APPENDIX B
STATE OF PRACTICE REVIEW

CITY OF SPEARFISH SAFETY ACTION PLAN

MEMORANDUM

SRF Project No. 19134

To: Jaymia Ecker
City of Spearfish

From: SRF Consulting Group, Inc.

Date: 10/15/25

Subject: City of Spearfish Safety Action Plan – State of Practice Review

Executive Summary

The State of Practice Review provides a robust foundation for the Spearfish Safety Action Plan (SAP), drawing from local, county, and state-level transportation planning documents. It highlights existing conditions, crash data, infrastructure gaps, and strategic recommendations that collectively inform a safer, more connected multimodal transportation network.

City of Spearfish Initiatives

- Comprehensive Plan (2025) – Emphasizes a shift from car-centric design to walkable, bikeable infrastructure with goals for traffic calming, multimodal integration, and sustainable expansion.
- Master Transportation Plan (2011) – Identifies high-crash intersections, pedestrian gaps, and outdated signal coordination; recommends targeted improvements and future corridor development.
- Parks & Recreation Master Plan (2022-2032) – Prioritizes trail connectivity and expansion.
- Traffic Impact Studies (Centennial Mountain & Miller Ranch) – Forecasts significant trip generation and recommends roundabouts, turn lanes, and pedestrian trail connections to mitigate congestion and improve safety.
- Engineering Design Standards (Section 200) – Mandates ADA-compliant sidewalks, dual access points for developments, and flexible design for hillside streets; formalizes Traffic Impact Study requirements.
- Corridor Studies (Jackson Blvd & Colorado Blvd) – Recommends roundabouts, medians, bike lanes, and enhanced pedestrian crossings to improve safety and traffic flow.

Lawrence County Contributions

- Master Transportation Plan (2024) – Projects will increase traffic near Spearfish and Deadwood. As such, coordination across jurisdictions is recommended, as well as ordinances for ATV/UTV regulation, four-foot shoulders, and the adoption of Traffic Impact Studies.

Statewide Safety Framework

- Strategic Highway Safety Plan (2024) – Sets goals to reduce fatalities and serious injuries statewide by 2029; focuses on lane departures, impaired driving, and vulnerable road users.
- Vulnerable Road User Safety Assessment (2023) – Identifies high-risk areas for pedestrians and cyclists; encourages Complete Streets policies and Safe Routes to School.
- US 85 Corridor Study (2024) – Evaluates crash-prone intersections and recommends access management, intersection redesigns, and Level of Service (LOS) improvements through 2050.
- US 14A Corridor Study (2012) – Evaluated needs on corridor from Spearfish Canyon Rd. to 27th St./I-90 Exit 14 area, including long term (2035) needs to address capacity and safety issues. Evaluated alternative improvements to the Exit 14 interchange in addition to the US 14A/Colorado Blvd corridor.

Strategic Takeaways:

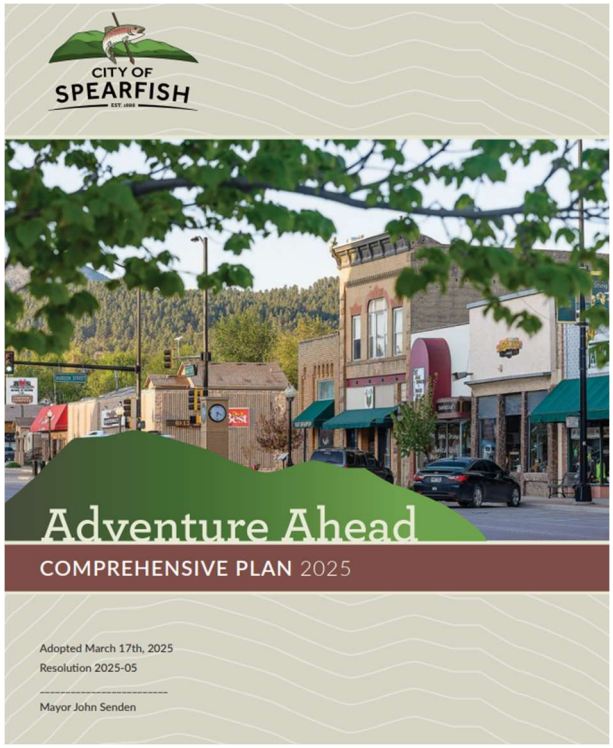
In addition to the plans and studies reviewed, SRF also reviewed the U.S. Department of Transportation's Safe System Approach. Strategic takeaways and best practices from this review of the Safe System Approach include the following:

- A target date for achieving zero or a significant reduction in roadway fatalities and serious injuries must be defined (includes leadership commitment to work towards goal).
- A successful SAP prioritizes locations for investments that improve the safety of all road users to guide future funding
- Transportation safety planning and policy is driven by robust data-driven processes to identify crash trends. Identifying characteristic crash profiles that contribute to the High Injury Network (HIN) is crucial to implementing strategies that will reduce or eliminate fatal and serious crashes.
- A successful SAP will align with the USDOT National Roadway Safety Strategy (NRSS), the Vision Zero Program, and the Safe System Approach.
- A successful SAP will champion projects and strategies that are informed by engagement conducted with stakeholders and community members.

Literature Review

What is The City of Spearfish Doing?

