvements			Long
20	SD 11/ 280th St	Intersection	Stop Control Enhancements Stop Sign Retroreflectivity Pavement Friction Man.	\$20,000 \$2,000	Lighting Intersection Improvements	\$400,000 \$150,000		Long
23	SD 44 from 468th to LC 111	Corridor	Remove Fixed Objects Stop Control Enhancements Pavement Friction Man.	\$20,000	Intersection Improvements			Long
27a	LC 102 (69th St)/ SD 11	Intersection			Will be done with Veterans Pkwy 2027			
30	SD 11 / LC 148	Corridor	Stop Control Enhancements	\$20,000				

** Intersection Improvements may include several countermeasures including turn lanes, lighting, signal, stop signs, and roundabouts

Short-term	0-5 years
Mid-term	5-12 years
Long-term	13 or more years
Separate Jurisdiction	



Appendix

1. Stakeholder Interview Report
2. Public Engagement Survey Report
3. Tech Report – HIN Network
4. Tech Report – Risk Factor Analysis
5. Tech Report - Countermeasure Selection Documentation
6. Self-Certification Checklist (completed)

Appendix:
1. Stakeholder Interview Report

Lincoln County SS4A Action Plan SAT Interview Summary

This document summarizes interviews conducted with members of the Study Advisory Team for Lincoln County, South Dakota, as part of the Safe Streets for All (SS4A) planning process. The primary goal of these interviews is to identify and understand the key safety concerns and potential improvements related to the Lincoln County road system. These conversations explored current maintenance practices, reporting systems, specific high-risk locations, and future strategies for enhancing road safety within the county. The insights gathered will be used to inform the development of a comprehensive safety action plan.

Major Safety Themes

Based on the interviews, several consistent themes emerged regarding road safety in Lincoln County:

1. **Problem Intersections:** Multiple interviewees identified specific intersections with challenging designs and limited safety countermeasures as contributing to safety hazards. The complexity and unconventional layouts of these intersections can lead to driver confusion and increased accident risk. These are the unsafe conditions that were discussed during the interviews:
 - Inadequate lighting, especially at night
 - Lack of clear signage or faded road markings
 - Confusing or complex intersection layouts
 - High traffic volumes during peak hours
 - Speeding vehicles approaching intersections
 - Insufficient turn lanes
 - Frequent stop sign running or failure to yield
 - Lack of traffic calming measures in high-risk areas
2. **Shoulder Width and Edge:** The consistent theme throughout all the interviews are narrow shoulder widths. The presence of narrow shoulder widths, often combined with steep ditch slopes, reduces the recovery space available to drivers who veer off the roadway. This increases the likelihood of accidents and the potential for serious injuries. Concerns were raised regarding uneven transitions between the road shoulder and the adjacent natural ground. Semi-truck drivers have reported feeling unsafe due to the potential for soft or unstable ground alongside the roadway, which could increase the risk of rollovers if they were to inadvertently drift off the paved surface. It was reported that the lack of shoulder width is a safety concern for law

enforcement due to unsafe conditions when conducting traffic stops. Additionally, slow moving farm equipment have limited space to allow for passing vehicles.

3. **Curves:** Roadways with challenging curves leading into intersections were repeatedly cited as a concern. These curves can reduce visibility and create difficult driving conditions, particularly for individuals unfamiliar with the area.
4. **Coordination with State Highways:** Addressing safety issues at intersections between county roads and state highways presents jurisdictional challenges. Collaborative efforts between the county and state transportation agencies are essential to implement effective safety improvements at these locations.
5. **Milling and Overlay Practices:** The county's existing practice of milling and overlaying roads, coupled with the strategic use of millings as shoulder material, has proven effective in incrementally improving shoulder width. This cost-effective approach contributes to enhanced safety and is a valuable component of the county's road maintenance strategy.
6. **Road Base Degradation:** Deteriorating road bases beneath asphalt surfaces reduce pavement lifespan and increase maintenance needs. This has prompted a shift towards more comprehensive solutions like full-depth reclamation and base stabilization to ensure long-term road integrity and safety.
7. **Traffic Impact:** Heavy truck and farm equipment traffic, particularly in the southern portions of the county, contributes to accelerated pavement wear. Understanding these traffic patterns is crucial for prioritizing maintenance and implementing appropriate road design and material strategies.
8. **Stop Sign Visibility:** There have been concerns raised regarding drivers failing to observe or running through stop signs at particular intersections. These concerns highlight the need to enhance signage and visibility at these locations.
9. **Guardrails:** It has been identified that steep drop-offs and ditch slopes may warrant the installation of guardrails or guard cables to prevent vehicles from leaving the roadway and potentially causing more serious accidents.
10. **Population Growth:** The county is experiencing population growth, which is impacting the amount of traffic. As population increases, it is important to proactively address the safety concerns.
11. **Reporting System Usage:** The county's online system for residents to report road safety concerns is currently utilized and provides a valuable channel for identifying

potential issues. Further investigation will be needed to discover out how the reporting system can be utilized to its full potential.

12. Prison Construction Impact: The future construction of a new prison within the county is anticipated to increase traffic volume, particularly truck traffic. This increase necessitates proactive safety improvements at key intersections to mitigate potential risks.

13. Driver Behavior: Driver behavior and distracted driving has created safety concerns on county roads.

Locations of Safety Concern

The following roadways and intersection were identified by SAT and county personnel during the interviews.

- **County Road 143 (Spur Ave) and CR 152 (294th Street):** This intersection, resembling half of a cloverleaf, is difficult to navigate and is slated for redesign pending funding.
- **Intersection of State Highway 115 and 276th St (County Road 116):** Characterized as a narrow intersection with a two-way stop, it has a history of crashes.
- **State Highways intersecting County Highways:** There have been issues of people driving through stop signs on intersecting county roadways. The State Highways are Highway 44, 115, 11, 46. Generally, the most accidents happen in the north half of the county due to higher average daily traffic.
- **Areas with steep ditch slopes:** Locations where steep drop-offs exist near the roadway edge pose a hazard to vehicles that leave the road.

Desires for Improved Safety

The study advisory team and county personnel that were interviewed expressed several common goals for enhancing road safety:

- **Redesigning dangerous intersections:** Prioritizing the redesign of hazardous intersections to improve sightlines, simplify navigation, design additional countermeasures and reduce the risk of accidents.
- **Shoulder widening:** Continuing and expanding efforts to widen shoulders during overlay projects to provide drivers with additional recovery space and reduce the severity of run-off-road incidents.

- **Base stabilization:** Implementing full-depth reclamation and base stabilization techniques to extend pavement life, reduce maintenance needs, and create a more durable road surface.
- **Guardrail Installation:** Installing guardrails or guard cables in areas with steep drop-offs to mitigate the risk of severe accidents.
- **Improved Signage:** Enhancing the visibility and conspicuity of stop signs at problematic intersections.
- **Funding:** Secure funding to implement safety improvements.

Conclusion

In summary, the SAT interviews revealed several key safety concerns on Lincoln County roads, including challenging intersection designs, inadequate shoulder widths, pavement degradation, and issues with traffic control device visibility. The insights from these interviews will be used to help develop a survey of Lincoln County residents. Both the SAT interviews and survey will be used as one important component of public engagement for an effective safety action plan for Lincoln County. The Action Plan will allow the County to actively pursue strategies to address these concerns through targeted countermeasures, improvement projects, and interagency collaboration.

Appendix:
2. Public Engagement Survey Report

Social Pinpoint Survey Results – what do the results tell us?

As a part of the public engagement process for the Lincoln County SS4A Action Plan, an on-line survey was conducted through the project website (Social Pinpoint). The survey was conducted from April through June. To this point, 336 completed the survey, and this information will be utilized to help provide a direction for the Lincoln County SS4A Action Plan. Below are results through May 20th from the survey and how the results should be used moving forward.

Question 2: On a scale from 1 to 5, to what degree are the following safety issues while traveling in Lincoln County?

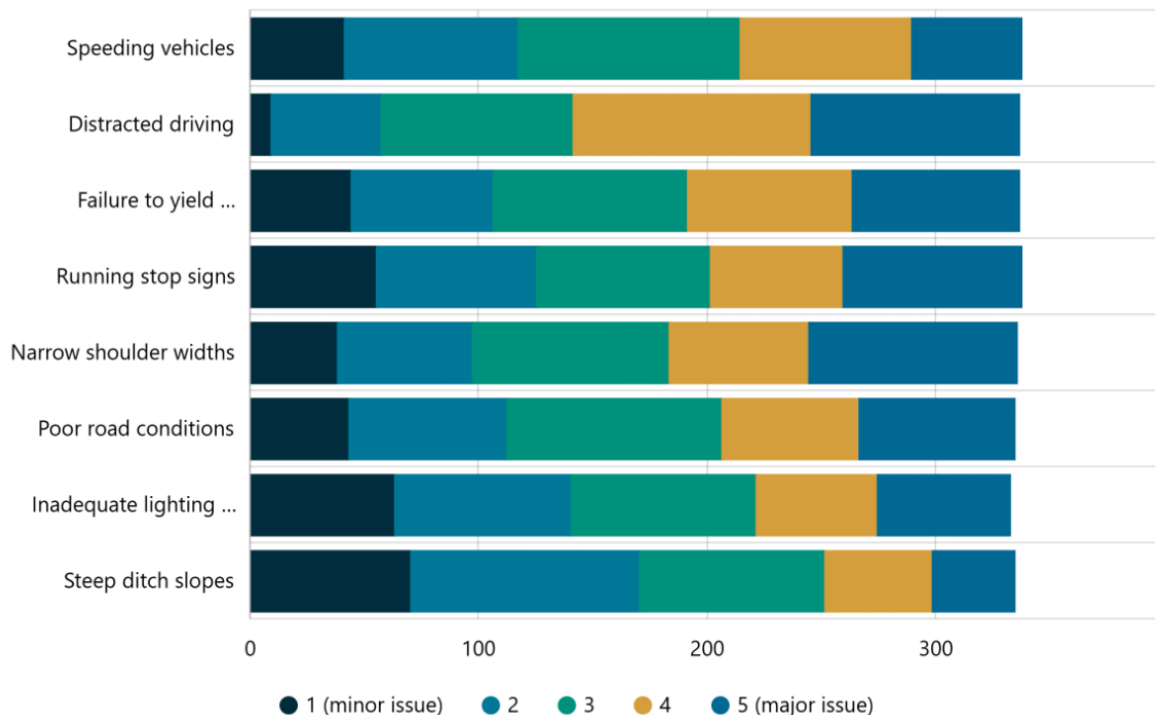
The top ranked issues were

- Distracted Driving – 58% major issue (4 or 5)
- Narrow Shoulders – 45% major issue (4 or 5)
- Failure to yield right-of-way – 43% major issue (4 or 5)

The top ranked safety issue was distracted driving by a fair amount over narrow shoulders and failure to yield the right-of-way.

2. On a scale of 1 to 5, to what degree are the following safety issues while traveling in Lincoln County? (Select all that apply)

Matrix | Skipped: 0 | Answered: 337 (100%)



Question 3: On a scale of 1 to 5, how safe do you feel using the following modes of transportation in Lincoln County? (1 = Very Unsafe, 5 = Very Safe)

The modes in which people felt the safest included:

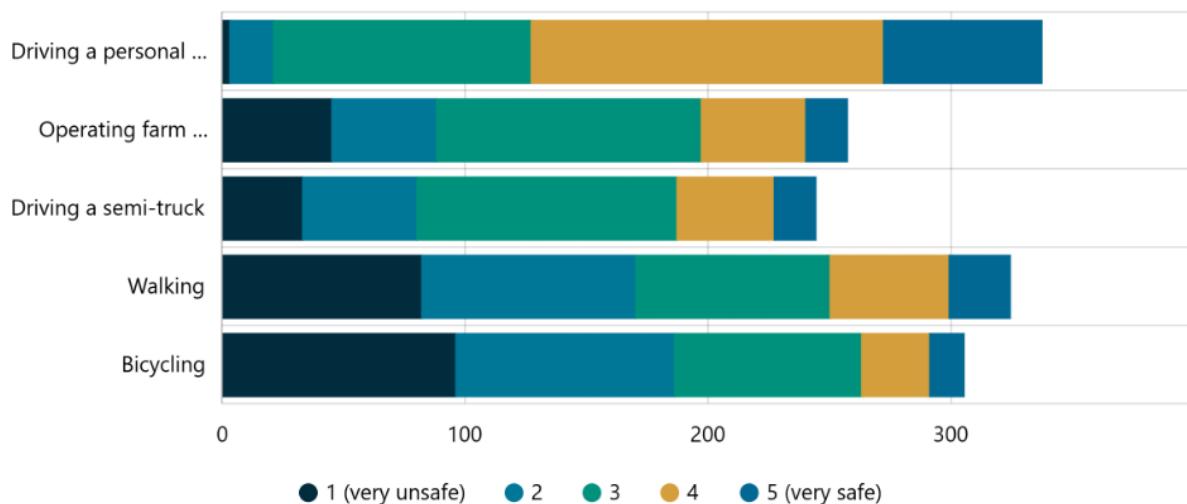
- Driving a personal vehicle – 19% very safe – 62% safe & very safe

The modes in which people felt the least safe included:

- Bicycling – 31.5% very unsafe – 61% unsafe & very unsafe
- Walking – 25% very unsafe – 52% unsafe and very unsafe

3. On a scale of 1 to 5, how safe do you feel using the following modes of transportation in Lincoln County? (1 = Very Unsafe, 5 = Very Safe)

Matrix | Skipped: 0 | Answered: 337 (100%)



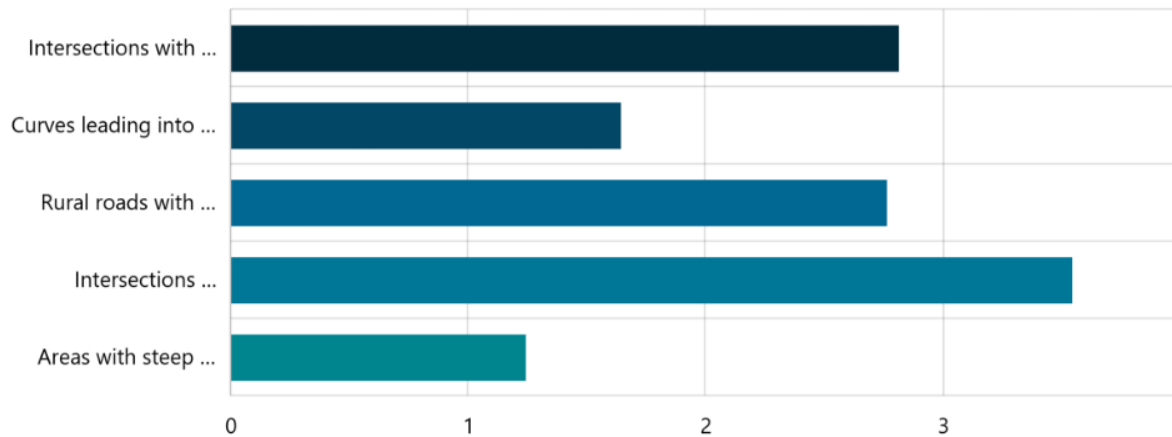
Question 4: Which of the following locations do you consider most dangerous for travelers in Lincoln County? (Select up to 3)

- Intersections between county roads and state highways – 269 selected
- Rural roads with narrow shoulders – 230 selected
- Intersections with challenging designs – 222 selected
- Curves leading into intersections – 146 selected
- Areas with steep ditch slopes – 117 selected

The results here show that the top three are generally all considered a priority by the survey respondents. However, quite a few also still picked the bottom two responses.

4. Which of the following locations do you consider most dangerous for travelers in Lincoln County? (Select up to three)

Ranking | Skipped: 9 | Answered: 328 (97.3%)



Question #5: Rank the following factors that you believe contribute to unsafe conditions on Lincoln County roads?

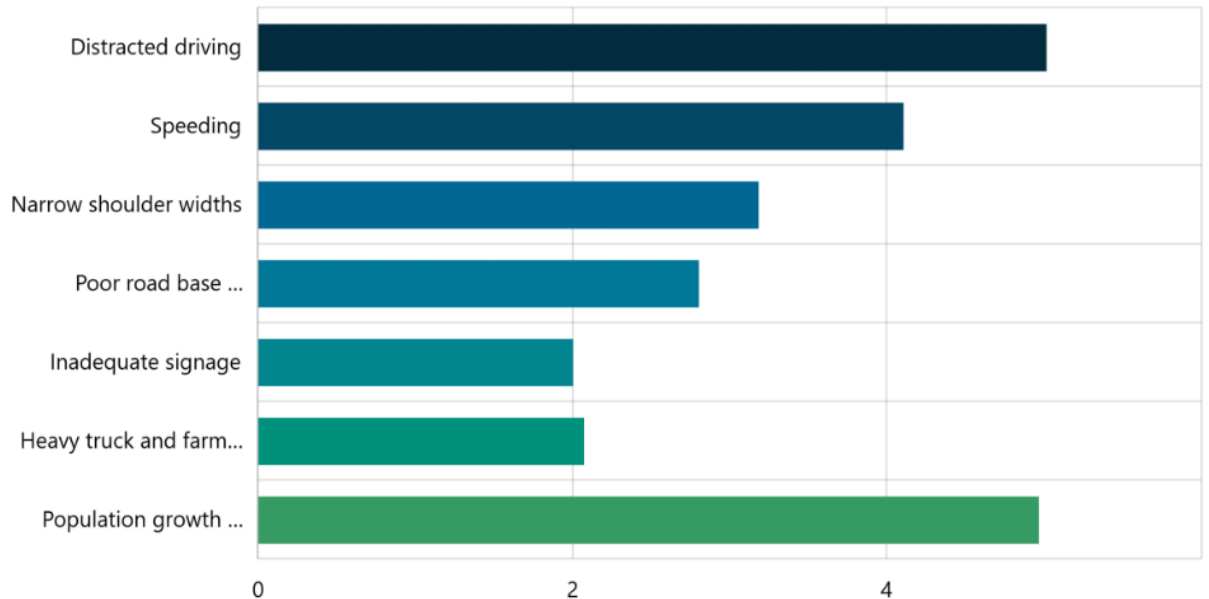
- Distracted Driving – 2.33 average rank (38% ranked #1)
- Population Growth – 2.62 average rank (27% ranked #1)
- Speeding – 2.97 average rank (24% ranked #1)
- Narrow Shoulders – 3.74 average rank (9% ranked #1 – 44% ranked in top 3)
- Poor road base conditions – 4.19 average rank (12% ranked #1 – 39% ranked in top 3)
- Heavy truck and farm equipment traffic - 4.86 average rank
- Inadequate signage – 5.04 average rank

The three highest ranked items were all fairly close – distracted driving, population growth, and speeding.

Narrow shoulders and poor base conditions were also ranked in the top three for quite a few people

5. Rank the following factors that you believe contribute to unsafe conditions on Lincoln County roads?

Ranking | Skipped: 1 | Answered: 336 (99.7%)

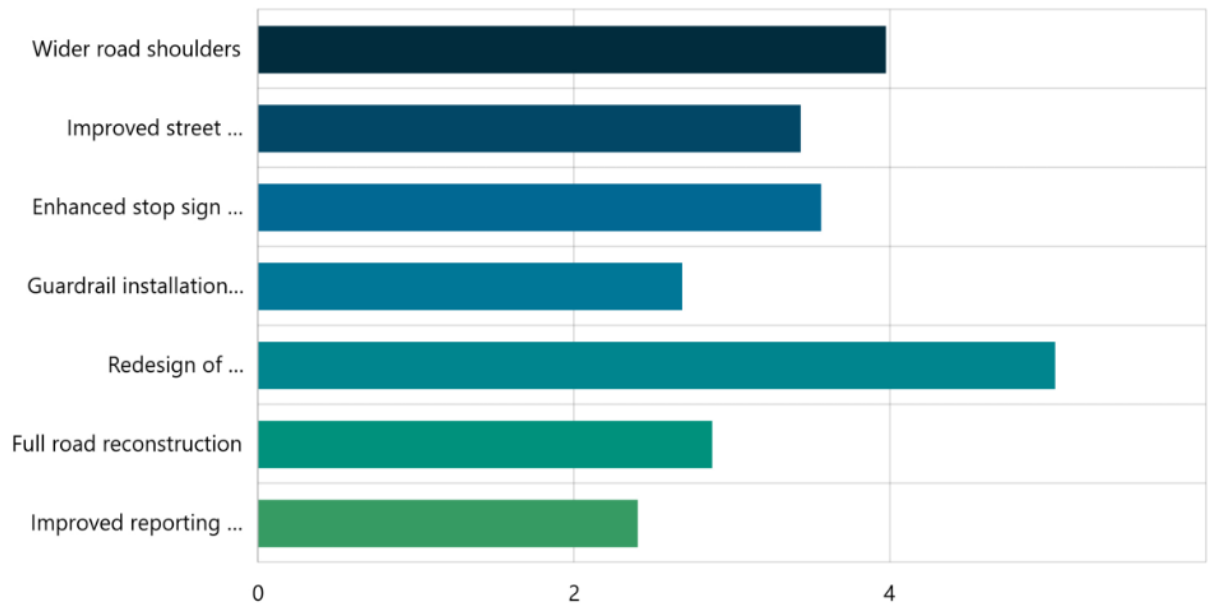


Question #6: Rank the following safety improvement you would like to see implemented in Lincoln County

