November 15, 2023

SOUTH DAKOTA

Vulnerable Road User Safety Assessment

SD DEPARTMENT OF TRANSPORTATION

Image courtesy of Travel South Dakota

Message from Secretary Jundt

The South Dakota Department of Transportation (SDDOT) is dedicated to our mission: to efficiently provide a safe and effective public transportation system. We, along with our partners, are working towards a future where everybody arrives home safely through the collective actions of planners, engineers, contractors, law enforcement, emergency responders, and educators. These efforts also depend on collaboration with those who travel on our roads by vehicle, motorcycle, bicycle, or on foot. All of us are responsible for creating safer roadways together.

South Dakota's 2023 Vulnerable Road User (VRU) Safety Assessment supports safety for pedestrians, cyclists, and other non-motorized transportation users. In this report, SDDOT outlines how it will take a collaborative effort of safety stakeholders to drive meaningful crash reductions. This report is a tool for state, county, and municipal governments; non-profit agencies; advocacy groups; and private sector partners to engage in supporting safe infrastructure for everyone – particularly our most vulnerable roadway users.

The VRU Safety Assessment is an addition to SDDOT's Strategic Highway Safety Plan (SHSP) that guides safety infrastructure priorities, education and training enhancements, enforcement improvements, as well as improvements in emergency response.

I am proud to call South Dakota home. This is a beautiful state that is known for being not only a fantastic place to live, work, and raise a family but also a prime tourist destination. Our goal is that South Dakota also stands as a state that provides a connected transportation network for residents, visitors, and travelers to safely and comfortably walk and bike for recreation and transportation. Our work and endeavors to support safety for our most vulnerable roadway users remains critical – and we need your help to continue to make safety a priority. The loss of even one life on our roads is one too many.

Joel Jundt (Nov 15, 2023 12:14 CST)

Joel Jundt

Secretary of Transportation

CONTENTS

Message from Secretary Jundt i

Abbreviations and Acronyms iv

1. Introduction 1

Why Address Vulnerable Road Users? 1
What is a VRU Safety Assessment? 1
How was the Assessment Completed? 1

2. Overview of VRU Safety Performance 4

Historic Comparison of VRU Safety Performance to Overall Safety Performance 4
Safety Performance Targets 5
Non-Motorist-Involved Crash Trends 6

3. Summary of Quantitative Analysis and Findings 7

Methodology 7
High-Risk Determination 7
Demographic Consideration 8

4. Summary of Consultation and Outcomes 14

Consultation Meetings 14

EAST RIVER CONSULTATION 14
WEST RIVER CONSULTATION 15
CITY OF RAPID CITY CONSULTATION 15
CITY OF SIOUX FALLS CONSULTATION 15
TRIBAL GOVERNMENTS COORDINATION 16

Bicycle and Active Transportation Interest Groups Survey 17

5. Program of VRU Improvement Strategies 18

Existing Resources and Programs 18

STATEWIDE LAWS 18
STATEWIDE EDUCATIONAL CAMPAIGNS 19
STATEWIDE PLANS 19
LOCAL AND REGIONAL PLANS 20
DOT FUNDING STRATEGIES 21

Infrastructure Strategies 22

BEST PRACTICE DESIGN RESOURCES 22

Education and Outreach Strategies 24
Programmatic or Policy Strategies 25

Appendix A: Consultation Meeting Summaries A-1

Appendix B: Tribal Survey Results B-1

Survey Questions B-1
Survey Results (3 total responses) B-2

Appendix C: Bicycle and Active Transportation Groups Survey Results C-1

Survey Questions C-1
Survey Results (36 total responses) C-2

Appendix D: Program of VRU Improvement Strategies D-1

Appendix E: Best Practice Design Resources E-1

TABLES

Table 1: 2018 to 2022 Safety Performance Measures 4

FIGURES

Figure 1: Safe System Principles. Source: USDOT, Safe System Approach Flyer 2
Figure 2: Safe System Approach Elements. Source: USDOT, Safe System Approach Flyer 2
Figure 3: Fatal and Serious Injury Crash Frequencies (2018-2022) 5
Figure 4: Non-Motorist Crashes (2018-2022) 6
Figure 5: Non-Motorist-Involved Crash Trends (2018-2022) 6
Figure 6: Fatal and Serious Injury VRU Crash Density (2018-2022) 9
Figure 7: Fatal and Serious Injury VRU Crash Rates by County (2018-2022) 10
Figure 8: Fatal and Serious Injury VRU Crash Density by Municipality (2018-2022) 11
Figure 9: Fatal and Serious Injury VRU Crash Rates by Tribe (2018-2022) 12
Figure 10: Fatal and Serious Injury VRU Crash Rates by Transportation Disadvantaged Census Tracts (2018-2022) 13
Figure 11: Don't Thump Your Melon Campaign Brochure 19
Figure 12: FHWA Proven Safety Countermeasures Relevant to VRUs 23

Abbreviations and Acronyms

BIA	Bureau of Indian Affairs
CMF	Crash Modification Factor
FARS	Fatality Analysis Reporting System
FHWA	Federal Highway Administration
HDC	Historically Disadvantaged Community
HSIP	Highway Safety Improvement Program
LRSP	Local Road Safety Plan
MUTCD	Manual on Uniform Traffic Control Devices
MPO	Metropolitan Planning Organization
RCAMPO	Rapid City Area Metropolitan Planning Organization
SHSP	Strategic Highway Safety Plan
SDDOT	South Dakota Department of Transportation
SDDPS	South Dakota Department of Public Safety
SDOHS	South Dakota Office of Highway Safety
SECOG	South Eastern Council of Governments
SIMPCO	Siouxland Interstate Metropolitan Planning Council
SSA	Safe System Approach
STEP	Safe Travel for Every Pedestrian
STIP	Statewide Transportation Improvement Program
TA	Transportation Alternatives
USDOT	United States Department of Transportation
VRU	Vulnerable Road User

1. Introduction

Why Address Vulnerable Road Users?

In the United States, a growing number of roadway fatalities and injuries are occurring between vulnerable road users (VRUs) and motor vehicles.[1] A VRU is a non-motorist such as a person walking, biking, or using a personal conveyance device. It also includes highway workers on foot in a work zone. Nationally, 2021 experienced the highest number of traffic fatalities since 2005. From 2020 to 2021, bicyclist fatalities were up 1.9 percent and pedestrian fatalities were up 13 percent.[2] The Federal Highway Administration's (FHWA) vision is achieving zero deaths on the nation's roads. Therefore, FHWA is encouraging states to prioritize VRU safety in all Federal highway investments and in all appropriate projects.

While VRU fatal and serious injury crashes have seen an increase nationwide, the numbers in South Dakota have stayed relatively flat. Between 2018 and 2022 in South Dakota, the total percent of VRU fatalities were 9.7 percent of the total roadway fatalities. South Dakota's 2019 Strategic Highway Safety Plan (SHSP) vision is to eliminate all deaths and life-changing injuries on South Dakota's roads, so everyone arrives home safely. The first target goal is to reduce fatalities to 100 or fewer deaths and reduce serious injuries to 400 or fewer by 2024. Addressing the safety of VRUs through a multifaceted, collaborative, and comprehensive approach will allow people that walk, bike, and roll safe and comfortable access to the transportation system.

What is a VRU Safety Assessment?

This initial VRU Safety Assessment is an addendum to the state's SHSP and will be updated with subsequent updates of the SHSP. The assessment consists of an overview of the state's safety performance as it relates to VRUs, including crash and demographic trends related to crashes involving fatalities and serious injuries. Using a data-driven approach, the assessment identifies high-risk areas in the state for VRUs. The assessment summarizes the consultation process with high-risk communities and the outcomes of those consultation meetings. Finally, the assessment presents existing programs and resources that can improve conditions for VRUs and a program of additional strategies such as infrastructure countermeasures, education and outreach, or programs or policies that may be implemented to further improve VRU transportation safety.

How was the Assessment Completed?

The VRU Safety Assessment started with an evaluation of the state's safety performance with respect to VRUs. Upon identifying high-risk areas, the project team consulted with those high-risk communities to evaluate strategies to improve the safety of VRUs. The findings from the data analysis and consultation with high-risk communities informed the program of strategies to improve safety conditions.

The VRU Safety Assessment adheres to the principles and objectives of the Safe System Approach (SSA), which addresses the safety of all road users. The SSA is a holistic and comprehensive approach that provides a guiding framework to make transportation safer for

[1] FARS Encyclopedia (dot.gov) & Fatality and Injury Reporting System Tool (FIRST) (dot.gov)
[2] Overview of Motor Vehicle Traffic Crashes in 2021 (dot.gov)

people. Fundamentally, the SSA works by anticipating human mistakes and lessening impact forces to reduce crash severity and save lives. **Figure 1** outlines the six SSA principles that explain how the overall goal of the approach is to prioritize eliminating crashes that result in death and serious injuries. **Figure 2** identifies the SSA elements which include infrastructure strategies such as safe speeds and safe roads, which slow motorized traffic and physically separate VRUs from motorized traffic in time and in space. The SSA deals with safety from multiple perspectives including types of road users, the vehicles we drive, the speeds we travel, the design of our roads, and post-crash care in the event of a crash.

Figure 1: Safe System Principles. Source: USDOT, Safe System Approach Flyer

Figure 2: Safe System Approach Elements. Source: USDOT, Safe System Approach Flyer

The VRU Safety Assessment also considers equity impacts such as racial disparities, access for elderly and those with disabilities, workforce development, economic development, and automobile dependence. Overall, pedestrian fatalities are overrepresented in American Indian/Alaskan Native and Black populations and those living in poverty.[3] The VRU Safety Assessment will address equity by considering the impacts to these underserved communities.

[3] National Roadway Safety Strategy (transportation.gov)

2. Overview of VRU Safety Performance

VRU safety performance was evaluated using South Dakota crash records from 2018 to 2022. VRU crashes were identified as severe injury non-motorist crashes (i.e., crashes that resulted in fatal or serious injuries sustained by the non-motorist). A non-motorist in this analysis is anyone walking, biking, or using a mobility aid device, including workers in construction zones.

Historic Comparison of VRU Safety Performance to Overall Safety Performance

VRU fatal and serious injury outcomes were compared to the trends of all transportation users from 2018 to 2022. Data were gathered from crash records provided by the South Dakota Department of Transportation (SDDOT) and South Dakota Department of Public Safety (SDDPS).

Based on VRU data, non-motorist fatalities are a relatively flat trend ranging between a low of nine and a high of sixteen per year. Similarly, non-motorist serious injuries observed a somewhat fluctuating trend ranging between a low of 26 and a high of 39 per year. VRU performance measures, shown at crash-level and person-level perspectives, are shown in **Table 1** and a comparison of fatal and serious injury crashes between all modes and non-motorists is depicted in **Figure 3**.

Table 1: 2018 to 2022 Safety Performance Measures

Performance Measures	2018	2019	2020	2021	2022	Total
Crash-Level						
Fatal Injury Crashes (all modes)	110	88	132	131	121	**582**
Serious Injury Crashes (all modes)	468	409	419	497	510	**2,303**
Number of Non-Motorized Fatal Injury Crashes	11	8	13	14	16	**62**
Number of Non-Motorized Serious Injury Crashes	38	26	28	34	28	**153**
Person-Level						
Fatal Injuries (all modes)	130	102	141	148	137	**658**
Serious Injuries (all modes)	569	520	548	620	619	**2,876**
Number of Non-Motorized Fatal Injuries	11	9	14	14	16	**64**
Number of Non-Motorized Serious Injuries	39	26	28	35	29	**155**

Notable findings when comparing non-motorist crash outcomes with total crashes include:

- For the five-year period, non-motorists represent six percent of fatalities and incapacitating injuries.
- By year, non-motorized users accounted for eight to 12 percent of all fatalities.
- By year, non-motorized users account for five to seven percent of serious injuries.

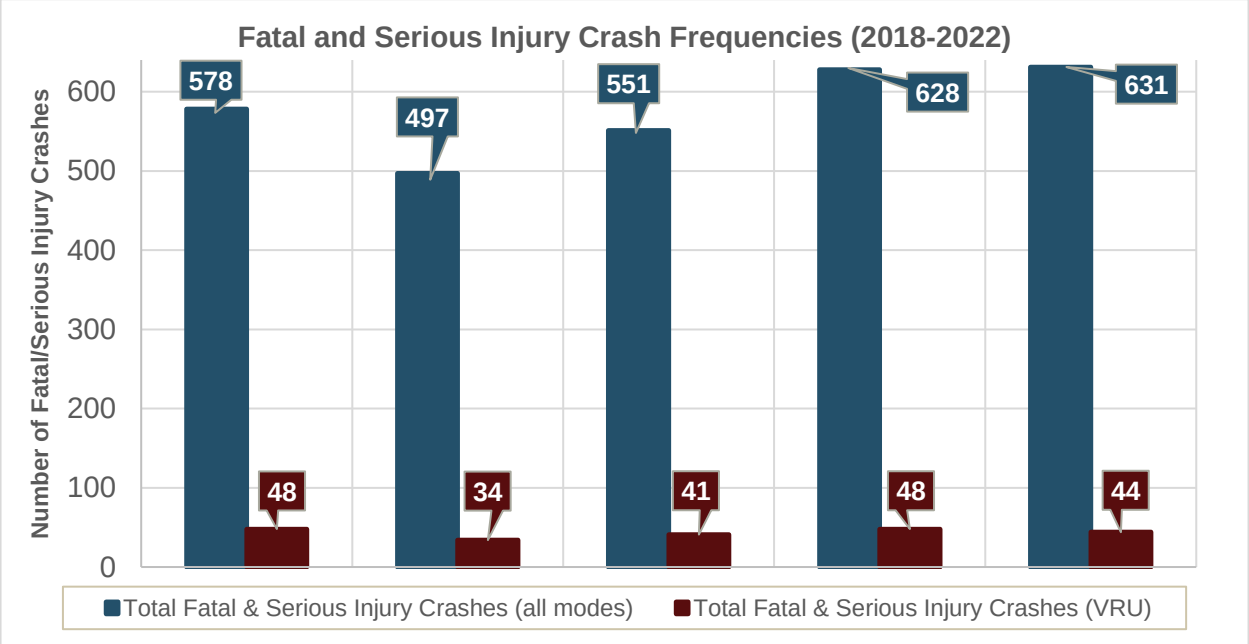


Figure 3: Fatal and Serious Injury Crash Frequencies (2018-2022)

Safety Performance Targets

Through the 2019 South Dakota Strategic Highway Safety Plan (SHSP), the SDDOT establishes annual safety performance targets. Systemwide safety goals specified in the SHSP are to reduce traffic fatalities to 100 or fewer deaths by 2024 and serious traffic-related injuries to 400 or fewer by the same year.[4]

While safety targets for pedestrian and bicycle fatalities and serious injuries were not specified in the 2019 plan, frequencies in these categories were reviewed during the initial emphasis area selection process. Between 2013 to 2017, the period previously reviewed for the 2019 SHSP, 178 fatal and serious injury pedestrian crashes occurred (a five percent reduction from the 2014 SHSP).[3] During the same period, 46 fatal and serious injury bicyclist crashes occurred (a 24 percent reduction from the 2014 SHSP).[3] In comparison to 2018 to 2022 data, 179 fatal and serious injury pedestrian crashes occurred (less than one percent change from the 2019 SHSP) as well as 36 fatal and serious injury bicyclist crashes (a 22 percent decrease from the 2019 SHSP).

[4] 2019 South Dakota Strategic Highway Safety Plan (sd.gov)

Non-Motorist-Involved Crash Trends

Fatal and serious injury pedestrian and bicyclist crashes were reviewed for years 2018 to 2022. **Figure 4** depicts these non-motorist crashes categorized by VRU type (pedestrians or bicyclists). In addition, a crash trend analysis was conducted to review several key factors including roadway/location type, time of day, month, lighting conditions, roadway surface conditions, and VRU characteristics. An infographic showcasing key findings from that crash trend analysis is provided in **Figure 5.**

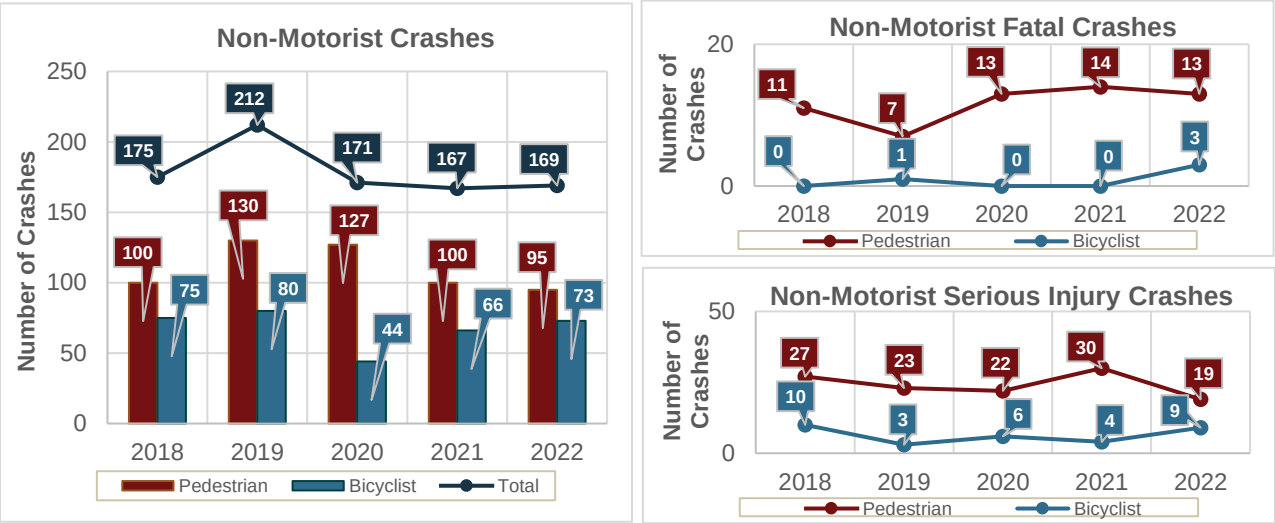


Figure 4: Non-Motorist Crashes (2018-2022)

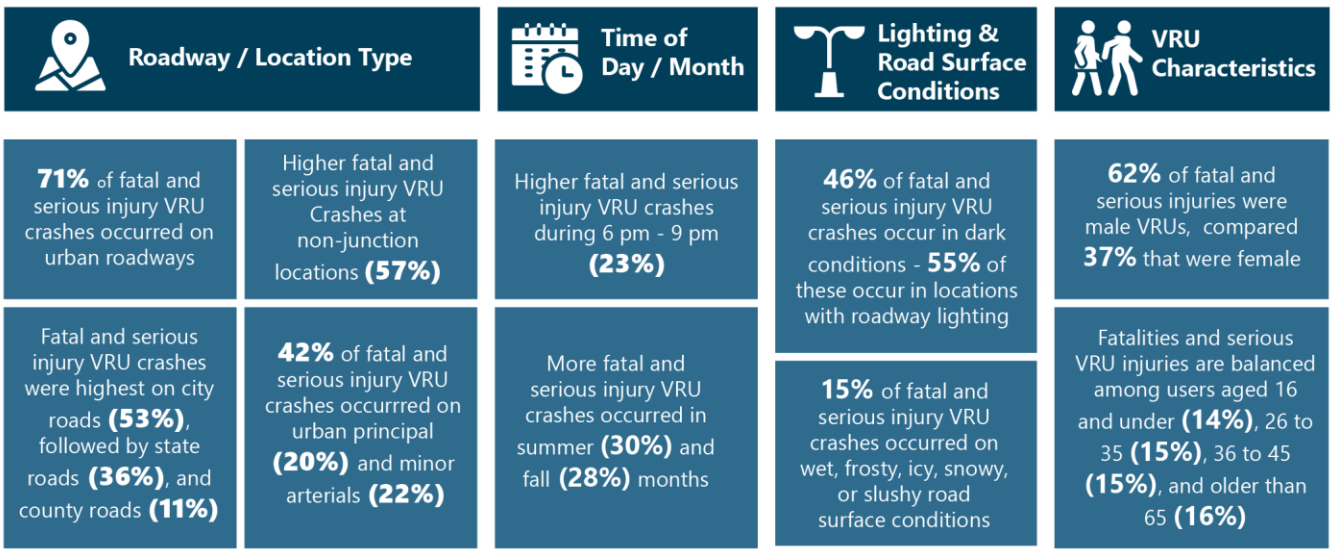


Figure 5: Non-Motorist-Involved Crash Trends (2018-2022)

3. Summary of Quantitative Analysis and Findings

The following sections detail the methodology, high-risk determination, and demographic consideration involved with the VRU safety assessment analysis. Ultimately through this process, select counties, cities, and tribal areas were found to have notable VRU crash frequencies or rates and highlighted for inclusion in the consultation process.

Methodology

Crash data was provided by SDDOT and SDDPS for the five-year period from 2018 to 2022. The data was filtered to only include crashes that involved a pedestrian or bicyclist fatality or serious injury.