Spearfish Comprehensive Plan (2025)



The 'Adventure Ahead' 2025 Spearfish Comprehensive Plan serves as a vision for the City of Spearfish's 10 to 20-year development. This vision involves maintaining the city's roots in agriculture, mining, and forestry while building a resilient future focused on creating a walkable, bikeable and connected community.

As part of this vision, the city is looking to move the needle, shifting away from a car-centric layout and promoting the expansion of multimodal options, especially outside of the urban core. The plan looks to address outdated roadways and enhance connectivity and meet the strong demand for pedestrian and cyclist infrastructure. These pedestrian and cyclist enhancements include implementing more and safer bike lanes along with wider and safer sidewalks. Maintenance is highlighted to ensure these pedestrian and cyclist facilities remain in great condition for all users.

The City of Spearfish has listed a series of goals to promote safety, sustainability, resilience, fiscal responsibility, and multimodal needs. The goals are as follows:

1. Consistent Implementation of Road Design Standards
2. Smart Development of Capital Improvements Plan
3. Incorporate Multi-Modal Needs in Road Updates
4. Financially Sustainable Transportation Network Expansion
5. Downtown Traffic Calming
6. Balanced Parking Management
7. Increase Connectivity and Access
8. Recreation and Economic Development
9. Pursue and Expand Partnerships

Spearfish Area Master Transportation Plan (2011)

The 2011 Spearfish Area Master Transportation Plan (the Plan) is a long-range document that identifies key transportation issues and needs in the Spearfish area. It outlines feasible solutions designed to meet current (2011) and future traffic demands while maintaining appropriate design standards.

The Plan documents existing conditions in the area, highlighting high-risk crash locations and issues affecting pedestrians, such as gaps in the sidewalk and trail networks. It also identifies areas where bicycle facilities and amenities can be improved. Additionally, the Plan includes a list of the top intersections by number of crashes from 2006 to 2009, broken down by crash type.

Rank	Intersection	Number of Accidents 2006-2009			Comments
		Total	PDO	INJ	
1	27th Street / Colorado Boulevard	20	15	5	Mostly angle crashes. Closely spaced accesses and intersections exacerbate safety problems
2	Jackson / Main St.	19	13	6	No clear accident pattern
3	Hillsview Rd. / St. Joe	13	10	3	No clear accident pattern
4	Colorado Boulevard / US Highway 85	12	5	7	High severity, no clear pattern. SDDOT recommended that the location be monitored as the pace of surrounding development quickens.[1]
5	North Avenue / East Rushmore Street	12	6	6	No clear accident pattern
6	27th Street / 1st Street	12	8	4	No clear accident pattern
7	Main Street / Illinois Street	12	8	4	7 angle accidents suggest difficulty entering/crossing major street
8	Jackson / Canyon St.	11	5	6	No clear accident pattern
9	North Avenue / Ryan Road	11	8	3	8 angle accidents, due mostly to failure to yield. Difficult for traffic to cross North Avenue
10	Exit 14 EB ramps / 27th Street	11	9	2	6 rear-end accidents typical of signalized intersections
11	Old Highway 14 / North Avenue	10	4	6	8 angle crashes, very difficult large intersection to traverse for minor street traffic
12	Jackson Boulevard / 5th Street	10	7	3	1 pedestrian accident
13	Main St. / Hudson St.	9	5	4	1 pedestrian accident
14	Exit 14 WB ramps / 27th Street	9	7	2	6 rear-end accidents typical of signalized intersections
15	Maitland Road / Colorado Boulevard	9	7	2	5 angle crashes suggest difficult entry to major street (Colorado Boulevard). SDDOT review recommended trimming small trees to improve entering sight distance.[1]

[1] Roadway Safety Improvement (RSI) Report, Rapid City Region (SDDOT, April 2007)
[2] PDO = Crashes resulting in Property Damage Only
[3] INJ = Crashes resulting in Injury or Injuries

Although none of the top intersections experienced fatal crashes, three fatal crashes did occur during the four-year period: two along Interstate 90 and one on St. Onge Road.

The Plan also identifies several additional concerns, including:

- Safety issues at the Jackson Boulevard/University Street intersection
- The need for future east–west corridors throughout the area
- Poor signal timing and lack of coordination between signalized intersections citywide

- No safe pedestrian crossings along North Avenue near the Safeway
- The need for expanded transit service
- A lack of sidewalks and paths along Evans Lane

SPEARFISH AREA MASTER TRANSPORTATION PLAN RECOMMENDATIONS

As a result of a crash and operations analysis, as well as public input received, the Plan recommends the City of Spearfish require traffic impact studies from all proposed developments so that the requirements for internal roadways and impacts to the surrounding roadway system can be evaluated. The Plan further recommends that new development should occur only where existing transportation facilities are adequate or where necessary improvements will be made as part of the development project. In order to accomplish this task, the Plan implores the City of Spearfish to establish traffic impact requirements to identify the need for improvements created by future developments in order to meet adopted level of service standards.

Parks and Recreation Master Plan (2022-2032)

The City of Spearfish Parks and Recreation Master Plan 2022-2032 provides a strategic 10-year framework for the city park and recreation investments. This involved an evaluation of parks, programs, and facilities which served to shape the goals and strategies by the Department and City. This coupled with data from internal and external sources helped guide the construction of new parks, install new facilities and equipment, implement new programs, and expand or update existing parks, paths, and assets. Maintaining existing paths and trails is a key focus for the city as well.