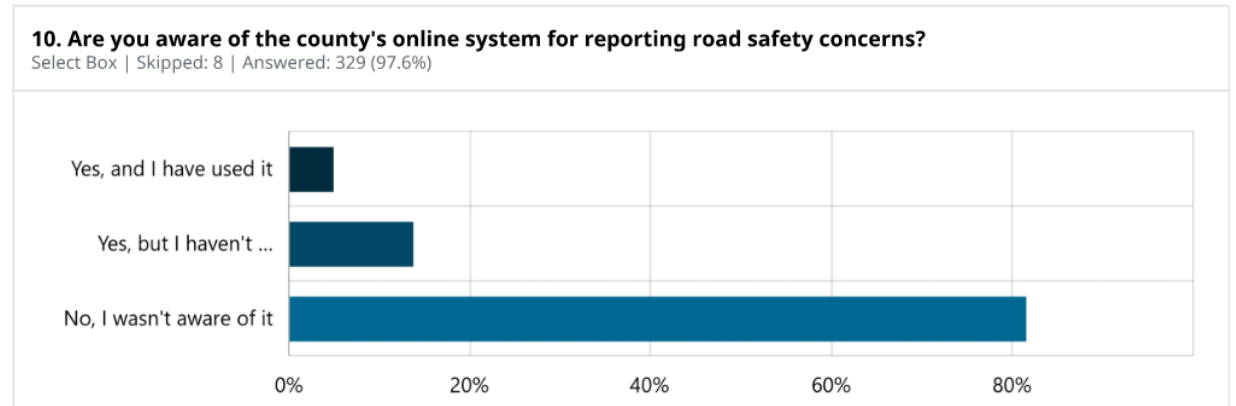
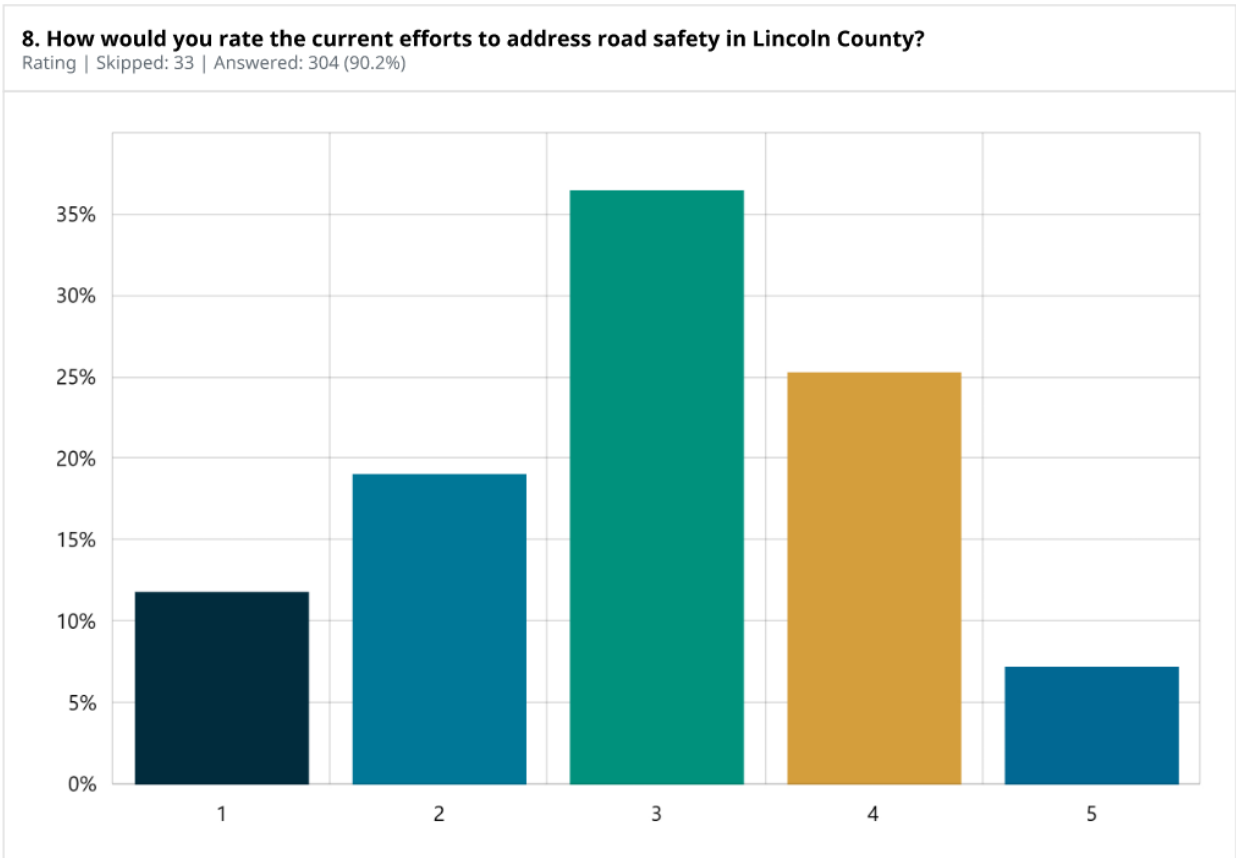
- Redesign of dangerous intersections – 2.25 average rank (44% selected as #1 rank)
 - Wider road shoulders – 3.11 average rank (25% selected as #1 rank)
 - Enhanced stop visibility – 3.47 average rank (10% selected as #1 rank)
 - Improved street lighting at intersections – 3.56 average rank (14% selected as #1 rank)
 - Full road reconstruct – 4.03 average rank (17% selected as #1 rank)
 - Guardrail installation in high risk areas – 4.27 average rank (6% selected as #1 pick)
 - Improved reporting system – 4.69 average rank (8% selected as #1 pick)
-
- Redesign of dangerous intersections was the clear #1 and was in top 3 for 81.94% of respondents
 - Wider road shoulders were in the top 3 for 64% of respondents
 - Enhanced stop visibility was in the top 3 for 57% of respondents
 - Improved street lighting at intersections was in top 3 for 52% of respondents

6. Rank the following safety improvements you would like to see implemented in Lincoln County?

Ranking | Skipped: 8 | Answered: 329 (97.6%)

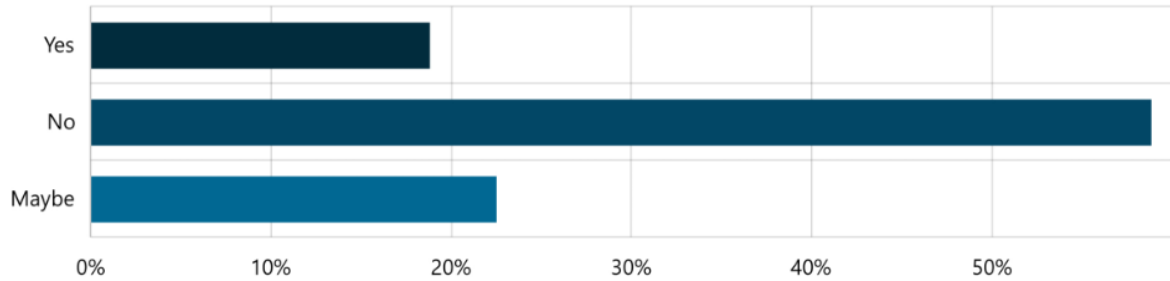


Question #8: How would you rate the current efforts to address road safety in Lincoln County?



11. Would you be interested in participating in future community meetings or workshops about road safety in Lincoln County?

Multi Choice | Skipped: 12 | Answered: 325 (96.4%)

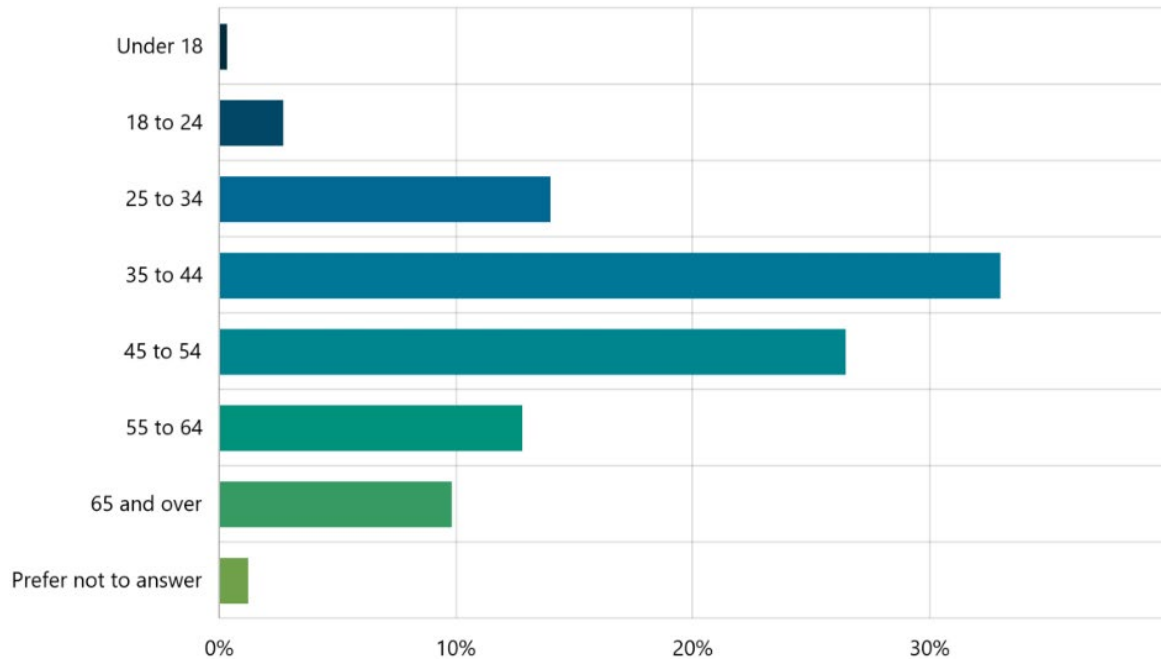


Age of Respondents

59% between the ages of 35 to 54

14. Which of the following best describes your age? Select one.

Multi Choice | Skipped: 0 | Answered: 337 (100%)

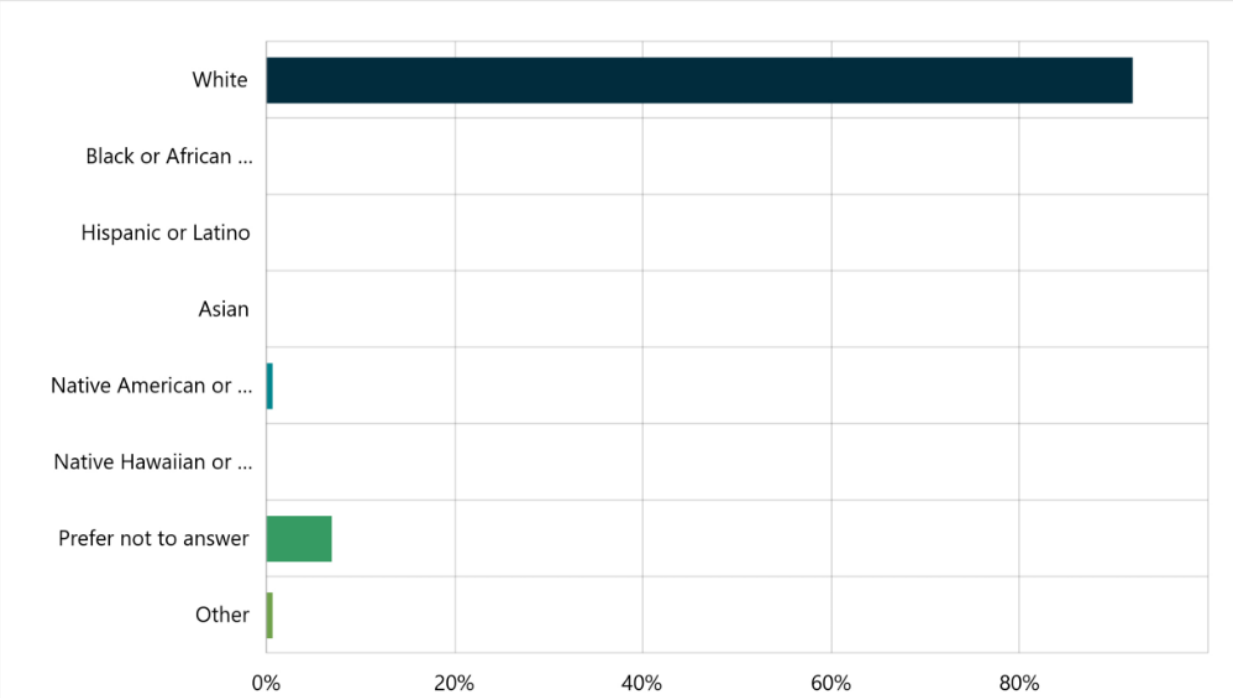


Race/Ethnicity

92% White

15. Which of the following best describes your race/ethnicity? Select all that apply.

Multi Choice | Skipped: 3 | Answered: 334 (99.1%)



A blurred background image showing the lower legs and feet of several people walking across a crosswalk on a city street. The image is out of focus, emphasizing movement and a public space.

Appendix: 3. Tech Report - HIN Network

To: Terry Fluit – Lincoln County, SD

From: Alta Planning + Design

Date: February 18, 2026

Re: High Injury Network Methodology

High Injury Network Development

Introduction

High Injury Networks (HIN) illustrate that often a small number of improvable roadways are responsible for a majority of life-altering crashes within a region. A HIN highlights crashes involving a fatality or severe injury, commonly referred to as KSI (killed or severely injured) crashes, while also incorporating the volume and distribution of crashes along a roadway network. Creating an HIN allows for a better understanding of the types of roadways where people driving, biking and walking are the most at-risk.

Alta developed an HIN for Lincoln County, SD. The resulting network can help responsible road authorities invest in meaningful improvements that will have the best safety outcomes for residents and visitors to the county. This memo explains Alta's approach to analyzing crash data and developing the HIN, alongside draft analysis results.

Inputs

HIN development requires two data sets, including a crash layer and a prepared roadway network. The following section details the collection and preparation of the two data sets.

Crash layer

Five-year crash data from 1/29/2020 – 1/6/2025 was used for the crash layer. This dataset included 6,101 total collisions of all severity levels, provided by the South Dakota Department of Public Safety. These collisions were inclusive of crashes involving motor vehicles, bicycles, pedestrians, and motorcycles within Lincoln County. Alta removed crashes on limited-access highways, interstates, ramps, and private roads from this analysis using ArcGIS Pro. The team then filtered remaining crashes to remove those with an injury severity of "Not Applicable" (assumed to be damage to parked cars) or "Wild Animal Hit" (randomly dispersed throughout the county). Crashes were also filtered to remove "Unknown" severity type crashes. Crashes were not normalized by traffic volumes.

Prepared Roadway Network

Street Centerlines were provided for the underlying roadway network, which included all roadways within Lincoln County. Alta first removed limited-access highways, interstates, ramps, and private roads. Then, Alta consolidated the divided roads so that each road was represented by one line, followed by merging road segments using the Dissolve Tool based on road name and functional classification. This eliminated any arbitrary splits in the centerline data.



To better reflect the surrounding county context, centerlines were divided into segments for rural or city/town analysis. Centerlines were divided into segments of approximately 800 feet each within the boundaries of cities and towns and ¼ mile each outside the boundaries of cities and towns, so that crashes could be summarized appropriately for the context. Unique IDs were also created for roadway segments.

Methodology

See **Figure 1** for a graphic overview of High Injury Network (HIN) creation, outlining the following process steps at a high level.

Alta Civic Analytics Explorer

Severity Weighting

- Minor Injury
- Serious Injury
- Fatality

Aggregate Weighting

- Lowest
- Highest

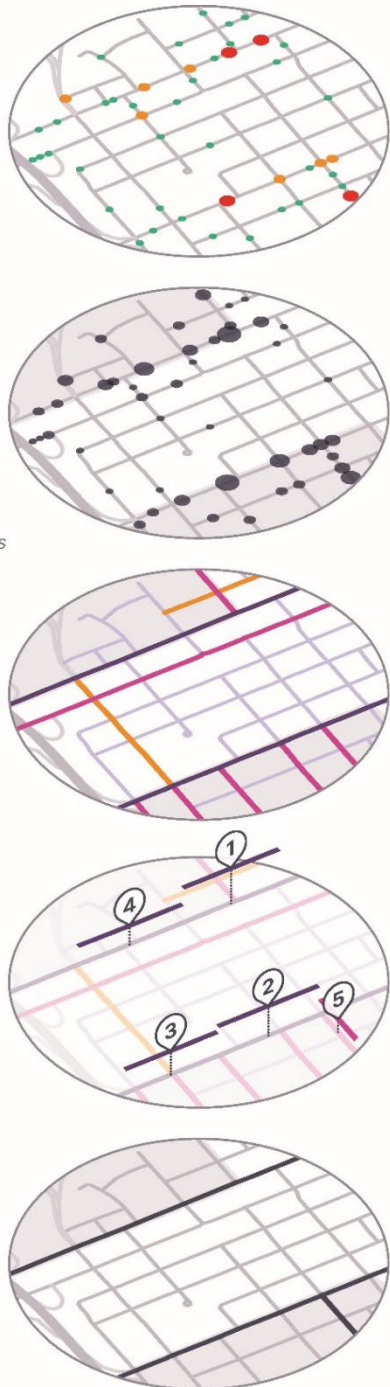
Highly Vulnerable Areas

Severity Index

- Lowest
- Highest

- 1 Order Segment is Added to High Injury Network

High Injury Network



Determining the High Injury Network

Severity Weighting

One goal of a High Injury Network (HIN) is to identify an improvable subset of a community's streets that address the majority of collisions where a victim is Killed or Severely Injured (KSI). To achieve this, KSI collisions are assigned higher scores so they have more "weight" relative to collisions with less tragic outcomes.

Other Considerations

These scores can also be modified to include other considerations such as whether collisions involve vulnerable road users (bicyclists and pedestrians) or occur in socially vulnerable communities. These factors can be directly incorporated into the weights associated with each collision.

Severity Index

After weights are developed, they are associated to the network, aggregated, and normalized so that we can understand the relative intensities of collisions of concern.*

Accumulated Collisions by Severity Index

Once an index is created, we progressively add segments to the HIN in the order indicated by the Severity index. As more segments are added to the network, we look at KSI (or other collisions of interest) directly on the network, and track the percentage of collisions on the network relative to the percentage of its length.

High Injury Network

At some point, a final High Injury Network determination is found based on stakeholder feedback and a qualitative review of when each additional mile added to the HIN starts to see a decreasing rate of severe collisions being added.

*There are many methods available develop a final index including kernel density estimation (euclidean or network based), rolling window analysis, or aggregations to a segment normalized by network miles.

Figure 1. Determining the High Injury Network (HIN) graphic

1. Prepared Crash Data

Using a visual examination, Alta removed any crashes near the boundary of Lincoln County whose associated roadway was not present in the provided street network. Each crash was provided with a weight using the numbers below as shown in **Table 1** based on the most serious injury sustained by any individual involved in the crash. Applying weights effectively prioritized areas where more serious crashes were occurring to identify areas where the most serious injuries could be reduced. These proportions were based on the ratio of the average cost to society from fatal and serious crashes compared to minor injury crashes. While some analyses weighed serious crashes higher in proportion to minor crashes, that could lead to every segment with a fatal crash being represented on the HIN. Using the ratios as shown in **Table 1** avoided overweighting fatal crashes that occurred as isolated events so that the HIN could only represent roadways with patterns of severe crashes. ¹

Table 1. Crash severity weighting scores

Crash Severity	Description	Weight
Fatal injury or serious injury	Fatal injury or incapacitating injury	4
Minor injury	Non-incapacitating injury	1
Property damage only	Possible injury or no injury	0.25

All KSI crashes were then snapped within 65 feet of the street centerline network to a prepared network segment (with possible distance adjustments after data review) and snapped to the highest functional class segment within 35 feet. This distance generally accounted for collisions on dual carriage roadways that occurred far from the now-consolidated centerline (such as wide highways) but was short enough to exclude collisions that occurred in parking lots adjacent to roadways.

2. Prepared Street Network

A Rolling Window / Sliding Window feature class was created where the lines were extended over each road segment approximately 50 percent of the length of the segment in each direction (see description of the Rolling Window Approach in **Figure 2**). Alta used custom splitting tools that have an overlap percentage (Wasserman, 2023). This process allowed rolling window statistics to be calculated on each road segment. The benefits of rolling window analysis include reducing the impact of dead-end streets, mitigating network segmentation artifacts, and removing impacts that anomalous crashes have on the final HIN. Fundamentally, this analysis captured the linear corridor crash patterns where they exist (Fitzpatrick, 2018)².

¹ There are many calculations of average cost of severe and fatal crashes. The ratio shown here is based on the FHWA's *Crash Costs for Safety Analysis* (Harmon et al, 2018), table 17. The weights shown here are proportional to the square root of average costs to society of serious crashes (fatal and serious injury) compared to the baseline of minor-injury crashes. Source: <https://safety.fhwa.dot.gov/hsip/docs/fhwasa17071.pdf>.

² These patterns would consider collisions that occurred indirectly on a particular segment to smooth out analysis results. Examples of this type of analysis are provided by FHWA in their [Guide Book on High Pedestrian Crash Locations](#).

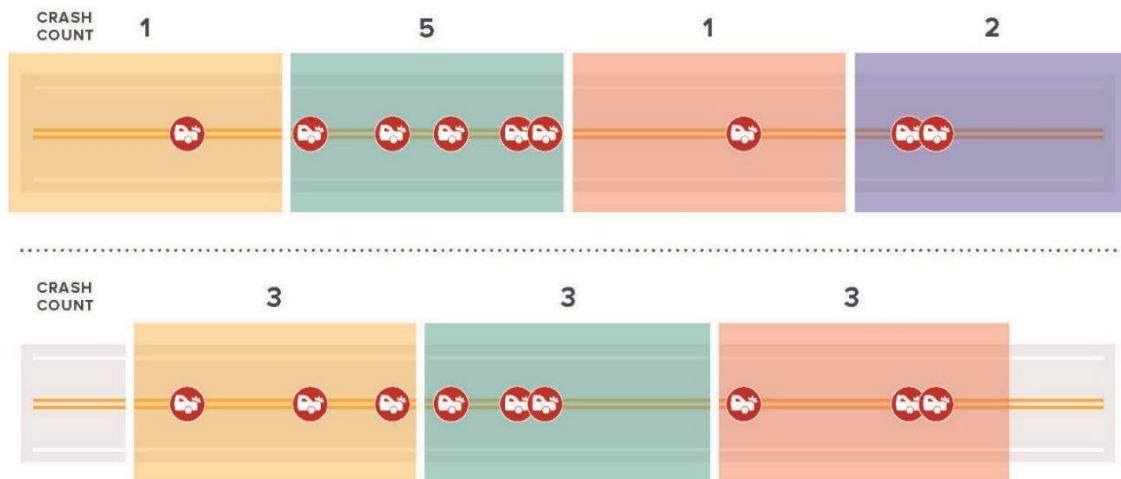
Alta Civic Analytics Explorer

Rolling Window Approach



Segmented roadways can be misleading.