The crash dataset was mapped with GIS software to spatially visualize where VRU fatal and serious injury crashes occurred, specifically in relation to county, municipal, tribal, and disadvantaged community boundaries. Each county, city, tribal area, and disadvantaged community was summarized by the crash frequency and crash rate of VRU fatalities and serious injuries, with the injury rate based on the population within the boundary area.

Figure 6 through **Figure 10** show fatal and serious injury crashes mapped within South Dakota, including by county, municipality, tribal area, and disadvantaged communities.

High-Risk Determination

The seven counties selected as high-risk areas for vulnerable road users were the counties with the highest crash rates and a minimum of three VRU fatal or serious injury crashes. Setting the minimum of three crashes within a county, rather than including counties with only one or two crashes, helps to focus on counties where there might be a pattern of crashes. They include:

- **Buffalo County** (3 crashes, 161.20 crashes/100,000 people)
- **Oglala Lakota County** (11 crashes, 81.37 crashes/100,000 people)
- **Pennington County** (54 crashes, 47.18 crashes/100,000 people)
- **Fall River County** (3 crashes, 40.71 crashes/100,000 people)
- **Roberts County** (4 crashes, 39.36 crashes/100,000 people)
- **Lawrence County** (10 crashes, 36.75 crashes/100,000 people)
- **Codington County** (9 crashes, 31.34 crashes/100,000 people)

The two cities selected as high-risk areas for vulnerable road users were the cities with the highest frequency of VRU fatal or serious injury crashes. Overall, these two cities account for nearly 48 percent of all VRU fatal or serious injury crashes. They include:

- **Sioux Falls (**56 crashes)
- **Rapid City** (47 crashes)

The three tribal areas selected as high-risk areas for vulnerable road users were tribal areas with the highest crash rates. They include:

- **Crow Creek Sioux Tribe** (3 crashes, 243.90 crashes/100,000 people)
- **Oglala Sioux Tribe** (11 crashes, 55.61 crashes/100,000 people)
- **Sisseton-Wahpeton Oyate** (5 crashes, 36.04 crashes/100,000 people)

Demographic Consideration

Crashes involving VRUs were mapped by disadvantaged community based on the USDOT Transportation Disadvantaged Census Tracts (Historically Disadvantaged Communities)[5] and compared to the high-risk areas identified above. Of the nineteen disadvantaged community census tracts within South Dakota, eleven had at least one VRU fatal or serious injury crash, nine of which are already included within an area identified as a high-risk area for VRUs. This disadvantaged census tracts with the top seven crash rate were included within the previously identified high risk areas. No further action was taken as most disadvantaged communities at-risk to VRUs were already included in previously identified counties, cities, and tribal lands in the high-risk determination process.

[5] USDOT Transportation Disadvantaged Census Tract (Historically Disadvantaged Communities)

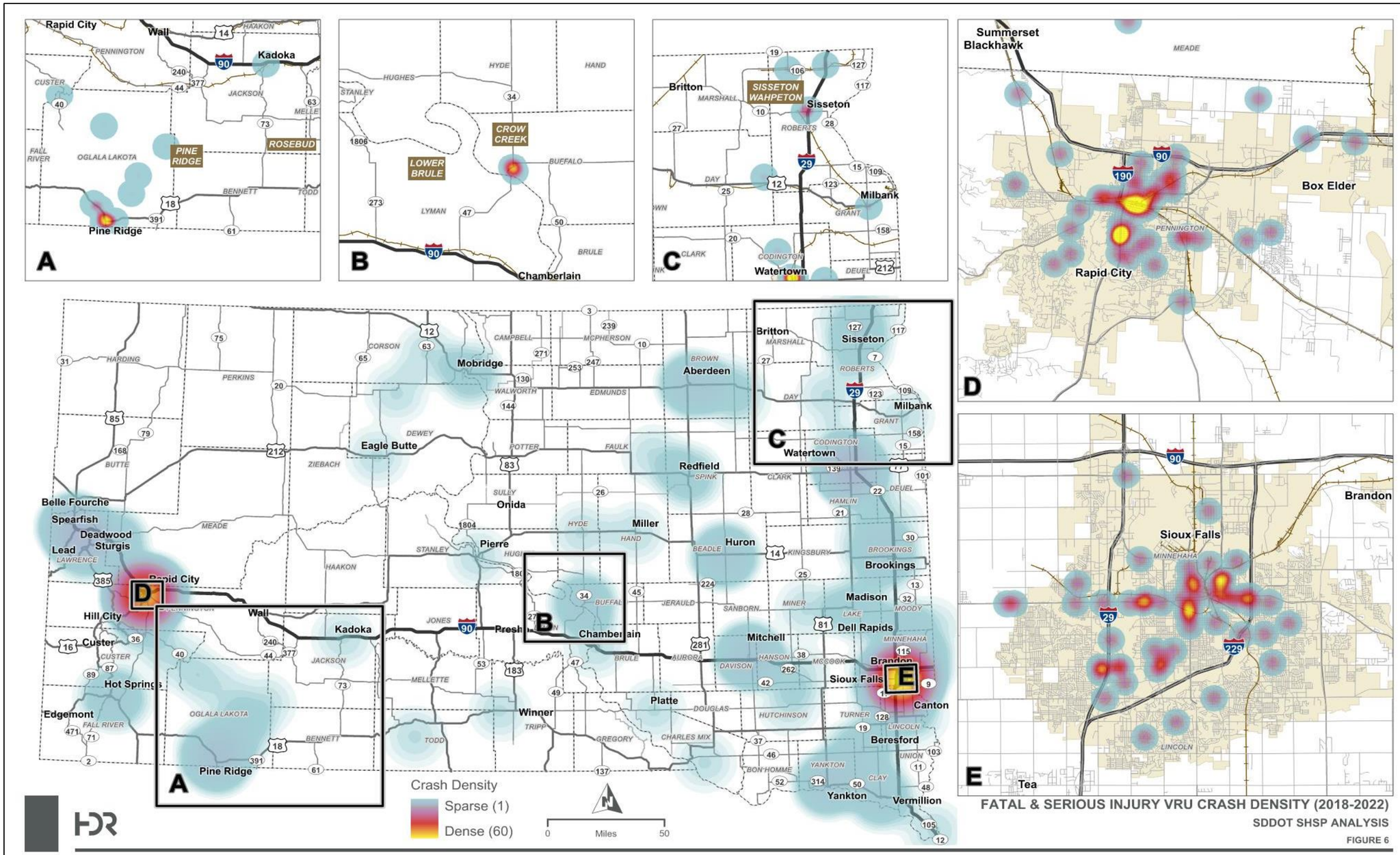


Figure 6: Fatal and Serious Injury VRU Crash Density (2018-2022)

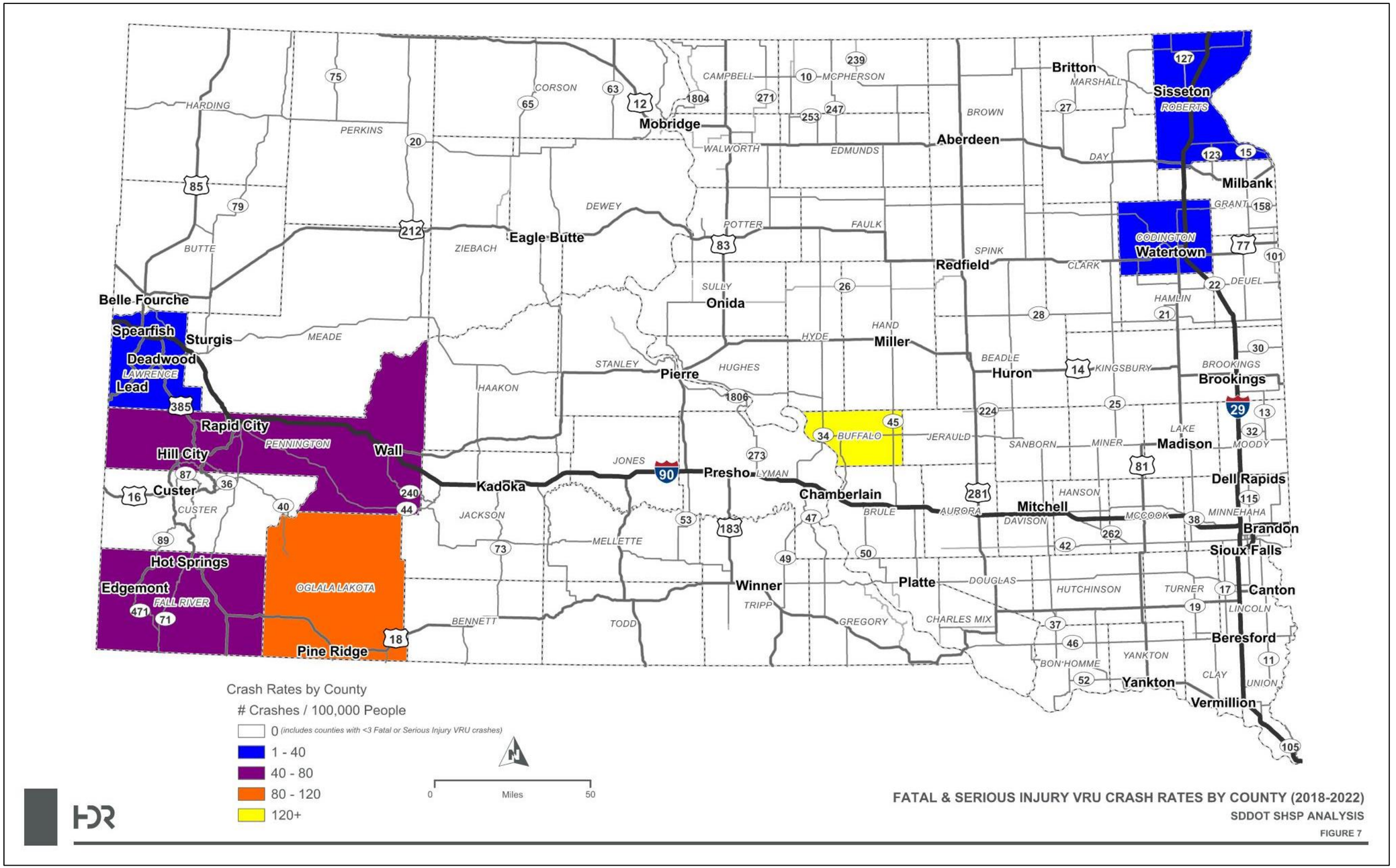


Figure 7: Fatal and Serious Injury VRU Crash Rates by County (2018-2022)

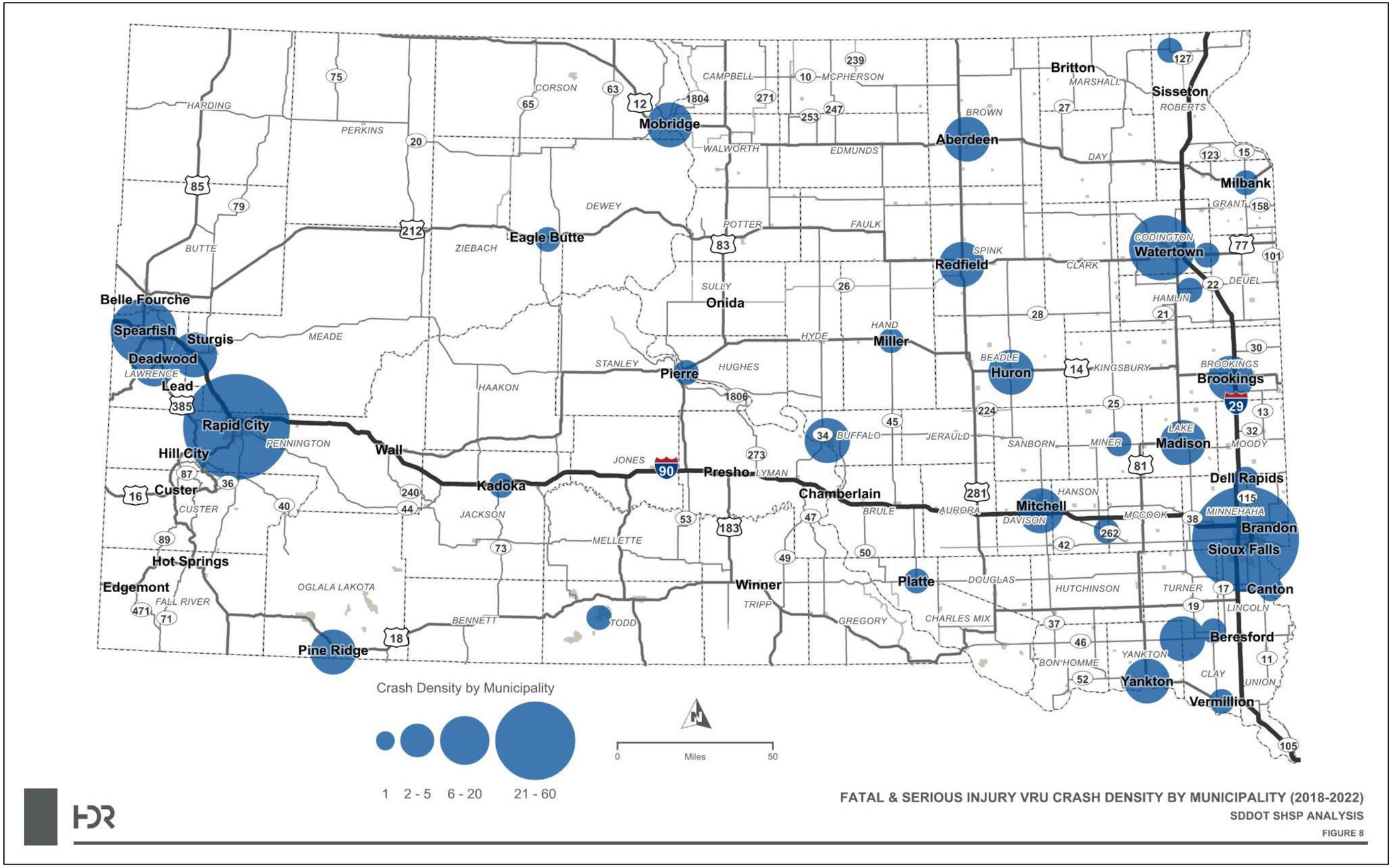


Figure 8: Fatal and Serious Injury VRU Crash Density by Municipality (2018-2022)

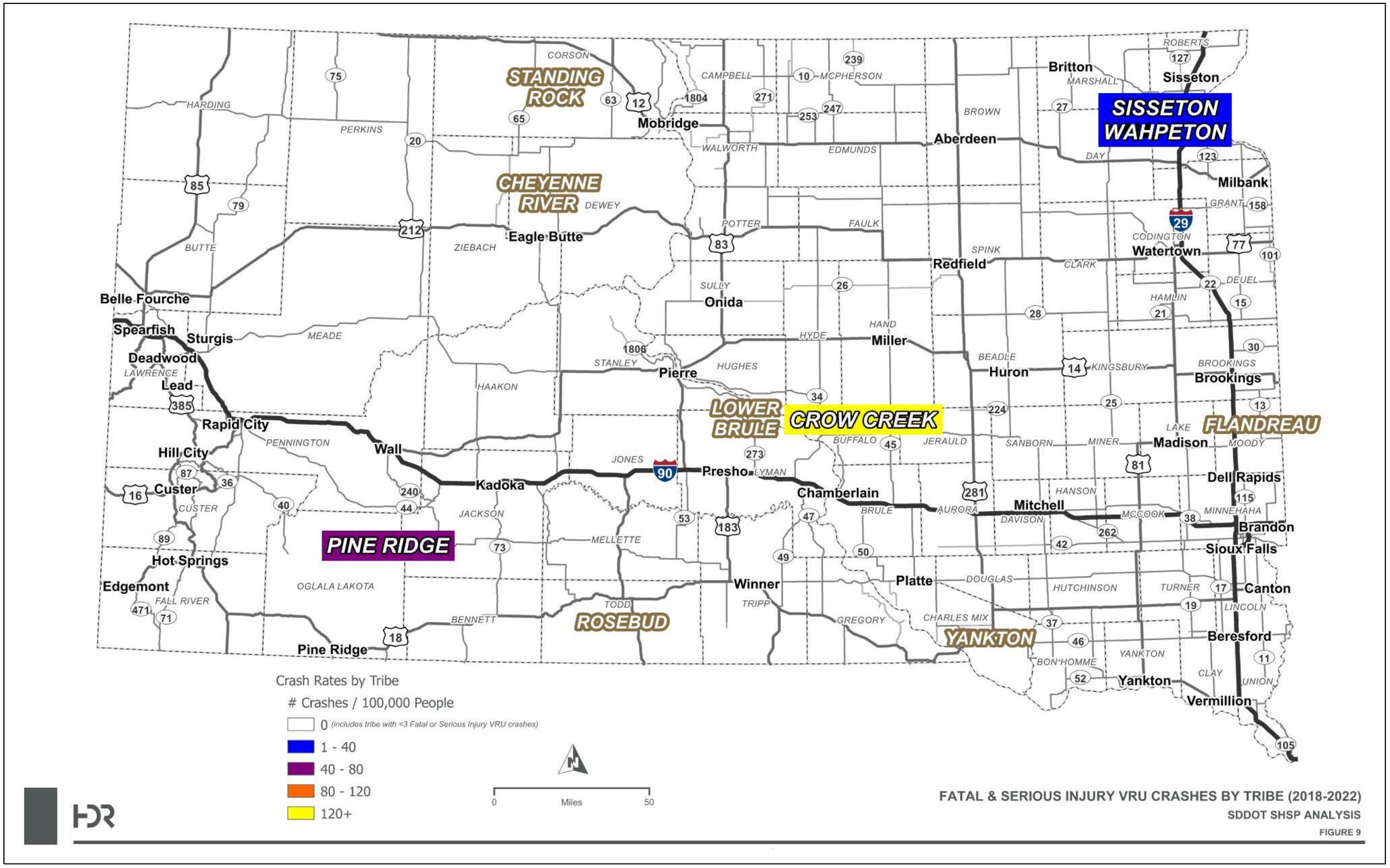


Figure 9: Fatal and Serious Injury VRU Crash Rates by Tribe (2018-2022)

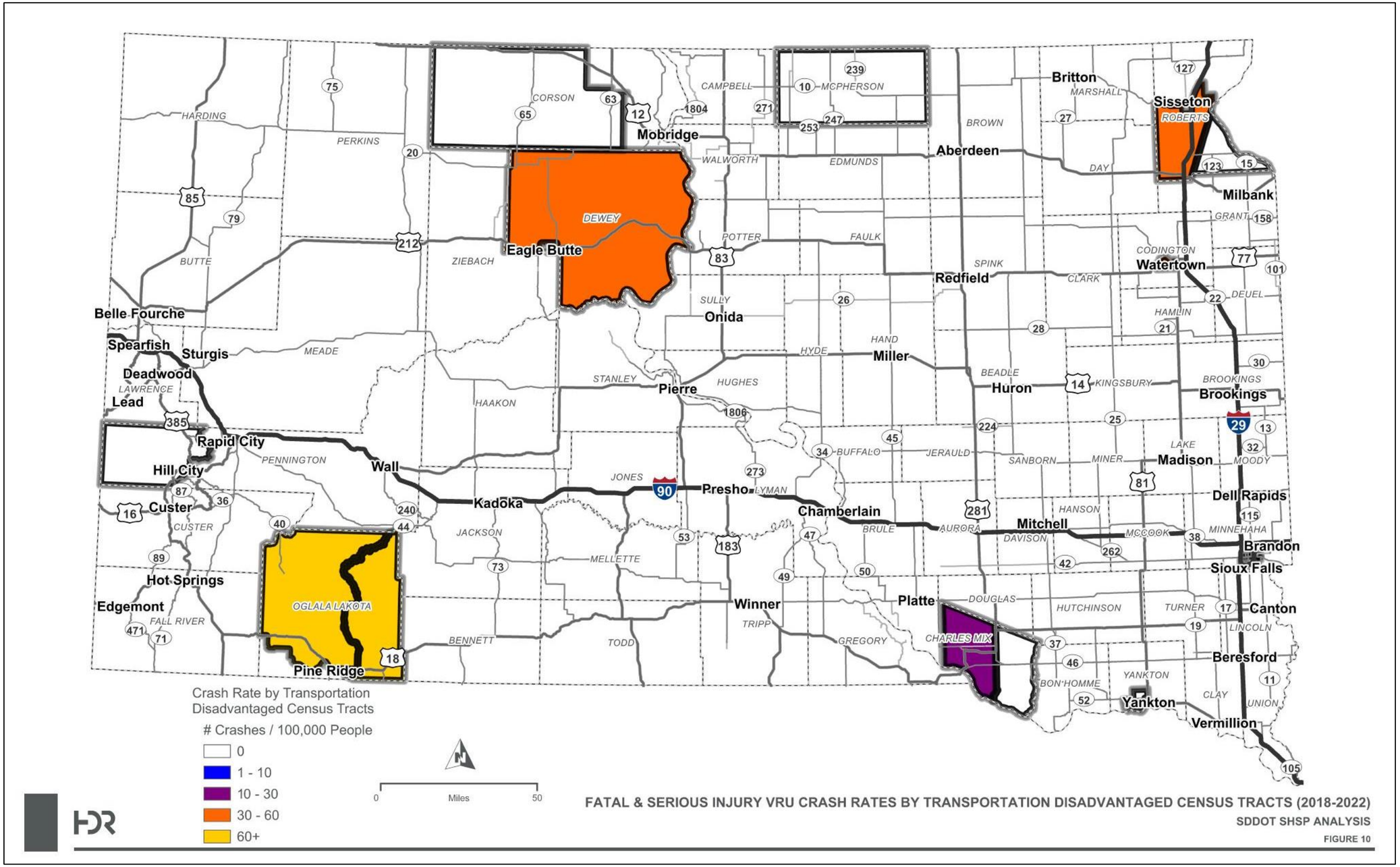


Figure 10: Fatal and Serious Injury VRU Crash Rates by Transportation Disadvantaged Census Tracts (2018-2022)

4. Summary of Consultation and Outcomes

To hear perspectives from identified high-risk areas, SDDOT held a series of stakeholder meetings. The purpose of these meetings was to introduce the VRU Safety Assessment process and federal requirements, describe the data analysis and findings, and receive local feedback on safety concerns and strategies for improvements. A summary of the consultation process is outlined below.