A preferred initiative identified through a survey process was the Recreation Path which would expand existing pedestrian and bicycle facilities and additionally improve connectivity in Spearfish. The following potential projects were listed as the primary focuses:

- The Creekside-Evans connection should be the first expansion considered.
- Exit 14-Exit 17 connection should be the second expansion considered.
- Mountain Shadow-Colorado Boulevard connection(s) should be the third expansion considered. Bicycle Advisory Group (BAG) recommendations for expansion should be explored/investigated whenever possible and pursued whenever feasible.
- When and where feasible, amenities/improvements should be added to the existing path.

Section 200 – City of Spearfish Engineering Design Standards Streets

Section 200 of the City of Spearfish's Engineering Design Standards lays out the requirements for sidewalks, pavement design, street design, and cul-de-sac design. It also defines the City's standards relating to construction of traffic control, off-street parking, street lighting, and signing/striping. Drainage requirements for all areas within the city can also be found in this section.

Many of the specifications outlined in Section 200 follow the basic principles of civil design and engineering. When design information is not provided within the section, the document says that the "current edition of AASHTO Standards *A Policy on Geometric Design of Highways and Streets* or *Guidelines for Geometric Design of Low-Volume Roads* shall be used." Sidewalks and shared-use paths must meet ADA requirements, and all developments must have two access points and be designed for safety.

Within Section 200, Traffic Impact Studies (TIS) are noted as an important tool for the City to ensure that capacity and safety needs are sufficiently met. A TIS is required for any non-residential development proposal when trip generation during the peak travel hour is expected to meet or exceed 100 vehicles or 1,000 trips per day. For older non-residential developments, a TIS is necessary for rezoning applications as well as if additional access off an arterial street to an existing use is being requested. Section 200 even goes so far as to provide an outline for traffic consultants regarding how a TIS should be structured prior to the City's review.

Perhaps the most notable area of Section 200 that might vary from an average city's design standards document is the designation of a type of street categorized as "Hillside Access." Due to the City of Spearfish's unique geographic location, steep terrain is not an uncommon hurdle to development. As such, a hillside access street is a general term denoting a roadway that functions like a collector street only with more flexible design parameters. Thie hillside section allows for the design of a steeper road profile with a smaller width/section that may be used through these areas of steep terrain if access would not otherwise be attainable utilizing other city street sections. These types of sections must be approved for use by the City Engineer. A Hillside Access Road Plan & Profile Example are provided within Section 200.

Centennial Mountain Estates Traffic Impact Study (2022)

The Centennial Mountain Estates 2022 Traffic Impact Study (the Study) analyzes the impacts of a 585-acre proposed residential and commercial development called "Centennial Mountain" on the surrounding roadway network. It evaluates existing and future traffic conditions and factors in the potential traffic generated by the new development. As part of the existing conditions analysis, the study notes the dimensions, material, and functional class of roadways adjacent to the development. Next, it lists existing traffic volumes as well as the most recent five-year crash data (2016-2020) for the area.

According to this crash data, a total of 63 crashes occurred within the study area. Out of those 63 crashes, 16 involved a wild animal. With those 16 disregarded, a total of 47 crashes occurred within the study area with eight being segment related and 39 being intersection related. Only one intersection (Highway 85 / Colorado Boulevard) had an observed crash rate higher than the critical crash rate.

Overall, the development is anticipated to generate 10,700 trips per day with over 1,400 trips occurring during both the AM and PM peak hour upon full buildout. All intersections under existing traffic control and existing geometry with existing traffic appear to operate reasonably

well as no approach was estimated to operate worse than LOS C. Accounting for future traffic, the Study anticipates all intersections studied to operate favorably except for the intersections of Colorado Boulevard / Rainbow Road, Highway 85 / Colorado Boulevard, the Eastbound I-90 Exit 17 Terminal, and the Westbound I-90 Exit 17 Terminal.

CENTENNIAL MOUNTAIN ESTATES TRAFFIC IMPACT STUDY RECOMMENDATIONS

The Study's recommendations for key intersections around the Centennial Mountain development are as follows:

- Most local intersections, including Rainbow Road at Lightning Bolt Court and Seven Half Box Street, are recommended to remain single lane with westbound stop control.
- At Rainbow Road and 2 Bar T Street (East), turn lanes are warranted by 2032, with a single-lane roundabout advised by 2042 to improve safety and flow.
- Similarly, Colorado Boulevard at Rainbow Road should receive turn lane improvements by 2027 and 2032, with a roundabout recommended by 2037.
- For intersections along Highway 85, including Exit 17 terminals and 2 Bar T Street (West), the South Dakota Department of Transportation (SDDOT) will conduct a separate corridor study to assess long-term improvements and potential connections.

Miller Ranch Residential Development Traffic Impact Study (2021)

The Traffic Impact Study for the Miller Ranch Residential Development provides an evaluation of the impacts of the proposed residential and retail commercial development. The proposed project consists of:

- 274 single family homes
- 151 townhomes
- 92 apartment units
- 25,000 square feet of retail commercial

The development is expected to generate 329 trips during the weekday a.m. peak hour, 491 trips during the weekday p.m. peak hours, and 5,136 weekday trips. By 2040, some movements (particularly the northbound left turn at East Colorado Boulevard/Sandstone Hills Drive) are projected to experience congestion. This will require future monitoring and potential upgrades such as a traffic signal or a roundabout. The Traffic Impact Study indicates that both access locations for the development provide adequate intersection sight distance, and no sight line issues are anticipated as a result of the project.