The same roadway, segmented in two different ways, paints a different picture of where crashes are happening. Where segments get divided is somewhat arbitrary.



The rolling window approach more accurately represents crash count figures.

The rolling window approach helps mitigate bias caused by arbitrary segmentation.

Rolled crash counts are shown here for simplicity. In the analysis, a sum of crash weights is used, and then divided by the segment length to show the weighted crash rate per mile.

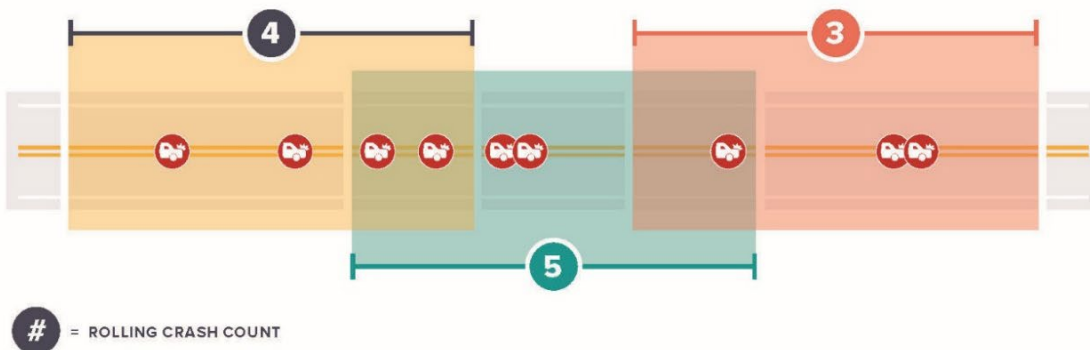


Figure 2. Rolling window approach

3. Applied Rolling Window Analysis

The crash layer was spatially joined to the rolling window road network and the summed rolling crash weight was calculated for each rolling road segment. This summed the weight of crashes on each rolling segment to reflect total crash severity on each segment. The sum of crash weights was divided by the length of the rolling road segment. This normalized the crash weight for the road length. However, for the purpose of calculating crash weight per road mile, any rolled segments of less than 800 feet were counted as 0.1 mile (528 feet), to avoid overrepresenting crashes on small road segments, as dividing by very small numbers yields very large numbers. The result was the crash severity index. The crash severity index was then joined from the rolling window layer back to the original centerline network to show the index on each segment.

4. Accumulated Crashes

Using Alta's custom-built HIN General tool, we began with segments with the highest crash weight per mile to progressively add segments to the HIN. This tool calculated the length in miles for each segment as it is added and kept track of the cumulative miles in the HIN and the number of crashes that occurred on those segments. It stopped when the designated threshold of KSI collisions had accumulated. The tool also generated a table that showed the number of crashes, and the number of roadway miles accounted for within each HIN segment.

Alta decided upon the threshold for the percentage of crashes included in the HIN by examining a graph of accumulated collisions and accumulated centerline miles and identified the natural inflection point in the data. This represented the point at which adding more roadways to the HIN had diminishing returns in terms of identifying more crashes. An example graph is shown below in **Figure 3**.

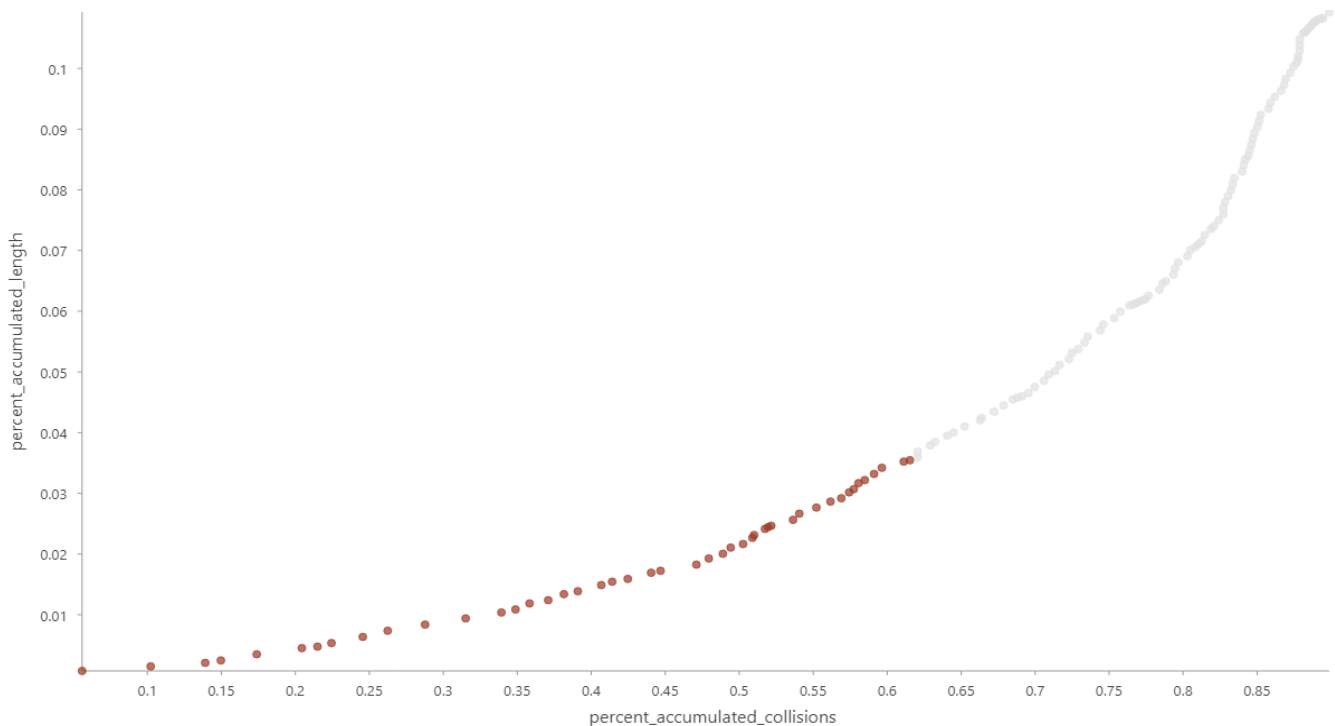


Figure 3. Example of a graph of accumulated collisions and accumulated centerline length. Collisions selected for the HIN are represented in brown.

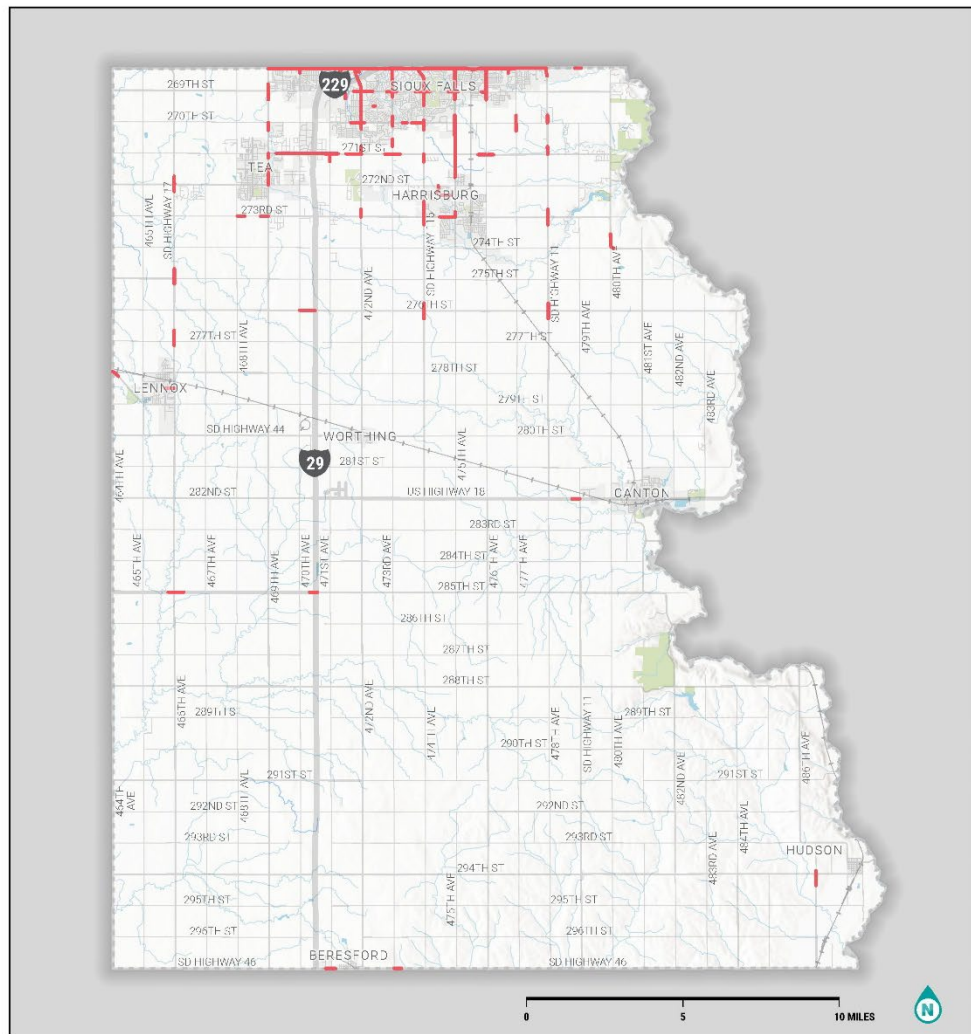


5. Final Refinement

The final refinement involved examining the map of qualifying HIN segments and performing manual cleaning output from the tool. This step eliminated segments that the tool may have selected where no crashes occurred. It also filled small gaps in otherwise contiguous networks on major roadways. Finally, the percentage of roadway miles and the percentage of KSI crashes were calculated and accounted for in the final HIN.

Findings

The highest concentration of HIN roadways can be found around the City of Sioux Falls and northern areas of Lincoln County, as shown in the map in **Figure 4** and online at [Lincoln Co, SD SS4A Action Plan](#).



HIGH INJURY NETWORK
LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

- Roadway on the HIN
- Railroads
- Jurisdiction Boundaries
- Lincoln County

Figure 4. High Injury Network map for Lincoln County

Alta analyzed 5,818 collisions, 151 of which were KSI crashes. Of those, 4,566 collisions (101 KSI collisions) were associated with roadways that weren't interstates or private roads and used to calculate the HIN. The HIN accounted for **75% of KSI crashes on 3%** of roadway centerline miles throughout the study area. See **Figure 5** for a graph of accumulated collisions and accumulated centerline lengths. Collisions selected for the draft 65% HIN are represented in red in **Figure 5**, and the final HIN (revised based on stakeholder feedback) added collisions up to 75%.

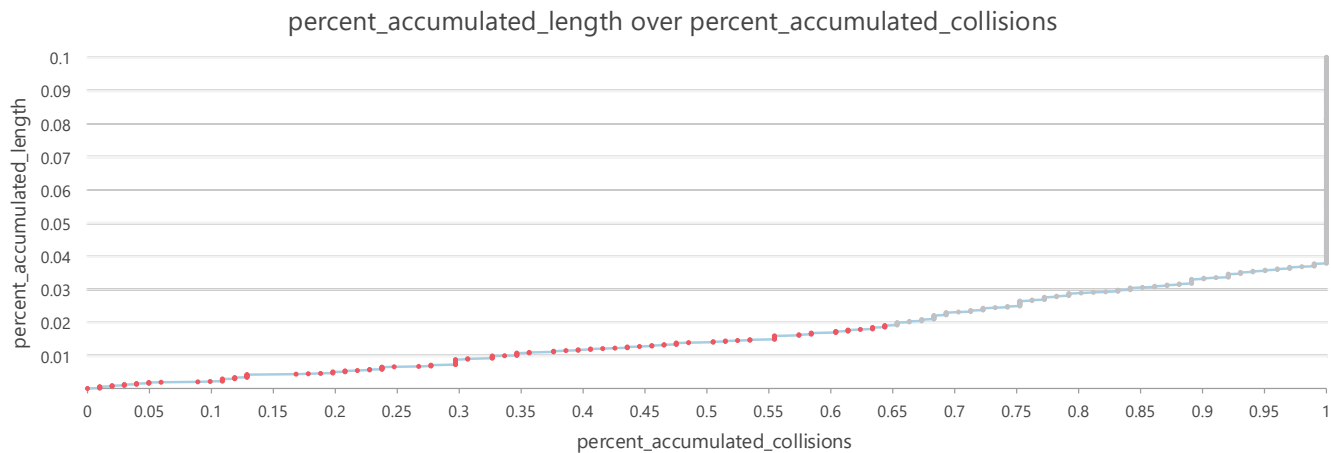


Figure 5. Chart of collisions cumulatively added to the draft HIN

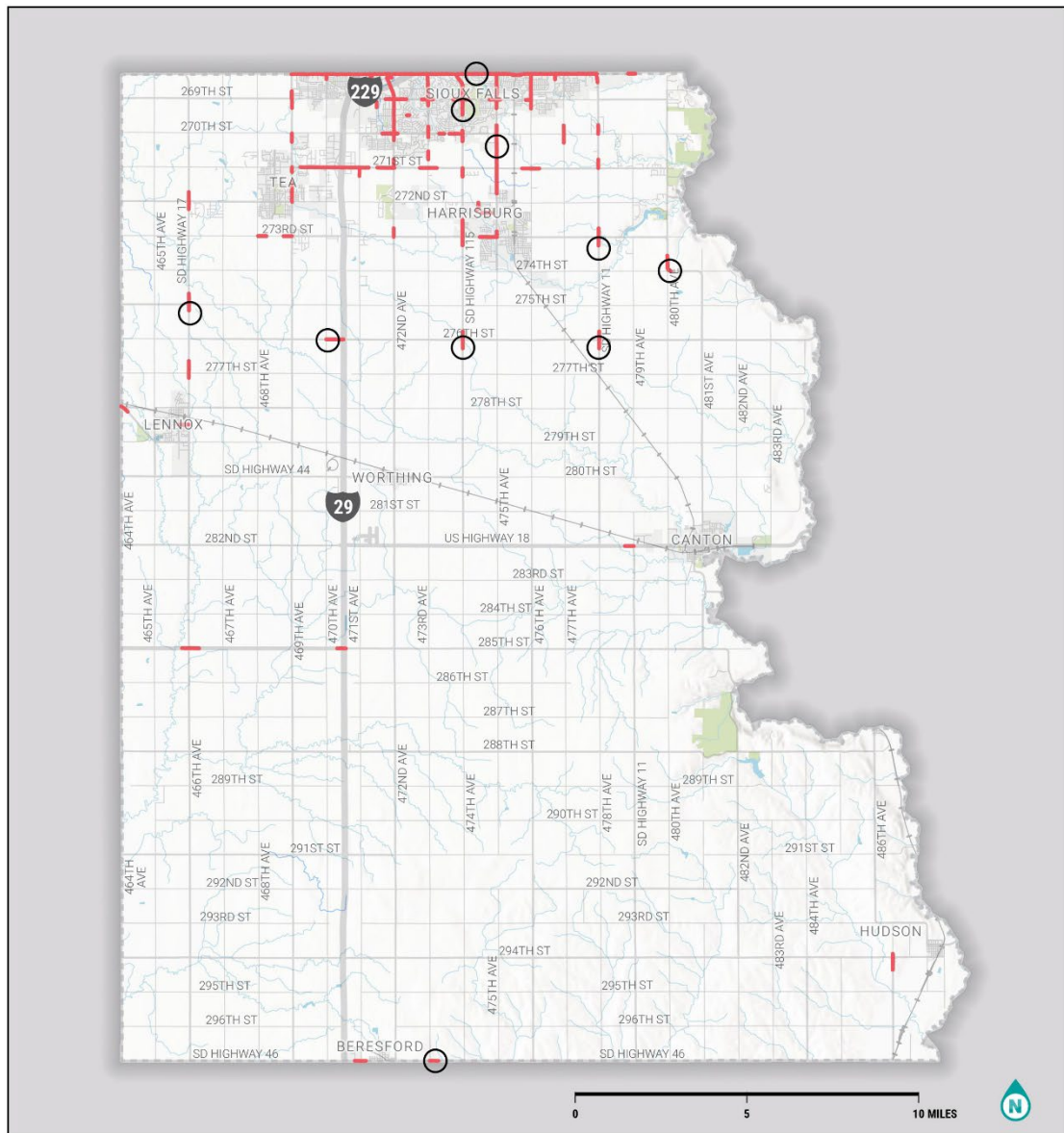
Key HIN Locations

The top three segments of the HIN by crash severity index had a combined 1 KSI crash and 229 non-KSI crashes and included the following:

- S Louise Ave between W 59th St and the I-229 crossing
- S Minnesota Ave south of the intersection with W 57th St
- S Louise Ave south of the I-229 crossing

Most crashes on the South Louisa Ave segments mentioned above were at a signal and the most common citation issued was following too closely. None of the crashes were KSIs, but the high number of minor injury and property damage-only crashes pushed them into the top-ranking segments.

Only 10 segments had more than one KSI crash. Unlike the HIN that is clustered on the northern edge of the county, the 10 segments with more than one KSI crash are dispersed around the county in more rural areas. There are two corridors with multiple of these high-KSI segments, including 276th St and SD Hwy 11 (shown in **Figure 6**). Half of the crashes along 276th St were angle crashes, which are frequently associated with severe crashes. Of these, common contributing factors were failure to yield the right of way and (to a lesser extent) speeding or driving too fast for conditions. The latter was cited around Hwy 29. At SD Hwy 11 and 273rd St, over half of the crashes near the intersection involved a collision with wildlife.



HIGH INJURY NETWORK
LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

- Roadway on the HIN
- Segment with >1 KSI Crash
- +— Railroads
- Jurisdiction Boundaries
- Lincoln County

Figure 6. Lincoln County HIN Highlighting Segments with More than One KSI Crash

The segment with the highest number of KSI crashes was a segment of SD-115 around the intersection of 276th Street. Three of the four KSI crashes occurred at night, and all were at the intersection, which is stop-controlled. The HIN is primarily located in the more urbanized areas of the county, particularly Sioux Falls. Much of the HIN (especially in the more rural parts of the county) are segments that pass through or approach intersections – there are fewer segments that are solely “mid-block.”

This does not necessarily mean that crashes on these segments happened at intersections. Most of the time, there was a mix of intersections and mid-block collisions where crashes occurred. Especially in the northern part of the county, there are relatively few locations to cross I-229. This likely means there is higher exposure (and therefore more crashes) on roadways that cross the interstate compared to other roadways with the same characteristics. These findings are highlighted in the HIN.

Additional HIN Trends

Angle crashes and **rear-end crashes** are over-represented on the HIN, compared to the county roadway network as a whole. Angle crashes represent 38% of HIN crashes compared to 26% of the countywide total. Rear-end crashes are also over-represented with 38% of HIN crashes compared to 27% of countywide crashes.

Table 2 shows the top four crash types resulting in a fatality or serious injury around the county, with their respective breakdown of KSI, KSI on the HIN, and all crashes. Angle crashes and single vehicle crashes are over-represented among serious crashes compared to the countywide roadway network. Angle crashes are prevalent among KSI crashes (31%) and KSI crashes on the HIN (46%), compared to countywide crashes overall (26%).

Single vehicle crashes, however, are over-represented among the total KSI collisions in the county, but they are directly proportional between KSI crashes on the HIN and countywide crashes. This likely reflects the more random nature of factors that can contribute to single vehicle crashes, such wildlife incidents, driving under the influence, or distracted driving. There can be spatial patterns within single-vehicle incidents, but overall they are more widely dispersed.

A few segments of the HIN with clusters of single-vehicle collisions include:

- S Cliff Ave from E 85th St to 271st St – three collisions, including two collisions with utility poles
- 271st St around Louise Ave and S Western Ave/473rd Ave – six collisions, including two alcohol-related
- 273rd At from 468th Ave to 469th Ave – three collisions, all alcohol or drug-related
- Spur Ave south of 294th St – two collisions, both driving too fast for conditions at a unique intersection design

Also of note, **head-on crashes** occur infrequently around the county, representing only 1% of total countywide crashes. Due to the impact energy of these collisions, however, they are disproportionately high among KSI crashes and KSI crashes on the HIN. Rear-end crashes present the opposite condition, where despite accounting for 27% of countywide crashes, they only represent 9% of KSI crashes.

Table 2. Crash Types Involved in KSI Crashes

Crash Type	% of All KSI Crashes	% of KSI Crashes on the HIN	% of all Countywide Crashes
Angle	31%	46%	26%
Head-on (front to front)	5%	7%	1%
Single vehicle collision	54%	35%	36%
Rear-end (front to rear)	9%	12%	27%

Members of the public identified **distracted driving** as a major safety concern across Lincoln County. Based on the five years of data in this study, around 6% of crashes across the county involved distracted driving (7% of crashes on the HIN and 6% off the HIN). Distracted driving did play a larger role in crashes with severe outcomes (7.3%) compared to crashes overall (6.0%).

Another theme from engagement and stakeholder conversations was **stop sign visibility**, especially at night. Across Lincoln County 62% of crashes occurred at night, consistent with the percent of crashes at stop-controlled intersections at night (62%). On the HIN 49% of crashes occurred at night, but 59% of stop-controlled crashes on the HIN occurred at night. These figures show the importance of addressing nighttime crashes more broadly, with some emphasis on stop-controlled collisions specifically.

The project team also looked for trends around crashes by roadway surface type and those involving an unlicensed driver, however there were no takeaways to inform safety interventions. Drivers with a license issue were similarly represented in crashes on and off the HIN, as well as in crashes with severe outcomes compared to all crashes. There were no discernable trends in crash types or contributing factors for crashes on gravel or concrete surfaces.

Limitations

The crash data provided did not specify which roadway the crash occurred on. Alta relied on geocoded locations to assign crashes to street segments. In the case where a crash was within 35 feet of two or more street segments, as at an intersection, Alta assigned the crash to the roadway with the higher (busier) functional class. This left the potential to misrepresent crashes that occurred on a lower functional class roadway near an intersection, or that had errors in geocoding.