Consultation Meetings

SDDOT held two virtual meetings with stakeholders from high-risk counties that were divided into two groups based on geographic location east and west of the Missouri River. SDDOT also held virtual meetings with representatives from the state's two largest cities, the City of Sioux Falls and the City of Rapid City, which were also identified as high-risk areas. For consultation with representatives from the three high-risk tribal areas, SDDOT presented in-person at the South Dakota Tribal Transportation Safety in Mobridge, South Dakota.

During the virtual consultation meetings with the local governments on October 16, 2023, SDDOT and HDR Engineering summarized the VRU Safety Assessment requirements and process, described the data analysis used to identify high-risk areas, and reviewed existing strategies and resources that can help improve conditions for VRUs. Additionally, a facilitated discussion allowed the opportunity to learn more about local challenges and concerns regarding VRU safety and potential strategies for improvements.

At the in-person meeting with the tribes on October 18, 2023, SDDOT and HDR Engineering provided a similar presentation as at the virtual meetings. Along with a facilitated conversation about VRU safety, a survey was also distributed to gather data and information about safety challenges local to the tribes.

Critical takeaways from the meetings are listed below, and full meeting summaries are in Appendix A.

EAST RIVER CONSULTATION

Attendance at the meeting included representation from Buffalo County, Roberts County, and Codington County. Discussion included the following:

- Potential countermeasures for individuals biking or walking on rural roads.
- Lack of available right-of-way space to add shoulders on rural roads.
- Access to infrastructure funding.
- Specific areas of concern for VRU safety, including Highway 47 in Ft. Thompson and a shared use path along Highway 10.

WEST RIVER CONSULTATION

Attendance at the meeting included representation from Pennington County and Lawrence County. Discussion included the following:

- Safety concerns with local bike groups and bike races.
- Challenges to accommodate adding shoulders to give cyclists a place to ride.
- Upcoming plans for pedestrian improvements in Spearfish, South Dakota.

CITY OF RAPID CITY CONSULTATION

Attendance at the meeting included representation from the City of Rapid City and the Rapid City Area Metropolitan Planning Organization (RCAMPO). Discussion included:

- Updates on the city's bike and pedestrian plan and metropolitan master transportation plan.
- An overview of grant applications the City has applied for, including through the Transportation Alternatives program, highway safety grant, and Safe Streets for All grant program.
- The city's implementation of and planned upgrades to rectangular rapid flashing beacons.
- Resistance from local developers in adding shared use paths due to extra cost.
- Plans to form an active transportation committee and to seek guidance from the City of Sioux Falls, who has an established committee.

CITY OF SIOUX FALLS CONSULTATION

Attendance at the meeting included representation from the Public Works Department for the City of Sioux Falls. Discussion included the following:

- Grant funding opportunities the City has applied for, including through the Transportation Alternatives program.
- The City's progress in the past ten to fifteen years in adding safety countermeasures and in updating the Sioux Falls bike and pedestrian plans.
- Through an internal cross-departmental quarterly meeting, the City reviews VRU crashes and is using this as an opportunity to make improvements moving forward in areas such as lighting.
- Opportunity to improve education in the community around the Safe Passing Law.
- Bike and pedestrian educational efforts in Sioux Falls includes work from South Dakota EMS for Children.

TRIBAL GOVERNMENTS COORDINATION

Attendance at the Tribal Transportation Summit included representation from seven of the nine tribal nations in South Dakota, including two of the three tribes identified as high risk to VRUs. The Summit included representatives from Cheyenne River Sioux Tribe, Standing Rock Sioux Tribe, Oglala Sioux Tribe, Sisseton-Wahpeton Oyate, Rosebud Sioux Tribe, Lower Brule Sioux Tribe, and Yankton Sioux Tribe. Crow Creek Sioux Tribe and Flandreau Santee Sioux Tribe were not in attendance.

HDR provided an overview presentation at the Summit and had time for discussion. In addition, HDR conducted two individual in-person conversations with tribal members from Oglala Sioux Tribe and Sisseton-Wahpeton Oyate to gather more feedback about safety concerns and challenges for VRUs in the tribal areas. Discussion included the following:

- Concerns on whether road design accounts for pedestrian safety.
- Funding concerns and jurisdictional challenges for road maintenance since several entities share management of roadways across tribal lands.
- Consistency of lane markings on roadways.
- Incongruencies between what is a planned infrastructure safety strategy versus what is followed by pedestrians and cyclists.
    - For example, pedestrians sometimes don't use shared use path and instead walk on the roads.
    - Another example was that individuals in wheelchairs in one tribal area use the road instead of the shared use path, due to a lack of lighting over the shared use path.
- A need for more educational campaigns and overall awareness for VRUs and motorists on transportation safety. Some easy solutions are to encourage individuals who walk early in the morning to wear reflective vests.
- Challenges with receiving and finding access to funding.

Survey

A survey was distributed during the in-person presentation at the South Dakota Tribal Transportation Safety Summit to gain information about safety concerns specific to the three higher risk tribal areas and to learn about safety challenges for the other tribes in attendance at the summit.

The survey contained less than 10 questions and focused on concerns, countermeasures, processes, and community sentiment around VRUs. The survey requested that respondents list their tribal affiliation but did not require them to provide a name. This tactic protected anonymity to promote open responses.

The survey received three responses from tribes across South Dakota, including the tribes in the high-risk areas. A summary of key findings is presented below and the full results along with a list of presentation attendees can be found in Appendix B.

- Lack of lighting is a major challenge for pedestrians.
- Desire for more education for all users of transportation.
- Challenging to implement transportation improvements due to lack of funding and/or staffing.

Bicycle and Active Transportation Interest Groups Survey

To gain feedback from people with a particular interest in biking and active transportation, a virtual survey was distributed via email to 15 biking organizations and active transportation boards across the state with a total of 36 individual responses. The survey's intent was to collect information that would inform an understanding of groups' concerns for improving safety conditions for VRUs.

The survey contained questions about bike safety and the opportunity to provide feedback on ideas for improving the biking environment. A summary of key findings is presented below and the full results can be found in Appendix C.

- Sixty percent of respondents typically feel safe when biking.
- Biking facilities that are separated from traffic and low traffic volumes make bicyclists feel safe.
- Careless and distracted drivers make cyclists feel unsafe.
- Communities should be investing dollars into improving infrastructure to create safer places for people to bike and walk.
- Signage, road diets, traffic calming, and other engineering efforts would make traffic slower in communities, which would improve in the environment for bicyclists and pedestrians.
- Drivers don't know the Safe Passing Law or understand how to pass bicyclists safely
- Bicyclists want to ride on the shoulders, but the location of rumble strips, chip-seal, and debris make it dangerous.

5. Program of VRU Improvement Strategies

This chapter outlines the existing resources and programs present in South Dakota that address VRUs. It also includes an additional menu of infrastructure countermeasures, educational and outreach ideas, enforcement efforts, and programmatic and policy approaches that can be implemented to further improve conditions for VRUs, especially for the high-risk areas identified in Chapter 3: Summary of Quantitative Analysis and Findings. The consultation process revealed several "Strategy Improvements Ideas" as attendees discussed their local challenges and concerns related to VRU safety. These strategies and countermeasures are applicable to common crash characteristics in South Dakota and consistent with the strategies previously identified in the state's 2019 SHSP.

Existing Resources and Programs

There are several existing plans, programs, and laws available in South Dakota that relate to VRUs. Refer to Appendix D for more details of the resources listed below:

STATEWIDE LAWS

- **Safe Passing Laws** require motor vehicle drivers to leave at least a legally defined amount of clearance space between the vehicle and the cyclist when overtaking the cyclist. This law helps to minimize the likelihood of a sideswipe, and to reduce the chance of a close encounter that could potentially destabilize or divert the course of a cyclist and cause a crash. In South Dakota, existing law requires a safe passing distance of not less than three feet for speeds of 35 mph or less and not less than six feet for speeds greater than 35 mph. South Dakota's law is codified as Law 32-26-26.1—Overtaking bicycle—Minimum separation—Violation as misdemeanor.
- **Pedestrian in Crosswalk Laws** require motor vehicle drivers to yield the right-of-way to a pedestrian crossing the highway within any clearly marked crosswalk. At controlled intersections, motor vehicles must yield to pedestrians crossing during a green or go signal, while in all other cases, pedestrians must yield the right-of-way to vehicles lawfully proceeding directly ahead. These laws help regulate the interaction between pedestrians and vehicles at crosswalks and establish when each user has the right-of-way. South Dakota's laws are codified as Law 32-27-1—Yielding right-of-way to pedestrian making proper crossing—Regulated intersection—Violation as petty offense and Law 32-27-2—Yielding right-of-way to pedestrians at controlled intersections—Circumstances under which pedestrians must yield—Violation as petty offense.
- **Work Zone Safety Laws** require motor vehicles drivers to yield the right-of-way to persons engaged in maintenance, survey, or construction work whenever the driver is notified of the presence of the worker. This law helps protect highway workers while they perform their work on public roads, highways, or within highway right-of-way. South Dakota's law is codified as Law 32-27-10—Failing to yield right-of-way to persons working on highways—Warning signals—Misdemeanor.

- **Bicycle Regulations** are provided for South Dakota and include laws that detail how bicycles may operate on sidewalks with all the rights and duties of a pedestrian, but they must yield the right-of-way to any pedestrian. Additional laws describe how bicycles must ride close to the right-hand curb when operating on a roadway and they must use hand signals to indicate stopping and turning movements. Lastly, all bicycles must also be equipped with a lighted lamp on the front of the bicycle and reflect mirror or lamp on the back.

Strategy Improvement Idea:

The consultation process revealed that additional education is needed to spread awareness about this law. The survey of biking groups received several comments related to vehicles passing too close to people biking. An awareness campaign supplemented by signage on the highways where there are often people biking is an option for increasing public compliance with this law.

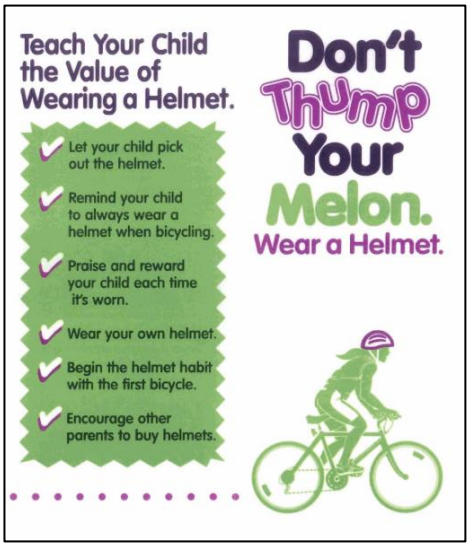


Figure 11: Don't Thump Your Melon Campaign Brochure

STATEWIDE EDUCATIONAL CAMPAIGNS

- **Don't Thump Your Melon** – Since 1994, this campaign has promoted bicycle helmet use and bicycle safety through helmet giveaways, t-shirts, and brochures. Partners include the South Dakota Office of Highway Safety, South Dakota Department of Health, Emergency Medical Services for Children, Monument Health Rapid City Hospital, Avera McKennan Hospital, and Sioux Valley Hospital and Health Systems.

STATEWIDE PLANS

- **The Long-Range Transportation Plan (LRTP)** supports SDDOT's mission, vision, and goals by providing a planning framework that guides decision-making, monitors and identifies transportation challenges and opportunities, highlights beneficial multi-modal relationships and opportunities, and ensures projects reflect fiscal and political reality through sustainable efforts.
- **Statewide Transportation Improvement Program (STIP)** provides a comprehensive overview of the South Dakota transportation system and is intended to inform the South Dakotans of the transportation improvements planned in the State. The program identifies highway and intermodal improvements to preserve, renovate, and enhance South Dakota's transportation system.
- **Safe Travel for Every Pedestrian (STEP)** is part of FHWA's Every Day Counts Initiative that SDDOT participated in to help address pedestrian crashes that occur at uncontrolled crossing locations and intersections with no traffic signals. The STEP initiative promotes cost-effective countermeasures with known safety benefits and includes best practices to help city engineers and designers address potential safety concerns.

- **The South Dakota Triennial Highway Safety Plan** includes data from the 2021 Fatality Analysis Reporting System (FARS) and 2022 state data that was used to set triennial safety targets for South Dakota. In addition to the FARS crash data, the South Dakota Office of Highway Safety (SDOHS) also incorporated the analysis of the Social Vulnerability Index data to help identify potential geospatial demographic patterns in crash incidence and outcomes.

Strategy Improvement Idea:

The consultation process revealed that lack of data and coordination may be holding back some safety improvement progress. Since safety analyses must be data-driven to lead to justifiable strategies, decision-makers need data and coordination with other entities to identify viable solutions. For example, the Bureau of Indian Affairs (BIA) and Tribal Police may have local crash information that is not regularly shared with the SDDOT, but which could be helpful in identifying statewide safety strategies and priorities. Additionally, most jurisdictions are not conducting bicycle and pedestrian counts or using outside data sources (e.g., StreetLight, Citi Logik, AirSage, INRIX, etc.) to estimate active transportation trips. This information could help identify areas where infrastructure improvements are needed due to high demand and estimate rates of crashes based upon the volume of VRU activity in the vicinity.

Another data-related concern was that the sporadic locations of crashes involving VRUs make it difficult to identify suitable infrastructure improvements. A strategy could be to conduct a systemic crash analysis to identify roadway characteristics that are more likely to lead to VRU-related crashes and implement infrastructure safety countermeasures to improve those characteristics. The FHWA provides guidance on systemic safety analysis.[6]

LOCAL AND REGIONAL PLANS

- **The Pennington County Local Road Safety Plan (LRSP)** was developed using FHWA's LRSP process and aligns with the 2019 South Dakota SHSP. It provides a data-driven framework to identify, analyze, and prioritize roadway safety improvements on local roads. LRSPs are one of several FHWA Proven Safety Countermeasures.
- **The Rapid City Bicycle and Pedestrian Master Plan** will guide the development of a network of bicycle and pedestrian routes that link activity centers within the city and provide opportunities for connections to surrounding areas.
- **RapidTRIP 2040** is the long-range transportation plan for the Rapid City Metropolitan Planning Area. It is a comprehensive study of the transportation network emphasizing the transportation modes of automobile, bicycle, pedestrian, and transit including interaction of these modes with aviation and freight movement by railroad and trucking throughout the region.
- **The Siouxland Interstate Metropolitan Planning Council (SIMPCO) Long Range Transportation Plan (LRTP)** is a tool for developing safe and efficient transportation improvements for the SIMPCO region through the year 2045. These improvements encompass all modes of transportation, including public transit, bicycle and pedestrian travel, and street and highway travel.

[6] Quick Start Guide Systemic Safety Analysis | FHWA (dot.gov)

- **The Sioux Falls MPO Long Range Transportation Plan (LRTP)** is designed to guide transportation planning activities by setting forth direction and strategies to help shape the region's transportation network through the year 2045. It considers all modes of transportation including driving, walking, bicycling, transit, rail, and air to set future priorities.
- **The Sioux Falls Pedestrian Plan** will provide goals, objectives, and policies including the identification of facility improvements, programs, and actions for all pedestrians.
- **The Sioux Falls Bicycle Plan** has a vision to construct a comprehensive network of bicycle lanes and trails that are safe and accessible to all.

Strategy Improvement Idea:

The City of Sioux Falls conducts a quarterly meeting to discuss crashes involving VRUs in their jurisdiction. These meetings include the Police, Engineering, Public Works, and Planning departments. Considering that the Safe System Approach recognizes that "Responsibility is shared" this cross-department coordination allows the issue of VRU safety to be addressed from multiple angles. This type of recurring coordination meeting to facilitate collaboration and data sharing can serve as a best practice to for other local or regional entities.

DOT FUNDING STRATEGIES

- **Transportation Alternatives (TA)** is a program that uses federal transportation funds for specific activities that enhance the inter-modal transportation system and provide safe alternative transportation options. TA encompasses a variety of smaller-scale non-motorized transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to storm water and habitat connectivity.
- **Highway Safety Improvement Program (HSIP)** is a Federal-aid program with the purpose of achieving a significant reduction in traffic-related fatalities and serious injuries on all public roads. Within South Dakota, HSIP funds will be used for a countywide signing project, systemic improvements, and spot locations with improvements ranked by benefit-cost.
- **Carbon Reduction Strategy** documents the many strategies, methods, approaches, activities, and tactics that can be used to implement SDDOT's main carbon reduction strategy which is to "Allocate Resources to Improve Energy Efficiency." The strategy was developed to be "context sensitive" by aligning with economic and market forces in ways that are appropriate to South Dakota.
- **Safe Routes to School** is an approach that promotes walking and bicycling to school through infrastructure improvements, enforcement, tools, safety education, and incentives to encourage walking and bicycling to school. This initiative improves safety as well as promotes physical activity for students.

Strategy Improvement Idea:

The consultation process revealed that lack of funding is a major obstacle to improving conditions for vulnerable road users. Many local jurisdictions were aware of the Transportation

Alternatives program, but others were not familiar with it. A state and federal funding guide could help local jurisdictions supplement local budgets. Since many of these programs would be new to local jurisdictions, they may need advice and guidance on applying for and managing grant funds. The SDDOT and the MPOs, as state and local leaders, could serve in the role of active transportation funding experts for local jurisdictions. There are online resources available from the FHWA to help state and regional leaders get started.[7]

Infrastructure Strategies

Infrastructure safety countermeasures can separate VRUs in time and space from motorized traffic, thereby reducing potential conflict and supporting the Safe System Approach element for Safe Roads. Improved infrastructure also enables more people to walk or bike for recreation and transportation since they feel more comfortable using the bicycle or pedestrian facility. The responses to the survey of biking groups support this statement by identifying infrastructure as the most important strategy to improve safety for people biking, ranking higher than education and outreach strategies. Using the Best Practice Resources described below, a menu of infrastructure treatments, where they are appropriate, and their Crash Modification Factors (CMFs) is presented in Appendix D. For all infrastructure strategies, any traffic control devices should be compliant with the Manual on Uniform Traffic Control Devices (MUTCD) or any interim approvals from the FHWA.

BEST PRACTICE DESIGN RESOURCES

While the Safe System Approach which is described in more detail in the **Introduction,** provides the principles and elements to achieve zero deaths and serious injuries, it does not provide design guidance. Several national and state guidance documents describe tested countermeasures and strategies to reduce traffic crashes and address safety risks experienced by VRUs. The FHWA provides a list of Proven Safety Countermeasures that can improve conditions for VRUs, as shown in Figure 12. Design guides also incorporate best practices for bicycle and pedestrian facility design – which is critical to the safe road users and safe roads objectives. Best practice design resources are listed in Appendix E.

Strategy Improvement Idea:

The consultation process revealed that lack of sufficient lighting is a contributing factor to vulnerable road user safety. The data analysis showed that 46 percent of fatal and serious injury VRU crashes occur in dark conditions and 55 percent of these occur in locations with roadway lighting. Considering sidewalk and shared use path lighting needs during design can improve visibility on the adjacent walkways. This can include installing lighting specifically for the sidewalk or shared use path or incorporating with the street lighting. Lighting at road crossings is also important. The SDDOT Road Design Manual provides warrants for installing lighting, which includes data related to existing lighting levels, past crashes, and pedestrian activity along the roadway. At intersections, the warrants include traffic volumes and conflicting vehicle or pedestrian movements, past crashes, presence of traffic signals, intersection geometry, existing lighting, presence of pedestrians, and proximity to a railroad crossing. Engineering

[7] ATFF Toolkit - Resources - Bicycle and Pedestrian Program - Environment - FHWA (dot.gov)

judgment may alter the need or extent of a lighting project.[8] All jurisdictions can play a role in ensuring that lighting is installed for all roads users on construction and reconstruction projects.