MILLER RANCH RESIDENTIAL DEVELOPMENT TRAFFIC IMPACT STUDY RECOMMENDATIONS

Turn Lane Warrants

While crash data shows minimal safety concerns at key intersections, turn lane improvements are recommended at three locations:

- East Colorado Boulevard/Sandstone Hills Drive – eastbound right turn lane = 300'
- East Colorado Boulevard/Christensen Srive – eastbound right turn lane = 300'
- Christensen Drive/development access – southbound right turn lane = 200'

Pedestrian & Bicycle Needs

The Traffic Impact Study notes a paved trail existing on the north side of East Colorado Boulevard. This trail extends east of Christensen Drive and west of Sandstone Hills Drive. A review of the Pedestrian and Bicycle Master Plan in the Spearfish Area Master Transportation Plan does not show any additional trails or pedestrian facilities in the area. To provide safe and adequate pedestrian and bicycle facilities, the Traffic Impact Study recommends the installation of sidewalks and trails throughout the development and notes potential trail connections at Christensen Drive and Sandstone Hills Drive. If trail connections were to be placed at these locations, crosswalks with adequate signing and striping would be necessary.

Stone Ridge Commons Development Traffic Impact Study (2024)

The Stone Ridge Commons Development Traffic Impact Study (the Study) evaluates the potential traffic impacts of a proposed mixed-use development bounded by Paramount Drive to the north and Platinum Drive to the south. The study area includes key intersections along 27th Street, Paramount Drive, 1st Avenue, and Platinum Drive. Existing conditions show that all intersections currently operate at acceptable levels of service (LOS C or better), although the 27th Street/1st Avenue intersection experiences notable congestion during the p.m. peak hour due to high westbound left-turn volumes, primarily influenced by nearby commercial activity.

As part of the Study, two development scenarios have been analyzed with "Concept B" being selected for traffic impact modeling due to its higher trip generation. Concept B includes townhomes, multi-family housing, a hotel, medical office, and retail pads, generating an estimated 5,417 daily trips. Traffic forecasts were developed for 2026 (retail opening) and 2034 (full build-out), incorporating a 1.5 percent annual background growth rate. Without signal timing adjustments, the 27th Street/1st Avenue intersection is projected to degrade to LOS D by 2026, with significant queueing issues. By 2034, with optimized signal timing, all intersections are expected to maintain LOS C or better. However, westbound queues at 1st Avenue may still intermittently block access to adjacent businesses.

STONE RIDGE COMMONS DEVELOPMENT TRAFFIC IMPACT STUDY RECOMMENDATIONS

The Study includes several key recommendations aimed at maintaining acceptable traffic operations as the area grows. One of the primary recommendations is to implement signal timing updates at the intersection of 27th Street and 1st Avenue upon the opening of the retail components in 2026. Without these updates, the intersection is projected to operate at an unacceptable Level of Service (LOS D) during the p.m. peak hour, with significant queueing that could block access to nearby businesses. With optimized signal timing, the intersection is expected to return to LOS C, mitigating delay and queueing issues.

For long-term conditions in 2034, the Study suggests monitoring signal operations and considering additional modifications if needed. These could include constructing dual westbound left-turn lanes or implementing split signal phasing at the 27th Street/1st Avenue intersection to address potential access blockages caused by extended queues. The Study also recommends adding pedestrian and bicycle facilities, ensuring proper sight distance, and aligning traffic controls with MUTCD standards. These improvements aim to enhance multimodal connectivity, safety, and internal circulation within the development.

Jackson Boulevard Corridor Study (2017)

The purpose of the City of Spearfish's Jackson Boulevard Corridor Study from University Street to 10th Street (the Study) was to create typical cross-sections and understand geometric and traffic control needs along Jackson Boulevard. These existing conditions provide context for improvements that can enhance current and future capacity and safety needs.

The Study notes that a capacity analysis was performed for the existing study intersections. This capacity analysis indicated that signalized intersections within the study area function at a Level of Service (LOS) of C or better in both peak travel hours. All movements at unsignalized intersections also operate at a LOS of C or better during peak hours. As part of the Study, Year 2040 peak hour volumes at study intersections have been generated using an assumed growth rate of 1.0 percent. This has resulted in a 1.27 growth factor for volumes along the corridor. Utilizing the 2040 peak hour volumes, a capacity analysis for study intersections notes that the signalized intersection of Main Street & Jackson Boulevard is expected to operate at LOC C or better during peak hours. All movements at unsignalized intersections are expected to operate at LOS D or better.

Crash data throughout the corridor has been collected and analyzed for the Study. This crash data indicates a total of 86 crashes recorded between 2013-2016. Of those 86 crashes, there were zero fatalities, four injuries, 71 property damage only crashes, six wildlife crashes, and five uncategorized crashes. The locations of both the highest number of crashes and crash rates were Main Street, Canyon Street, 3rd Street, and 10th Street. However, no single intersection shows a crash rate over the critical crash rate.