Conclusion

Takeaways from the High Injury Network analysis will help inform next steps of the Lincoln County Safety Action Planning process. Key findings to guide future conversation with the Study Advisory Team, countermeasure identification and project selection include:

- Focus on high-scoring roadway segments on the HIN
- Focus on segments with multiple KSI crashes, especially along 276th St
- Focus on crash types with disproportionately severe outcomes and presence on the HIN, such as angle crashes
- Look for additional clusters of run-off road, wildlife, and other single vehicle collisions on the HIN/countywide
- Explore night-time visibility improvements for stop-controlled intersections, especially at key locations on the HIN

References

- Fitzpatrick, K. A. (2018). *Guidebook on Identification of High Pedestrian Crash Locations. FHWA-HRT-17-106. Supplemental Material*. McLean, VA: Federal Highway Administration Office of Safety Research and Development.
- Harmon, T. G. (2018). *Crash Costs for Highway Safety Analysis. Report No. FHWA-SA-17-071*. Washington, D.C.: Federal Highway Administration.
- Wasserman, D. (2023, March 30). Study-Line-Editor. Portland, OR, USA. Retrieved from <https://github.com/d-wasserman/study-line-editor/tree/dev>

A blurred background image showing the lower legs and feet of several people walking across a crosswalk on a city street. The image is out of focus, emphasizing movement and a public setting.

Appendix: 4. Tech Report - Risk Factor Analysis



To: Terry Fluit – Lincoln County, SD

From: Alta Planning + Design

Date: 6/5/2025

Re: DRAFT Risk Factor Analysis Memo

Systemic Safety – Risk Factor Analysis

Enabling safe systems requires building a proactive understanding of where safety risks¹ are in a wider mobility system and how traffic speeds can be kept low enough to prevent high severity crashes. In systemic safety analyses, [risk factors](#) are contextual characteristics or exposures that are associated with an increased likelihood of harm from a crash.

This memo documents Alta’s proactive safety analysis approach that evaluated risk factors based on existing travel network data and other contextual data for Lincoln County, SD. This evaluation of risk factors includes available data on posted speeds, built environment context, and intersection characteristics such as signal presence. This process involved joining contextual data to the Lincoln County roadway centerline network, associating the contextual characteristics of each segment with crashes that occurred on it, and computing the ratio of crash counts to road network length for each contextual characteristic. This provided a measure of risk associated with each contextual characteristic.

Because only four pedestrian or bike-involved crashes occurred in Lincoln County from 2020 – 2024, there was not enough data to assess risk factors relating to active mode crashes specifically. This analysis therefore focused on risk factors associated with vehicle crashes.

Contextual and Crash Data Review

Alta used data from all crashes in Lincoln County from 2020 – 2024 for this analysis. Alta also reviewed additional datasets from Lincoln County and other sources to determine what contextual data was available.

Table 1 identifies the risk factors that were evaluated and their data sources. Risk factors associated with crashes rather than roadways (such as crash time of day) were not considered roadway risk factors.

¹ Risk is conventionally defined as the magnitude of consequences of some event multiplied by its probability. [Within transportation safety](#), it is often referencing the probability of a crash of a given severity per unit of exposure. While Alta did not compute actual probabilities of events per unit of exposure, we refer to risk as the association of specific contextual characteristics to historical propensities for severe crashes per mile of that contextual characteristic.

Table 1. Table of Risk Factor Data Sources and Risk Factors Considered

Possible Contextual Factor	Data Source
Posted Speed	Lincoln County (Edited by Houston Engineering)
Road functional class	Lincoln County
Road width	Lincoln County
Lane width	Highway Performance Monitoring System (HPMS)
Presence of parking lane	Highway Performance Monitoring System (HPMS)
Presence of turn lanes	Highway Performance Monitoring System (HPMS)
Presence of signal	Highway Performance Monitoring System (HPMS)
95 th Percentile speed	UrbanSDK
Average annual daily traffic (AADT)	UrbanSDK
Additional attributes available through UrbanSDK, but which Alta does not anticipate using for this analysis, include: Travel Time Index, Planning Time Index, Buffer Time Index, Vehicle Miles Traveled, Average Annual Hourly Traffic, 85 th percentile speed, 85 th percentile difference, and 95 th percentile difference, among others.	

Methodology

The risk analysis methodology included the following steps, as shown in the flow chart in **Figure 1**:

1. Load Contextual Attributes and Street Centerline Network of Lincoln County

The first step was to load the citywide road centerline data for Lincoln County into ArcGIS Pro, ensuring comprehensive coverage of streets and highways. The contextual attributes were cleaned for this analysis, which involved manually extending features from boundary road segments with data to ensure complete coverage. For this analysis, UrbanSDK data did not include data for all the roads along the county boundary. Then, other contextual datasets and a County obtained crash dataset were loaded, followed by merging divided roadway lines if necessary.

2. Conflate Contextual Data Based on Centroid Relationships

Next, each centerline segment centroid was identified and spatial relationships with relevant contextual datasets were established (e.g., land use, speed limits, active transportation networks). Attributes were conflated (e.g., speed limit, road class, zoning, sidewalk status, etc.) based on the nearest spatial relationship between the centerline segment's centroid and the contextual data layer. The road segment-level dataset was then exported for further analysis in R Studio.

3. Associate Contextual Attributes on the Centerline to Crash Data

The crash points were then snapped to the centerline segments, using a nearest distance approach to assign crashes to the nearest centerline segment. Conflated contextual attributes were loaded from Step 1 (road class, traffic signals, speed limits, etc.) with the crash data to facilitate further analysis. Each crash was identified as either a KSI (Killed or Severely Injured) crash or any other crash. The crash-level dataset was exported for further analysis in a program outside of GIS, such as R Studio.

4. Tabulate the Percentage of KSI and Total Factor Category

We tabulated the number of KSI and non-KSI crashes associated with each contextual factor category (e.g., road segments with specific intersection types, or within specific speed limit thresholds) in R Studio. We also summed the total crash weights for each category, using the same severity-based weights as we used for the High Injury Network. Then, the crash count associated with each contextual factor category was expressed as a percentage of KSI, non-KSI crashes, and total crash weights across the network, which allowed for the identification of contextual factors that disproportionately contribute to higher crash severity.

5. Tabulate the Percentage of Network Length Each Contextual Factor Category Represents

The total length of road segments associated with each contextual factor category (e.g., road segments with specific intersection types, segments within specific speed limit thresholds) was calculated in R Studio. Next, the network length associated with each contextual factor category was expressed as a percentage of the total network length for comparative analysis against the crash totals.

6. Determine Risk Categories to be Used in Scoring

We evaluated the risk factor ratios for all the risk factors shown in Table 1. After an initial evaluation of these tables, we chose six risk factors to use for scoring that had meaningful risk associated with them:

- AADT
- Functional class
- Left turn lane
- Presence of signal
- Speed limit
- 95th percentile speed

The risk factors not used in the analysis (after the initial evaluation) were due to either having a low crash ratio or not having enough representation in the Lincoln County road network to make a meaningful comparison.

7. Compute Risk Ratios and Identify Top Two Riskiest Categories for Each Contextual Factor

For each qualifying contextual factor category within the selected risk factors (e.g., road segments with 40 MPH speed limits), a **crash index ratio** was computed and defined as the ratio of the percentage of crash weights in that category to the percentage of the network length that category represents. For example, 51.3% of severity-weighted crashes occurred on 35-40 MPH roads, but these roads only account for 3.7% of centerline miles. The risk ratio for 35-40 MPH roads is $51.3/3.7 = 13.86$ ². Complete risk ratio tables are provided below in Table XX. This ratio highlights which contextual factor categories have a higher concentration of risk relative to their physical presence on the network (those with a risk ratio greater than 1). We then qualitatively and quantitatively assessed whether each contextual factor listed in **Table 1** was relevant to include in a final risk index and heat map based on the crash index ratio, share of KSI crashes, correlation with other variables, and expert opinion. Alta selected six contextual risk factors to calculate the final risk index. Where possible, we identified the top two riskiest categories for each contextual factor based on the risk ratio. For example, with the risk factor of speed, the two riskiest categories were 35-40 MPH roads (Tier 1 risk factor) followed by 65+

MPH roads (Tier 2 risk factor). If a factor only had one category with a risk ratio over 1, then only one tier was used.

8. Classify Risk Factors into Tier 1 and Tier 2 and Assign Points by Factor

Each segment was assigned points if it met criteria for one of the two riskiest categories described above, for each risk factor:

- Tier 1 Risk Factors: The top-ranking riskiest category within each contextual factor. **Assigned 3 points for a final risk index.** For example, any 40 MPH road segment received 3 points for the speed risk factor.
- Tier 2 Risk Factors: The second highest ranking risky category within each contextual factor. **Assigned 1 point for a final risk index.** For example, any 35 MPH road segment received 1 point for the speed risk factor.

9. Aggregate Risk Scores for Each Network Segment

We summed all Tier 1 and Tier 2 risk points for an aggregated risk score for each road segment in the centerline dataset, using contextual risk factors chosen through Alta's qualitative and quantitative assessment (step 7). The aggregated risk score provided a comprehensive risk profile across the network, with segment-level scores identifying the locations with the contextual factors that have the highest risk. The following scenario provides the process for calculating an example risk score on one segment. This sample score combined two risk factors (speed limit and zoning type):

- o Speed Limit Tier 1 Factor – 35-40 MPH (3 points)
- o Speed Limit Tier 2 Factor – 65+ MPH (1 point)
- o Functional Class Tier 1 Factor – Class 4 (3 points)
- o Functional Class Tier 2 Factor – Class 3 (1 point)

Under this example, a road segment that had a speed limit of 35-40 MPH and was functional class 3 was assigned four points (out of six possible points) for these two factors for the risk score. If there were more tiered categories from a different contextual factor present on the segment (such as number of lanes), they would also be included into the aggregated risk score for that roadway segment.

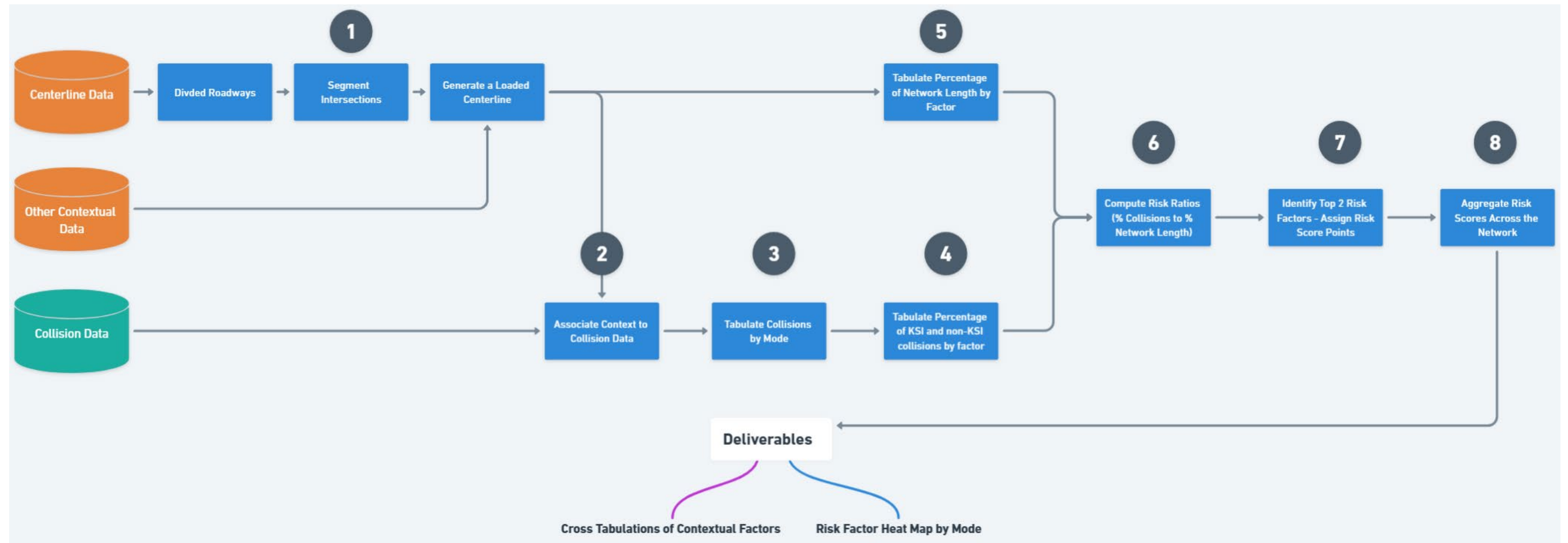
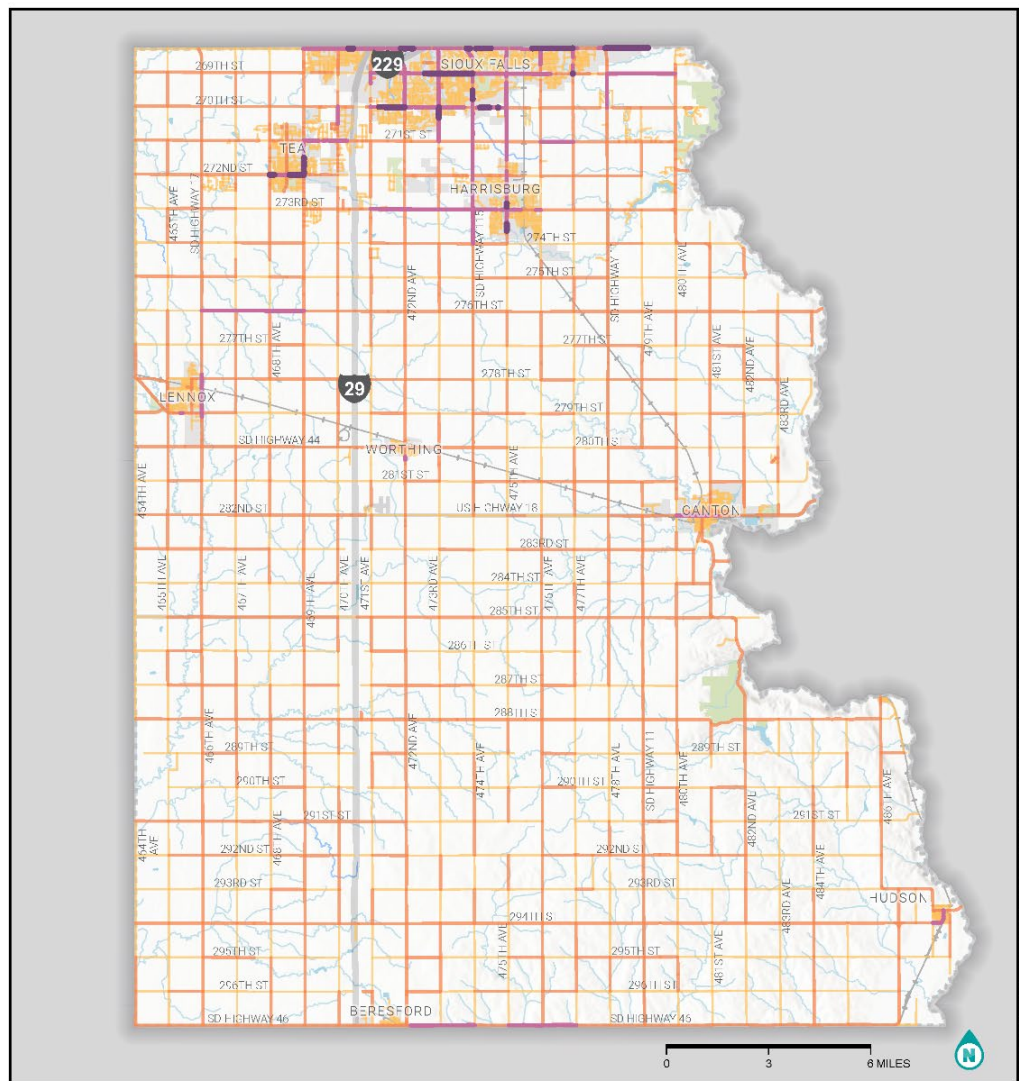


Figure 1. Flow chart identifying the major steps and deliverables from the risk factor analysis

Findings

Key Findings

Some of the highest-scoring road segments for overall risk score are on West and East 57th Street, West 69th Street, South Cliff Avenue, and 85th Street. See Figure 2 below for a map of high risk roadways or view the same [map online](#).



RISK FACTOR ANALYSIS

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

Legend

Composite Risk Score

- 13 - 18
- 7 - 12
- 2 - 6
- 0 - 1

- Lincoln County
- Railroads
- Water Bodies
- Parks + Outdoor Space

Figure 2. Risk Factor Analysis Results Map



Possible contextual factors were assessed using the crash index ratio to understand the impacts of factors on the High Injury Network. Factors such as lane width, presence of turn lanes, parking lanes, roadway width, signals, roadway surface, functional class, speeds, and traffic volumes were explored in greater detail. The results are summarized in the following section.

Factors Used in Final Analysis

Left-Turn Lane

While more crashes generally occur on roadways without left-turn lanes, the presence of a left-turn lane on a roadway has a much higher ratio of crash risk than roadways without left-turn lanes, as shown in **Table 3**. This may be due to the types of crashes associated with left turns, such as angle crashes, which are one of the more severe crash types. 31% of crashes involving a left turn occurred on a road with a left-turn lane, compared with 22% of all crashes. However, it could not be determined whether a crash happened in, or near, the left-turn lane.

Thus, it appears that roads with left-turn lanes are associated with higher rates of left-turn crashes. However, some of this is likely due to more people on those roads attempting to make left turns. Left-turn crashes on roads with left-turn lanes were due to a variety of factors, but the most common was failure to yield right of way or failure to obey a signal or stop sign.

Table 2: Presence of left-turn lane risk factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
1	16%	12.82%	15.72%	1.69%	24.4	7.60	9.23	9.31
0	84%	87.18%	84.28%	98.31%	1421.5	0.89	0.86	0.86



Presence of Signal

Signalized roadways have a much higher crash ratio than unsignalized (see **Table 7**) and typically have higher traffic volumes necessitating signalization. Some crash types may increase with the presence of a signal, such as rear-end crashes.

Table 3: Presence of signal factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
1	22%	24.79%	22.08%	4.86%	70.3	5.10	4.45	4.55
0	78%	75.21%	77.92%	95.14%	1375.7	0.79	0.82	0.82

Functional Class

The functional class associated with the highest risk was minor arterials, as depicted in **Table 9**. Although it was initially surprising that higher functional class roads were not riskier, this is likely a function of these roads having higher volumes. Most of these minor arterial roads are in the urbanized area of Sioux Falls. Most of these segments scored at least 15 out of possible 18 points, indicating that they met risk tier thresholds in at least five categories.

Table 4: Functional class factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
4	64.9%	52.99%	64.31%	21.53%	311.3	2.46	3.01	2.99
3	14.1%	20.51%	14.67%	5.84%	84.4	3.51	2.42	2.51
2	2.6%	5.13%	2.76%	1.41%	20.3	3.65	1.85	1.96
5	18.4%	21.37%	18.27%	71.22%	1029.9	0.30	0.26	0.26



Speeds

Among crashes that involved a person speeding, 25% occurred on a road with a 95th percentile speed of 40 MPH or below, while another 25% were on a road with a 95th percentile speed of 55 MPH or higher. This demonstrates that speed-related crashes can occur even on roads with relatively moderate speeds. Roads with 95th percentile speeds between 41 and 50 mph were associated with the highest crash risk as shown in **Table 10**.

While this may be surprising, about a third of these segments are minor arterials in towns and cities, where there are higher levels of activity, less predictable conditions, and higher volumes that could contribute to higher crash rates. On a related note, speed limits associated with most crashes were 35-40 mph as shown in **Table 11**. Crashes may be occurring on these roadways when motorists exceed these speeds by 10-15 MPH. Conversely, roadways under 20 mph had the lowest crash risk.

Table 5: 95th percentile speed factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
41 - 50 mph	42.993%	23.08%	41.65%	21.07%	304.6	1.10	2.04	1.98
71 + mph	6.511%	12.82%	6.97%	6.34%	91.7	2.02	1.03	1.10
51 - 60 mph	7.040%	14.53%	7.73%	8.48%	122.6	1.71	0.83	0.91
31 - 40 mph	13.882%	16.24%	14.26%	16.88%	244.1	0.96	0.82	0.84
NA	9.490%	7.69%	9.28%	12.00%	173.6	0.64	0.79	0.77
61- 70 mph	9.512%	22.22%	10.43%	14.30%	206.8	1.55	0.67	0.73
21 - 30 mph	7.813%	2.56%	7.18%	12.91%	186.7	0.20	0.61	0.56
Under 20 mph	2.759%	0.85%	2.50%	8.01%	115.9	0.11	0.34	0.31

Table 6: Posted speed factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
35 - 40 mph	52.9%	26.50%	51.27%	3.70%	53.5	7.16	14.30	13.86
65 + mph	11.9%	21.37%	12.72%	7.73%	111.7	2.77	1.54	1.65
55 - 60 mph	16.5%	29.91%	17.42%	18.27%	264.2	1.64	0.90	0.95
25 - 30 mph	13.6%	5.13%	12.52%	18.08%	261.4	0.28	0.75	0.69
45 - 50 mph	4.9%	17.09%	5.96%	50.97%	737.0	0.34	0.10	0.12
Under 20 mph	0.1%	0.00%	0.11%	1.26%	18.2	0.00	0.11	0.09



Traffic Volumes

The highest Average Annual Daily Traffic (AADT) is associated with the greatest number of crashes as seen in **Table 12**, which is logical given the increased exposure to traffic. As more vehicles travel through a particular area, the likelihood of crashes rises due to the higher volume of their inevitable interactions.