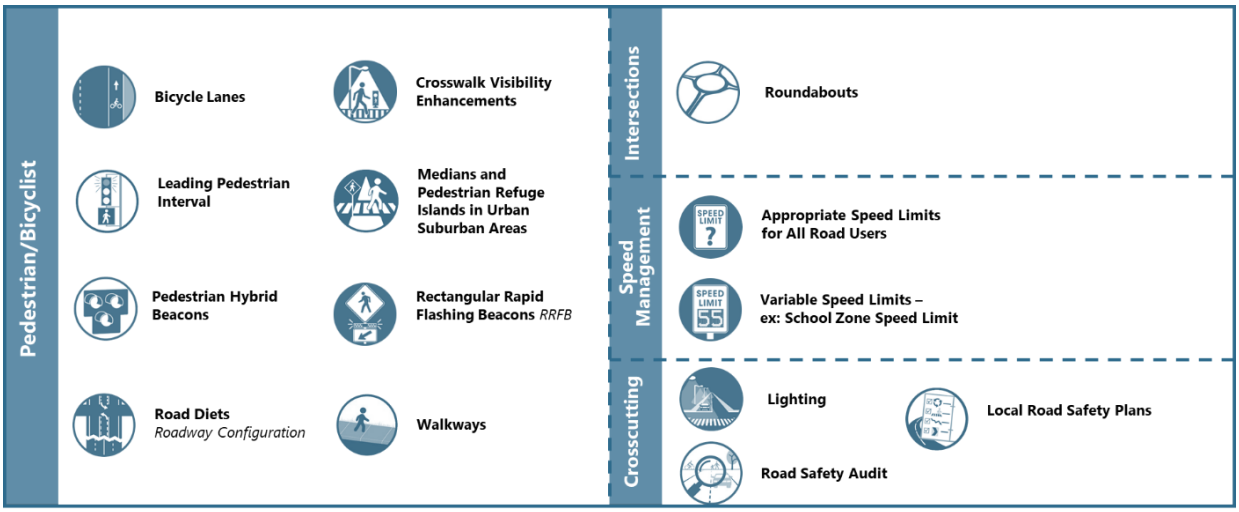


Figure 12: FHWA Proven Safety Countermeasures Relevant to VRUs

Strategy Improvement Idea:

The consultation process revealed that lack of sufficient right-of-way is a challenge for installing dedicated biking and walking facilities, especially in many rural areas. Depending upon the context of the existing road, this challenge may be addressed in a few ways:

- **Road Diet** – Consider if the road is overbuilt for the existing and future traffic volumes. Can the road be reduced from four to three lanes? Can the lanes be narrowed? These methods reallocate space within existing right-of-way for people biking and walking.
- **Right-of-Way Acquisition** – Consider the possibility of acquiring additional right-of-way. If this is a rural setting, acquiring additional right-of-way along the edge of agricultural property may have minimal impact on agricultural operations, allow the road and ditches to maintain current drainage patterns, and provide a space for a shared use path for people biking and walking. Fences and landscaping can help preserve privacy for the adjacent property owner.
- **Shared Space** – Consider shared space options for people biking and walking along with people driving. Some low volume and low speed roads may be suitable for shared lane markings in which people bike and drive in the same space. Roads with adequate sight distance may be suitable for advisory/dashed bike lanes in which vehicles are allowed to encroach into the advisory/dashed lane, after yielding to any bicyclist or pedestrian in the advisory lane, to avoid collision with another vehicle. (Advisory/dashed bike lanes currently have experimental status with the FHWA and have not yet been included in the MUTCD.)

[8] SDDOT, *Road Design Manual*, Chapter 15, Traffic (sd.gov)

- **Alternative Routes** – Consider whether there is another route that could be better suited for people biking and walking, or more easily improved for biking and walking, and still meet connectivity goals. An active transportation plan can help to identify a preferred biking and walking network for the jurisdiction.

Education and Outreach Strategies

Refer to Appendix D for more details on VRU education and outreach strategies, which support the Safe System Approach element for Safe Road Users.

Education and outreach strategies for pedestrians, bicyclists, and other non-motorists that could be adopted or expanded in South Dakota include:

- **Elementary-Age Child Pedestrian Training** includes in-school curriculum that equips children with knowledge and practice to enable them to walk safely in environments with traffic and other safety hazards.
- **Walking or Biking School Buses** is a program that uses volunteer adults, usually parents, to walk or bike a group of students on a specific route to and from school, collecting or dropping off children on the way.
- **Bike Safety Rodeo/Safety Town** and similar events like cycling skills clinics and bicycle safety fairs are local events often run by law enforcement, school personnel, or other civic and volunteer organizations. Their purpose is to teach children on-bicycle skills and how to ride defensively in traffic conditions. South Dakota EMS For Children, in coordination with the South Dakota Office of Highway Safety, provides a Bike Rodeo Instructor Guide.[9]
- **Bicycle Safety Education for Adult Bicyclists** aims to improve knowledge of laws, risks, and cycling best practices, and to lead to safer cycling behaviors, including riding predictably and use of safety materials such as reflective clothing and helmets.
- **Media Campaigns** may be designed to target any demographic and focus on any traffic safety issue, such as distracted driving, impaired driving, or sharing the road with VRUs.
- **Drivers' Education** including pedestrian and bicycle safety-related training is intended to increase the sensitivity of drivers to the presence of pedestrians and bicyclists and their shared responsibility to prevent crashes and enhance the safety of all road users. South Dakota Department of Public Safety provides a *Driver License Manual* to provide information on safe driving rules and practices and help potential drivers to pass the knowledge test for licensing. The current manual provides information on the safe passing law related to bicycles and to yield to pedestrians crossing at an intersection. There is a section of the manual dedicated to sharing the road with pedestrians and bicyclists.[10]

[9] Bicycle Safety and Equipment - South Dakota EMS for Children (sdemsc.org)

[10] South Dakota Driver Licensing, an agency of the Department of Public Safety, Your South Dakota Drivers Education Guide | DMV.com, 2021

Programmatic or Policy Strategies

Refer to Appendix D for more details on VRU programmatic or policy strategies, which support the Safe System Approach elements for Safe Roads and Safe Road Users.

Programs and policies for pedestrians, bicyclists, and other non-motorists that could be adopted or expanded in South Dakota include:

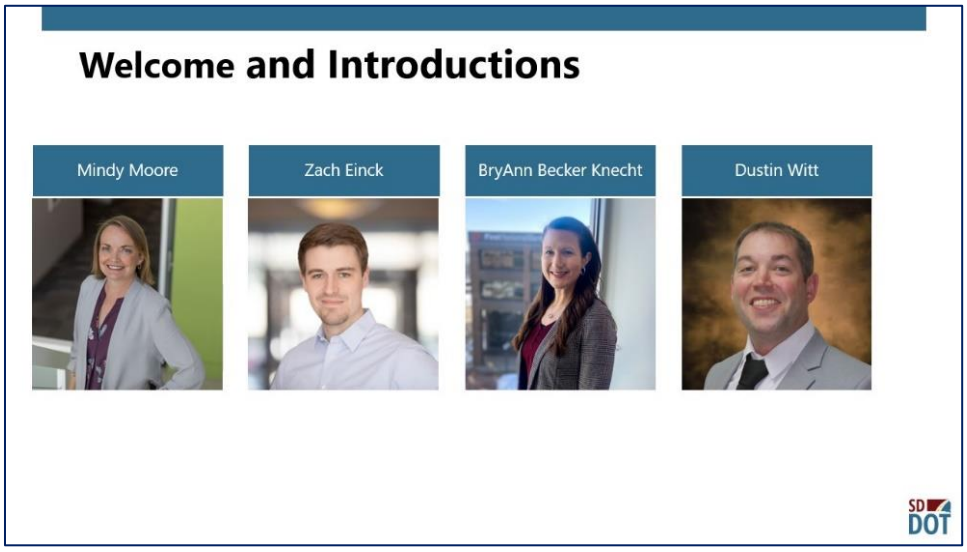
- **Complete Streets** policies are designed and operated to enable safe use and support mobility for all users. The concept of complete streets encompasses many approaches to planning, designing, and operating roadways and rights of way with all users in mind to make the transportation network safer and more efficient. These approaches may include sidewalks, bicycle lanes, bus lanes, public transportation stops, crossing opportunities, median islands, accessible pedestrian signals, curb extensions, modified vehicle travel lanes, streetscape, and landscape treatments.
- **Pedestrian Safety Zones** are programs that increase cost-effectiveness of interventions by targeting education, enforcement, and engineering measures to geographic areas and audiences where significant portions of the pedestrian crash problem exist.
- **Safe Routes to School** are community-based programs that educate about safe walking and bicycling behavior and safe driving behavior around pedestrians and bicyclists. The programs also include enforcement and engineering activities to improve traffic safety and reduce or eliminate risky elements of the traffic environment around schools.

Strategy Improvement Idea:

The consultation process revealed that some jurisdictions lack authority to require land developers to install active transportation infrastructure as part of platting, subdivision, or site plan approval. Walking and biking networks and goals should stem from the community's comprehensive plan. If the local jurisdiction has developed a bicycle, pedestrian, or active transportation master plan, it should also be adopted with the same authority as an element of the comprehensive plan. Once the plan is adopted, the jurisdiction should move forward with updating codes and polices to achieve the goals of the plan. This could include requirements for platting and subdivisions that dedicate sufficient right-of-way for complete streets and shared use paths. Site plan requirements can be updated to require construction of sidewalks and shared use paths.

Appendix A:
Consultation Meeting Summaries

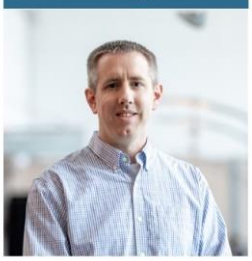
Consultation Presentation



Welcome and Introductions

BryAnn Becker Knecht

Jon Wiegand



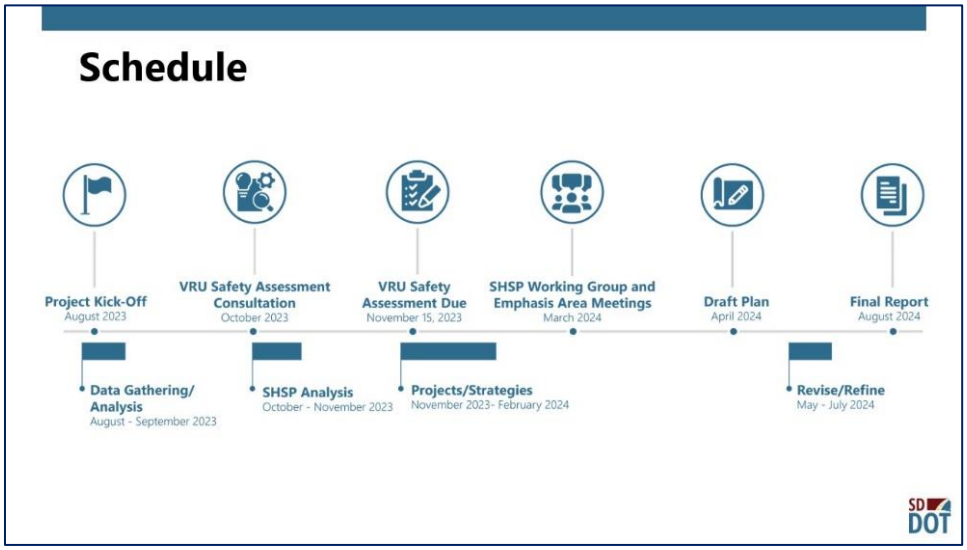
SD DOT

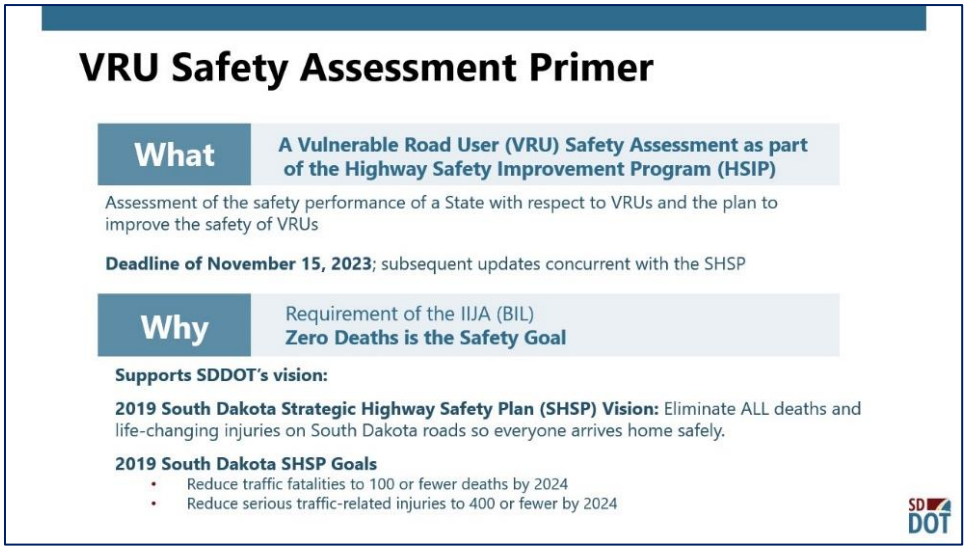
Agenda

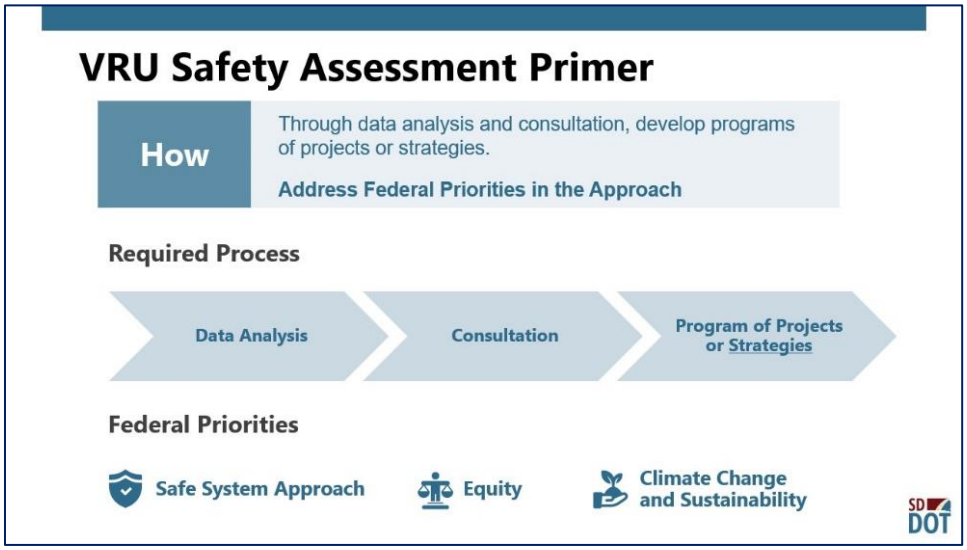
- Background on VRU Safety Assessment
- Description of Data Analysis and Findings
- Strategies
- Discussion

SD DOT

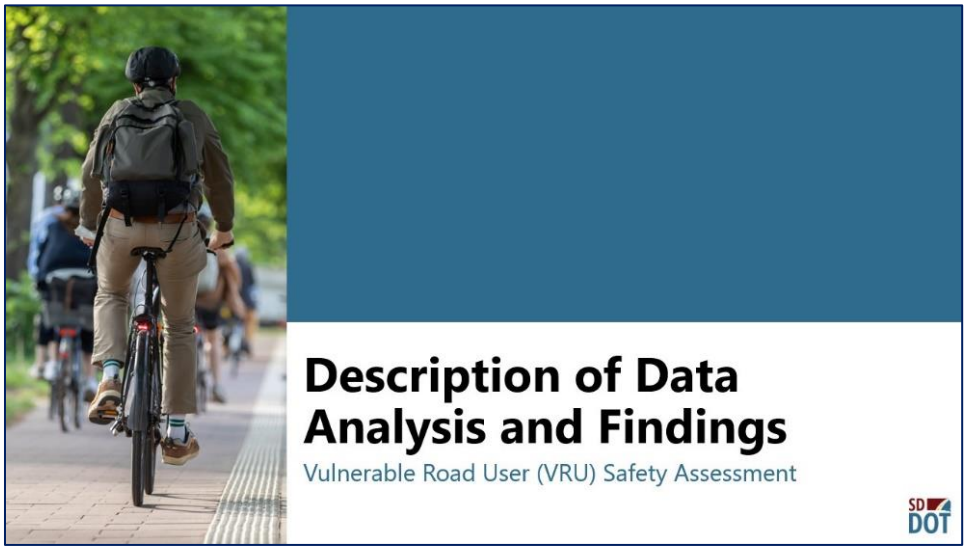

Background on
VRU Safety Assessment
Vulnerable Road User (VRU) Safety Assessment
SD DOT


Schedule
Project Kick-Off
August 2023
VRU Safety Assessment Consultation
October 2023
VRU Safety Assessment Due
November 15, 2023
SHSP Working Group and Emphasis Area Meetings
March 2024
Draft Plan
April 2024
Final Report
August 2024
Data Gathering/ Analysis
August - September 2023
SHSP Analysis
October - November 2023
Projects/Strategies
November 2023- February 2024
Revise/Refine
May - July 2024
SD DOT


VRU Safety Assessment Primer
What
A Vulnerable Road User (VRU) Safety Assessment as part of the Highway Safety Improvement Program (HSIP)
Assessment of the safety performance of a State with respect to VRUs and the plan to improve the safety of VRUs
Deadline of November 15, 2023; subsequent updates concurrent with the SHSP
Why
Requirement of the IIJA (BIL)
Zero Deaths is the Safety Goal
Supports SDDOT's vision:
2019 South Dakota Strategic Highway Safety Plan (SHSP) Vision: Eliminate ALL deaths and life-changing injuries on South Dakota roads so everyone arrives home safely.
2019 South Dakota SHSP Goals
Reduce traffic fatalities to 100 or fewer deaths by 2024
Reduce serious traffic-related injuries to 400 or fewer by 2024
SD DOT


VRU Safety Assessment Primer
How
Through data analysis and consultation, develop programs of projects or strategies.
Address Federal Priorities in the Approach
Required Process
Data Analysis
Consultation
Program of Projects or Strategies
Federal Priorities
Safe System Approach
Equity
Climate Change and Sustainability
SD DOT


DEATH AND SERIOUS INJURIES ARE UNACCEPTABLE
HUMANS MAKE MISTAKES
HUMANS ARE VULNERABLE
RESPONSIBILITY IS SHARED
SAFETY IS PROACTIVE
REDUNDANCY IS CRUCIAL
SAFE SYSTEM APPROACH
Safer People
Safer Vehicles
Safer Speeds
Safer Roads
Post-Crash Care
Source: USDOT
SD DOT


Description of Data Analysis and Findings
Vulnerable Road User (VRU) Safety Assessment
SD DOT

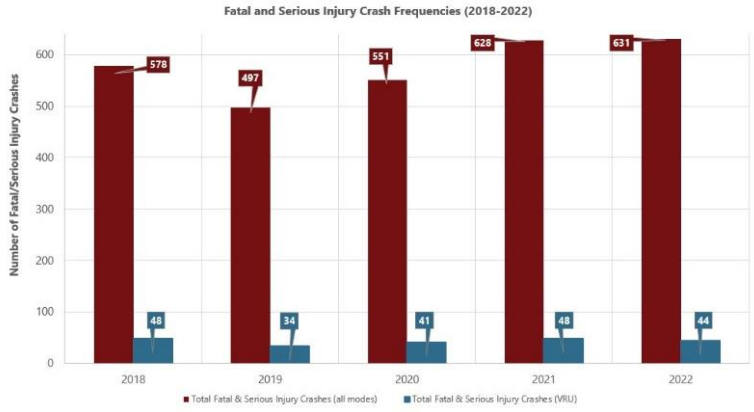
Description of Data Analysis and Findings

VRU Safety Assessment Overview (2018-2022)

- **Compare VRU Safety Performance to Overall Safety Performance**
- **Review Safety Performance Targets for Fatal and Serious Injury Crashes**
- **Investigate High-Level Non-Motorist-Involved Crash Trends**
  - Focused on crashes where pedestrian or bicyclist sustained a fatal or serious injury

Comparison of VRU to Overall Safety Performance

(2018-2022)



Safety Performance Targets

2019 South Dakota Strategic Highway Safety Plan (SHSP) Goals:

- Reduce traffic fatalities to ***100 or fewer deaths*** by 2024
- Reduce serious traffic-related injuries to ***400 or fewer*** by 2024

2022 Fatalities and Serious Injuries

- **137 Fatalities** (all modes)
- **619 Serious Injuries** (all modes)

2013 – 2017 Pedestrian & Bicyclist Crashes (2019 SHSP)

- **178 fatal & serious injury pedestrian crashes** (5% reduction from 2014 SHSP)
- **46 fatal & serious injury bicyclist crashes** (24% reduction from 2014 SHSP)

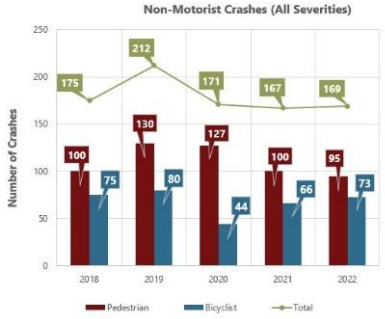
2018 – 2022 Pedestrian & Bicyclist Crashes