JACKSON BOULEVARD CORRIDOR STUDY RECOMMENDATIONS

Intersection Control & Lane Configuration

- 10th Street – The Study recommends a roundabout at the 10th Street intersection only if the geometry could be refined in such a way that minimally impacts adjacent properties.
- Main Street – The Study recommends a center median be constructed to provide access control and traffic calming. The gas station driveway on the north side of Jackson Boulevard located approximately 70 feet west of Main Street should be eliminated as it

does not meet SDDOT urban spacing requirements. If it is not eliminated, then access should be limited to a Right-In, Right-Out (RIRO).

- Canyon Street – The Study recommends side street lanes be a left-turn lane and shared right-thru lane in each direction with the bike lane being reintroduced on the west leg of the intersection.
- Ames/St. Joe Streets – Instead of one general recommendation for this intersection, the Study proposes three different design alternatives: Full movement for both streets, full movement for St. Joe Street and Ames Street as Three-Quarter, and Ames Street as a roundabout.
- University Street – The Study recommends a two-way, stop controlled intersection via the elimination of the stop control for the west leg.

Access Management

For access management, the Study recommends a raised median where possible throughout the corridor along with the elimination of driveways within the functional area of intersections, especially signalized intersections.

Traffic Calming

The Study recommends the construction of nodes[1] at intersections where possible throughout the corridor as well as chokers[2] in blocks that would otherwise be uninterrupted by on-street parking. Enhanced conspicuity for pedestrian crossings using lane markings and signage at State Street, Main Street, and 5th Street is recommended.

Bike & Pedestrian Accommodations

ADA-compliant sidewalks and curb ramps are recommended to be built throughout the corridor, with on-street bike lanes also recommended. Direct connections to Spearfish Canyon Trail are also encouraged.

Colorado Boulevard Corridor Study (2023)

The Colorado Boulevard Corridor Study (the Study) is an evaluation of Colorado Boulevard from 27th Street to US 85. Colorado Avenue, once an east-west connector, which now serves as a primary route to developing areas along the south end of the corridor. The Study identifies and recommends future projects that properly address increased traffic volumes as well as projects which improve pedestrian and bicycle facility connectivity between the eastern extent of the existing bike path and the new sports complex near US 85.

[1] A curb extension into the street or on-street parking area at an intersection.
[2] A curb extension into the street or on-street parking area at the mid-block or away from intersections.

Various build alternatives are analyzed within the Study and are focused on meeting the future traffic operations of the city. Comparative costs, right-of-way (ROW) acquisitions, and potential environmental impacts are also analyzed and accounted for along with traffic safety, bicycle and pedestrian considerations, and stakeholder/public input.

As part of the Study, a traffic operations analysis was conducted in the study area. This analysis found that a sharp increase in east/west volumes is expected due to planned developments in the corridor as well as limited alternate east/west routes. This analysis also found that Rainbow Road is an important link across I-90 in local network connectivity due to continued growth on the north and south side of Colorado Boulevard. Due to the previously mentioned development, traffic operations at major intersections will slow, with many having a Level of Service (LOS) of D or F by 2035. The LOS for these intersections will further decline to LOS F by 2050. Many of the unsignalized intersections, including Colorado Boulevard & Maitland Road and Colorado Boulevard & Rainbow Road will have met or exceeded signal warrants by 2029/2030.

In addition to the traffic operations and signal warrant analysis that was conducted, crash data for years 2017 through 2021 was also gathered for the Study. Analysis of this crash data revealed that angle crashes were the most frequent intersection crash type, consisting of approximately 59 percent of the crashes at these intersections. The intersection of Colorado Boulevard & 27th Street and the intersection of Colorado Boulevard and US 85 exhibited crash rates greater than or equal to 70 percent of the critical crash rate, indicating the need for additional safety improvements at these intersections.

COLORADO BOULEVARD CORRIDOR STUDY RECOMMENDATIONS

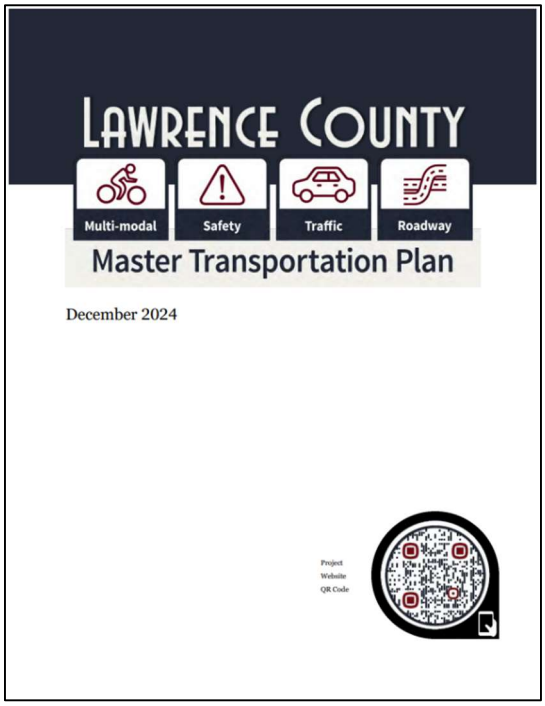
The Study notes that there are several safety improvements that could be implemented within the corridor which would assist with reducing crashes. These include the installation of roadway lighting, the addition of raised medians, the relocation of driveways to minor streets, the consolidation of driveways, and the adequate spacing of future driveways. Additional recommendations include signal optimization at signalized intersections and the reconstruction / reconfiguration of the 27th Street intersection, the Heritage Drive intersection, the Maitland Road intersection, and the Rainbow Road intersection when acceptable levels of service are no longer obtainable. Alternative configurations include roundabouts, traditional signals with turn lanes and no raised median, as well as continuous green T intersection a right-in right-out approach. The type of alternative chosen should be selected after careful consideration and study.