Table 7. Average Annual Daily Traffic (AADT) factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
Over 10,000	21.96%	6.84%	20.90%	1.05%	15.2	6.52	20.94	19.93
6001 - 10,000	16.77%	11.11%	16.29%	1.53%	22.1	7.26	10.95	10.64
3001 - 6000	11.52%	19.66%	12.19%	3.52%	50.9	5.58	3.27	3.46
NA	19.58%	19.66%	19.79%	9.16%	132.5	2.15	2.14	2.16
1001 - 3000	14.90%	15.38%	15.00%	10.47%	151.4	1.47	1.42	1.43
1000 or less	15.27%	27.35%	15.83%	74.26%	1073.8	0.37	0.21	0.21

Factors Considered but not Used in Final Analysis

Roadway Width

Very narrow roads or very wide roads both have higher relative risk of crashes, as seen in **Table 6**. Narrow roads may be difficult for motor vehicles to navigate, and very wide roads encourage high speeds. This factor was not chosen for the final analysis because the relationship to crash severity did not appear as strong as for other factors.

Table 8: Roadway width factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
12 ft or less	58.6%	27.35%	56.26%	16.39%	237.0	1.67	3.58	3.43
49 + feet	2.7%	3.42%	2.74%	1.92%	27.7	1.79	1.42	1.43
25 - 36 ft	6.8%	8.55%	6.92%	5.64%	81.5	1.52	1.21	1.23
13 - 24 ft	31.8%	60.68%	34.09%	76.06%	1099.8	0.80	0.42	0.45



Right-Turn Lane

The presence of a right-turn lane has a higher crash risk than roadways without right-turn lanes, as depicted in **Table 4**. This could be due to larger corner radii, with vehicles able to turn at higher speeds, reduced visibility of approaching vehicles, and lengthened crossing distances for pedestrians. This factor was not chosen for the final analysis because it was highly correlated with the presence of a left-turn lane, which was selected, and including both would be redundant.

Table 9: Presence of right turn lane risk factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
1	16%	12.82%	15.72%	1.69%	24.4	7.60	9.23	9.31
0	84%	87.18%	84.28%	98.31%	1421.5	0.89	0.86	0.86

Parking

The presence of a parking lane is common on roadways on the HIN. However, there is a slightly elevated crash risk for roadways without street parking as shown in **Table 5**. If roadways are routinely parked with high occupancy, then they can create both a physical and visual narrowing of the roadway, potentially impacting travel speeds. This in turn could lower crash risk. This factor was not chosen for the final analysis because the crash index was fairly low, indicating only a slight association with higher crash severity.

Table 10: Presence of parking lane factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
0	9%	17.95%	9.84%	8.83%	127.7	2.03	1.05	1.11
1	91%	82.05%	90.16%	91.17%	1318.2	0.90	1.00	0.99



Lane Width

Wider lane widths were more associated with crashes and had the highest crash risk as seen in **Table 2**. Wide lanes are the most common roadway widths on the HIN. Narrow roadways typically encourage slower speeds and therefore can result in less severe crashes. Crash risk was the lowest at 10 feet in width, which would be wide enough to comfortably accommodate a motor vehicle (not including farm equipment), but narrow enough to encourage slower speeds. This factor was not chosen for the final analysis because it had a low crash index ratio, indicating only a very slight association with higher crash severity.

Table 11: Lane width risk factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
12	99.559%	98.29%	99.48%	96.07%	1389.2	1.02	1.04	1.04
11	0.287%	0.85%	0.33%	0.33%	4.7	2.62	0.88	1.02
8	0.022%	0.00%	0.02%	0.06%	0.8	0.00	0.39	0.32
10	0.022%	0.85%	0.07%	0.58%	8.4	1.47	0.04	0.13
NA	0.110%	0.00%	0.09%	2.74%	39.6	0.00	0.04	0.03

Roadway Surface

Most roadways are comprised of bituminous or asphalt material, whereas concrete may be used for bridge decks, and gravel used for very low volume roadways. The majority of crashes occurred on roadways with bituminous surfaces, as shown in **Table 8**. KSI crashes were elevated for roadways made of concrete and gravel, versus their share of non-KSI crashes. This factor was not chosen for the final analysis because concrete accounted for a very small share of centerline miles, leaving a high margin of error.

Table 12: Roadway surface factor results

Value	Share of Non-KSI Collisions	Share of KSI Collisions	Share of Severity-Weighted Crashes	Share of Centerline Miles	Centerline Miles	KSI Ratio	Non-KSI Ratio	Crash Index Ratio
CONCRETE	2.34%	5.13%	2.48%	0.93%	13.5	5.49	2.50	2.65
BITUMINOUS	91.59%	77.78%	90.53%	45.76%	661.6	1.70	2.00	1.98
	1.46%	0.00%	1.39%	0.70%	10.2	0.00	2.07	1.97
GRAVEL	4.59%	17.09%	5.59%	50.73%	733.5	0.34	0.09	0.11
GRADED	0.02%	0.00%	0.02%	0.73%	10.6	0.00	0.03	0.03



Conclusion

This analysis evaluated how different contextual risk factors relate to crash history in Lincoln County. Key factors found to increase roadway risk include:

- High traffic volumes
- 95th percentile speeds between 41 and 50 mph
- Left turn lanes present
- Signalized roadways
- Minor arterials

Limitations

While the findings are useful for informing safety countermeasures, this analysis has a few limitations worth considering:

- **Lack of Exposure Data:** The analysis did not account for the volume of vehicles using each segment, leading to an incomplete understanding of relative risk. Exposure was accounted for by proxy by evaluating the network mileage. Despite this limitation, targeting improvements where the most crashes occur – regardless of exposure – will result in reducing the most injuries and saving the most lives.
- **Risk Categorization Process:** Categorical assignments of risk factors may have oversimplified nuanced relationships, masking gradients of risks or interactions between these factors. The cutoffs were carefully selected for this analysis, but there are still limitations to these types of tabulations.
- **Indirect Risk Representation:** Some variables evaluated might act as proxies for exposure. For example, bike lanes might appear to be a risk factor for bicyclists solely because more bicyclists tend to use those facilities. Ideally, a mode specific rate (crashes per bicycle mile traveled) would be able to be tabulated to address these concerns when identifying risk factors. However, this type of count information is rarely universally available or even estimated.
- **Changes During the Study Period:** This analysis used the most recent and best available contextual and infrastructure data to identify risk factors. This means that if the study area changed during the analysis period, that is not captured directly in this analysis. For example, this analysis used speed limits in current roadway data, which may be different than the speed limit in effect at the time of the crash.
- **Correlating Factors:** Since higher speed roads tend to have more lanes, we cannot determine which of these had a greater impact on crash rates. For this reason, we determined which factors had the greatest impact on crash rates and did not choose both as final risk factors.
- **Lacking Data:** Additional data at the roadway level would aid in more detailed analysis, such as lighting quality and the presence of driveways, particularly in commercial areas. The map-based analysis depends on universal availability of relevant datasets to capture areas.

A blurred background image showing the lower legs and feet of several people walking across a crosswalk on a city street. The image is out of focus, emphasizing movement and a public setting.

Appendix: 5. Tech Report - Countermeasure Selection Documentation



To: Terry Fluit – Lincoln County, SD

From: Alta Planning + Design

Date: February 18, 2026

Re: Countermeasure Selection Documentation

Introduction

The countermeasure suitability analysis provides a conservative estimate of where countermeasures could be most beneficial by filtering collisions to specific crash factors that are most associated with that countermeasure. It builds on the high injury network (HIN), countermeasure identification process, and other collision analysis. Previous analysis examined spatial patterns of collisions and identified key groups of collisions with similar characteristics. These findings informed the development of countermeasures to address the most common collision types in the county.

The diverse nature of collisions and environments in Lincoln County resulted in many possible countermeasures that could be applicable. As a result, Alta saw a need for an analysis to identify and compare the high-level benefits of these countermeasures and created the countermeasure suitability tool to meet that need. Based on the concentrations of collisions, this countermeasure suitability tool estimates the benefits of applying certain countermeasures on HIN segments within Lincoln County that fall outside of city jurisdictions. The tool also identifies road segments where multiple countermeasures apply. This memo describes the countermeasure suitability tool and key considerations of its analysis.

Countermeasure Selection

The following list of countermeasures was selected from the Federal Highway Administration's Proven Safety Countermeasures in Rural Communities¹, as well as countermeasures identified in the South Dakota Strategic Highway Safety Plan². Based on this selection, the following analysis for Countermeasure Suitability is limited only to locations on the HIN and classified as a non-city area. There are urbanized areas where these countermeasures might be applicable for this analysis, but they intentionally are excluded from the analysis to focus on rural counter measure applications where Lincoln County has the greatest influence on roadway design and improvements.

¹ https://highways.dot.gov/sites/fhwa.dot.gov/files/2024-01/FHWA_PSCs_in_Rural_Communities_508.pdf

² https://dot.sd.gov/media/0f230540/SDDOT_SHSP_Condensed.pdf

Table 1 Evaluated Counter Measures and their Descriptions

Number	Countermeasure	Category	Countermeasure Description
1	Wider Edge Line	Roadway Departure	Wider edge lines improve visibility and more clearly mark the edge of the road.
2	Longitudinal Rumble Strips and Stripes on Two-Lane Roads	Roadway Departure	Shoulder rumble strips provide a tactile warning to drivers that they are leaving the road.
3	Centerline Rumble Strips	Lane Departure	Centerline rumble strips provide a warning to drivers that they are encroaching into an oncoming lane.
4	Increase Retroreflectivity of Stop Signs	Intersections	Stop signs with higher retroreflectivity increase their visibility to drivers.
5	Dedicated Left- and Right-Turn Lanes at Intersections	Intersections	Auxiliary turn lanes—either for left turns or right turns—provide physical separation between turning traffic that is slowing or stopped and adjacent through traffic at approaches to intersections. Turn lanes can be designed to provide for deceleration prior to a turn, as well as for storage of vehicles that are stopped and waiting for the opportunity to complete a turn.
6	Conversion of Intersection into Single-lane Roundabout	Intersections	Roundabouts have fewer conflict points than traditional intersections and are designed to prevent vehicles from traveling through intersections at high speeds.
7	Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections	Intersections	This countermeasure includes the following: Double-Up Intersection Warning Signs. Add Advanced Street Name Plaque. Double-Up Stop or Yield Signs. Install Retroreflective strips on sign-posts. Place minor road stop bars within 4 to 10 ft from the edge of the nearest through lane along the major road. Install yield bars on all lanes having yield conditions. Add dashed white edge-lines along the major road through the intersection. Remark all existing stop bars, crosswalks, arrows and word messages. Remark all turn lanes to include the pattern of lane arrows and text marking "ONLY" based on the turn lane length.
8	Pavement Friction Management	Crosscutting	High Friction Surface Treatment involves the application of very-high quality aggregate within a polymer binder in order to improve pavement friction. This should help motorists maintain better control of their vehicle in dry and wet driving conditions

Number	Countermeasure	Category	Countermeasure Description
9	Lighting	Crosscutting	Lighting along a corridor or at an intersection improves visibility for all roadway users.
10	Install roadside barrier	Roadway Departure	Roadside barriers can be installed to protect vehicles from leaving the road and to protect objects that cannot be removed from the clear zone.

Countermeasure Allocation and Benefit Tool Methodology

The countermeasure suitability tool used a multistep process that can be summarized as follows:

1. **Filtered all collisions to the subset to which a countermeasure applies.** For example, bicycle boulevards are limited to collisions in urbanized areas, on roadways with two lanes or fewer, and in areas that involve cyclists. Bicycle boulevards are not shown to help reduce collisions in other contexts.
2. **Associated collisions to a rolling network that corresponds to a regional centerline study network.** The rolling network, which was also used in the HIN development, has the same number of records but modifications to its geometry, so the lines have some overlap between segments. This overlap adjusted for bias that can occur where road segment breaks happen to fall (modifiable areal unit problem³). This slightly improved the estimate of collisions to address on any one segment. **Figure 2** illustrates the rolling window concept.
3. **Applied the collision rate for the rolled segment to the original study network segment.**
 - o For example, a segment on the original study network may be 0.7 miles and the rolled segment is 1 mile. If there are five collisions on the rolled segment, then the rate is 5 collisions per mile. By applying that rate to the study segment length, we estimate $0.7 * 5 = 3.5$ collisions on the study segment (see **Figure 1**).

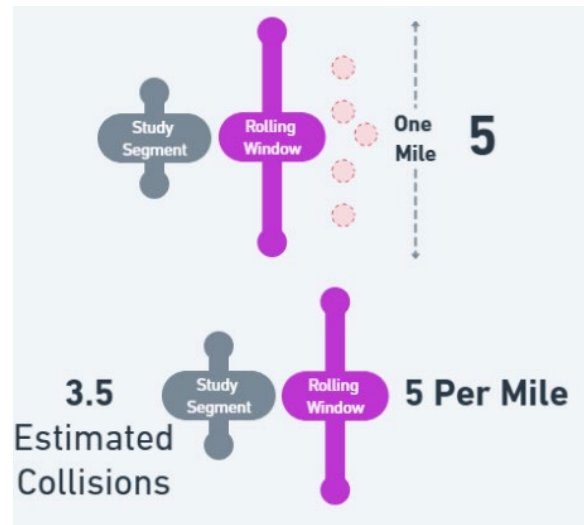


Figure 1 Applying the collision rate from the rolled segment to the study segment.

³ For an explanation of a modifiable areal unit problem, see the Wikipedia article on this subject: https://en.wikipedia.org/wiki/Modifiable_areal_unit_problem.

4. **Joined these estimates to the study network and then used them for further processing.** Crash modification factors (CMFs) were applied per countermeasure evaluated to identify the possible benefits of each countermeasure individually.
5. **Determined countermeasure benefits based on economic value and a safety index, separately.** The tool percent ranked the **safety index** values (severity-weighted collisions per mile), and then selected a given percentile threshold to identify whether a countermeasure was allocated to that segment. This ensured that a countermeasure was only applied to a segment if there were enough applicable collisions on that segment to justify it. The tool applied each countermeasure to **the top 30% of segments** by safety index values per mile.
6. **Aggregated total countermeasure allocations after evaluating each countermeasure separately.** The tool determined aggregate benefits of each countermeasure by multiplying each CMF by the effective share of collisions each countermeasure applies to on each segment. For example, if a bicycle boulevard and a speed hump were allocated to the same location, their CMFs would be 0.37 and 0.6, respectively. However, in this location, bicycle boulevards were applicable to 20% of collisions and speed humps applicable to 50%, so the CMFs do not apply to all collisions on the segment. The tool would determine effective CMFs for individual countermeasures using the following formula:
 - o $Effective\ CMF = (Collision\ Share * CMF) + (1 - Collision\ Share)$
 - In this example, Bicycle boulevards at this location would have an effective CMF of 0.87 and speed humps would have an effective CMF of 0.8.
7. **Combined the effective CMFs using multiplicative dampening to determine a final CMF for each road segment for multiple countermeasures.** The tool used the following formula:
 - o $Total\ CMF^x = Effective\ CMF^1 * Effective\ CMF^2 * ... Effective\ CMF^x$
 - o In the example above, the total CMF would be: $0.87 * 0.8 = 0.696$

Alta used this total CMF to determine the aggregate benefit of all countermeasures being applied in a corridor and used the overlap of multiple countermeasures with high benefits to prioritize and identify possible project corridors.

A visual explanation of this process is provided in **Figure 3**, and an architecture diagram that informed the process for the tool is shown in **Appendix B: Architecture Diagram for Countermeasure Tool**.

Alta Civic Analytics Explorer

Rolling Window Approach



Segmented roadways can be misleading.

The same roadway, segmented in two different ways, paints a different picture of where crashes are happening.

Where segments get divided is somewhat arbitrary.



The rolling window approach more accurately represents crash count figures.

The rolling window approach helps mitigate bias caused by arbitrary segmentation.

Rolled crash counts are shown here for simplicity. In the analysis, a sum of crash weights is used, and then divided by the segment length to show the weighted crash rate per mile.

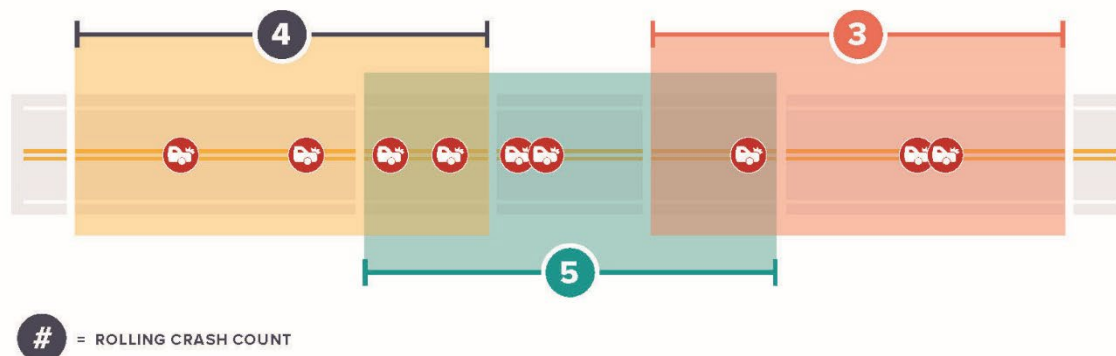


Figure 2: A visual explainer of the rolling window concept.

Alta Civic Analytics Explorer

Countermeasures Allocation & Benefit Analysis

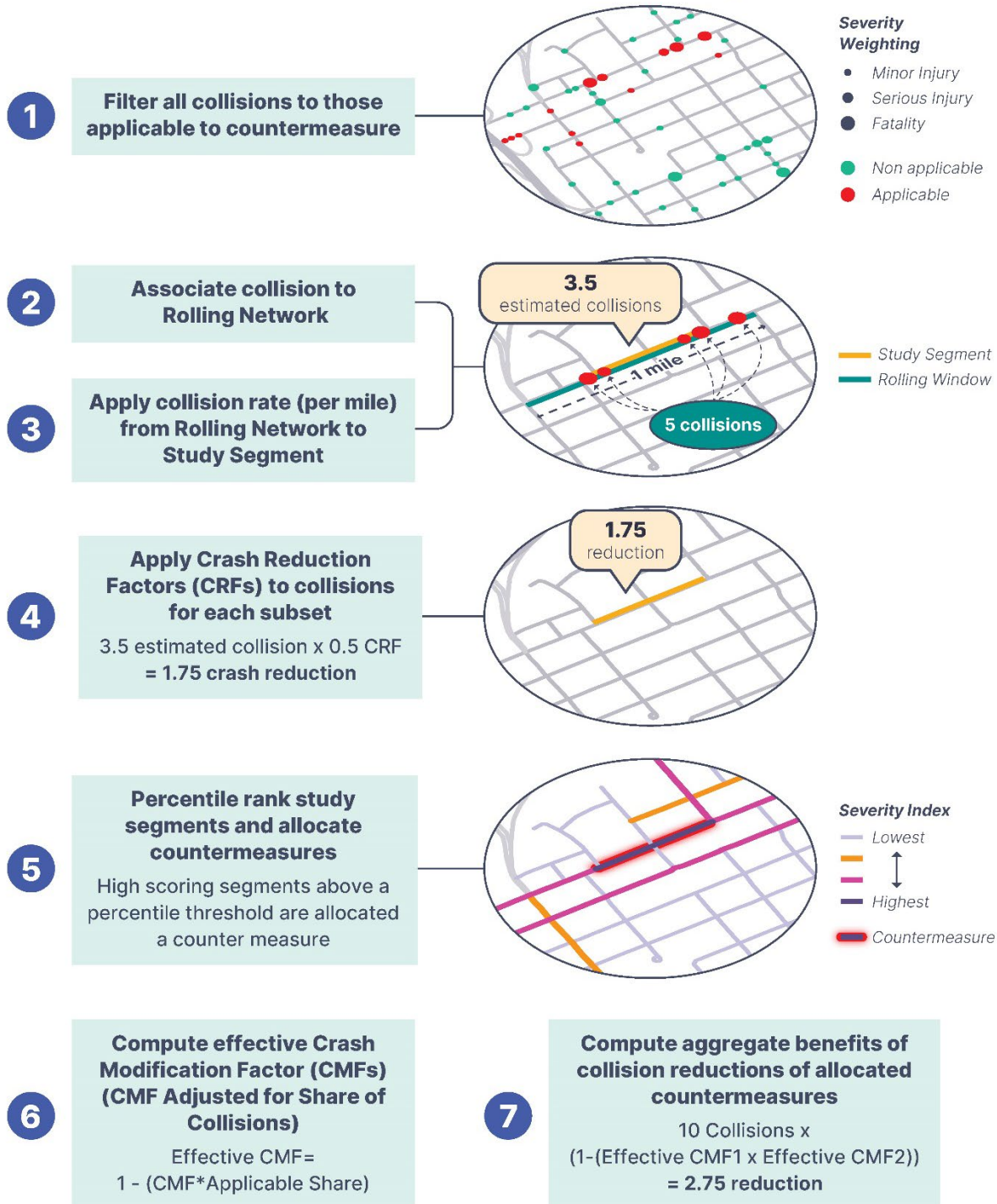


Figure 3 The general process used by the countermeasure suitability tool.

Results

The tool produced a wealth of new information about the potential countermeasure applications of each road segment in Lincoln County. The new dataset includes 13 new fields that summarize the aggregate benefits of all countermeasures applied on each road segment. These are detailed in **Table 2**.

Table 2. New overall fields.