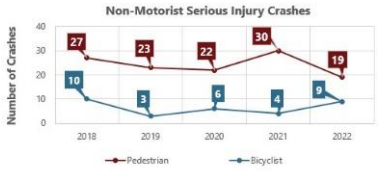
- **179 fatal & serious injury pedestrian crashes** (<1 change from 2019 SHSP)
- **36 fatal & serious injury bicyclist crashes** (28% reduction from 2019 SHSP)

SD DOT

Non-Motorist-Involved Crash Trends

(2018-2022)





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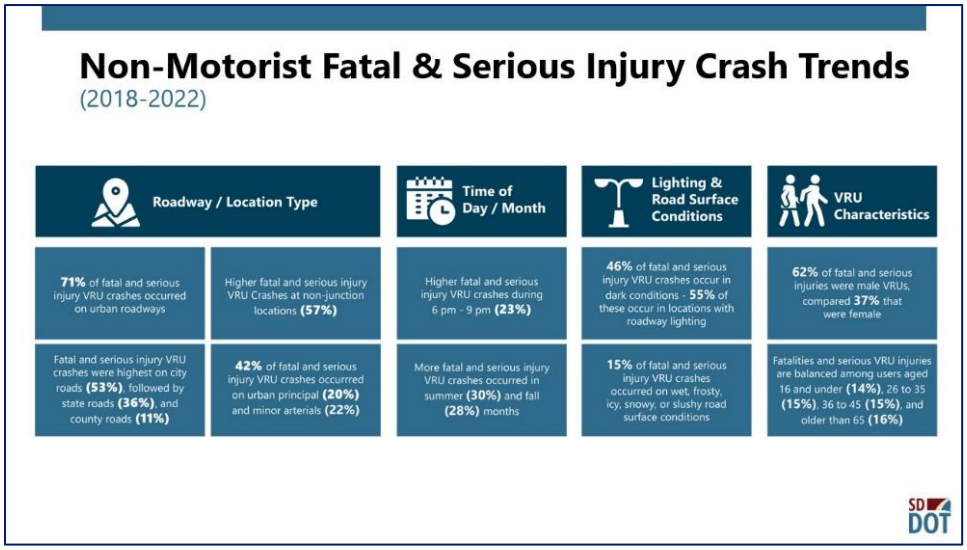
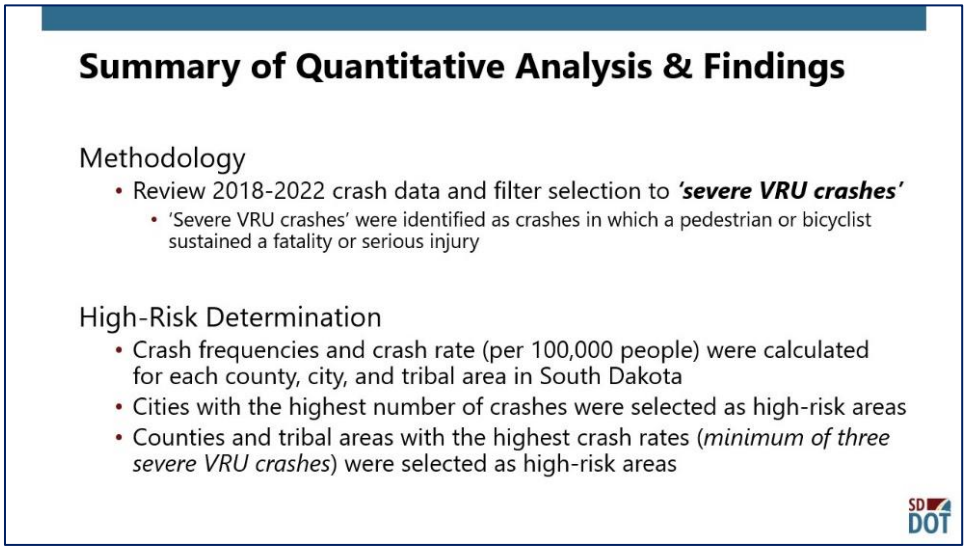
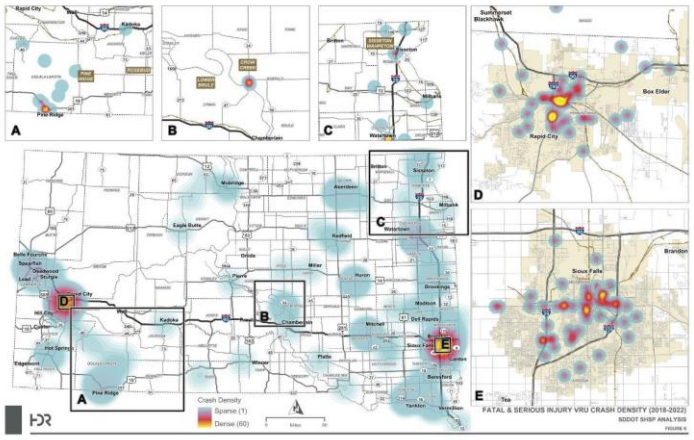
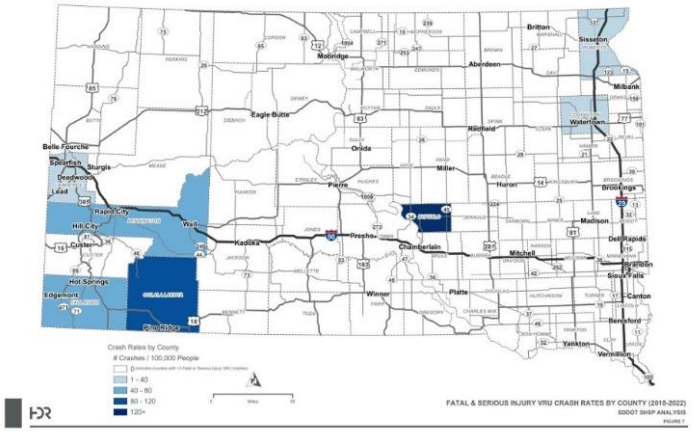

Non-Motorist Fatal & Serious Injury Crash Trends
(2018-2022)
Roadway / Location Type
Time of Day / Month
Lighting & Road Surface Conditions
VRU Characteristics
71% of fatal and serious injury VRU crashes occurred on urban roadways
Higher fatal and serious injury VRU Crashes at non-junction locations (57%)
Higher fatal and serious injury VRU crashes during 6 pm - 9 pm (23%)
46% of fatal and serious injury VRU crashes occur in dark conditions - 55% of these occur in locations with roadway lighting
62% of fatal and serious injuries were male VRUs, compared 37% that were female
Fatal and serious injury VRU crashes were highest on city roads (53%), followed by state roads (36%), and county roads (11%)
42% of fatal and serious injury VRU crashes occurred on urban principal (20%) and minor arterials (22%)
More fatal and serious injury VRU crashes occurred in summer (30%) and fall (28%) months
15% of fatal and serious injury VRU crashes occurred on wet, frosty, icy, snowy, or slushy road surface conditions
Fatalities and serious VRU injuries are balanced among users aged 16 and under (14%), 26 to 35 (15%), 36 to 45 (15%), and older than 65 (16%)
SD DOT


Summary of Quantitative Analysis & Findings
Methodology
• Review 2018-2022 crash data and filter selection to 'severe VRU crashes'
• 'Severe VRU crashes' were identified as crashes in which a pedestrian or bicyclist sustained a fatality or serious injury
High-Risk Determination
• Crash frequencies and crash rate (per 100,000 people) were calculated for each county, city, and tribal area in South Dakota
• Cities with the highest number of crashes were selected as high-risk areas
• Counties and tribal areas with the highest crash rates (minimum of three severe VRU crashes) were selected as high-risk areas
SD DOT

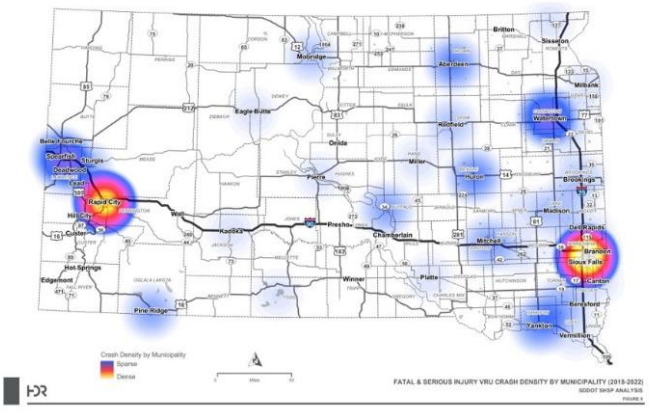
Fatal & Serious Injury VRU Crash Density



Fatal & Serious Injury VRU Crash Rates by County



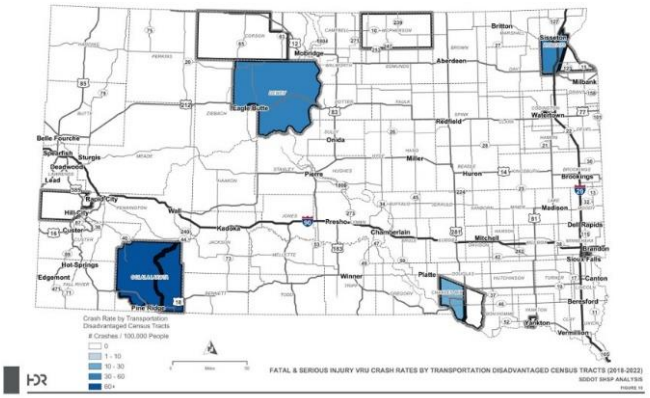
Fatal & Serious Injury VRU Crash Density by Municipality

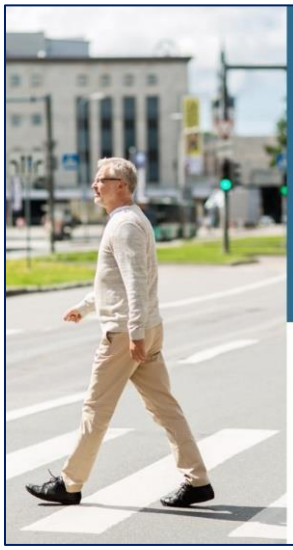


Demographic Consideration

- High risk areas were compared with USDOT Transportation Disadvantaged Communities census tracts
- 11 of 19 tracts within South Dakota had at least one fatal or serious VRU crash
- 9 tracts were already included within an already identified high-risk VRU area

Fatal & Serious Injury VRU Crash Rates by Transportation Disadvantaged Census Tracts





Strategies

Vulnerable Road User (VRU) Safety Assessment

Existing Statewide Plans & Programs

SDDOT Long Range Transportation Plan (LRTP)	Supports SDDOT's mission, vision, and goals by providing a planning framework that guides decision-making and highlights beneficial multi-modal relationships and opportunities.
Statewide Transportation Improvement Program (STIP)	Identifies highway and intermodal improvements to preserve, renovate, and enhance South Dakota's transportation system.
South Dakota Triennial Highway Safety Plan	Used data from the 2021 Fatality Analysis Reporting System (FARS) and 2022 state data to set triennial safety targets for South Dakota.

Existing Statewide Programs

Safe Travel for Every Pedestrian (STEP)	Promotes cost-effective countermeasures with known safety benefits to address potential safety concerns at uncontrolled crossing locations and intersections with no traffic signals.
Transportation Alternatives (TA)	Uses federal transportation funds for specific activities that enhance the inter-modal transportation system and provide safe alternative transportation options.

Existing State Law

Safe Passing Law	Requires motor vehicle drivers to leave at least 3' of clearance when traveling at 35 mph or less or 6' when traveling over 35 mph of between the vehicle and the cyclist when overtaking the cyclist.

Existing Educational Campaign

Don't Thump Your Melon	Promotes bicycle helmet usage through giveaways, t-shirts, and brochures.

SD DOT

Existing Local Plans

The Pennington County Local Road Safety Plan (LRSP)	Provides a data-driven framework to identify, analyze, and prioritize roadway safety improvements on local roads.
Rapid City Bicycle and Pedestrian Master Plan	Guides the development of a network of bicycle and pedestrian routes that link activity centers within the city and provide opportunities for connections to surrounding areas.
RapidTRIP 2040	The long-range transportation plan for the Rapid City MPO that includes a comprehensive study of the transportation network emphasizing the transportation modes of automobile, bicycle, pedestrian, and transit.

SD DOT

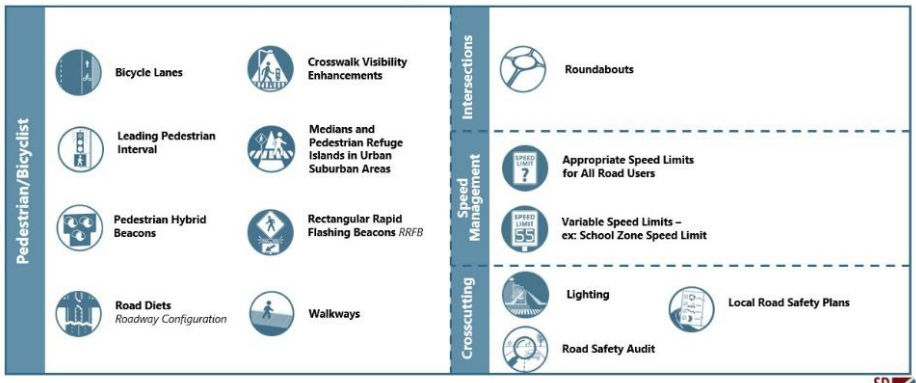
Existing Regional and Local Plans

Sioux Falls MPO Long Range Transportation Plan (LRTP)	Guides transportation planning activities for all modes including walking and bicycling by setting direction and strategies to help shape the region's transportation network through the year 2045.
Sioux Falls Pedestrian Plan & Bicycle Plans	The Pedestrian Plan provides goals, objectives, and policies for pedestrians while the Bicycle Plan works to construct a comprehensive network of bicycle lanes and trails that are safe and accessible to all.

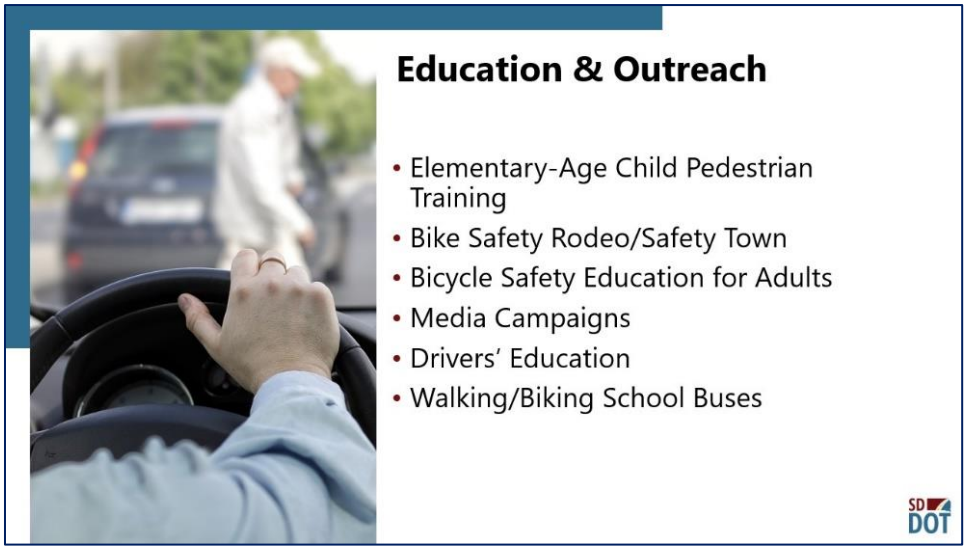
SD DOT

Infrastructure Strategies

FHWA Proven Infrastructure Safety Countermeasures



SD DOT


Education & Outreach
• Elementary-Age Child Pedestrian Training
• Bike Safety Rodeo/Safety Town
• Bicycle Safety Education for Adults
• Media Campaigns
• Drivers' Education
• Walking/Biking School Buses
SD DOT


Policy & Programs
• Complete Streets
• Pedestrian Safety Zones
• Safe Routes to School
SD DOT

Discussion

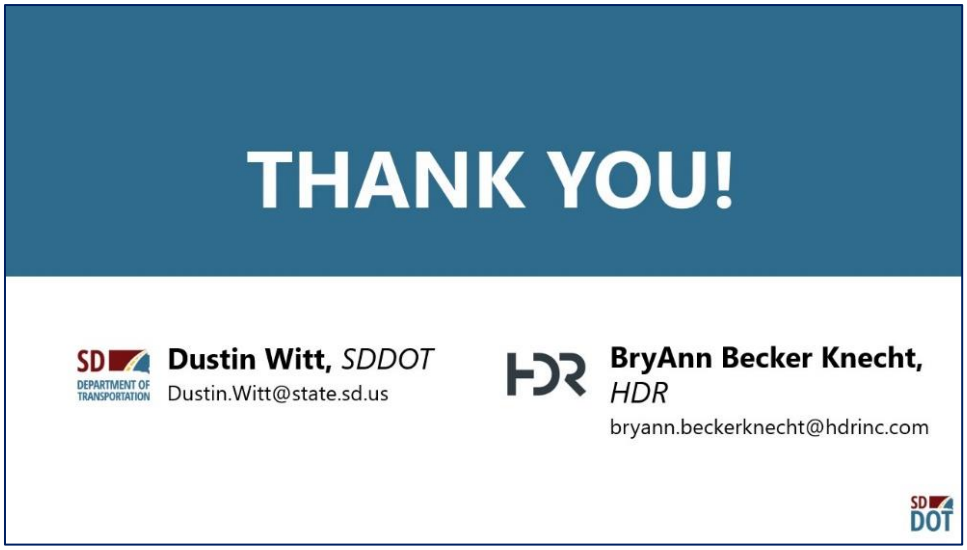
Vulnerable Road User (VRU) Safety Assessment

SD DOT

Discussion

1. **What** state plans or programs have you made use of (such as Safe Travel for Every Pedestrian, Transportation Alternatives Program)?
2. **What** local or regional plans, programs, or policies do you have in place?
3. **What** infrastructure strategies have you made use of?
4. **What** do you see as the key challenges for tribal communities concerning pedestrian and bicycle safety?
5. **What** new plan, program, policy, or infrastructure strategy would be helpful in the future?

SD DOT



Meeting Summaries

October 16, 2023

Consultation with East River Counties:

Buffalo County, Roberts County, and Codington County

In attendance: Tanner Grohs, Highway Superintendent, Buffalo County, along with a representative from the Crow Creek Sioux Tribe and the Bureau of Indian Affairs; Pat Stickland, Roberts Country Highway Superintendent; and Rick Hartley, Codington County Highway Superintendent. SDDOT Staff: Dustin Witt, Highway Safety Engineer, and Amanda Kurth, Director of the Office of Highway Safety. HDR staff: Mindy Moore, Jon Wiegand, Zach Einck, and BryAnn Becker Knecht.

Invited: Buffalo County: Tanner Grohs, Highway Superintendent, and Wayne Willman, Sheriff. Roberts County: Pat Stickland, Highway Superintendent, and Tyler Appel, Sheriff. Codington County: Rick Hartley, Highway Superintendent, and Brad Howell, Sheriff.

After introductions and the initial presentation from HDR and comments from SDDOT, the meeting opened for discussion. Rick Hartley asked about what road/safety improvements are available for those biking in rural areas.

There was conversation around addressing safety for VRUs on gravel roads. HDR shared that there aren't countermeasures specifically to address safety concerns on gravel roads; options include safer speeds (many drivers travel more slowly on gravel than on paved surfaces) and providing suitable shoulder space. SDDOT shared the importance of addressing safety concerns, especially in busy areas, and providing education in rural areas.

Rick Hartley shared that even some of the asphalt roads are limited in space to provide adequate shoulders, with 23- to 25-foot-wide roads without shoulder. Tanner Grohs echoed concerns that roads are narrow and don't allow for shoulders.

There was discussion around the STEP program and degree of awareness of this resource by local governments.

HDR asked if the group had specific areas of concern. Pat Stickland said that there are housing concerns on the east end of Roberts County. There was discussion about plans to address pedestrian improvements on Highway 10, which has roundabouts and a lot of traffic. SDDOT shared that pedestrian improvements, specifically a shared use path, are scheduled for 2028.

A representative from the Crow Creek Sioux Tribe shared that there are some problem roads, including state and Bureau of Indian Affairs (BIA) roads. Ft. Thompson has a high rate of people walking and bicyclists; people are often crossing busy highways, like on Highway 47. There was discussion on opportunities for improvement and future plans for improvement in place for Four Corners. SDDOT confirmed that a shared use path and crossings were programmed for 2027.

There was discussion about the importance of adequate lighting and the need for improved visibility of VRUs.

There was discussion around the importance of funding and a desire to learn more about funding strategies. SDDOT and HDR shared information that funding is available through Transportation Alternatives and offered to share additional information.

There was a question about the plan for bike paths and walking routes on state highways in the future.

The group also asked who would be responsible for keeping the snow plowed from a shared use path and if there were any requirements based on the source of funding for the project.

Rick Hartley asked if the state has plans for designated walking paths along Codington County. SDDOT shared that there are upcoming projects, including a shared use path on the west side of S. Lake Drive in 2024.