In addition to the previous recommendations, the Study also proposes various multimodal facility concepts as a direct result of the public input received regarding the need for a recreation path extension from 27th Street to US 85. The Study highlights the need for pedestrian / bicyclist enhancements needed at the crosswalks of the 27th Street Intersection as well as the desire for

grade separated pedestrian crossings – specifically pedestrian underpasses at auxiliary path connections.

What is Lawrence County Doing?

Lawrence County Master Transportation Plan (2024)



The Lawrence County Master Transportation Plan (MTP) seeks to collaborate on current and future growth projections with strategies for how to achieve the County's safety and mobility priorities. Within the MTP, the City of Spearfish is highlighted as an area that is experiencing growth within its boundaries and along its periphery. The MTP talks about the potential for Spearfish and other larger municipalities to start to annex additional land within the County to provide for their future development needs. With this expectation of increased traffic on the County Road system, the MTP calls attention to the need for coordination of jurisdictional transitions between the County, the municipalities, and the SDDOT to be prioritized.

Current and projected daily traffic volumes for the County are underscored within the MTP, with the majority of traffic volume increases expected to occur near the cities of Spearfish and Deadwood. In addition to daily traffic volumes, the MTP also produces an array of crash data for the County. From 2018 to 2022, there were 2,016 crashes reported, including 137 crashes that resulted in an incapacitating injury and 26 crashes that resulted in a fatality. County-wide there were a total of 1,685 single-vehicle crashes which accounted for 83.6 percent of the total crashes (single vehicle crashes occurred most frequently within the Town of Lead, as well as Whitewood and along Interstate 90, and Highway 14A). Of the single-vehicle crashes, 1,010 (59.9 percent) occurred along a roadway segment (non-junction related). One particularly unique section of the MTP specifically speaks to the recurrence of wild animal crashes along some corridors which are used to access Spearfish, Deadwood, and Whitewood.

Throughout the MTP it is noted that the region's topography and location near outdoor recreation points of interest such as the Black Hills National Forest makes the area among the best locations for all-terrain vehicles (ATV), Recreational Off-Highway Vehicles (ROV, and utility-terrain vehicles (UTV). Due to the prevalence of these vehicles in Lawrence County, the MTP notes that there has been expressed concern about operators not obeying traffic laws, trespassing private property, and creating dust on gravel roads. As such, the South Dakota Department of Transportation (SDDOT) has initiated a study, *Development of Strategies for Shared Use of Roadways between ROV/ATV and Typical Highway Vehicles*, to address the issues.

LAWRENCE COUNTY MASTER TRANSPORTATION PLAN RECOMMENDATIONS

The concluding chapters of the MTP recommend a slate of short-term and long-term transportation projects, as well as recommendations for strategies and ordinances to make County roadways safer for all users. The priority list of projects can be found on pages 116-123 of the MTP. Recommendations for strategies and ordinances are as follows:

- The County should write a new ordinance to regulate UTV/ATV traffic.
    - The County should incorporate findings from the SDDOT's ROV/ATV study.
- The County should define a Traffic Impact Study in the County Code.
    - The example provided within the MTP appears to be the same definition and requirements of a TIS as defined by Section 200 of the City of Spearfish.
- The County should adopt four-foot shoulders when ROW allows.
- The County should continue to support improvements along State and US highway systems to maintain existing and future designated freight routes.

What is the State Doing?

South Dakota Strategic Highway Safety Plan (2024)

The South Dakota Strategic Highway Safety Plan (SHSP) seeks to reduce fatalities and serious injuries across all public roads in South Dakota, including state highways, county and township roads, city streets, and roads on tribal lands. The overarching goals of the SHSP are to reduce traffic deaths to 100 or fewer by 2029 and reduce traffic-related injuries to 400 or fewer by the same year. According to the SHSP, the majority of fatal and serious injuries in the state take place on rural roads and along straight roadway alignments. Crashes resulting in fatalities and injuries frequently occurred from June through September, which the SHSP notes is related to increased tourist traffic during the summer months (a particularly busy time for municipalities which rely on outdoor recreation like the City of Spearfish).

Throughout the SHSP, strategies and data are tied to one of nine emphasis areas. These emphasis areas include the following:

- Lane Departures
- Unbelted Vehicle Occupants
- Drug & Alcohol-Related Driving
- Intersections
- Aggressive & Speed-Related Driving
- Motorcycles (South Dakota is home of the annual Sturgis Motorcycle Rally which saw 537,459 vehicles in 2025)
- Older Drivers

- Young Drivers
- Distracted Driving

The SHSP strategies for these Emphasis Areas range from intersection realignments to the installation of median cable barriers for high volume locations with crash histories identified as "high-risk" for median crossover-crashes. All strategies consider the Four Es of Safety, Safe System Approach Elements which have been championed by the USDOT in recent years, and the Safe System Roadway Design Hierarchy. While implementation of the Emphasis Areas' key strategies is primarily being championed by the South Dakota Department of Transportation (SDDOT) and South Dakota Department of Public Safety (SDDPS), other key partners such as Metropolitan Planning Organizations (MPO), municipalities, cities, tribes, and counties are expected to assist in the effort as well.