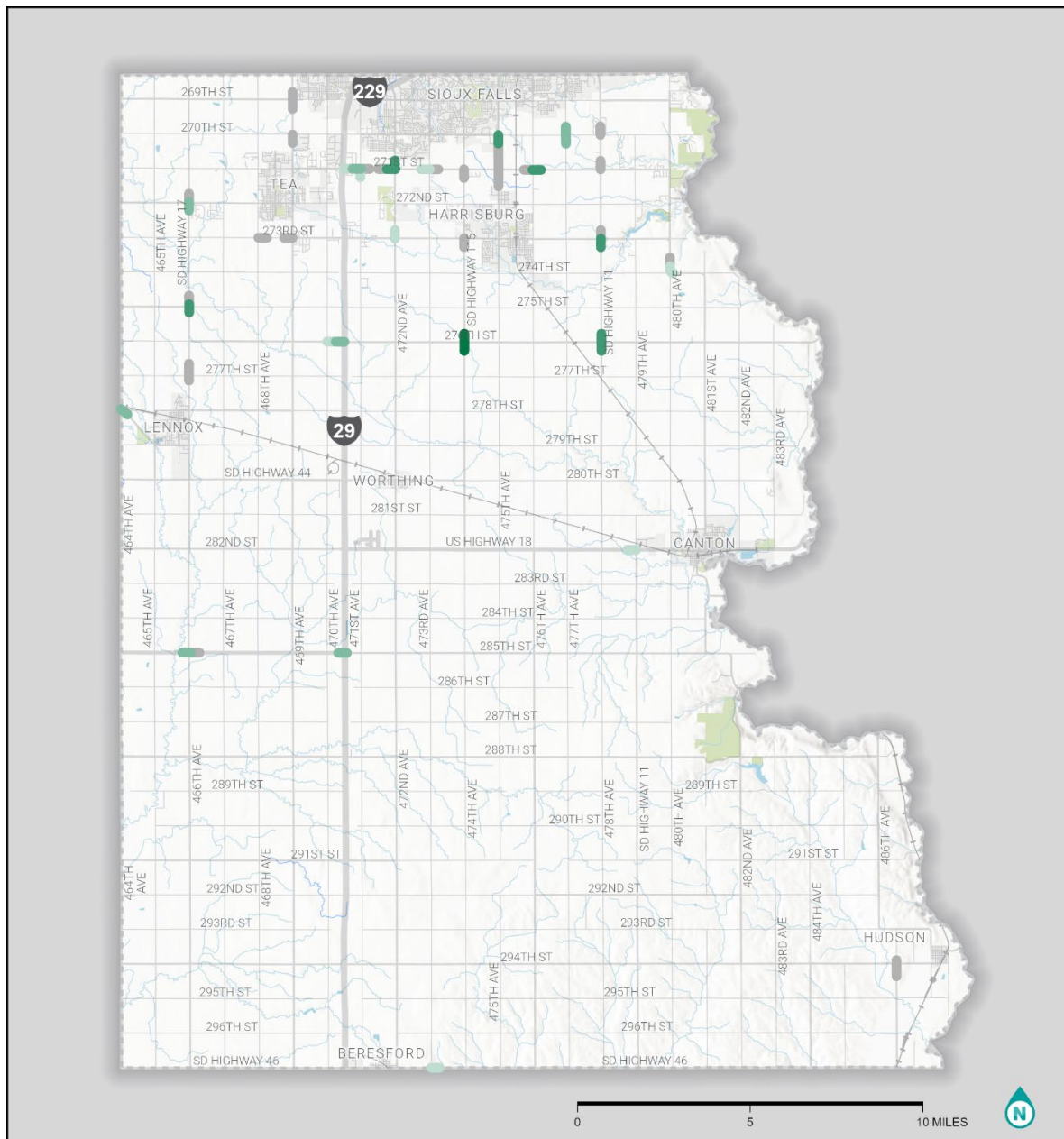
Field Name	Description	Details
Collision_count	Collision count	Total number of collisions that occurred on the segment.
Crash_weight	Crash weight sum	The sum of collision weights of all collisions that occurred on the segment.
Crash_cost	Crash cost	Sum of costs of all collisions that occurred on the segment. Should be in dollars for the current study year.
Total_collision_count	Normalized collision count	Collision count, adjusted for segment length.
Total_crash_weight	Normalized collision weight sum	Crash weight, adjusted for segment length.
Total_crash_cost	Normalized collision cost sum	Crash cost, adjusted for segment length.
Total_cm_applications	Total countermeasures applied	Total number of unique countermeasures that applied to this segment.
Total_cm_effective_crf	Effective CRF	The effective Crash Reduction Factor (CRF) is equal to 1 – effective CMF, as described in Step 7. This represents the CRF adjusted for the share of collisions that the countermeasure applies to on this segment.
Total_cm_index_benefit	Index benefit	A measure of safety benefits expected from implementing all recommended countermeasures.
Total_cm_index_benefit_per_mi	Index benefit per mile	Index benefit on a per-mile rate. This is the estimated weighted collisions with a final effective collision reduction procedure applied.
Total_cm_economic_benefit	Total economic benefit	Total economic benefit in dollars expected from all countermeasures that apply to this segment.
Total_cm_economic_benefit_per_mi	Total economic benefit per mile	Total economic benefit on a per-mile rate.
All_cms_applied	All countermeasures applied	List of all countermeasures applied on this segment.

In addition, this analysis calculated the following eight fields for each of the 10 countermeasures considered, for a total of 200 new countermeasure-specific fields. Each field was calculated for each of the 25,001 segments in the street centerline database. **Table 3** shows the fields calculated for each countermeasure. Actual field names use a tag specific to each countermeasure in place of the [cm] text, such as wide_shoulder_economic_benefit.

Table 3. Fields added for each countermeasure.

Field Name	Description	Details
[cm]_collision_count	Collision count	Number of collisions that occurred on the rolled segment that this countermeasure would apply to.
[cm]_crash_weight	Crash weight	Sum of the weights of all collisions counted in [cm]_collision_count.
[cm]_index_benefit	Index benefit	A measure of safety benefits expected from implementing the countermeasure based on the collision weights used for analysis.
[cm]_index_benefit_per_mi	Index benefit per mile	The index benefit rate per mile on the segment.
[cm]_index_benefit_score	Index benefit score	Percentile ranking of the [cm]_index_benefit field.
[cm]_economic_benefit	Economic benefit	The economic benefit in dollars from the expected CRF of the countermeasure, based on cost to society of collisions by severity level.
[cm]_economic_benefit_per_mi	Economic benefit per mile	The economic benefit rate per mile on the segment.
[cm]_apply_cm	Number of countermeasures applied	The number of countermeasures that could be applied to this segment based on the road conditions and the collisions that occurred there.

Figure 4: Dedicated Turns Countermeasure Benefit Index



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS Weighted Collisions per Mile

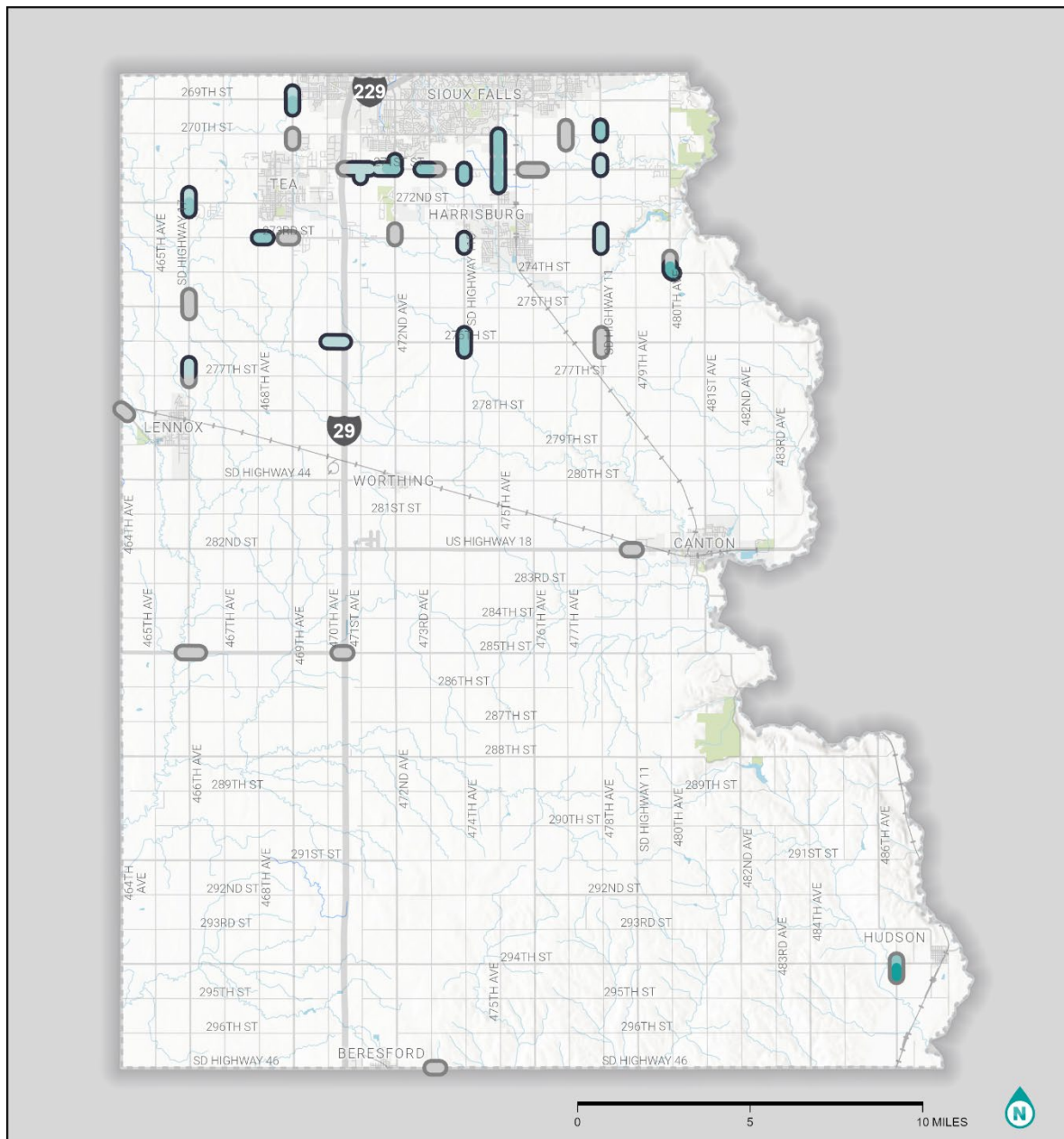
Dedicated Turns Benefit Index

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

- < 2
- 3 - 8
- 9 - 11
- 12 - 24
- < 45

- Railroads
- Jurisdiction Boundaries
- Lincoln County

Figure 5: Wider Edge Line



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Wider Edge Line

LINCOLN COUNTY

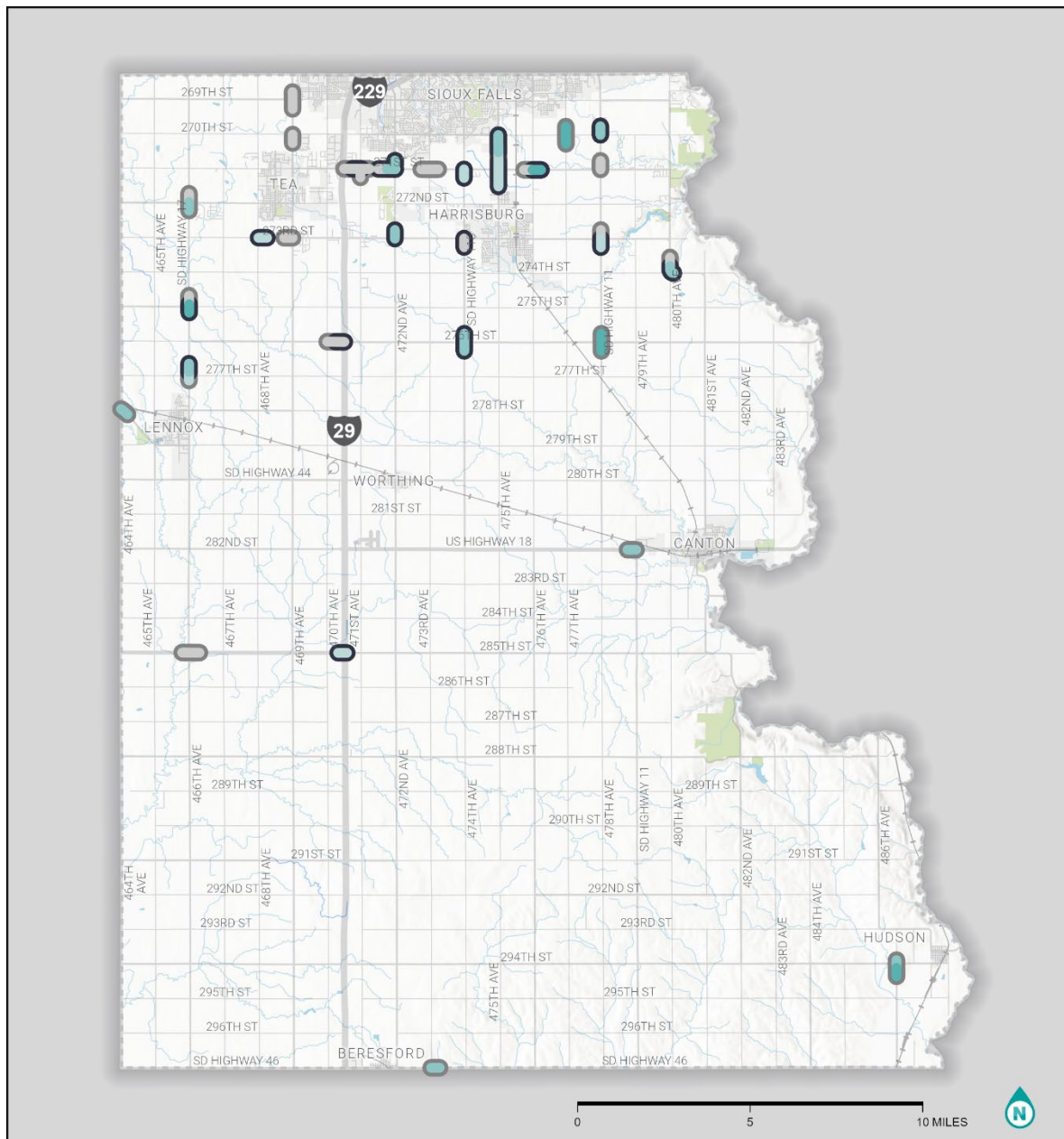
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 6: Longitudinal Rumble Strips and Stripes on Two-Lane Roads



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Longitudinal Rumble Strips and Stripes on Two-Lane Roads

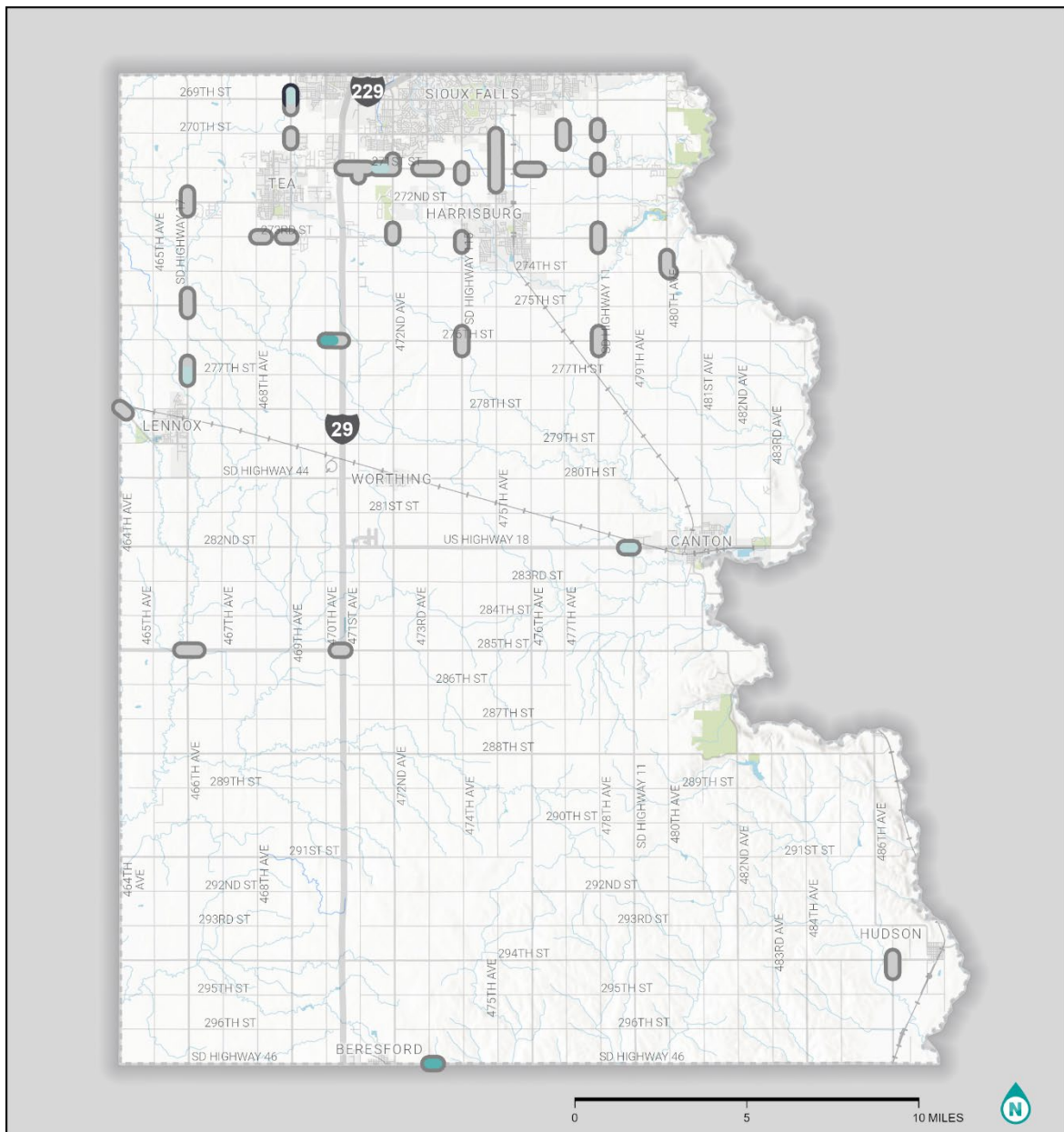
LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 7: Centerline Rumble Strips



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS Economic Benefit Per Mile

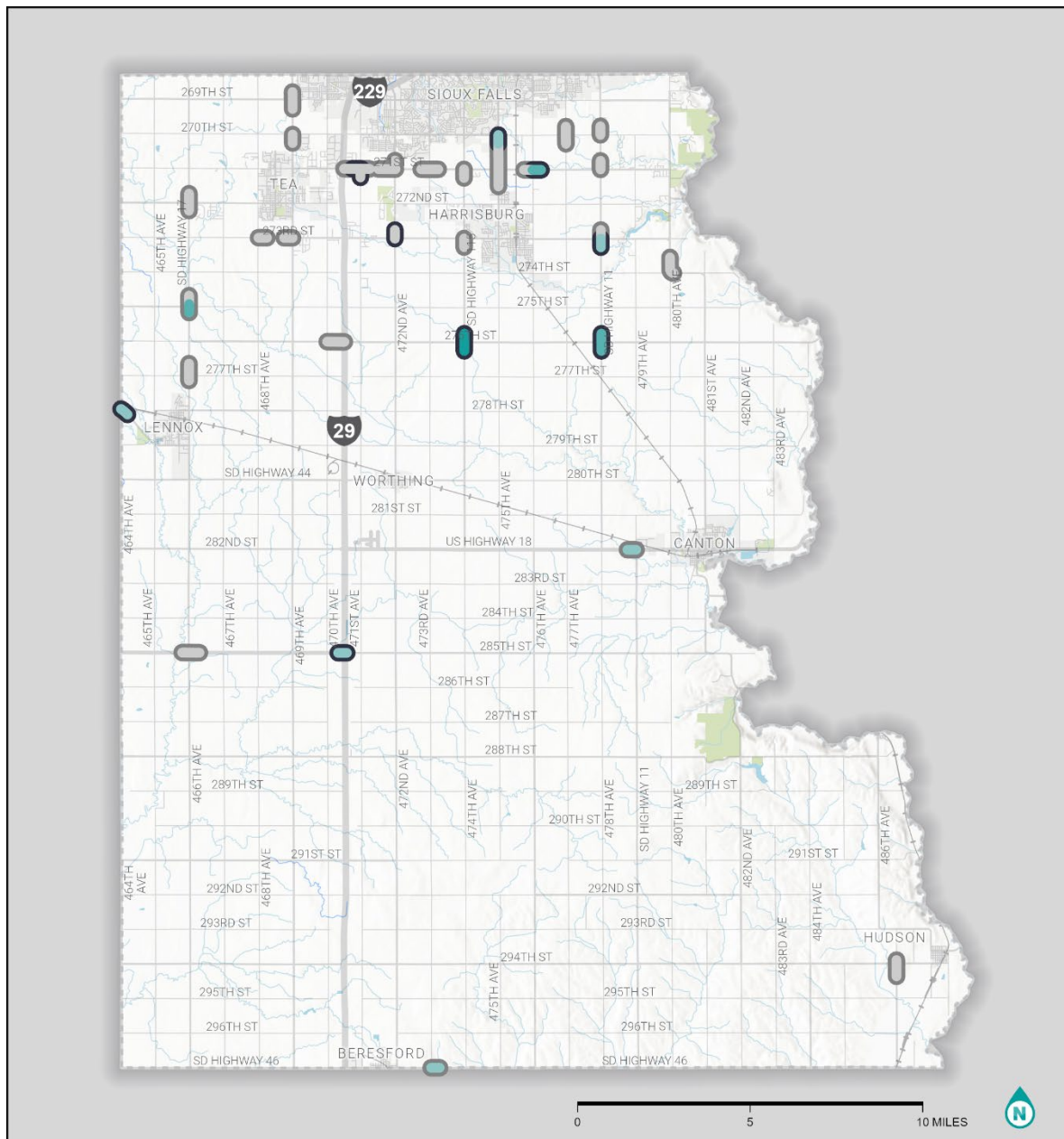
Centerline Rumble Strips

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 8: Increase Retroreflectivity of Stop Signs



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Retroreflectivity Improvements to Stop Signs