SDDOT shared to keep them posted on areas of concern and additional questions.

Meeting with West River Counties:

Oglala Lakota, Pennington, Fall River, Lawrence

In attendance: John Bey, Lawrence County Highway Superintendent (Spearfish, South Dakota) and Eric Radke, Pennington County Highway Project Manager (Rapid City, South Dakota). SDDOT Staff: Dustin Witt, Highway Safety Engineer; Amanda Kurth, Director of the Office of Highway Safety; and Logan Gran, Active Transportation Engineer. HDR staff: Mindy Moore, Jon Wiegand, Zach Einck, and BryAnn Becker Knecht.

Invited: Ogalala Lakota County: Lynx Bettelyoun, Highway Superintendent; Oglala Sioux Tribe: Algin Young, Chief of Police; Pennington County: Joe Miller Highway Superintendent; Fall River County: Randy Seiler, Highway Superintendent, and Kyle Norton, Sheriff; Lawrence County: John Bey, Highway Superintendent, and Brian Dean, Sheriff.

After introductions and the initial presentation from HDR and comments from SDDOT, the meeting opened for discussion. Both highway superintendents discussed how they are monitoring safety concerns with bike groups and bike races in their communities. Fortunately, cyclists in these bike groups typically wear helmets. John Bey shared that they have a right-of-way permit application for events and a waiver policy requiring insurance and indemnity policy for bike races. They are also working on a Master Transportation Plan which will address biking as well; this kicked off recently and will be completed in 2024.

Eric Radke shared that commissioners approve bike race routes; if it's on the county road, the commission has to approve it. When new roads are being built, they are adding in shoulders, which at least gives cyclists somewhere to ride. There is a preference for shared use paths rather than on-street bike lanes. The mountainous terrain is also a challenge for biking and walking. There was also conversation around challenges along Nemo Road, a narrow road with a lot of traffic, including challenges with side-by-sides, pedestrians, and cyclists.

John Bey shared concerns that roads around Spearfish don't have accommodations for an extra lane for cyclists. The City bike path is a standalone bike path. SDDOT shared that there are plans for two shared use paths in the next year in Spearfish.

Eric Radke also shared challenges with adding in shoulders when new roads are designed; limited right of way is a challenge.

Meeting with the City of Rapid City

Invited: City of Rapid City: Don Hedrick, Chief of Police; Dale Tech, Director of Public Works; Dale Pfeifle, Manager of Streets Division of Public Works; and Vicki Fisher, Current Planning Division Manager. Rapid City Area Metropolitan Planning Organization: Kip Harrington, Long Range Planning Division Manager.

In attendance: Michelle Lashley, Design Group Coordinator, Engineering Project Manager, City of Rapid City; Kip Harrington; Rapid City community development and MPO, Long range planning director, City of Rapid City; Matt Layman, Traffic Engineer, City of Rapid City; Lt. Jeff McCoy, Police, City of Rapid City; and Roger Hall, City Engineer, City of Rapid City. SDDOT Staff: Dustin Witt, Highway Safety Engineer; Amanda Kurth, Director of the Office of Highway Safety; and Logan Gran, Active Transportation Engineer. HDR staff: Mindy Moore, Jon Wiegand, Zach Einck, and BryAnn Becker Knecht.

After introductions and the initial presentation from HDR and comments from SDDOT, the meeting opened for discussion. The City of Rapid City has a bike and pedestrian master plan, along with a metropolitan master transportation plan called RapidTRIP 2045. The next MTP will start in 2024 for adoption in 2025 with a target year of 2050. They have received several grants over the years, including a Transportive Alternatives grant. Matt Layman shared that they will be establishing some dynamic speed limit signs and messaging boards near a local school with the grant funding. They also submitted a Safe Streets for All action grant and are waiting to see if they receive this funding.

The City of Rapid City has received a highway safety grant award from SDDOT covering 240 hours for officers to patrol school zones and high-speed areas and 10 movable school speeds

signs. Jeff McCoy shared that they stack those calls and do a lot with crosswalk safety. The school zone speed limit is 15 mph.

For infrastructure strategies, representatives from the City of Rapid City shared that they don't have a lot of bike lanes, but they are using rectangular rapid flashing beacons. They will be upgrading these with audible messaging and changing out the push buttons to meet new MUTCD and PROWAG requirements. HDR asked what feedback they have received on these beacons, and Matt Layman shared that there haven't been a lot of questions. Most drivers understand this is a yield situation and they don't need to stop. The group mentioned there is opportunity to have more education at the schools.

Michelle Lashley mentioned reconstruction of ADA ramps and working on securing active transportation funding.

Matt Layman mentioned relacing loop detection with camera detection at signalized intersections, which is better for people biking since they can be detected by the camera.

Roger Hall indicated they are adding shared use paths where possible.

Kip Harrington mentioned that a deterrent in adding shared use paths is local developers, who typically aren't in favor of adding these paths, since it's an additional expense. They need more "teeth" in the regulations for implementation.

Kip Harrington also mentioned that Rapid City is forming an active transportation committee. They also want to ensure equity and include the underserved population's voice into planning decisions. They plan to reach out to City planners from the City of Sioux Falls discuss their Active Transportation Board to gain insight as Rapid City starts this board. SDDOT also offered to assist as they start planning this board.

Meeting with the City of Sioux Falls

Invited: City of Sioux Falls: Mark Cotter, Director of Public Works; Shannon Ausen, Civil Engineer, Program Manager; and Heath Hoftiezer, Principal Traffic Engineer. South Eastern Council of Governments, Sioux Falls MPO: Sean Hegyi, Planner.

In attendance: City of Sioux Falls: Mark Cotter, Director of Public Works; Shannon Ausen, Civil Engineer, Program Manager; and Heath Hoftiezer, Principal Traffic Engineer. SDDOT Staff: Mike Behm, Division Director, Planning and Engineering; Amanda Kurth, Director of the Office of Highway Safety; and Logan Gran, Active Transportation Engineer. HDR staff: Mindy Moore, Jon Wiegand, Zach Einck, and BryAnn Becker Knecht.

Summary: After introductions and the initial presentation from HDR and comments from SDDOT, the meeting opened for discussion.

There was discussion around how the City tracks pedestrian counts at intersections. The City of Sioux Falls shared that they are doing a 13-hour counts at signalized intersections and those expected to be signalized. HDR shared that it may be beneficial to determine what data to collect at a statewide level, such as bicycle and pedestrian counts, for future updates to the VRU Safety Assessment. The City of Sioux Falls also shared that it's guided by strategies in the

Sioux Falls MPO Long Range Transportation Plan and City of Sioux Falls bicycle and pedestrian plans.

The City of Sioux Falls shared that they have used funding from state programs, including the Transportation Alternatives program. Shannon Ausen shared that the City hasn't been awarded these in previous years because they often have more funds than other communities. The City received a grant for a shared use path on 26th Street but haven't spent the funds yet.

Shannon Ausen shared that the City of Sioux Falls has come a long way in the last 10 to 15 years for safety improvements for VRUs, including updating the Sioux Falls bike and pedestrians plans. The city has added many miles of improvements for bicycle lanes and/or sidewalks on more than 90 percent of city streets. The City has implemented many of the infrastructure strategies that were noted in the presentation over the past several years.

Heath Hoftiezer shared that they are holding an internal cross-departmental quarterly meeting, including employees from Planning, Engineering, Public Works, and the Sioux Falls Police Department to review VRU crashes in detail. They are using this meeting as a learning tool and investigate improvements. Lighting is often a concern in locations, and it's helping the City determine what to fix moving forward to reduce accidents.

Mike Behm noted education about driving around agricultural equipment across the state.

The group discussed the Safe Passing Law, and HDR asked the City of Sioux Falls to gauge the level of awareness from the general public (drivers and non-motorists) about this law. The group shared that active cyclists may know about this law, but most motorists may not, and there is an opportunity to improve education.

Amanda Kurth shared that the nonprofit, South Dakota EMS for Children, is working on bike and pedestrian safety education in the community and they received a grant. They also run the "Don't Thump Your Melon" campaign and distribute bike helmets in Sioux Falls and provide education for elementary and day care providers.

Meeting with Tribal Governments

Invited: All nine tribes, including three tribes identified as high-risk areas to VRUs (Crow Creek Sioux Tribe, Oglala Sioux Tribe, and Sisseton-Wahpeton Oyate.

Tribal Transportation Safety Summit; Mobridge, SD; October 18, 2023

The Summit included representatives from Cheyenne River Sioux Tribe, Standing Rock Sioux Tribe, Oglala Sioux Tribe, Sisseton-Wahpeton Oyate, Rosebud Sioux Tribe, Lower Brule Sioux Tribe, and Yankton Sioux Tribe. Crow Creek Sioux Tribe and Flandreau Santee Sioux tribes were not in attendance. A complete list of attendees is below:

Name	Tribe/Agency	Name	Tribe/Agency
Todd Brockmann	FHWA	Becky Bey	KLJ
Paul Knofczynski	KLJ	Ginny O'Connor	Toxcel
Mark Hoines	FHWA	Georgiana Ande	Yankton Sioux Tribe

Brian Cheney	MN State Patrol	Larissa Young	SRST
Mike Wedin	MN State Patrol	Kirk Fredrichs	FHWA
LaJuanda Stands and Looks Back	Rosebud Sioux Tribe	Gina Espinosa-Salcedo	NHTSA
Chuck Fromelt	SDLTAP	Rahya Geisler	MNDOT
Roxanne Hunger	Rosebud Sioux Tribe LES	Michael Moran	BIA
Tiffancy Hodge	KLJ Eng	John Villbrandt	SDDOT
James Cross	OST	Rob Weinmedsfer	DPS-OHS
Nichol Omen-White Eagle	SRST	Jon Wiegand	HDR
Peru Estes	LBST	Iver Crow Eagle III	RST LES
Craig Smith	SDDOT	Amanda Kurth	DPS-OHS
Mark Peterson	SDDOT	Harold Frazier	SRST
Jamie Wark	SRF Consulting	Cliff Eloerharct	SWO
Leon Wright	Rosebud Sioux Tribe	Douglas Archabault	SRST
Shawn Boyd	Rosebud Sioux Tribe	Denae Johnson	KLJ Eng
Andrea Peterson	TTAP	BryAnn Becker Knecht	HDR
Mike Behm	SDDOT	Linda Antell	SRST
Nicky White Eyes	CRST	Aimee Hoyle	Rep. Dusty Johnson
Korey Fischer	CRST	Beka Zerbst	Sen. Thune
Kara Mueller	NHTSA	Jen Hieb	Sen Rounds
Jerome Eagle Bear	RST	Blake Wilcox	KLJ Eng
Shauna Provancial	RST	Chris Kwilinski	FHWA-OTT
Louis Folus	YST	Gil Hedman	TTAP/SDLTAP
Bernadette Zephier	YST	Cliff Reuer	TTAP/SDLTAP
Bonnie Zephier	YST	Dakota Longbrake	CRST DOT
Louis L Galus Jr	YST	Kyle Kurtly	Brosz Eng
Caleb Walter	SDHP	Christina Bennett	SDDOT
Lynda Douville	RST	June Hansen	SDDOT
Darin Falcon	KLJ Eng	Mike Behm	SDDOT

HDR presented an overview of the VRU Assessment, data analysis, infrastructure strategies, and programs at the Summit and allowed time for discussion throughout the presentation. HDR also distributed a survey, which is available in the Appendix. Additionally, HDR had individual conversations with representatives who were at the conference from two of the three areas identified as high risk: Pine Ridge and Sisseton-Wahpeton Oyate. Representatives from Crow Creek Sioux Tribe were not in attendance, but a representative was in attendance during the separate meeting with Buffalo County.

During the discussion, a representative from Standing Rock Sioux Tribe shared concerns that there are a lot of state highways without shoulders and asked if the SDDOT would be adding shoulders on roads. SDDOT shared that they focus on adding shoulders while doing roadway

improvements and will continue to do that moving forward. The VRU Safety Assessment is incorporating all modes of transportation as appropriate.

A representative from Sisseton -Wahpeton Oyate shared concerns about counties lacking funding to include transportation safety into their plans. He shared that Roberts County doesn't have funds to build safety into their plans, and asked if there was anything in the statewide Strategic Highway Safety Plan about finding counties funding. The SDDOT shared that this is an overall statewide safety plan, and they are working with counties on local road improvements.

There was discussion about pedestrian connections and the Transportation Alternatives program. Individuals commented about the importance of transportation improvements being a statewide approach.

A tribal representative from Sisseton-Wahpeton Oyate shared concerns about grant requirements for townships and counties to access funding, as the conditions of these roads also affects tribal members.

The SDDOT shared that safety is about everyone, everywhere and how we all deal with safety.

A representative from the Rosebud Sioux Tribe expressed concerns about sharing and communicating crash data from the tribes and said that we need to share more of this data. HDR invited the tribal representatives to share this data, as they are comfortable, as it can be incorporated into the update to the statewide plan.

SDDOT addressed a question about the focus of the statewide highway plan. They shared that the plan is focused on the greatest opportunity to improve safety and reduce fatalities and serious injuries.

A tribal representative shared concerns that roads are not marked very well, and there was conversation about signage varying according to tribal areas.

There was conversation about ongoing safety improvement projects on tribal lands. Several tribal members also shared the need for more public education on transportation safety (PSAs, etc.).

During a conversation on infrastructure strategies, individuals shared areas where strategies are in place, such as bike lanes, shared use paths, and flashing beacons. One tribal representative shared that they would like to add lighting above a shared use path; he expressed concerns that individuals using wheelchairs often use the road instead of the shared use path because the lighting is above the road and not over the shared use path. Others shared that tribal members sometimes still walk on and use the road instead of shared use paths, and there was discussion around the need for more community engagement and education. There was discussion around the importance of encouraging the use of a shared use path, such as having a 5K run on bike paths.

During a conversation with James Cross, Oglala Sioux Tribal Council Pass Creek District Representative, he discussed his work on seeking funding to improve Allen Road, which runs through Bennett County through Allen, South Dakota, between Kyle and U.S. Highway 18. The roadway deterioration was a continued concern and there have been several fatalities along this roadway. There were funding challenges and disputes over the jurisdictional issues of the road,

but eventually the Oglala Sioux Tribe secured funding through a bond to repair 6 miles of the road and add a walking path. Two miles of the road are still in poor shape. He shared that they are now seeking funding to improve lighting to finish this transportation improvement project.

This individual also shared concerns about the lack of participation and input from those in tribal communities on improving transportation safety.

HDR also visited individually with Cliff Eberhardt, Transportation Director from Sisseton-Wahpeton Oyate. He discussed safety concerns for pedestrians, as there are often no shoulders, and there are many individuals who like to walk in the community. He shared the idea for individuals to wear reflective gear while they are walking. He also shared the importance of adding appropriate signage of who should be using shared use paths. Depending on the width of the path, signage should indicate whether cyclists and/or walkers should use the path.

Cliff Eberhardt shared that they have used the Transportation Alternatives program to establish pathways at a local school, but the schoolchildren are still walking through the parking lot and not using the new route/shared use path that has been added that connects the road with the school.

Appendix B: Tribal Survey Results

Survey Questions

- **Tribal Affiliation**
- **What do you see as the key challenges for tribal communities concerning pedestrian and bicycle safety?**
- **What areas would you like to improve specifically for pedestrian and bicycle safety?**
- **What state plans or programs have you made use of (such as Safe Travel for Every Pedestrian, Transportation Alternatives Program, Don't Thump Your Melon educational campaign)?**
- **What local or regional plans, programs, or policies do you have in place?**
- **What infrastructure strategies have you made use of?**
    - **Pedestrian/Bicyclist**
        - Bicycle Lanes
        - Leading Pedestrian Interval
        - Pedestrian Hybrid Beacons
        - Road Diets
        - Crosswalk Visibility Enhancements
        - Medians and Pedestrian Refuge Islands in Urban Suburban Areas
        - Rectangular Rapid Flashing Beacons
        - Walkways
    - **Intersections**
        - Roundabouts
    - **Speed Management**
        - Appropriate Speed Limits for All Road Users
        - Variable Speed Limits, ex. School Zone Speed Limit
    - **Crosscutting**
        - Lighting

  - Safety Road Audit
  - Local Road Safety Plans

- **What new plan, program, policy or infrastructure would be helpful in the future?**

- **What else would you like to share?**

Survey Results (3 total responses)

Tribal Affiliation

- Rosebud Sioux Tribe Highway Safety
- Yankton Sioux Tribe
- Rosebud Sioux Tribe

What do you see as the key challenges for tribal communities concerning pedestrian and bicycle safety?

Rosebud Sioux Tribe Highway Safety
- Lack of lighting is a major challenge for peds in tribal communities

Yankton Sioux Tribe
- Lighting is always an issue for tribes. It's either no lighting or if there's lighting, then it's who's going to pay for it

Rosebud Sioux Tribe
- No traffic safety education, spread out communities with limited or no pathways

What areas would you like to improve specifically for pedestrian and bicycle safety?

Rosebud Sioux Tribe Highway Safety
- Gather more education to promote to our communities

Yankton Sioux Tribe
- Lighting issues that would maybe help with not only create a safe walkway but help with crime in those areas

Rosebud Sioux Tribe
- Advanced warning signs. Everything on the infrastructure strategies from HDR

What state plans or programs have you made use of (such as Safe Travel for Every Pedestrian, Transportation Alternatives Program, Don't Thump Your Melon educational campaign)?

Rosebud Sioux Tribe Highway Safety

- We have used national traffic safety campaigns

Yankton Sioux Tribe

- TAP & TISP (Editor's note: We believe the respondent was referring to the Statewide Transportation Improvement Program – STIP)

Rosebud Sioux Tribe

- none

What local or regional plans, programs, or policies do you have in place?

Rosebud Sioux Tribe Highway Safety

- N/A

Yankton Sioux Tribe

- Our Tribe has a safety plan and a LRTP to address all of our road safety issues.

Rosebud Sioux Tribe

- BIA Highway Safety Program

What infrastructure strategies have you made use of?

Rosebud Sioux Tribe Highway Safety
Yankton Sioux Tribe
Rosebud Sioux Tribe

Rosebud Sioux Tribe Highway Safety

- Walkways
- Appropriate Speed Limits for All Road Users
- Variable Speed Limit, ex. School Zone Speed Limit

Yankton Sioux Tribe

- Pedestrian Hybrid Beacons
- Crosswalk Visibility Enhancements
- Walkways
- Appropriate Speed Limits for All Road Users
- Variable Speed Limit, ex. School Zone Speed Limit
- Lighting
- Safety Road Audit
- Local Road Safety Plans

Rosebud Sioux Tribe

- Crosswalk Visibility Enhancements
- Walkways
- Appropriate Speed Limits for All Road Users
- Variable Speed Limit, ex. School Zone Speed Limit

- Safety Road Audit
- Local Road Safety Plans

What new plan, program, policy or infrastructure would be helpful in the future?

Rosebud Sioux Tribe Highway Safety

- Lighting, roundabouts, and bicycle lanes

Yankton Sioux Tribe

- STEP would be helpful to our Tribe

Rosebud Sioux Tribe

- BIA Indian Highway Safety Programs, Tribal Transportation Program, Safety Element

What else would you like to share?