South Dakota Vulnerable Road User Safety Assessment (2023)

The South Dakota Vulnerable Road User Safety Assessment (VRU Safety Assessment) is an addendum to the State's previous SHSP and is within the appendix of the newest SHSP. The objective of the VRU Safety Assessment is to use data-driven approaches to identify high-risk areas in the State for Vulnerable Road Users (VRUs). VRUs are defined as non-motorists who are either walking, biking, or using a personal conveyance device. The term also includes highway workers on foot in a work zone. According to the VRU Safety Assessment, VRU fatalities made up 9.7 percent of all South Dakota roadway fatalities between 2018 and 2022.

The majority of the VRU Safety Assessment focuses on quantitative analysis of crash data and trends in the state before summarizing the outcomes of consultation meetings between SDDOT and stakeholders from "high-risk" counties. These stakeholders were divided into two groups based on geographic location east and west of the Missouri River (i.e. East River and West River). Lawrence County, where the City of Spearfish is located, was among the stakeholders who attended the West River Consultation. Discussion at that meeting included safety concerns with local bike groups and bike races, challenges in adding shoulders to give cyclists a place to ride, and upcoming plans for pedestrian improvements in Spearfish.

The concluding chapters of the VRU Safety Assessment highlight existing plans, programs, and laws available in South Dakota that relate to VRUs. These chapters also present a variety of "strategy improvement" ideas including road diets, additional right-of-way acquisitions, and shared space options for people biking and walking along with people driving. Ultimately, the VRU Safety Assessment encourages municipalities, counties, and tribal governments to adopt Complete Streets policies while also creating Pedestrian Safety Zones and Safe Routes to School.

US 85 Corridor Study (2024)

The US 85 Corridor Study (the Study) evaluates existing and anticipated future conditions to identify potential improvements to the study corridor and associated intersections. The Study identifies both short and long-term improvements through the year 2050. Objectives of the Study are the following:

- To determine an ultimate reconstruction recommendation for the intersection of US 85 & E. Colorado Boulevard/St. Onge Road.
- To determine potential intersection configurations for study area intersections.
- To determine the need for additional through and turning lanes along the corridor.
- To develop an access management strategy for the corridor.
- To determine project limits, prioritization, and timing for construction within shortened construction seasons.
- To create environmental scan documentation.
- To create final products for use by the South Dakota Department of Transportation (SDDOT), City of Spearfish, City of Deadwood, and Lawrence County which will guide implementation of recommended improvements.

Based on discussions as part of the City of Spearfish's Comprehensive Plan and Long Rage Transportation Plan updates, future growth and development is noted in the Study as having the potential to lead to the expansion of the local roadway network. This includes but is not limited to a potential east-west roadway along or near the south edge of the existing Elkhorn Ridge RV Resort, resulting in an intersection with US 85 at the location of an existing median access opening. The Study highlights the fact that the resulting spacing between this intersection and the Colorado Boulevard / St. Onge Road intersection would be approximately one-half mile. The resulting spacing between this intersection and the median opening at the Elkhorn Ridge RV Resort driveway would be one-quarter of a mile and would thus require an exception to SDDOT's access management criteria.

A review of crash history for the corridor is included in the Study and shows a total of 203 crashes within the study area. Of these 203 crashes, 53 took place near one of the 10 study intersections. The remaining 150 crashes occurred along highway segments within the study corridor but between intersections. The intersection of US 85 & E. Colorado Boulevard/St. Onge Road experienced 32 crashes – the only study intersection with an average of one or more crashes per year. The Study notes that the number of crashes at this intersection declined substantially after the implementation of AWSC in 2022.

As part of the Study, a Level of Service (LOS) analysis was conducted for project area intersections and corridor segments. Utilizing forecasted traffic numbers for 2027, all but four intersections within the corridor are expected to operate at LOS A during peak travel times. The four intersections noted as experiencing LOS worse than A include the following:

- US 85 intersections at the Exit 17 westbound ramp terminal – LOS F during both AM and PM peak times
- E. Colorado Boulevard/St. Onge Road – LOS F during both AM and PM peak times

- US 85 intersection at the Exit 17 eastbound ramp terminal – LOS B during AM peak time and LOS F during PM peak time
- US 85 & US 14A – LOS C during AM peak time and LOS F during PM peak time (anticipated to operate at LOS A when operated under signal control).

A second LOS analysis was conducted forecasting 2040 traffic numbers. This LOS analysis notes that all intersections previously mentioned are anticipated to worsen "beyond" the deficiencies previously described in the horizon year 2027 traffic operations analysis.

US 85 CORRIDOR STUDY RECOMMENDATIONS

Several recommendations can be found within the Study for both near-term, mid-term, and long-term implementation. These recommendations include a number of build alternatives and commentary on these alternatives for intersections within the study area.

For the Duke Parkway Intersection, the Study recommends that any build alternative be based on the future Exit 17 interchange configuration and that the function of the intersection be coordinated in function, design, and operation. Alternatives recommended for the Duke Parkway Intersection include the following:

- No Build
- Stop Control with Northbound Left-turn Lane
- Signalization with Northbound Left-turn Lane
- Roundabout

For the E. Colorado Boulevard / St. Onge Road Intersection the Study notes that improvements at the location are being planned by SDDOT for year 2028 and that alternatives include signalization, reconfiguration into a Reduced Conflict Intersection (RCI), and a roundabout.