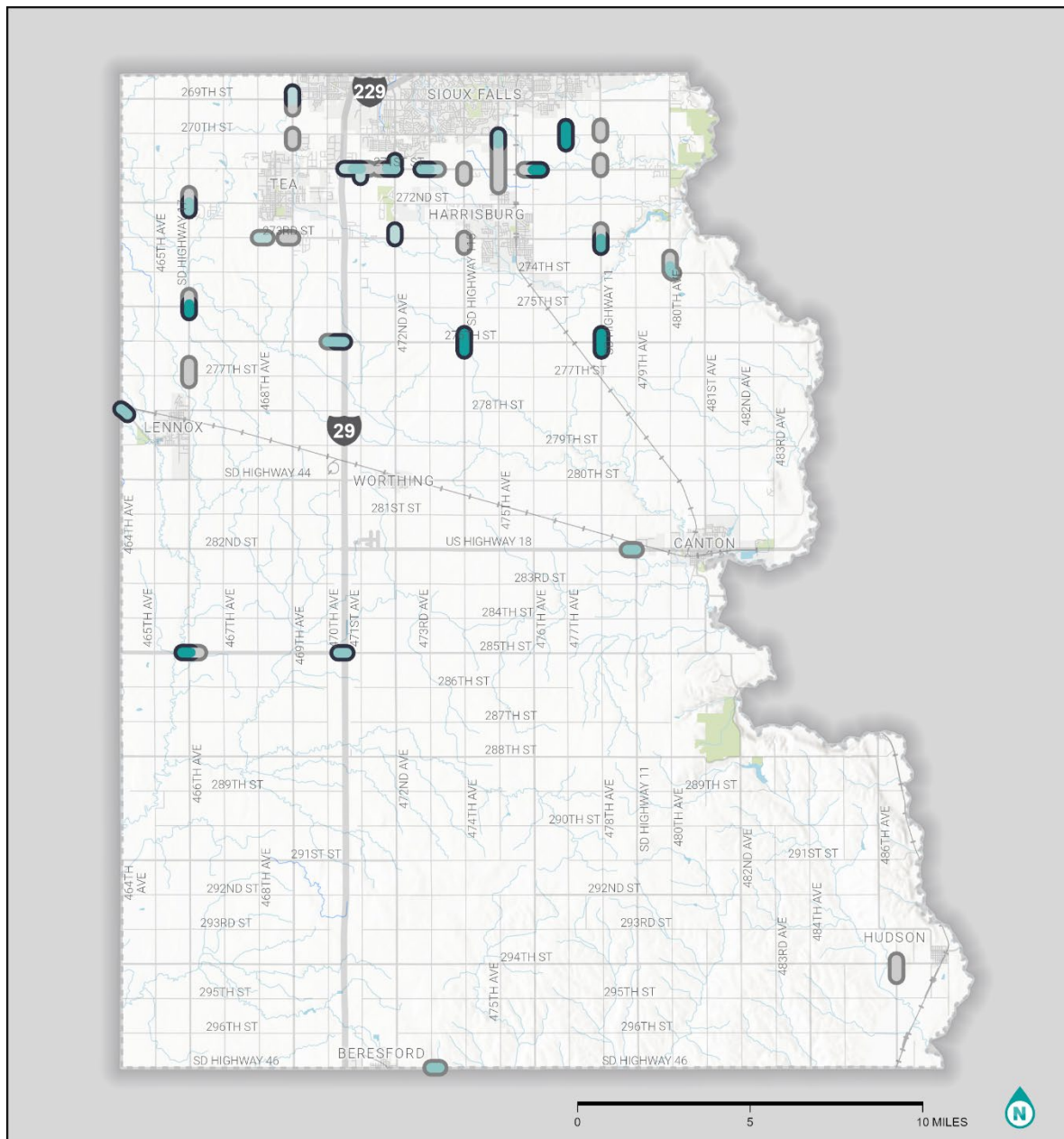
LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 9: Dedicated Left- and Right-Turn Lanes at Intersections



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Dedicated Turn Lanes at Intersections

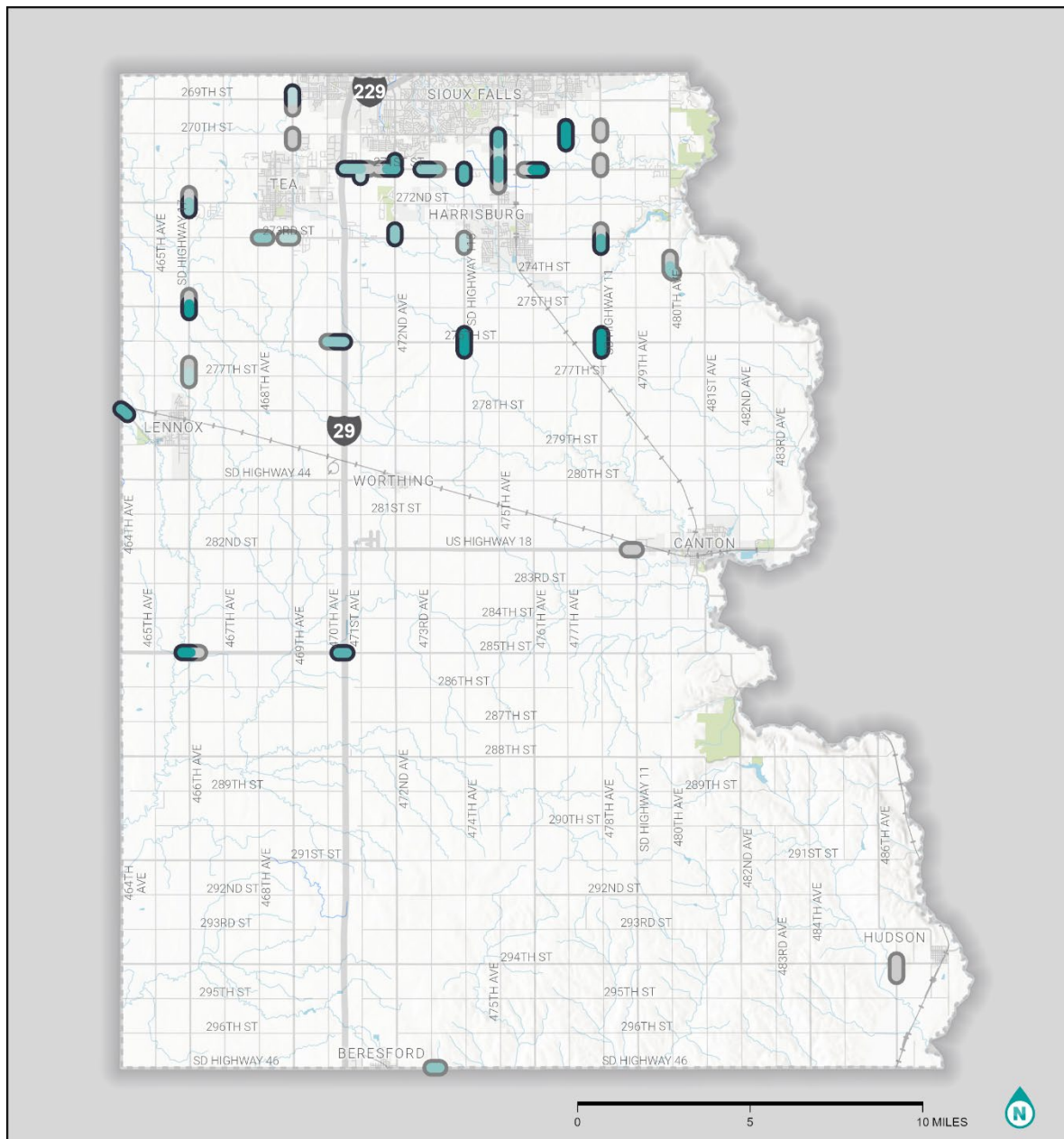
LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 10: Conversion of Intersection into Single-lane Roundabout



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Single Lane Roundabout Conversion

LINCOLN COUNTY

SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

< \$25,000

< \$150,000

< \$1,000,000

< \$5,000,000

< \$36,000,000

Railroads

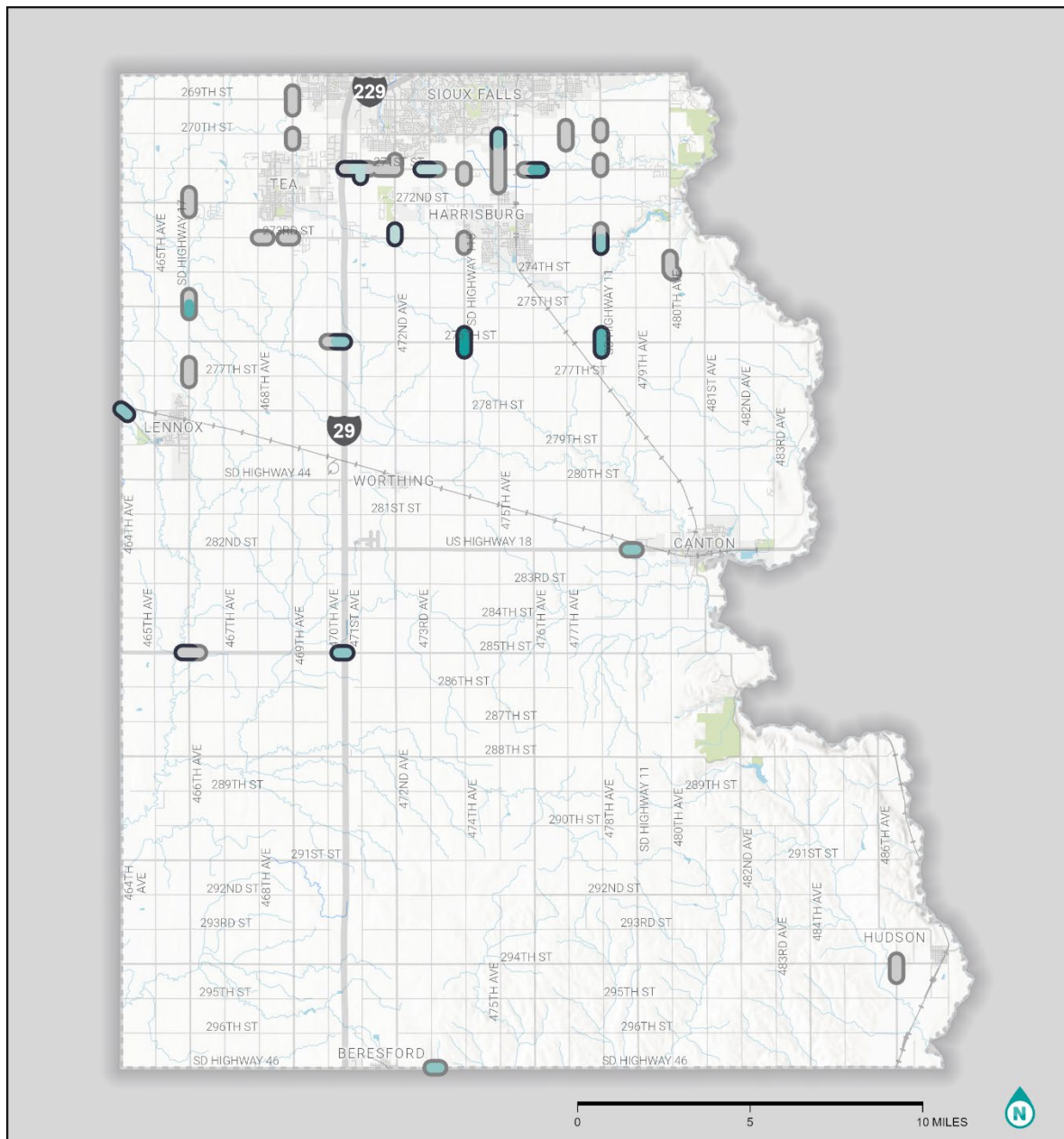
Jurisdiction Boundaries

Lincoln County

> 1 Crash Sample Size

<= 1 Crash Sample Size

Figure 11: Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Multiple Low-Cost Countermeasures
at Stop-Controlled Intersections

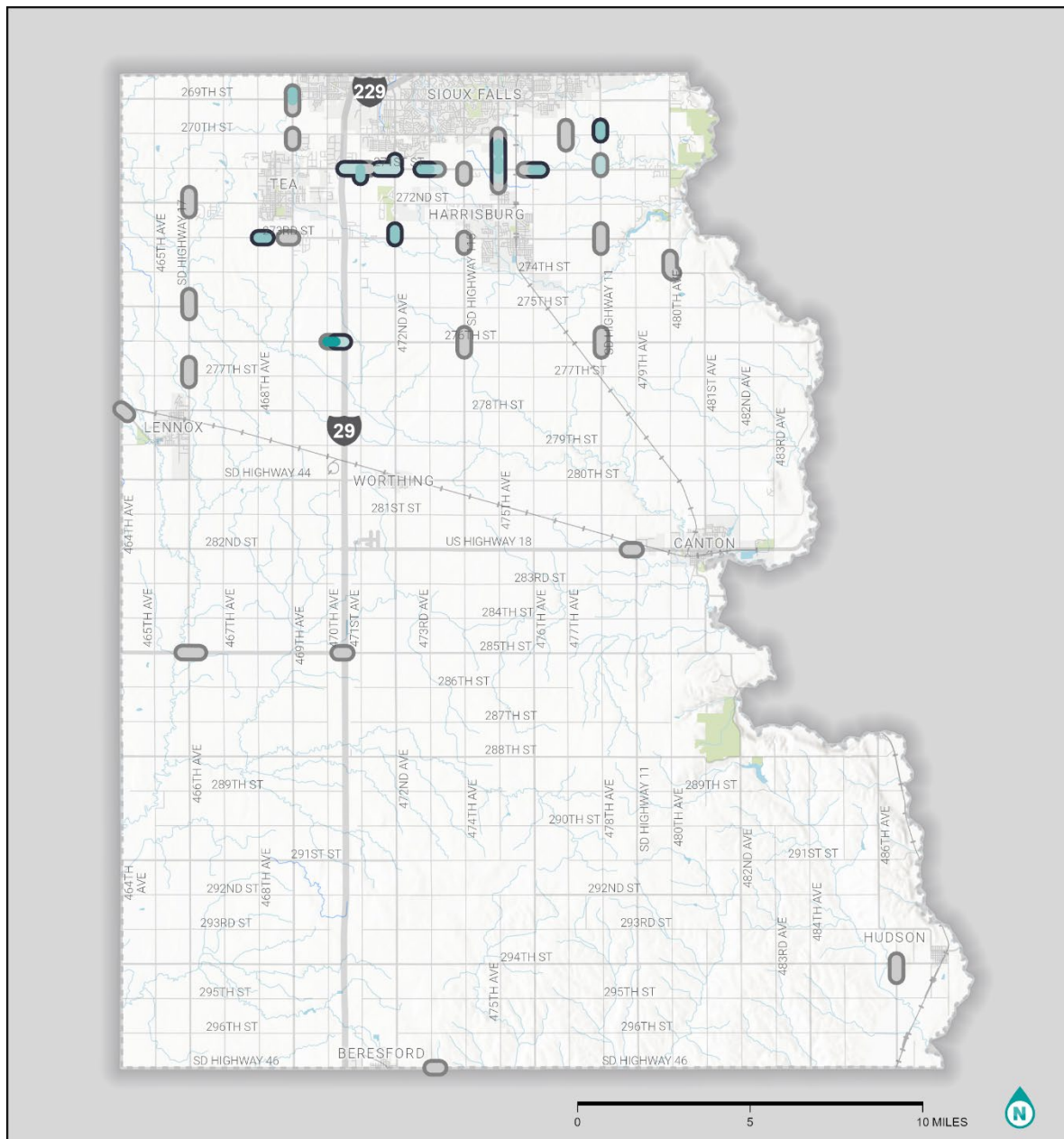
LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 12: Pavement Friction Management



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Pavement Friction Management

LINCOLN COUNTY

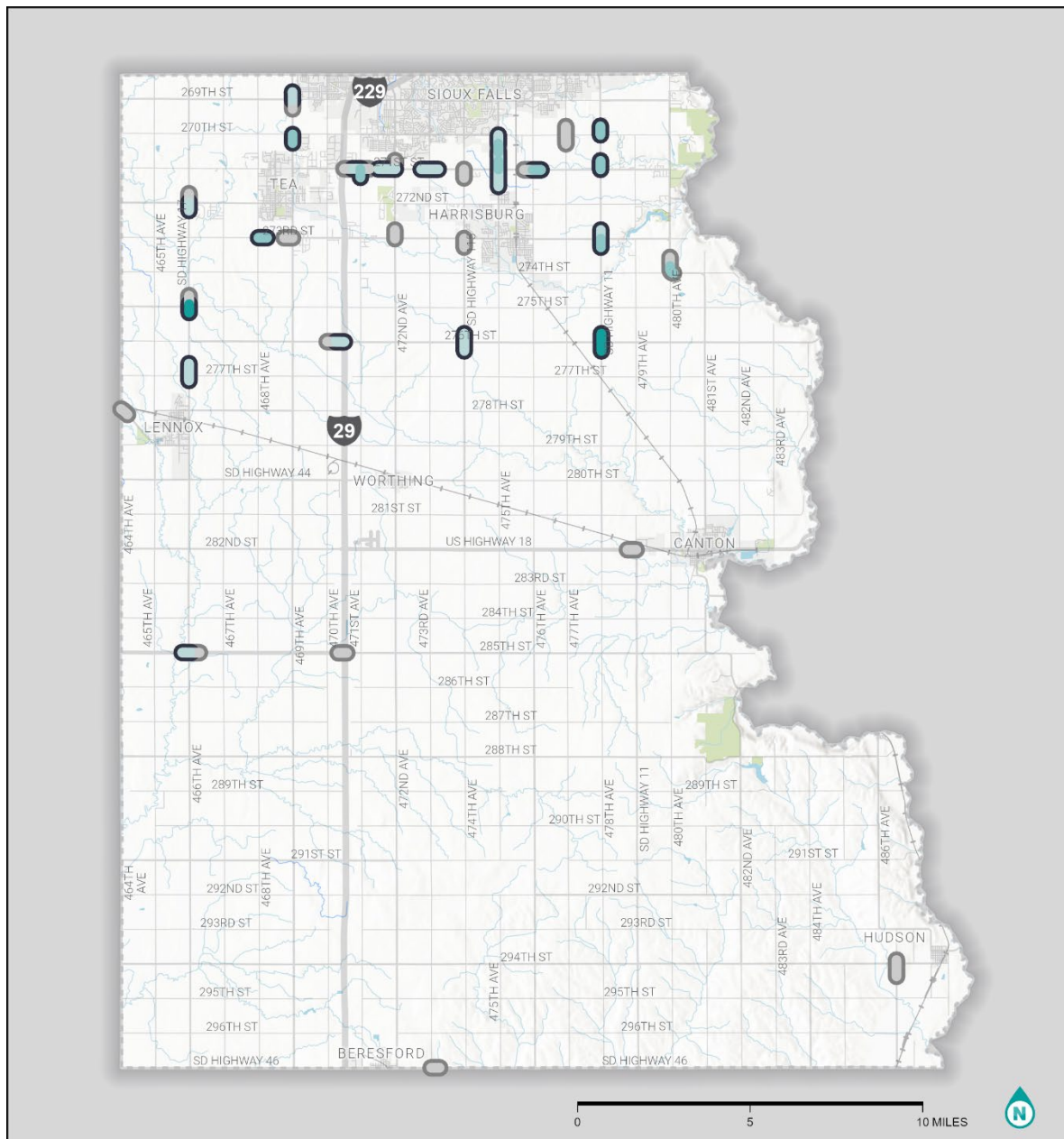
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 13: Lighting



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Lighting

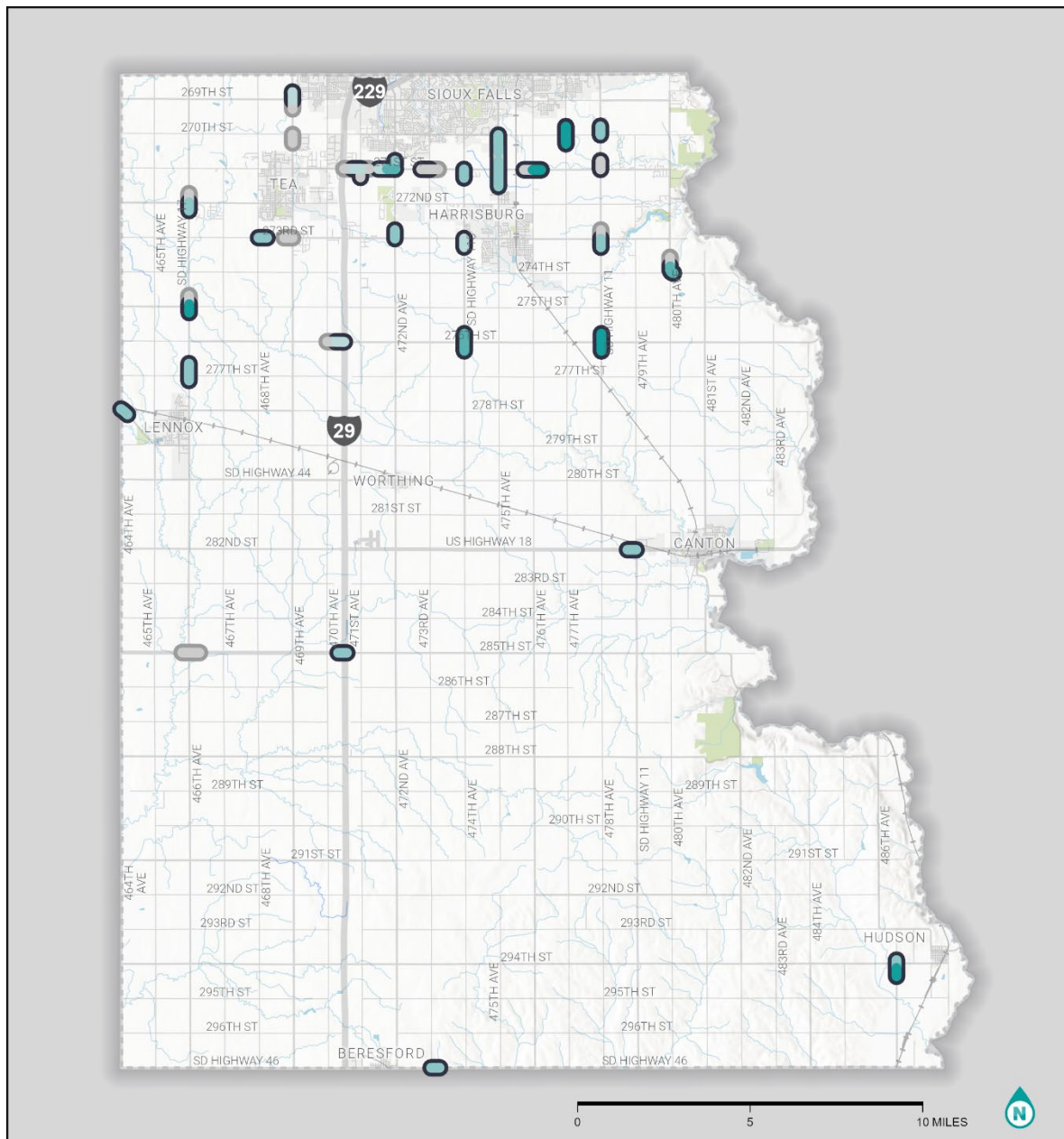
LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- <= 1 Crash Sample Size