Rosebud Sioux Tribe Highway Safety

- N/A

Yankton Sioux Tribe

- Left empty

Rosebud Sioux Tribe

- Being under funded and under staffed cause delay & hinderance to employing many traffic safety measures

Appendix C: Bicycle and Active Transportation Groups Survey Results

Survey Questions

- **In what cities or counties do you typically bike?**
- **Do you typically feel safe while biking?**
    - Yes
    - No
- **What makes you feel safe when biking?**
    - Low traffic volume
    - Low traffic speed
    - Biking facility is separated from motorized traffic
    - I'm familiar with the route
    - Most motorists drive cautiously in that area
    - Other
- **What makes you feel unsafe when biking?**
    - High traffic volume
    - High traffic speed
    - I have to bike with motorized traffic
    - Some motorists drive carelessly in this area
    - Other
- **Please prioritize the following activities in order of how you believe your community should be investing dollars into improving the biking environment.**
    - Education/outreach to motorists about sharing the road with people biking.
    - Education/outreach to adult bicyclists about how to safely navigate the transportation system.
    - Education/outreach to children about bicycle safety.
    - Improve infrastructure to create safer places for people to bike and walk (improve/expand trails, bike lanes and intersections, etc.)
- **Please tell us a little bit about why you ranked those areas the way you did.**
- **What do you consider the most significant contributing factors to crashes involving bicyclists and pedestrians?**
    - Motorist speeding
    - Inadequate separation of modes of transportation
    - Distraction
    - Poor compliance with traffic laws

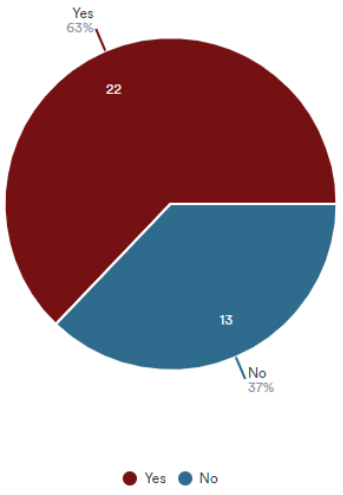
  - Improper use of facilities (e.g., cyclist traveling on wrong side of road)
  - Other
- **If you would like to receive updates on the SHSP, please provide your email.**

Survey Results (36 total responses)

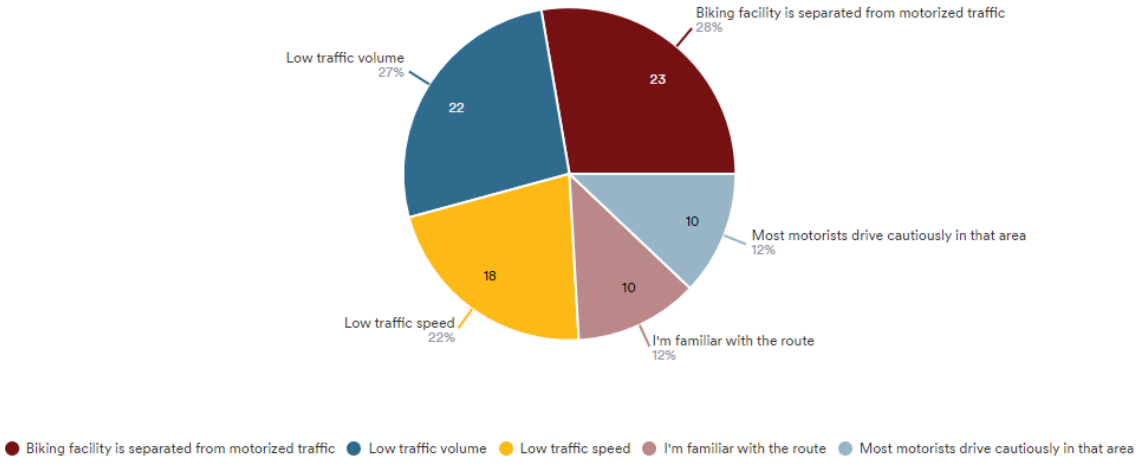
In what cities or counties do you typically bike?

City or County	Count	City or County	Count
Custer	1	Perkins	1
Fort Pierre	1	Pierre	15
Hughes	13	Potter	1
Jones	1	Rapid City	2
Lawrence	4	Sioux Falls	9
Lemmon	2	Spearfish	3
Lyman	1	Stanley	7
McCook	1	Sturgis	1
Minnehaha	5	Sully	1
Mitchell	1	Wall	1
Pennington	3	Yankton	1

Do you typically feel safe while biking?



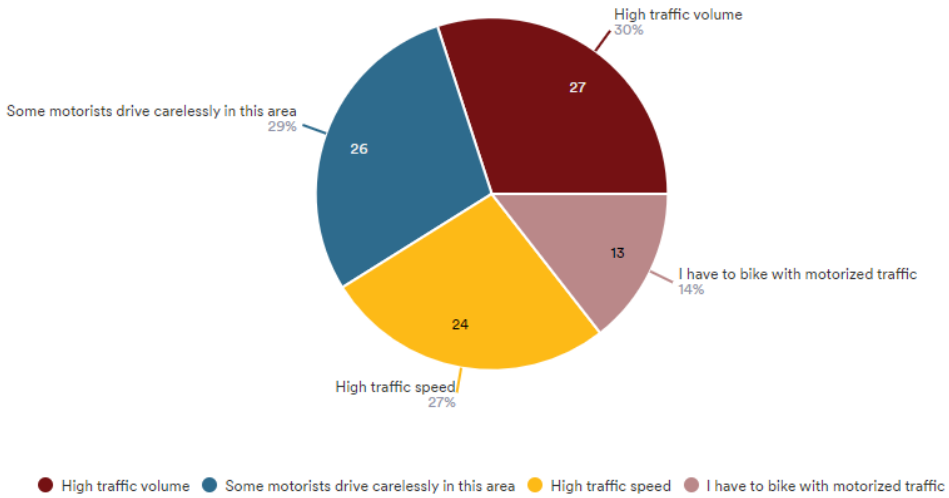
What makes you feel safe when biking?



Other entries:

- Large shoulders without rumble strips in the shoulder
- If motorists slow down and move over when passing
- Protected bike lanes
- Gravel
- Wide shoulder without rumble strips or rumble strips placed near the left side of the shoulder so that they don't make the shoulder un-rideable
- Adequate signage about bicycle & pedestrian safety

What makes you feel unsafe when biking?



Other entries:

- Narrow shoulders
- Unusable or too narrow of shoulders
- No shoulder or rumble strips on the shoulder not the fog line
- Rumble strips force bicycle into high speed auto lane
- Distracted drivers, aggressive/angry drivers, won't pass safely

Please prioritize the following activities in order of how you believe your community should be investing dollars into improving the biking environment.

1. Improve infrastructure to create safer places for people to bike and walk (improve/expand trails, bike lanes and intersections, etc.) (total score: 51)
2. Education/outreach to motorists about sharing the road with people biking (total score: 74)
3. Educational/outreach to adult bicyclists about how to safely navigate the transportation system (total score: 115)
4. Education/outreach to children about bicycle safety (total score: 120)

Note: Scores were determined by adding up priority rankings (1 = 1 point, 2 = 2 points…), therefore the item with the lowest score is the highest priority.

Please tell us a little bit about why you ranked those areas the way you did.

- Build segregated trails.
- Infrastructure is the only thing that can protect people outside of 3000 pound metal boxes from minor mistakes that those driving can make. Education is great but it is secondary to improving safety through design.
- Children need to learn basic driving skills
- Motorists are the most impactful change to immediate safety of bicyclists, pedestrians and community members.
- Building safer communities will take time even with best immediate changes like more robust public transportation and bicycling focus.
- Education for adults and then children.
- Motorists seem to not know or care about giving space when driving.
- Drivers are not respectful or even notice bikers. Need improvement to separate biker from drivers.
- The education outreach for motorists should be about drivers of motor vehicles to give priority to all forms of alternative transportation (biking, walking, mobility devices, runners, etc). The top priority really should be engineering safer roads! The engineering design of Sioux Falls roads is straight, flat, and WIDE! Speed limit signs, education, and traffic enforcement will have very little impact on speed. Proper road design and speed reducing facilities (chicanes, bump outs, road side trees, narrower lanes, traffic calming circles, etc.) will make the roads safer for all users, motor vehicle drivers and vulnerable road users.

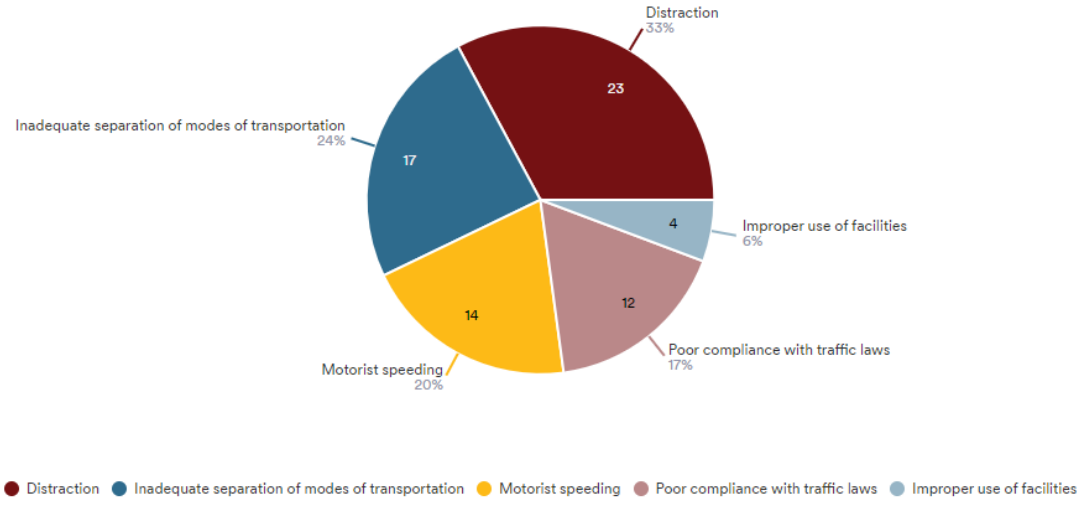
- low maintenance of trails causes bikes to ride roadways in areas. drunk bumps put riders on roadway when they confront obstacles, wider space outside bumps would allow bike/trikes to pass obstacles without riding on roadway,
- Infrastructure first - with focus on highway shoulders!
- With wide, useable shoulders, bicyclists are much safer and vehicle operators don't feel that they are being slowed down by them. When bicyclists are forced into or partially into the driving lane (due to lack of adequate shoulders), some motorists seem to have more resentment toward the cyclists.
- South Dakota's 6-ft law is unique and in theory, makes cyclists a lot safer! Unfortunately, it's not widely known. It should be a question in the Driver Licensing written test (if not already included) and more outreach from the Department of Public Safety about this would help a lot.
- Lack of enforcement of vehicle traffic around bikes
- Biking in other cities that have bike lanes and/or separation barriers feels much safer, even with heavy traffic.
- In my experience, many motorists in South Dakota do not move over when approaching or passing cyclists, even when there is not a vehicle in the oncoming lane, as compared to other states I've lived in.
- I have been ran off the road several times by vehicles who have told me that I belong on a sidewalk.
- The shoulders of highways have shrunk over the years giving cyclists less room to ride. Would be awesome to see more space given to cyclists.
- Distracted driving is a major concern. Riding with less traffic is ideal.
- 1. good infrastructure is important to create safe bike and pedestrian traffic. 2. It is first the bikers or pedestrians responsibility for their safety 3. Education is important to support 1 &2. Helping people be aware of the rules and proper use of roadway 4. Teaching children is everyone's responsibility."
- The loop around the dam is a great way for bikers to get a good ride in. However, on the Pierre side, riders must ride on the shoulder of the highway. This can be very dangerous as it is also used by trucks carrying over width loads who can't always move to the center of the road to give bikers room. And then there are the truckers and motorists that don't move over at all for no reason.
- I appreciate infrastructure that supports safe bicycling.
- Education is great for all involved, however only good when followed.
- Separation is best safety approach, especially considering rarity of bikes on road and drivers distracted by communication devices. Intelligent rumble stripe design also helps to alert drivers and riders when deviating from lane.
- I don’t believe most motorists care about bicyclists. Education of motorists won’t move the needle!

- Distracted drivers pose the greatest risk to cyclists IMHO
- 6' law
- If motorist understand that bicyclists aren't trying to take over the road just want to share it in a safe way the attitude of some drives would be better. Then improve the size of the shoulders. Make sure bicyclists need to be cautious and aware of surroundings at all times.
- I truly encounter far more courteous drivers than seemingly discourteous or uncaring and believe more outreach would raise awareness of our life-changing vulnerability.
- I think our state lags in cycling infrastructure compared to other places I've visited out of state. I would love to see more interconnected cycling lanes within our cities.
- 1. We always need safer trails to bike on. Need wide shoulders (8 Ft +) on State and Federal highways. Need Bike trails to run along side interstate highways. Need Bike lanes on city streets. Do Not Use Chip Seal on Bike Trails, Bike lanes, or bike paths. Place Rumble strips between lanes of traffic and bike lanes (shoulders). 2. Children need to be educated on bike safety, and encouraged to bike to school. 3. Motorist also need to educated to yield for bikes. 4. Adult bicyclist need to be educated about bicycling, rules off the road apply to cyclist (stopping at intersections, red lights stop signs).
- The safest route is a separate bike path.
- Motorists don’t move over OR slow down on the highway. Semis and large trucks travel at least 60 mph in the lane right next to cyclists. The gravel intersections have rocks which need to be avoided and as a cyclist you have to pull into the lane with traffic which is dangerous since traffic doesn’t know the law.
- You can’t ever educated away carelessness with this stuff. Infrastructure is certain to improve safety.
- Need to get more people biking and walking for a lot of reasons, and this will happen if the biking/walking infrastructure is there. Also need to educate bicyclists so they can bike safely. I put motorist education last because I think the other activities we will get more bang for the buck.
- Drivers often think bicycles must be on the sidewalk, or shouldn't be on urban or rural roads. Education/PSAs may help nudge sympathy or empathy, but more infrastructure should be a close second so everyone can navigate/recreate as necessary.
- I ranked infrastructure as number one because in Lemmon we have zero bicycle/pedestrian specific trails or lanes. Most sidewalks are not contiguous for even an entire block. We also have highway 12 cutting through town and there is no shoulder, bicycle lane, adjacent sidewalk or rec path in town along the highway. I listed education for cyclists in front of education for motorists because it’s very important for cyclists to advocate for themselves, whereas for motorists this is not necessary.
- One of my next goals as I exit the Lemmon Chamber of Commerce Executive Director position, is to focus on how to make our area and town, county more bike-able/Bike Friendly. Not everyone likes to bike on gravel, but a goal of mine is to get more people

on bikes, and outside! In order to do that, we need a safe and separate place for people to enjoy their experience!

- Infrastructure is really where all the money should be going. Good infrastructure can do a lot of the work of education by clearly communicating to motorists and vulnerable road users how they should be using the street network. Narrowing streets and adding road furniture makes it clear that a lower speed is expected of all users. It also requires everyone to pay more attention!
- Mitchell is the city where I bike most often. We do not have any marked lanes where paved trail is not available. Mitchell is not a bike friendly community on any road.
- We need to educate kids on bicycling rules and how to ride cautiously. Automobiles do not look out for cyclists.
- I have been riding and been targeted by motorists for harassment. Posting the distance cars need to stay away from cyclists would be helpful.
- Motorists need to see the volume of cyclists to impact their driving habits.
- Historically motorists took the high road (excuse the pun) as well as horse travel. Pedestrians always had to get out of the way…

What do you consider the most significant contributing factors to crashes involving bicyclists and pedestrians?



Other entries:

- Motorists distraction and failure to observe/yield to bicyclists or pedestrians.
- Drivers not knowing the current rules of spacing on highways and giving cyclist enough room as they pass.
- Infrastructure that does not take vulnerable road users into account.

If you would like to receive updates on the SHSP, please provide your email.

- 17 emails were received.

Appendix D: Program of VRU Improvement Strategies

Existing Laws and Education - Statewide

#	Strategy	Bike/Ped/Both	Description	Target Demographic	Reference Documents
1	Safe Passing Law	Bike	Safe passing laws require motor vehicle drivers to leave at least a legally defined amount of clearance space between the vehicle and the cyclist when overtaking the cyclist. This law helps to minimize the likelihood of a sideswipe, and to reduce the chance of a close encounter that could potentially destabilize or divert the course of a cyclist and cause a crash. In South Dakota, existing law requires a safe passing distance of not less than three feet for speeds of 35 mph or less and not less than 6 feet for speeds greater than 35 mph. South Dakota's law is classified under codified Law 32-26-26. Overtaking bicycle—Minimum separation—Violation as misdemeanor.	Motorists	NHTSA 3.4 Motorist Passing Bicyclist Laws | NHTSA South Dakota Legislature Codified Law 32-26-26 | South Dakota Legislature (sdlegislature.gov)
2	Pedestrian in Crosswalk Laws	Ped	Pedestrian in crosswalk laws require motor vehicle drivers to yield the right-of-way to a pedestrian crossing the highway within any clearly marked crosswalk. At controlled intersections, motor vehicles must yield to pedestrians crossing during a green or go signal, while in all other cases, pedestrians must yield the right-of-way to vehicles lawfully proceeding directly ahead on a green or go signal. These laws help regulate the interaction between pedestrians and vehicles at crosswalks and establish when each user has the right-of-way. South Dakota's laws are codified as Law 32-27-1—Yielding right-of-way to pedestrian making proper crossing—Regulated intersection—Violation as petty offense and Law 32-27-2—Yielding right-of-way to pedestrians at controlled intersections—Circumstances under which pedestrians must yield—Violation as petty offense.	Motorists	South Dakota Legislature Codified Law 32-27-1 | South Dakota Legislature (sdlegislature.gov) Codified Law 32-27-2 | South Dakota Legislature (sdlegislature.gov)
3	Work Zone Safety Laws	Ped	Work zone safety laws require motor vehicles drivers to yield the right-of-way to persons engaged in maintenance, survey, or construction work whenever the driver is notified of the presence of the worker. This law helps protect highway workers while they perform their work on public roads, highways, or within highway right-of-way. South Dakota's law is codified as Law 32-27-10—Failing to yield right-of-way to persons working on highways—Warning signals—Misdemeanor.	Motorists	South Dakota Legislature Codified Law 32-27-10 | South Dakota Legislature (sdlegislature.gov)
4	Bicycle Regulations	Bike	Bicycle regulations are provided for South Dakota and include laws that detail how bicycles may operate on sidewalks with all the rights and duties of a pedestrian, but they must yield the right-of-way to any pedestrian. Additional laws describe how bicycles must ride close to the right-hand curb when operating on a roadway and they must always use turning, stopping, and starting signals. Lastly, all bicycles must also be equipped with a lighted lamp on the front of the bicycle and reflect mirror or lamp on the back.	Bicyclists	SDDOT BICYCLElawsforSD.pdf
5	Helmet Campaign – "Don't Thump Your Melon"	Bike	Bicycle helmet promotions aim to increase bicycle helmet use and thereby reduce the number of severe and fatal head injuries. This countermeasure involves conducting single events and/or extended campaigns to promote helmet distribution and use among all ages.	Bicyclists	NHTSA 3.2 Promote Bicycle Helmet Use With Education South Dakota Pedestrian & Bike Safety | SD DPS

Existing Plans and Programs - Statewide

#	Strategy	Bike/Ped/Both	Description	Target Demographic	Reference Documents
1	Long Range Transportation Plan	Both	The LRTP supports SDDOT's mission, vision, and goals by providing a planning framework that guides decision-making, monitors and identifies transportation challenges and opportunities, highlights beneficial multi-modal relationships and opportunities, and ensures projects reflect fiscal and political reality through sustainable efforts.	All users	SDDOT Long Range Plan - South Dakota Department of Transportation (sd.gov)
2	Statewide Transportation Improvement Program	Both	The Statewide Transportation Improvement Program (STIP) provides a comprehensive overview of the South Dakota transportation system and is intended to inform South Dakotans of the transportation improvements planned in the State. The program identifies highway and intermodal improvements to preserve, renovate, and enhance South Dakota's transportation system.	All users	SDDOT Statewide Transportation Improvement Program – STIP - South Dakota Department of Transportation (sd.gov)
3	Safe Travel for Every Pedestrian	Ped	Safe Travel for Every Pedestrian (STEP) is part of FHWAs Every Day Counts Initiative that SDDOT participated in to help transportation agencies address pedestrian crashes that occur at uncontrolled crossing locations and intersections with no traffic signals. The STEP initiative promotes cost-effective countermeasures with known safety benefits and includes best practices to help city engineers and designers address potential safety concerns.	Pedestrians at uncontrolled crossings	FHWA & SDDOT Microsoft Word - STEP guide draft 6-17-20.docx (sd.gov)
4	South Dakota Triennial Highway Safety Plan	Both	The South Dakota Triennial Highway Safety Plan includes data from the 2021 Fatality Analysis Reporting System (FARS) and 2022 State data that was used to set triennial safety targets for South Dakota. In addition to the FARS crash data, the South Dakota Office of Highway Safety (SDOHS) also incorporated the analysis of the Social Vulnerability Index data to help identify potential geospatial demographic patters in crash incidence and outcomes.	All users	South Dakota Department of Public Safety SD_FY24HSP-tag.pdf (nhtsa.gov)

Existing Funding Programs - Statewide

#	Strategy	Bike/Ped/Both	Description	Target Demographic	Reference Documents
1	Transportation Alternatives	Both	Transportation Alternatives (TA) is a program that uses federal transportation funds for specific activities that enhance the inter-modal transportation system and provide safe alternative transportation options. TA encompasses a variety of smaller-scale non-motorized transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to storm water and habitat connectivity.	All users	FHWA & SDDOT Transportation Alternatives - South Dakota Department of Transportation (sd.gov)
2	Highway Safety Improvement Program (HSIP)	Both	HSIP is a Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. Within South Dakota, HSIP funds will be used for a countywide signing project, systemic improvements, and spot locations with improvements ranked by benefit-cost.	All users	FHWA & SDDOT HSIP(South Dakota) 2022 Report (dot.gov)
3	Carbon Reduction Strategy	Both	Carbon Reduction Strategy documents the many strategies, methods, approaches, activities, and tactics that can be used to implement SDDOT's main carbon reduction strategy which is to "Allocate Resources to Improve Energy Efficiency". The strategy was developed to be "context sensitive" by aligning with economic and market forces in ways that are appropriate to South Dakota.	All users	SDDOT Draft Carbon Reduction Strategy - South Dakota Department of Transportation (sd.gov)
4	Safe Routes to School	Both	Safe Routes to School is an approach that promotes walking and bicycling to school through infrastructure improvements, enforcement, tools, safety education, and incentives to encourage walking and bicycling to school. This initiative improves safety as well as promotes physical activity for students.	All users	FHWA Safe Routes to School Programs | US Department of Transportation