For the Elkhorn Ridge RV Resort Driveway Intersection, the Study highlights the fact that existing traffic volumes satisfy criteria for a southbound right-rune lane and traffic conditions should be monitored to determine when additional intersection improvements are needed. A southbound right-turn lane is recommended as a potential alternative, as well as a reconfiguration into an RCI.

Similar recommended build alternatives are proposed for other intersections throughout the corridor. Ultimately, the Study notes that safety improvements will more than likely be necessary as traffic increases. In addition to intersection reconfigurations, other improvements, such as intersection lighting and access control, are needed. Multimodal facilities, including a way for bicyclists to cross the highway, will be necessary although the Study warns against the implementation of a bike facility within or immediately adjacent to the highway.

As a final note, the Study points out that from 2017 to 2021 there were 90 animal-related crashes reported within the limits of the study area. More than half of these crashes occurred between the Crook City Road/Pendo Road and US14A intersections with the majority of the crashes involving

deer. As future projects along US 85 are developed, mitigation strategies such as highway fencing are recommended. The Study notes that if fencing is ultimately recommended at a mitigation strategy, "it should be recognized that the associated design at driveway access openings will need to minimize the occurrence of animals circumventing the fencing and positioning themselves on the highway side of the fencing."

US Highway 14A Corridor Study (2012)

The US Highway 14A Corridor Study (the Study) was initiated by the South Dakota Department of Transportation (SDDOT) in 2009 to identify the needs of the Corridor and make recommendations for future infrastructure improvements. The study area includes portions of the City of Spearfish and unincorporated Lawrence County. Specific sections studied include the I-90 Exit 14 Interchange and 27th Street and US Highway 14A (US 14A or Colorado Boulevard) between Spearfish Canyon Road and Heritage Drive.

The Study notes that most of the roadway will require replacement between 2025-2035. At the time of the study, 27th Street carried approximately 11,000 vehicles per day through the interchange area, and Colorado Boulevard carried approximately 8,000 vehicles per day. Future traffic volumes for 27th Street are anticipated to more than triple by 2035, with traffic volumes for Colorado Boulevard nearly doubling in that same time period. Operational analysis of Year 2035 traffic volumes and the No Action interchange configuration show that the 27th Street intersections with the south ramp terminal intersection and Colorado Boulevard are anticipated to operate poorly by the Year 2035 as individual intersections. Similarly, movements at the intersection of 27th Street with Platinum Drive will also operate poorly, particularly the eastbound left-turn movement from Platinum onto 27th Street.

In addition to an operations analysis of intersections studied, a traffic safety study was also initiated as part of the Study. Crash data collected from 2006 to 2009 shows a total of 26 crashes at two closely spaced signalized intersections south of Exit 14. These crashes are likely due to how close the intersection spacing is at these locations. The intersection of 27th Street and Colorado Boulevard had the greatest number of crashes reported (12). Six of these crashes involved left turns. Other intersections experienced fewer collisions, with the next highest concentration in the midblock section between 26th Street and Christensen Drive, with left turns representing one half of the collisions. The greatest number of reported collisions along any mid-block segment was the area between Country Club Drive and Stone Gate Drive, which had eight reported crashes in the four-year period. Half of the collisions along this segment were deer collisions.

US HIGHWAY 14A CORRIDOR STUDY RECOMMENDATIONS

Due to projected traffic congestion, as well as the projected level of service for infrastructure in the study area, the Study recommends that a single-point I-90 under shifted bridge build alternative (the preferred build alternative) be selected for construction. The Study discusses the pros and cons of the various build alternatives proposed, including that of the preferred build alternative. It was found during the final screening of alternatives that the preferred build alternative would allow the study intersections to operate at a level of service (LOS) C or better

during peak hours. It was also found that the preferred build alternative would match existing grades, and the off-ramps on an uphill grade would assist in deceleration leaving I-90. A concern frequently mentioned by members of the public and project stakeholders was the need to minimize the duration of construction activities. The analysis of alternatives determined that the preferred build alternative's estimated construction schedule is 18 months with an additional 100 days to account for the complexity of a temporary bridge and switching mainline and crossroad grades.

In addition to the construction of a single-point interchange, the Study also recommends that the US Highway 14A Corridor be maintained as mix of two, three, and four-lane segments and that roundabouts be constructed at each major intersection independently as signal warrants are met at each of the major intersections, or as a group should pavement conditions warrant reconstruction. In support of these recommendations, the Study notes the importance of access management and provides a draft Memorandum of Understanding (MOU) between the City of Spearfish and the State of South Dakota concerning this topic.

What Are Other National Best Practices?

Integrating the Safe System Approach with the Highway Safety Improvement Program

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

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

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

- Ensuring that road users comply with traffic rules and are not under the influence of drugs or alcohol.
- Improving roadway design through measures such as clear zones, roundabouts, and functional class delegation.

- Setting appropriate speed limits to reduce the risk of accidents and mitigate their impact.
- Encouraging the use of safer vehicles with active safety features and technology that can interact with the transportation system.
- Ensuring timely emergency services and effective crash reporting practices.

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