Figure 14: Install Roadside Barrier



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Install Roadside Barrier

LINCOLN COUNTY

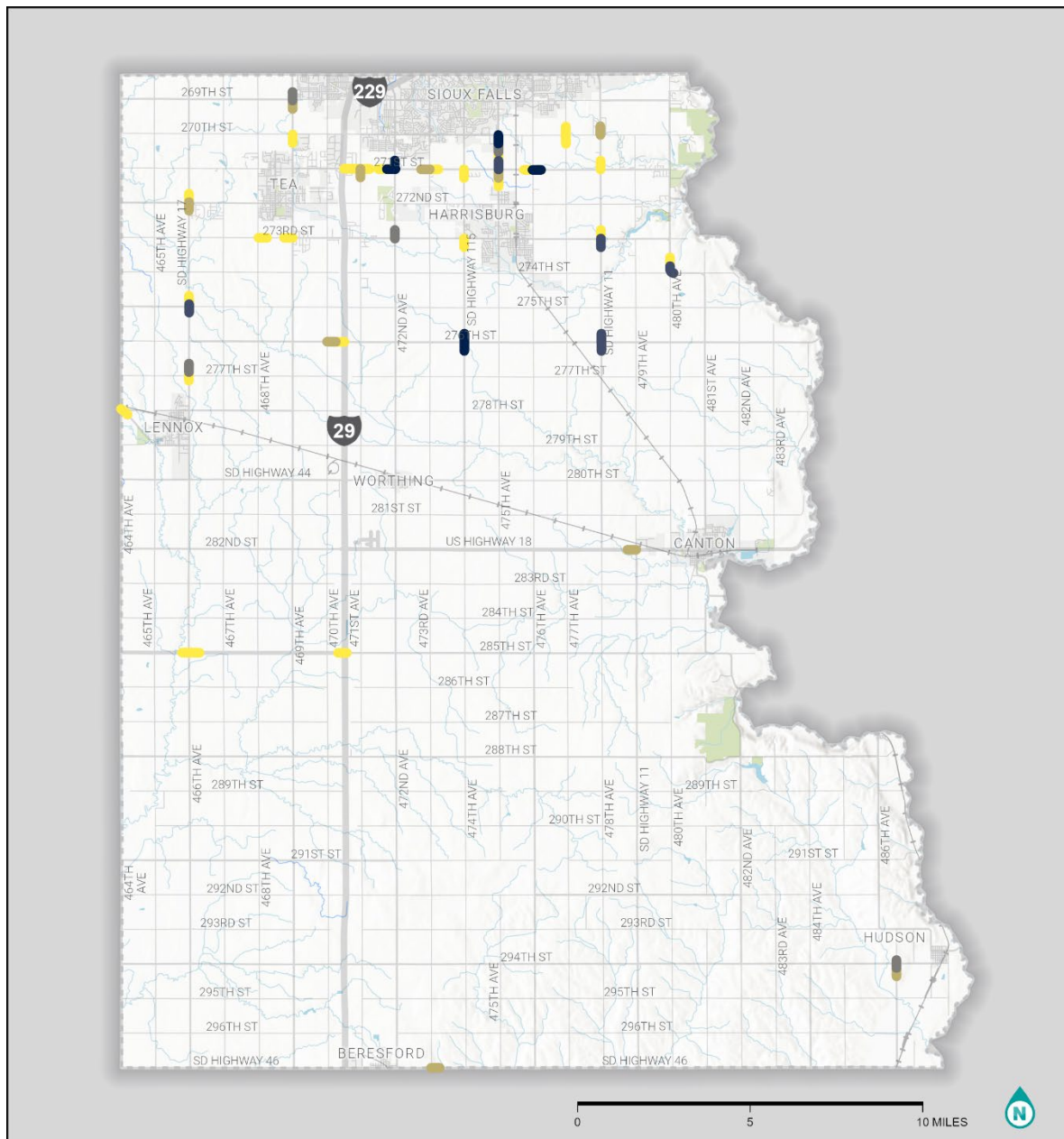
SS4A SAFETY ACTION PLAN

Economic Benefit Per Mile

- < \$25,000
- < \$150,000
- < \$1,000,000
- < \$5,000,000
- < \$36,000,000

- Railroads
- Jurisdiction Boundaries
- Lincoln County
- > 1 Crash Sample Size
- ≤ 1 Crash Sample Size

Figure 15: Total Countermeasure Applications at 70th Percentile



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS Total Applications

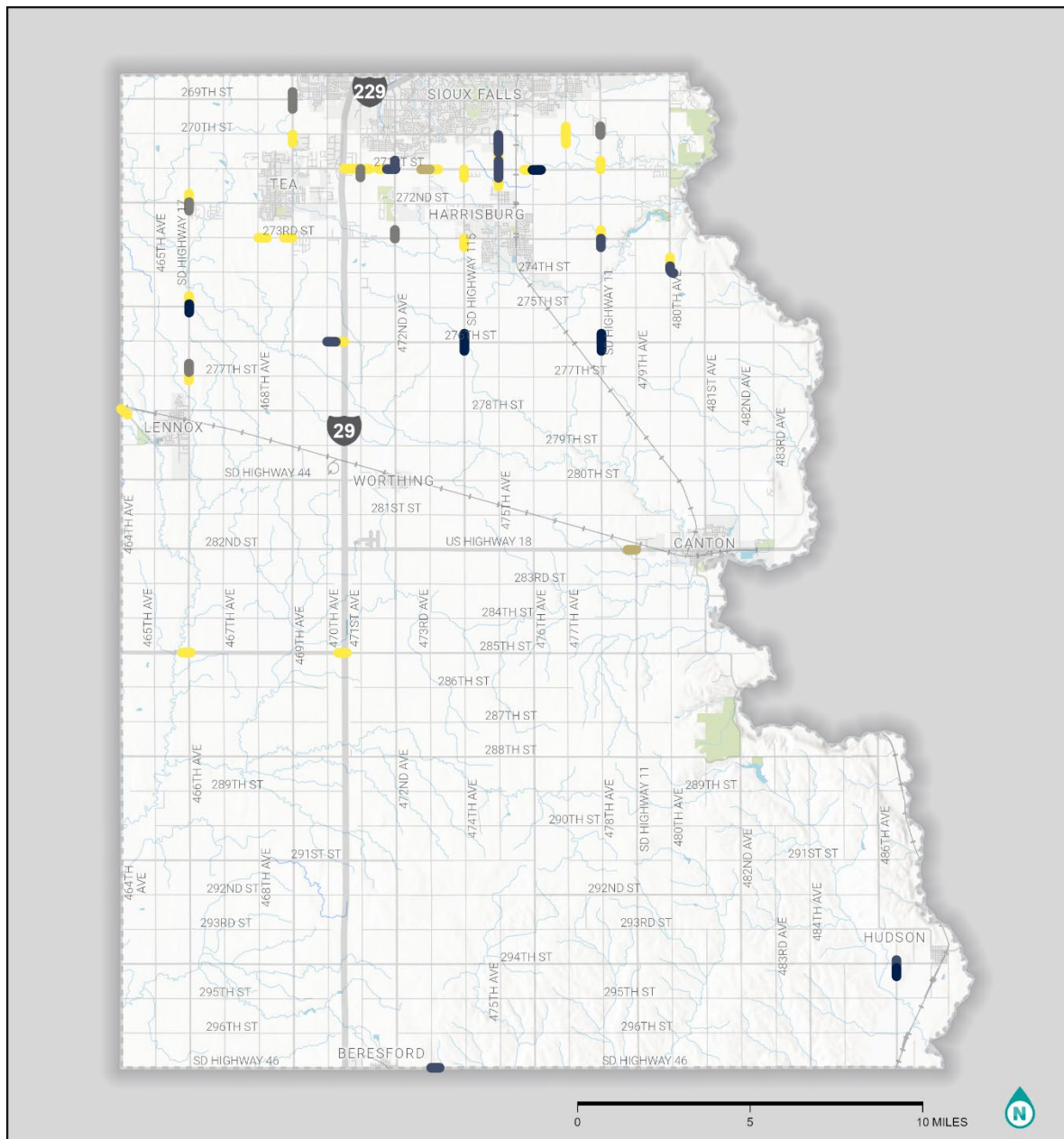
Total Countermeasure Applications
at 70th Percentile

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN

- 0
- 1 - 2
- 2 - 3
- 4 - 5
- < 7

- +— Railroads
- Jurisdiction Boundaries
- Lincoln County

Figure 16: Total Countermeasure Economic Benefit per Mile at 70th Percentile



Data provided by Lincoln County and the South Dakota Department of Public Safety. Results limited to the High Injury Network outside of urbanized areas.

COUNTERMEASURE ANALYSIS

Total Economic Benefit per Mile at 70th Percentile

LINCOLN COUNTY
SS4A SAFETY ACTION PLAN



Economic Benefit per Mile

- \$0.00 - 25,000
- \$25,000 - 175,000
- \$175,000 - 1,000,000
- \$1,000,000 - 5,000,000
- \$5,000,000 - 50,000,000

- +— Railroads
- Jurisdiction Boundaries
- Lincoln County

Considerations

This analysis has a few key considerations that should be recognized alongside the findings.

- **Sample Size Considerations** – The collision data is very sparse across much of the region, and so some of the economic benefit scores provided could be attributed to a few high severity collisions that meet the applicable criteria in the area. The index values provided by our analysis would weight severity to a lesser extent than the economic evaluation weights used for the analysis, and should be considered alongside these economic benefit estimates.
- **Conservative Estimates of Benefit** – This tool looks at very specific types of collisions for consideration of where a counter measure might be most suitable. The crash reduction factors used might apply to more collisions than just the type scrutinized by this analysis. We therefore find this tool provides a conservative evaluation of possible benefits.

Conclusion

Text

Appendix A Collision Suitability Queries

Table 4 Lists out the counter measures evaluated, the CRF used for the analysis, and the query used to filter collisions to collisions with that characteristic.

Name	CRF Used	Applicable Collisions SQL Query
Wider Edge Line	0.368	FIRST_BASENAME IS NULL And manner_of_collision = 'No collision between 2 MV in transport' ¹
Longitudinal Rumble Strips and Stripes on Two-Lane Roads	0.14	FIRST_BASENAME IS NULL And evnts LIKE '%Ran off road%' ¹
Centerline Rumble Strips	0.076	FIRST_BASENAME IS NULL And evnts LIKE '%Cross median/centerline%' ¹
Increase Retroreflectivity of Stop Signs	0.154	is_intersection = 1 And (driver_contrib_circum LIKE '%Disregarded traffic signs or signals%' Or driver_contrib_circum LIKE '%Failed to yield to vehicle%') And traff_device LIKE '%Stop sign%'
Dedicated Left- and Right-Turn Lanes at Intersections	0.26	is_intersection = 1 And left_turn_lane_presence = 0 And right_turn_lane_presence = 0
Conversion of Intersection into Single-lane Roundabout	0.59	road_width <= 35 AND is_intersection = 1
Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections	0.167	is_intersection = 1 AND traff_device LIKE '%Stop sign%'
Pavement Friction Management	0.44	road_contrib_circum LIKE '%Road surface condition (wet, icy, snow, slush, etc.)%'
Lighting	0.38	light_condition = 'Dark - roadway not lighted'
Install roadside barrier	0.51	evnts LIKE '%Ran off road%'

1. FIRST_BASENAME was a field associated with where there we municipal jurisdictions associated with the collision. Where this is null it is assumed to be a rural area for the purposes of the counter measure.

Appendix:

6. Self-Certification Checklist (completed)

All applicants should follow the instructions in the NOFO to correctly apply for a grant. See the [SS4A website](#) for more information.

Table 1 of the [SS4A NOFO](#) describes [seven components of an Action Plan](#), which correspond to the questions in this worksheet. Applicants should use this worksheet to determine whether their existing plan(s) contains the required components to be considered an eligible Action Plan for SS4A.

This worksheet is required for all SS4A **Implementation Grant** applications and any **Planning and Demonstration Grant applications to conduct Supplemental Planning/Demonstration Activities only**. Please complete the form in its entirety, do not adjust the formatting or headings of the worksheet, and upload the completed PDF with your application.

Eligibility

An Action Plan is considered eligible for an SS4A application for an Implementation Grant or a Planning and Demonstration Grant to conduct Supplemental Planning/Demonstration Activities if the following two conditions are met:

- You can answer "YES" to Questions **3, 6, and 8** in this worksheet; *and*
- You can answer "YES" to **at least three of the five remaining** Questions, **1, 2, 4, 5, and 7**.

If both conditions are not met, an applicant is still eligible to apply for a Planning and Demonstration Grant to fund the creation of a new Action Plan or updates to an existing Action Plan to meet SS4A requirements.

Applicant Information

Lead Applicant: Lincoln County, South Dakota

UEI: CNZWETPVLKY7

Action Plan Documents

In the table below, list the relevant Action Plan and any additional plans or documents that you reference in this form. **Up to three plans or documents may be included**. Please provide a hyperlink to any documents available online or indicate that the Action Plan or other documents will be uploaded in Valid Eval as part of your application. Note that, to be considered an eligible Action Plan for SS4A, the plan(s) coverage must be broader than just a corridor, neighborhood, or specific location.

Document Title	Link	Date of Most Recent Update
Lincoln County SS4A Comprehensive Safety Action Plan	https://engage.hei.mysocialpinpoint.com/lincoln-county-SSA	2026



Action Plan Components

For each question below, answer "YES" or "NO." If "YES," list the relevant plan(s) or supporting documentation that address the condition and the specific page number(s) in each document that corroborates your response. This form provides space to reference multiple plans, but please list only the most relevant document(s).

1. Leadership Commitment and Goal Setting

Are **BOTH** of the following true?

- A high-ranking official and/or governing body in the jurisdiction publicly committed to an eventual goal of zero roadway fatalities and serious injuries; and
- The commitment includes either setting a target date to reach zero OR setting one or more targets to achieve a reduction in roadway fatalities and serious injuries by a specific date.

☒ **YES**

☐ **NO**

Note: This may include a resolution, policy, ordinance, executive order, or other official announcement from a high-ranking official and the official adoption of a plan that includes the commitment by a legislative body.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)
Lincoln County SS4A Action Plan Resolution	38

2. Planning Structure

To develop the Action Plan, was a committee, task force, implementation group, or similar body established and charged with the plan's development, implementation, and monitoring?

☒ **YES**

☐ **NO**

Note: This should include a description of the membership of the group and what role they play in the development, implementation, and monitoring of the Action Plan.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)
Lincoln County SS4A Action Plan	13



3. Safety Analysis

Does the Action Plan include **ALL** of the following?

- Analysis of existing conditions and historical trends to provide a baseline level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or region;
- Analysis of the location(s) of crashes, the severity, contributing factors, and crash types;
- Analysis of systemic and specific safety needs, as needed (e.g., high-risk road features or specific safety needs of relevant road users); and,
- A geospatial identification (geographic or locational data using maps) of higher risk locations.

☒ **YES**

☐ **NO**

Note: Availability and level of detail of safety data may vary greatly by location. The [Fatality and Injury Reporting System Tool \(FIRST\)](#) provides county- and city-level data. When available, local data should be used to supplement nationally available data sets.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)
Lincoln County SS4A Action Plan	20

4. Engagement and Collaboration

Did development of the Action Plan include **ALL** of the following activities?

- Engagement with the public and relevant stakeholders, including the private sector and community groups;
- Incorporation of information received from the engagement and collaboration into the plan; and
- Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.

☒ **YES**

☐ **NO**

Note: This should include a description of public meetings, participation in public and private events, and proactive meetings with stakeholders.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)
Lincoln County SS4A Action Plan	12



5. Policy and Process Changes

Are **BOTH** of the following true?

- The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety; and
- The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.

☒ **YES**

☐ **NO**

Note: This may include existing and/or recommended Complete Streets policy, guidelines for community engagement and collaboration, policy for prioritizing areas of greatest need, local laws (e.g., speed limit), design guidelines, and other policies and processes that prioritize safety.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)
Lincoln County SS4A Action Plan	40-44

6. Strategy and Project Selections

Does the plan identify a comprehensive set of projects and strategies to address the safety problems in the Action Plan, with information about time ranges when projects and strategies will be deployed, and an explanation of project prioritization criteria?

☒ **YES**

☐ **NO**

Note: This should include one or more lists of community-wide multi-modal and multi-disciplinary projects that respond to safety problems and reflect community input and a description of how your community will prioritize projects in the future.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)
Lincoln County SS4A Action Plan	27



7. Progress and Transparency

Does the plan include **BOTH** of the following?

- A description of how progress will be measured over time that includes, at a minimum, outcome data.
- The plan is posted publicly online.

☒ **YES**

☐ **NO**

Note: This should include a progress reporting structure and list of proposed metrics.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)
Lincoln County SS4A Action Plan	38

8. Action Plan Date

Was at least one of your plans finalized and/or last updated between 2020 and June 26, 2025?

☒ **YES**

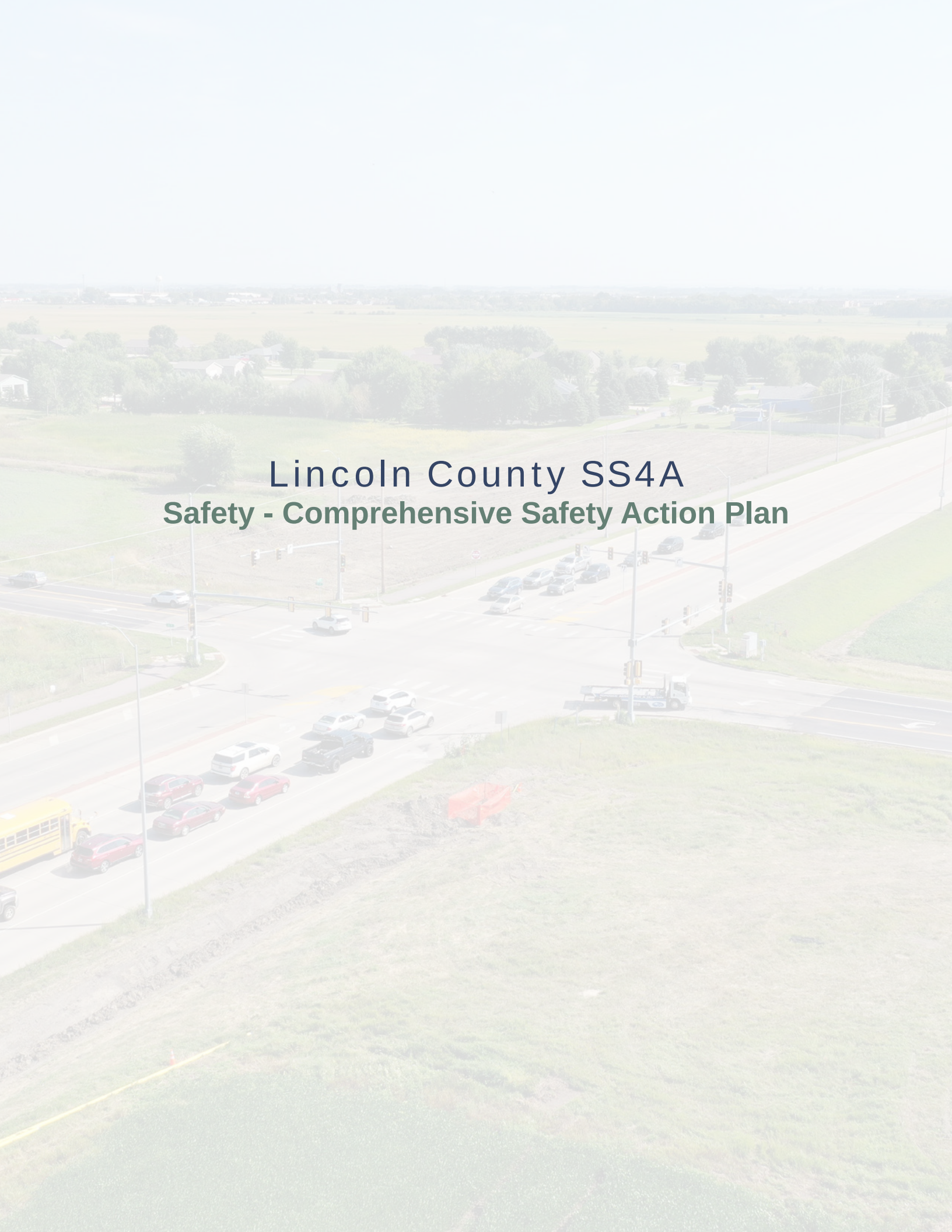
☐ **NO**

Note: Updates may include major revisions, updates to the data used for analysis, status updates, or the addition of supplemental planning documents, including but not limited to an ADA Transition Plan, one or more Road Safety Audits conducted in high-crash locations, or a Vulnerable Road User Plan.

If "YES," please list your most recent document, date of finalization, and page number(s) that corroborate your response.

Document Title	Date of Most Recent Update	Page Number(s)
Lincoln County SS4A Action Plan	April 28, 2026	see resolution at front of plan



An aerial photograph of a multi-lane intersection in Lincoln County, SS4A. The image shows a complex intersection with multiple traffic lights and lanes. A yellow school bus is visible in the lower-left foreground, stopped at a red light. Several cars are waiting at the intersection, and a white truck is visible on the right side. The background features a mix of green fields, trees, and some buildings under a clear sky. The text "Lincoln County SS4A" and "Safety - Comprehensive Safety Action Plan" is overlaid in the center of the image.

Lincoln County SS4A

Safety - Comprehensive Safety Action Plan