Existing Plans – Local and Regional

#	Strategy	Bike/Ped/Both	Description	Target Demographic	Reference Documents
1	Pennington County Local Road Safety Plan	Both	The Pennington County LRSP was developed using FHWA's LRSP process and aligns with the 2019 South Dakota SHSP. It provides a data-driven framework to identify, analyze, and prioritize roadway safety improvements on local roads. LRSPs are one of several FHWA Proven Safety Countermeasures.	All users	FHWA & Pennington County
2	Rapid City Area Bicycle and Pedestrian Master Plan	Both	The Rapid City Bicycle and Pedestrian Master Plan will guide the development of a network of bicycle and pedestrians routes that link activity centers within the city and provide opportunities for connections to surrounding areas.	Pedestrians and Bicyclists	Rapid City Area MPO & City of Rapid City Bike-PedPlanCombined_forweb..pdf (rapidcityareampo.org)
3	RapidTRIP 2040	Both	RapidTRIP 2040 is the long-range transportation plan for the Rapid City Metropolitan Planning Area. It is a comprehensive study of the transportation network emphasizing the transportation modes of automobile, bicycle, pedestrian, and transit including interaction of these modes with aviation and freight movement by railroad and trucking throughout the region.	All users	Rapid City Area MPO RPT CVR rapid_city_LRTPU_14259.ai (rapidcityareampo.org)
4	Siouxland Interstate Metropolitan Planning Council (SIMPCO) MPO's Long Range Transportation Plan	Both	The LRTP is a tool for developing safe and efficient transportation improvements for the SIMPCO MPO region through the year 2045. These improvements encompass all modes of transportation, including public transit, bicycle and pedestrian travel, and street and highway travel.	All users	SIMPCO 2045-LRTP-Final.pdf (simpco.org)
5	Sioux Falls MPO 2045 Long Range Transportation Plan	Both	The Sioux Falls MPO LRTP is designed to guide transportation planning activities by setting forth direction and strategies to help shape the region's transportation network through the year 2045. It considers all modes of transportation including driving, walking, bicycling, transit, rail, and air to set future priorities.	All users	Sioux Falls MPO 2045 LRTP Final.pdf (revize.com)
6	2021 Sioux Falls Pedestrian Plan	Ped	The Sioux Falls Pedestrian Plan will provide goals, objectives, and policies including the identification of facility improvements, programs, and actions for all pedestrians.	Pedestrians	City of Sioux Falls 2021-pedestrian-plan.pdf (revize.com)
7	2023 Sioux Falls Bicycle Plan	Bike	The Sioux Falls Bicycle Plan has a vision to construct a comprehensive network of bicycle lanes and trails that are safe and accessible to all.	Bicyclists	City of Sioux Falls Bicycle-Plan-2023-f.pdf (revize.com)

Pedestrian and Bicycle Infrastructure Countermeasures

#	Countermeasure	Bike/Ped/Both	Description	Targeted Crash Characteristics	Where to Use	Reference Documents	Potential Percentage Reduction in Crashes Sources: CMF Clearinghouse Oregon DOT CRF
1	Sidewalks, Walkways	Pedestrian	Sidewalks and other walkways, and provide pedestrians space that is separated from roadway vehicles so they can safely travel within the public right-of-way.	Walking along roadway (adjacent to travel lane)	New and renovated road facilities	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Install Sidewalk (CMF ID: 11246)** % reduction in crashes = 40% • Crash Type = Vehicle/Ped • Crash Severity = All • Area = N/A • Intersection = None – roadway • Star Quality = 4/5
2	Curb extensions (bulb-outs or neckdowns)	Pedestrian	Curb extensions shorten the distance of a crosswalk by extending the sidewalk or curb line out into the parking lane. This feature reduces the effective street width and reduces the time that pedestrians are in the street.	Crossing roadway Failure to yield	Intersections with on-street parking lanes	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Curb Extensions (ODOT: I33)** % reduction in crashes = 30% • Crash Type = All • Crash Severity = All • Area = Urban • Intersection = Signalized or unsignalized
3	Raised Pedestrian Crossings (Raised Crosswalk or Raised Intersection)	Pedestrian	Raised pedestrian crossings make pedestrians more prominent in a driver's field of vision by having them cross the road at the same level as the sidewalk. It also reduces vehicle speeds and improves vehicle yielding.	Crossing roadway Failure to yield	Midblock crossings Intersections Local and collector roads where traffic calming is desired	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Install Raised Pedestrian Crosswalks (CMF ID: 136)** % reduction in crashes = 46% • Crash Type = Vehicle/Ped • Crash Severity = All injury • Area = Urban or suburban • Intersection = None – roadway • Number of lanes = 2 • Star Quality = 3/6
4	Crossing Island (Pedestrian Refuge Island)	Pedestrian	Crossing islands protect pedestrians crossing multilane roads by including a refuge area in the median. This feature allows pedestrians to focus on one direction of traffic at a time as they cross the road.	Crossing roadway Failure to yield	Multi-lane controlled intersections Midblock crossings on roads with three or more travel lanes, speed limits 35 mph or greater and/or AADT of 9,000 or higher	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Install Raised Median with or without Marked Crosswalk (CMF ID: 8799)** % reduction in crashes = 32% • Crash Type = Vehicle/Ped • Crash Severity = All • Area = Urban or suburban • Intersection = None – roadway • Number of lanes = 2-8 • Star Quality = 4/5
5	Leading Pedestrian Interval (LPI)	Pedestrian	LPIs provide pedestrians the WALK signal three to seven seconds before the motorists are allowed to proceed through the intersection. This measure positions pedestrians in the crosswalk by the time the traffic signal turns green and allows them to establish their	Crossing roadway Failure to yield	Signalized intersections	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Modify Signal Phasing (Implement a Leading Pedestrian Interval) (CMF ID: 9903)** % reduction in crashes = 19% • Crash Type = Vehicle/Ped • Crash Severity = All • Area = Urban or suburban

			presence in the crosswalk before motorists can start turning.				• Intersection = Signalized • Star Quality = 5/5
6	PUFFIN signal crossing	Pedestrian	PUFFIN stands for Pedestrian User Friendly Intelligent Intersection. It uses active detection and passive presence of pedestrians in crosswalks to determine whether the pedestrian phase of a traffic signal or beacon should be extended or canceled.	Crossing roadway	Signalized crossings with a high frequency of pedestrians aged 65 and above and/or pedestrians with disabilities Traditional traffic signals with pedestrian signals Pedestrian Hybrid Beacons	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Convert Pelican Crossing or Farside Pedestrian Signal to Puffin Crossing (CMF ID: 3889)** % reduction in crashes = 24% • Crash Type = Vehicle/Ped • Crash Severity = Fatal and all injury • Area = Not specified • Intersection = Signalized • Star Quality = 3/5
7	Rectangular Rapid Flashing Beacon (RRFB)	Pedestrian	The RRFBs, located under the crosswalk signs, flash when activated to alert motorists to the presence of a pedestrian in the crosswalk. Activation can be either passive or active detection.	Crossing roadway Failure to yield	Multilane crossings with speed limits less than 40 mph Uncontrolled marked crosswalks	FHWA Rectangular Rapid Flashing Beacons (RRFB)	**Install Enhanced RRFB Pedestrian Crossing at Mid-Block Crossing Location (CMF ID: 9124)** % reduction in crashes = 36% • Crash Type = Vehicle/Ped • Crash Severity = All • Area = All • Intersection = None – roadway • Number of lanes = 2-5 • Star Quality = 1/5 **Install Rectangular Rapid Flashing Beacon (RRFB) (CMF ID: 11158)** % reduction in crashes = 69% • Crash Type = Vehicle/Ped • Crash Severity = All • Area = All • Intersection = Roadway/pedestrian crossing (e.g., midblock crossing) • Star Quality = 4/5
8	Standard Bicycle Lanes	Bicycle	Bicycle lanes provide an exclusive space for bicycles that is distinct from roadway vehicles through pavement markings and signage.	Biking along roadway (in or adjacent to travel lane)	Most appropriate for roads with speeds up to 25 mph and volumes up to 3,000 ADT	BikeSafe Bicycle Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Install Bicycle Lanes (CMF ID: 10738)** % reduction in crashes = 49% • Crash Type = All • Crash Severity = All • Area = Urban • Intersection = None – roadway • Number of lanes = 4 • Star Quality = 4/5 **Install Bicycle Lanes (CMF ID: 10742)** % reduction in crashes = 31% • Crash Type = All

							• Crash Severity = All • Area = Urban • Intersection = None – roadway • Number of lanes = 2 • Star Quality = 4/5
9	Buffered Bicycle Lanes	Bicycle	A buffered bike lane adds a painted buffer to the bike lane, typically between the motorized travel lane and the bike lane. If on-street parking is present, a buffer may be added between the bike lane and the parking lane to provide separation between bicyclists and motorists opening vehicle doors.	Biking along roadway (in or adjacent to travel lane)	Any road where a standard bicycle lane is being considered Most appropriate for roads with speeds up to 25 mph and volumes between 3,000 and 6,000 ADT	BikeSafe Bicycle Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**N/A**
10	Separated Bicycle Lanes (aka Protected Bicycle Lanes or Cycle Tracks)	Bicycle	A separated bike lane is an exclusive facility for bicyclists that is located within or directly adjacent to the roadway and that is physically separated from motor vehicle traffic with a vertical element.	Biking along roadway (in or adjacent to travel lane)	Any road where a bicycle lane is being considered Most appropriate for roads with speeds greater than 25 mph and volumes greater than 6,000 ADT	Bike Safe Bicycle Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Install Cycle Tracks, Bike Lanes, or On-Street Cycling (CMF ID: 4102 & 4097)** % reduction in crashes = 59% - 74% • Crash Type = Vehicle/Bike • Crash Severity = All Injury • Area = Urban • Intersection = None – roadway • Number of lanes = 1-3 • Star Quality = 2/5
11	Bicycle Signals	Bicyclist	Bicycle signals may be used to separate bicycle through movements from vehicle right turning movements. They can also be used to facilitate complex bicycle movements or help people on bicycles navigate complex intersections. A leading bicycle interval, which uses a bicycle signal lens to provide three to five seconds of green time before the corresponding vehicle green indication, can be used to increase the visibility of bicyclists to motorists.	Failure to yield Turning conflicts	Signalized intersections	FHWA Separated Bike Lane Design Guide NACTO Bicycle Signal Heads	**Install Bike Signal (ODOT: BP21)** % reduction in crashes = 45% • Crash Type = Bike • Crash Severity = All • Area = Urban or rural • Intersection = Signalized

12	Bike Boxes	Bicycle	Bike boxes are designated areas at the head of a traffic lane at a signalized intersection that provides bicyclists a way to get ahead of queuing traffic during the red signal phase. Placed between the stop line and the pedestrian crosswalk, bike boxes increase the visibility of queued bicyclists and provide them with the ability to start up and enter the intersection in front of motor vehicles when the signal turns green. In the past, bike boxes also facilitated left turns for bicyclists; however, recent best practices recommended Two-stage Turn Queue Boxes for left turns.	Crossing roadway Failure to yield Turning conflicts	Signalized intersections	NACTO Bike Boxes FHWA Separated Bike Lane Design Guide	**Install Bike Box at Conflict Points (ODOT: BP7)** % reduction in crashes = 35% • Crash Type = Bicycle • Crash Severity = All • Area = Urban or Rural • Intersection = Signalized
13	Two-stage Turn Queue Boxes	Bicycle	Two-stage turn queue boxes allow bicyclists to make left turns at multilane intersections from a right-side separated bike lane, or right turns from a left-side separated bike lane. Cyclists who arrive on a green light travel into the intersection and pull out into the two-stage turn queue box away from through-moving bicycles and in front of cross-street traffic.	Turning conflicts	Signalized and unsignalized intersections	NACTO Two-Stage Turn Queue Boxes FHWA Separated Bike Lane Design Guide	**Install Bike Box at Conflict Points (ODOT: BP7)** % reduction in crashes = 35% • Crash Type = Bicycle • Crash Severity = All • Area = Urban or rural • Intersection = Signalized
14	Shared Use Paths	Both	Shared use paths are physically separated from motorized travel lanes and designed for bi-directional travel by both bicyclists and pedestrians.	Biking or walking along roadway (in or adjacent to travel lane)	Roadways with few intersections or driveways	Bike Safe Bicycle Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Install Shared Path (CMF ID: 9250)** % reduction in crashes = 25% • Crash Type = Vehicle/Bike • Crash Severity = Fatal, all injury, and property damage only (PDO) • Area = Urban • Intersection = None – roadway • Star Quality = 2/5
15	Road Diet (Roadway Configuration)	Both	A road diet typically converts an existing four-lane undivided roadway to a three-lane roadway with a two-way left-turn lane. This measure improves safety by providing fewer lanes for pedestrians and bicycles to cross. It can also better accommodate the needs of all road users by providing the space to install additional features such as refuge islands, bicycle lanes, wider sidewalks, etc.	Crossing roadway Failure to yield Biking along roadway (in or adjacent to travel lane) Walking along roadway (adjacent to travel lane)	Existing four-lane undivided roadways	FHWA Road Diets (Roadway Configuration)	**Converting 4-Lane Roadways to 3-Lane Roadways with Center Turn Lane (Road Diet) (CMF ID: 2841)** % reduction in crashes = 47% • Crash Type = All • Crash Severity = All • Area = Urban or suburban • Intersection = None – roadway • Number of lanes = 4 • Star Quality = 5/5

16	Pedestrian Hybrid Beacon (PHB)	Both	PHBs remain dark until activated by a pedestrian or bicyclist wishing to cross the street. The signal will turn to yellow flashing, then yellow steady to slow traffic. The next phase is red steady then red flashing while the person is crossing. The signal will then return to the dark phase allowing motorized traffic to resume.	Crossing roadway Failure to yield	Uncontrolled intersections Midblock Crossings Locations where gaps in traffic are not sufficient, or speed limits exceed 35 miles per hour Locations where pedestrians and bicyclists are crossing three or more lanes, or traffic volumes are above 9,000 AADT	FHWA Pedestrian Hybrid Beacons	**Install a Pedestrian Hybrid Beacon (PHB or HAWK) (CMF ID: 10591)** % reduction in crashes = 43% • Crash Type = Vehicle/Ped • Crash Severity = All • Area = Urban or suburban • Intersection = Not specified • Star Quality = 5/5
17	Roundabout	Both	Roundabouts are circular intersections designed to eliminate left-turns. They are designed for slow speeds and geometry which better facilitates motor vehicles yielding to pedestrians and bicyclists.	Crossing roadway Failure to yield Speed-related	Intersections Contexts with fewer lanes on the major and minor road are better suited for enhancing the safety of bike and pedestrian users. Roundabouts should be avoided near active, at-grade railroad crossings.	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Convert Intersection to Roundabout (CMF ID: 9156)** % reduction in crashes = 72% • Crash Type = All • Crash Severity = Fatal • Area = Not specified • Intersection = Not specified • Star Quality = 5/5 **Convert Intersection to Roundabout (CMF ID: 9157)** % reduction in crashes = 44% • Crash Type = All • Crash Severity = All injury • Area = Not specified • Intersection = Not specified • Star Quality = 5/5
18	Lighting and Illumination	Both	Appropriate quality and placement of lighting can increase comfort and safety by illuminating pedestrians and bicycles for approaching motorists.	Dark (not lighted)	Along both sides of streets At intersections At midblock crossings	PedSafe Pedestrian Safety Guide and Countermeasure Selection System (pedbikesafe.org)	**Install Intersection Lighting (CMF ID: 10993)** % reduction in crashes = 21% • Crash Type = All • Crash Severity = All • Area = Rural • Intersection = Not specified • Time of Day = All • Star Quality = 4/5

							Install Lighting (CMF ID: 7776) % reduction in crashes = 32% • Crash Type = All • Crash Severity = All • Area = All • Intersection = None – roadway • Time of Day = Night • Star Quality = 4/5
19	Tighter Turning Radii	Both	Tighter curb radii can improve sight lines between driver and pedestrian or bicyclist, shorten the crossing distance, bring crosswalks closer to the intersection, and reduce speeds of right-turning vehicles. Consider accommodating larger vehicles instead of designing for them.	Speed-related Failure to yield Turning conflicts	Intersections	WSDOT STEP - Action Plan	**N/A**
20	Traffic Calming	Both	A variety of techniques can be implemented to create horizontal or vertical deflection forcing motorists to slow down. Examples include speed tables/humps, speed cushions, chicanes, mid-block medians, pinch point/choker, neighborhood traffic circles, and narrowed lanes.	Speed-related	Any location where traffic speeds are higher than desired Locations where green infrastructure or sewer improvements are desired	NACTO Speed Management	**Area-Wide or Corridor-Specific Traffic Calming (CMF ID: 586)** % reduction in crashes = 11% • Crash Type = All • Crash Severity = Injury • Area = Urban • Intersection = None – roadway • Star Quality = 3/5 **Traffic Calming (CMF ID: 128)** % reduction in crashes = 32% • Crash Type = All • Crash Severity = Fatal, all injury, and PDO • Area = Urban • Intersection = None – roadway • Star Quality = 3/5

Education and Outreach Strategies

#	Strategy	Bike/Ped/Both	Description	Target Demographic	Reference Documents
1	Elementary-Age Child Pedestrian Training	Pedestrian	In-school curriculum that equips children with knowledge and practice to enable them to walk safely in environments with traffic and other safety hazards.	Elementary school-age children	NHTSA 2.1 Elementary-Age Child Pedestrian Training
2	Bike Safety Rodeo/Safety Town	Bicyclist	Cycling Skills Clinics, bicycle safety fairs, and rodeos are local events often run by law enforcement, school personnel, or other civic and	Elementary school-age children	NHTSA

			volunteer organizations. Their purpose is to teach children on-bicycle skills and how to ride defensively in traffic conditions.		1.4 Cycling Skills Clinics, Bike Fairs, Bike Rodeos
3	Bike Safety Education for Adults	Bicyclist	Bicycle safety education for adult bicyclists aims to improve knowledge of laws, risks, and cycling best practices, and to lead to safer cycling behaviors, including riding predictably and use of safety materials such as reflective clothing and helmets.	Adults	NHTSA 2.2 Bicycle Safety Education for Adult Cyclists
4	Media Campaigns	Both	Media campaigns may be designed to target any demographic and focus on any traffic safety issue, such as distracted driving, impaired driving, or sharing the road with VRUs.	Adults – or as designed	NHTSA 4.2 Share the Road Awareness Programs
5	Drivers' Education	Both	Pedestrian and bicycle safety-related training is intended to increase the sensitivity of drivers to the presence of pedestrians and bicyclists and their shared responsibility to prevent crashes and enhance the safety of all road users.	Motorists - Teens and older	NHTSA 4.5 Driver Training 4.1 Driver Training
6	Walking/Biking School Buses	Both	A program that uses volunteer adults, usually parents, to lead a group of students walking or biking along a specific route to and from school, collecting or dropping off children at their homes along the way.	Elementary school-age children	NHTSA 2.3 Walking School Buses

Programmatic or Policy Approaches

#	Program/Policy	Bike/Ped/Both	Description	Target Demographic	Reference Documents
1	Pedestrian Safety Zones	Pedestrian	Programs that increase cost-effectiveness of interventions by targeting education, enforcement, and engineering measures to geographic areas and audiences where significant portions of the pedestrian crash problem exist.	All pedestrians	NHTSA and FHWA 4.1 Pedestrian Safety Zones
2	Complete Streets Policy	Both	Complete streets are designed and operated to enable safe use and support mobility for all users. The concept of complete streets encompasses many approaches to planning, designing, and operating roadways and rights of way with all users in mind to make the transportation network safer and more efficient. These approaches may include sidewalks, bicycle lanes, bus lanes, public transportation stops, crossing opportunities, median islands, accessible pedestrian signals, curb extensions, modified vehicle travel lanes, streetscape, and landscape treatments.	All users (drivers, pedestrians, bicyclists, public transportation users, etc.)	US Department of Transportation Complete Streets
3	Safe Routes to School	Both	Community-based programs that educate about safe walking and bicycling behavior and safe driving behavior around pedestrians and bicyclists. The programs also include enforcement and engineering activities to improve traffic safety and reduce or eliminate risky elements of the traffic environment around schools.	Elementary school-age children	NHTSA 2.2 Safe Routes to School | NHTSA

Appendix E: Best Practice Design Resources

National Countermeasure Resources

- Federal Highway Administration (FHWA)
  - PEDBIKESAFE: Safety Guides and Countermeasure Selection Systems
  - Proven Safety Countermeasures | FHWA (dot.gov)
- National Highway Traffic Safety Administration (NHTSA)
  - Countermeasures That Work

Crash Modification/Reduction Factors

- FHWA
  - CMF Clearinghouse
  - CMF Clearinghouse
- Oregon Department of Transportation
  - Crash Reduction Factors

National Design Resources

- American Association of State Highway Transportation Officials (AASHTO)
  - Guide for the Development of Bicycle Facilities
  - Guide for the Planning, Design, and Operation of Pedestrian Facilities
- FHWA
  - Separated Bike Lane Planning and Design Guide
- National Association of City Transportation Officials (NACTO)
  - Designing for All Ages & Abilities
  - Urban Bikeway Design Guide
- U.S. Department of Transportation
  - Complete Streets | US Department of Transportation